

Strategic Doing: A Strategy Model for Open Networks

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Strategic Doing: A Strategy Model for Open Networks

A Dissertation Presented to the
University of the Sunshine Coast
School of Business and Creative Industries
in fulfillment of the requirement for the degree of Doctor of Philosophy

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March, 2021

Abstract

This thesis presents a new model for developing and implementing strategy in open networks. Most of the strategy literature, indeed virtually all of it, addresses the challenge of one organization attempting to survive and thrive in the world. Over the last 30 years, since the 1990s, strategic management has had to make two big adjustments. First, the environments in which we operate have become far more turbulent. Second, our organizations have become more porous, more networked, and less hierarchical. The enormous impact of the Internet has accelerated both trends.

My practice and research focuses at the intersection of these two trends. The challenge can be defined this way. First, can an open, loosely connected network, operating outside the boundaries of any single organization and with no pre-existing routines of governance, form and execute a strategy? If so, how? Second, can these open networks strategically develop solutions to complex, wicked problems? Again, if so, how?

This thesis brings a practitioner's perspective and sensibilities to these questions. Knowledge and learning now drive strategy. Scholars focus on generating knowledge through their research and then sharing this knowledge with practitioners. Less recognized within the university, experienced practitioners generate useful knowledge in what Donald Schön called the "swampy lowlands" of their practice. They can then turn to existing scholarship to explain why their actionable knowledge works.

Through the lens of pragmatism and reflective practice, this thesis reports on over two decades of action research projects. These initiatives explored the challenges of developing and implementing strategy to address complex challenges in open networks: from violence-torn neighborhoods in Flint to NASA research centers. My work points to a neglected area of research and practice: the strategic conversation. Through my practice, I uncovered an underlying structure and trajectory to these conversations. A simple set of rules can guide strategic conversations, unleash human ingenuity, and lead to new solutions to complex, wicked problems. I have distilled these rules into the strategy practice of Strategic Doing. This thesis provides an account of my journey.

Author's Declaration

The work contained in this thesis has not been previously submitted to meet requirements for an award at this or any other high education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

Edward F. Morrison

March 2021

Acknowledgements

This thesis comes at the end of a career, so it is payback time, and the list is too long for this section. Instead, I am reaching out with individual expressions of gratitude. In Loonshots Safi Bathcall tells the story of Judah Folkman, who discovered a completely new approach to treating cancer. In Folkman's long quest, he gives special mention to the "Spouse Activation Factor" that kept him going through many "false fails". So it is here. Without the support of my wife, Bei, none of this work would have been possible. Bei's story of becoming a doctor in the first medical class to graduate after the Cultural Revolution in China inspires us in her family. In 2000 or 2001, I visited Bei's lab, and I saw a signaling pathway poster, a series of chemical reactions that control a cell function. A flash of insight: her work and my work were closely connected. As a molecular biologist researching cancer, she was trying to understand complex cellular networks that were so small she could not see them. I was doing much the same, except that my networks were also invisible and were extensive social networks. It dawned on me: trying to figure out a new model for strategy in open, loosely connected networks is not easy. It's like molecular biology.

People at three extraordinary universities — Purdue University, the University of the Sunshine Coast, and the University of North Alabama helped bring this work to light: Martin Jischke, Vic Lechtenberg, Sam Cordes, Peggy Hosea, Scott Hutcheson, Ken Burbank, Duane Dunlap, Mike Hefferan, Phil Graham, Anna Potter, Greg Carnes, Ross Alexander, Janyce Fadden, and Liz Nilsen.

My last salute goes to my older brother, Hunter. For over twenty years as city planning director, Hunter led to comeback of our hometown. He built the stage set for today's Cleveland, including the improbable landing of the Rock' n Roll Hall of Fame. He deeply understands the complexities of operating in the "swampy lowlands" of professional practice. He continues to trigger my thinking with his insights. When I asked him how he managed to inspire others in the dark days following the city's bankruptcy, his answer was simple and direct: Focus on doing the doable. Every day.

Wise words.

Publications, Courses and Award

Book:

Morrison, E., Hutcheson, S., Nilson, E., Fadden, J., & Franklin, N. (2019)
 Strategic Doing: Ten Skills for Agile Leadership, Wiley.

Journal:

- Morrison, E., Barrett, J. D., & Fadden, J. B. (2019). Shoals Shift project: An ecosystem transformation success story. Journal of entrepreneurship and public policy 8(3) 339-358.
- Morrison, E., (2018). Three perspectives on regional economies: A convergence on ecosystems and platforms, Australasian journal of regional studies 24(3) 369-400.

Book chapter:

 Morrison, E. (2015). Network-based engagement for universities: leveraging the power of open networks, Carlot, C., Filloque, J., Osborne, M., & Welsch, P., (eds.), The Role of Higher Education in Regional and Community Development in the Time of Economic Crisis, (National Institute of Adult Continuing Education, 2015).

Peer-reviewed conference publications:

- Morrison, E. & Knowles, R. (2020) Strategy and complexity: two models for guiding strategy in complex community environments. Journal on Policy and Complex Systems, Fall, 2020.
- Nilsen, E., Morrison, E. F., Ascencio, R., & Hutcheson, S. (2017). Getting "there": Understanding how innovation and entrepreneurship become part of engineering education. American Society for Engineering Education, Paper ID, 18624, 25-28, 28 June 2017.

Courses

- Collaborative Leadership and Agile Strategy, School of Engineering Technology, Purdue University, 3 credits, ENGT 507 (in person) Coauthored with Scott Hutcheson.
- Strategic Doing Workshop Leader Certification, 10 weeks, Center for Learning and Professionals Development, University of North Alabama, (on-line). Co-authored with Elizabeth Nilsen and Janyce Fadden.
- Ten Skills for Agile Leadership, 7 weeks, Center for Learning and Professionals Development, University of North Alabama, (on-line). Coauthored with Elizabeth Nilsen and Janyce Fadden.
- Introduction to an Agile Economy, 3 weeks, Center for Learning and Professionals Development, University of North Alabama, (on-line).

Award:

• Strategic Doing: Ten Skills for Agile Leadership selected as a 2019 Best Business Book, Soundview Magazine. Co-authored with Scott Hutcheson, Elizabeth Nilsen, Janyce Fadden and Nancy Franklin.

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Key words

- Collaboration
- Dynamic capabilities
- Entrepreneurial ecosystem
- Open strategy
- Platform
- Reflective theory
- Reflective practitioner
- Strategy-as-practice
- Strategic doing

List of abbreviations

AEM-Cube: The AEM-Cube measures three important dimensions of change and growth:

Attachment, Exploration and Managing Complexity. These three dimensions describe an individual's natural and unique contribution to change and growth. (Robertson& Schoonman, 2013).

ANZRSAI: Australia New Zealand Regional Science Association International.

CRASP: Action research that is Critical, Reflective, Accountable, Self-evaluating, and Participative, a model proposed by Zuber-Skerritt and Fletcher (2007).

EDEN: Economic, Development, Education and Entrepreneurship Network.

ESHIP: Entrepreneurship.

PCRD: Purdue Center for Regional Development.

SBIR: Small Business Innovation Research program.

SD: Strategic Doing

SECI: Four modes of knowledge conversion: Socialization, Externalization, Combination, Internalization (Nonaka et al., 2000).

WIRED: Workforce Innovation in Regional Economic Development, an initiative of the U.S. Department of Labor.

Chapter 1: Introduction

[A]s the premium on innovating grows, especially for wicked problems—those with incomplete, contradictory, or changing requirements—more organizations are tapping the capabilities of new and far-flung partners. That such cross-industry collaborations can generate radical innovations is clear. How to build and run them is another matter.

Amy Edmondson Wicked Problem Solvers Harvard Business Review, 2016

We need new metaphors that better capture the challenges of making strategies both real and realizable, metaphors that bring life to the human dimension of creating new futures for institutions, that move us beyond the sterility of traditional approaches to strategic planning in large organizations.

Jeanne Liedtka In Defense of Strategy as Design California Management Review, 2000

[S]trategy answers two questions: "Where do you want to go?" And "How do you want to get there?"

Kathleen Eisenhardt Strategy as Strategic Decision Making Sloan Managment Review, 1999

1.1 Summary

This Thesis by Publication explores how strategy practitioners can meet complex, adaptive challenges by developing strategies in open, loosely joined networks. The research defines and validates a strategy process developed over twenty-six years of professional practice and academic research. The work is grounded in pragmatism, reflective practice, and action research. This thesis is unorthodox: it comes at the end of a career, not the beginning. It also distills decades of reflective practice across dozens of action research projects. It follows a path lit by Donald Schön, a pioneer who applied the insights of pragmatism to professional practice. As Schön stated, "When someone reflects in action, he becomes a researcher in the practice context"

(Lynton, 1997). To illustrate the opportunity of reflective practice, Schön used a powerful metaphor. He compared the academy's high hard ground with the swampy lowlands of professional practice (Schön, 1983: 42-43).

The difficulty is that the problems of the high ground, however great their technical interest, are often relatively unimportant to clients and the larger society, while in the swamps are the problems of greatest human concern... There are those who choose the swampy lowlands. They deliberately involve themselves in the messy but crucially important problems, and, when asked to describe their methods of inquiry, they speak of experience, trial and error, intuition, and muddling through.

With that as a backdrop, an overview of my travels through the swampy lowlands provides helpful context. This thesis tells the story of developing a new strategy model specifically designed to address wicked problems in open, loosely joined networks. In the beginning, I used the conventional tools available to any strategy practitioner (Ghemawat, 2002, 2016; Hakala & Vuorinen, 2020). These tools do not work well in networks, so I abandoned them. Using open-source software as a model to guide me, I began developing a new strategy discipline from scratch. For over a decade, I designed experiments in a variety of different contexts. When I thought I had a workable prototype, I moved into the university to learn how to teach it. In a progression described by Argyris and Schön (1974), I developed a model, *Strategic Doing*, and I moved the model from my head ("an implicit theory-in-use") into an explicit model (a "theory of action"), as well as a set of teachable skills to deploy the model. In the beginning, I thought this process would take only three or four years. I was off by a factor of five.

I began my journey as a practitioner-researcher in strategy in the early 1970s in Washington, D.C. Initially, I served as a legislative assistant to a U.S. Congressman. In this role, I developed legislative strategies to address the energy crisis in the wake of the first Arab oil embargo. My efforts focused on a complex challenge: promoting renewable energy and moving the U.S. away from its oil dependence. During this deep controversy, I witnessed the early stages of ideological polarization that now grips the U.S. Congress. In 1975, I published an article in the Harvard Journal on Legislation to describe the early breakdown of bipartisanship in U.S. House of Representatives (Morrison, 1975). Later, I served as staff counsel to the Senate Democratic Policy Committee, where I advised Democratic Senators on other thorny issues: globalization

and competitiveness. Political polarization continued to grow. Getting nowhere, I left Capitol Hill.

In the early 1980s, I focused on developing a deeper understanding of globalization. I worked on a team to create one of the early public policy summaries on the impact of globalization on the U.S. economy (Magaziner & Reich, 1982). Next, I wanted to learn more about the dynamics of corporate decision-making in rapidly globalizing markets. To do that, I accepted a position with a corporate strategy consulting firm, a spin-out from the Boston Consulting Group. For three years as a corporate strategy consultant, I worked with multinational companies as they dismantled their U.S. manufacturing operations and moved them to lower-cost locations in Mexico and Asia. Seeing the devastation left behind, I left the world of corporate strategy consulting and began consulting directly with communities, regions, and states in the U.S. My clients all struggled with severe economic dislocations. To distill my experience, I produced a paper for a publication for the National Academies of Sciences (Morrison, 1987). The article reported on my two-year experiment applying corporate strategic planning methodologies to one city struggling with globalization. I also produced a book chapter on the policies undertaken by state and local governments to accelerate innovation (Morrison, 1986) and testified as an expert witness before Congress (Morrison, 1985).

Throughout the 1980s and 1990s, I continued this consulting work with communities and regions. As soon it began opening to the world through foreign trade zones, I realized China would drive globalization in new directions. To understand more completely this shift, I began extensive work negotiating joint ventures in China in 1990. During this time, I also served as a consultant to the United Nations Development Program in China. I rode the initial wave of foreign direct investment and experienced the undertow of corruption that has subsequently swept through the Chinese economy. I formed and served as the managing director of a Chinese joint venture with U.S. investors for fifteen years. Our team built the third largest mineral water company in Xi'an with over 40,000 customers to address that city's growing water shortages. Our work collapsed, as a criminal gang seized our prime real estate, and provincial government officials stood by. That turned out to be a complex challenge, indeed.

In 1993, I began the work that forms the basis of this thesis. After ten years of consulting work in Oklahoma, Louisiana, and Kentucky, I moved into the academy to learn how to teach the model. In 2003, I accepted a faculty position in the department of economics at Case Western Reserve University. I began the process of formalizing the Strategic Doing model. When my initial work at Case Western Reserve failed, administrators at Purdue University offered me a professional position and a courtesy faculty appointment to continue developing the model. From 2005-2019, I led a team to develop, formalize, test, and teach the model.

Strategic Doing is now being taught in undergraduate and graduate-level courses at Purdue University, in graduate business courses at the University of North Alabama (UNA), and in professional education courses at Purdue, the University of Oregon, and UNA. When the pandemic hit, we moved executive education on-line. While incubating this new strategy practice at Purdue, our team conducted Strategic Doing workshops and training sessions in forty-four states and seven foreign countries. The model is cross-cultural, and my colleagues now teach this model in Dutch in the Hague and Spanish in Puerto Rico. The model's core intellectual property is open-source by agreement with the Vice Provost for Engagement at Purdue University. The discipline is now taught globally through fellows certified by a non-profit organization, the Strategic Doing Institute. The purpose of this Thesis by Publication is to document and formalize the journey that led to Strategic Doing.

1.2 Research Context

Each year, the British Broadcasting Corporation presents a lecture series called the Reith Lectures. Named after the BBC's first Director-General, Lord Reith, these radio presentations invite leading thinkers to share their insights into issues of contemporary concern. In 1970, the BBC invited Donald Schön to present that year's Reith Lectures. Shön, a philosopher and professor of urban studies and education at the Massachusetts Institute of Technology, titled his first lecture, "The Loss of the Stable State." Schön's observations provide the backdrop to this research (Schön, 1970). He used his Reith Lectures to distill his thinking over the previous decade of the 1960s. It was a turbulent time in the United States: the civil rights movement; the growing opposition to the Vietnam War; the assassinations of John Kennedy, Robert Kennedy,

and Martin Luther King; the urban riots. All of this turbulence led Schön to conclude that an era of relative stability was coming to an end.

He structured his argument as follows. First, society and all its institutions are entering a continuing process of transformation. We will no longer see long periods of stability stretching over decades. Second, to manage this process of continuous change, we must learn to guide the process. Third, to do that, we must become adept at learning. We must design and develop institutions that are "learning systems." That is, we must develop organizations capable of bringing about their transformation. Finally, to prepare these organizations and institutions, we must now learn more about how humans learn (Schön, 1971). Schön dedicated his professional life to that quest. He explored how professionals could become more effective in practice and how educators could teach professionals more effectively. A disciple of John Dewey, Schön grounded his work firmly in Dewey's notion of continuous learning (Dewey, 1910; Schön, 1987, 1992).

The implications of Schön's argument are profound. Organizations and institutions designed for stability have little chance to survive in an increasingly turbulent world. They must now continually learn and adapt. Starting in the 1980s, management practitioners and scholars began embracing Schön's view. For example, De Geus, the head of planning at Royal Dutch Shell, promoted the idea of planning as learning (De Geus, 1988). He argued that the only sustainable competitive advantage for a company might be its ability to learn faster. De Geus pointed out that one-third of the world's largest companies in 1970 had disappeared by 1983 because these companies had failed to learn and adapt. Two years later, Senge released his popular book, The Fifth Discipline, in which he set forth how corporations can become "learning organizations" (Senge, [1990] 2006). The concept of learning has always been a part of the idea of strategy (Leavy, 1998), but, paradoxically, interest has faded in recent years. Google Book Ngram Viewer identifies the frequency of a specific term in a corpus of books. Figure 1-1 illustrates how the concept of "learning organization" gained popularity in the 1990s and then started to fade after 2006.

It is unclear why scholarly interest in learning organizations has faded, but this thesis implies one: no consensus has emerged about developing a learning organization. Management

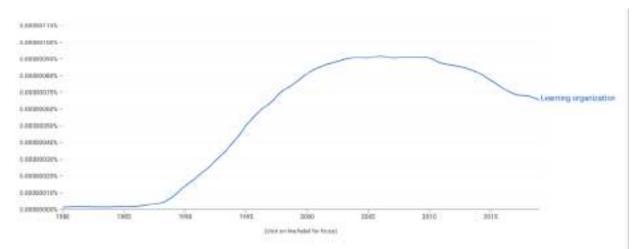


Figure 1.1: Citations in books for the term, "learning organization". Compiled by Google Books Ngram Viewer, November 4, 2020. Corpus of books in English from 1980-2019.

practitioners and scholars are still grappling with guiding organizations to learn and adapt (Carlisle & Macmillan, 2017). Years ago, Argyris explained the difficulty. Moving from stable, if inflexible, routines to more adaptive learning disciplines requires profound shifts. The transformation calls for new individual behaviors, new organizational structures, new management information systems, and new organizational norms (Argyris, 1976). Moving in this direction often triggers resistance, and the transformation slows. This thesis makes a case for a different approach and a revival of research into learning organizations. By focusing on the critical role conversations play in generating and distributing knowledge (Webber, 1993; Von Krogh et al., 2000; Beer, 2020a, 2020b), it charts a practical path to address Schön's unfinished work.

In the late 1960s and early 1970s, an equally important insight was taking hold at the University of California-Berkeley. West Churchman, a pioneer in operations research and systems analysis, joined with Horst Rittel, a design professor, to define the concept of "wicked problems" (Churchman, 1967; Rittel & Webber, 1973). In a 1967 seminar, Rittel outlined attributes of wicked problems distinct from technical and scientific ones (Skaburskis, 2008).

These characteristics, later refined by Rittel and Webber in their 1973 article, include the following:

1. Wicked problems are both unique and challenging to define. They have no simple cause-

- and-effect origin. The causes of wicked problems are numerous and interconnected. They are often both hidden from and contested by participants facing the problem.
- 2. Wicked problems interconnect to other wicked problems. As a result, there is no clear "stopping rule" to determine an inquiry's end.
- 3. There is no clear, correct, or "optimal" answer to a wicked problem. Solutions to wicked problems are not true or false. They fall along a gradient from better to worse.
- 4. Solutions are largely a matter of judgement and depend on the values and perspectives of those involved.
- 5. Researchers cannot run disciplined true-or-false or controlled trials on wicked problems.

 They must rely on multiple approaches to generate useful knowledge.
- Wicked problems are dynamic and continuously shifting. They also change with efforts to solve them. Proposed solutions trigger consequences which alter the problem. (Rittel & Webber, 1973).

We find wicked problems everywhere: persistent poverty, economic dislocations from globalization, pandemics, food insecurity, biodiversity loss, and climate change, to name a few (Head, 2008; Head & Alford, 2015; Parkinson et al., 2017; Ranabahu, 2020). Multiple parties and perspectives are engaged in these wicked problems (Schad & Bansal, 2018). There is no one "all-knowing" perspective. Instead, participants approach these challenges from diverse viewpoints and with different values. By the same logic, there are multiple ways to generate new knowledge about wicked problems. In Schön's terminology, wicked problems exist "beyond the stable state" (Schön, 1971). As Schön predicted in 1970, these wicked problems are rising (George et al., 2016; Schad & Bansal, 2018; Keenan, 2020). Scholars sometimes refer to wicked challenges as "grand challenges" (George et al., 2016). The United Nations' Sustainable Development Goals represents the first time global leaders have attempted to manage the planet's future from an integrated perspective. They also embed wicked challenges (Light et al., 2020; Ranabahu, 2020).

Alford and Head (2017) suggest we pause and distinguish among different types of wicked problems because the scholarship has become a bit confusing. They have come up with an approach to help us see through the thicket. Wicked problems fall along two dimensions: the

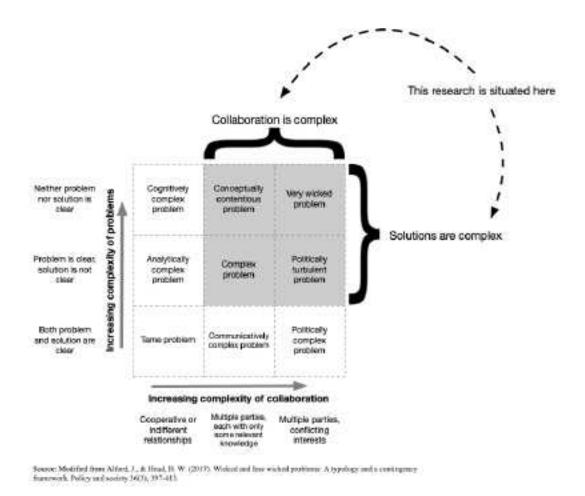


Figure 1.2: Positioning wicked problems along two dimensions. The framework presented by Alford & Head (2017) situates the research more precisely as confronting a set of wicked problems.

increasing complexity of the problem and the expanding engagement of participants in generating solutions to these problems. Using Alford and Head's insights, Figure 1-2 explains where this research is situated. The action research projects in this thesis reflect situations in which both the problems and the collaborations are complex.

The fundamental challenge in developing solutions to wicked problems involves transferring and integrating knowledge across multiple participants (Weber & Khademian, 2008). In other words, as Schön predicted, to address these wicked problems, we need to design and develop organizations and institutions that learn and adapt. These organizations and institutions can bring about their continuing transformation in the face of growing challenges to their stability (Schön, 1971: 30). Both the "end of the stable state" and the emergence of "wicked problems" describe

our human encounter with dynamic, open systems. Scholars also refer to these systems as "complex adaptive systems" (Holland, 1992). These systems are composed of connected, interacting, and diverse entities. Originating in the natural sciences, the concept of complex adaptive systems in the social sciences tends to focus on emergence: the idea that social interactions among individuals give rise to larger patterns (Levin, 2003).

The patterns that give rise to wicked problems emerge from a vast array of interactions between ourselves and our natural environment. However, our ability as individuals to absorb and analyze complex information is limited. We can understand only so much. Economist Herbert Simon put a label on our limitations: "bounded rationality." We can now see, from an individual perspective, how our perception of wicked problems arises. Wicked problems emerge as we fail to make sense of complex interactions. Because we cannot fit these patterns into our existing mental models, we perceive them as wicked problems.

Learning to address these complex systems is inherently problematic. Each person's capabilities are limited, and we do not yet have collective understandings, what scholars refer to as a "shared mental model," to grasp these wicked problems. Without a shared understanding, we have no way to guide our collective actions to better outcomes (Johnson-Laird, 2013; Redlich et al., 2017). Yet, as Simon (1991) has pointed out, all learning takes place within the individual. So, if we are to get a better grasp on wicked problems, we must put our different perspectives together somehow. This integration gives rise to another question. Our interactions take place within our social networks. Our shared knowledge is embedded in these networks, largely hidden from view and continuously shifting (Itami & Roehl, 1987). How do we reveal what we know?

We face yet another challenge: one of practicality. To address these complexities, we must move from generalizations about learning and adaptation. We need to design practical tools and processes that help us understand the complexity and guide our learning (Sterman, 1994). Like molecular scientists, we can use visualizations to help us (Frankel & DePace, 2012; Goodsell & Jenkinson, 2018). We can begin to develop shared mental models to address these complex challenges through visualizations to facilitate our creativity (Redlich et al., 2017). Visualizations, coupled with an explicit, rigorous, and replicable process, can move us toward developing shared mental models. By focusing on our conversations' hidden structure, this research proposes an

approach of shared learning and action in the face of wicked problems. The method includes a visual language to speed out understanding.

An example, drawn from a testbed for Strategic Doing, explains how this process works. Citizens in Flint, Michigan, encounter high levels of youth violence and teenage homicides in their neighborhoods. Because these citizens cannot easily understand all of the complex underlying interactions that give rise to high levels of teenage homicides, they have struggled to address this challenge. In 2013, a colleague from Michigan State University and I have worked with WOW Outreach, a neighborhood group committed to reducing youth violence. This group has followed the Strategic Doing model outlined in Chapter 4, and they have seen improvements in reducing neighborhood violence (Cook, 2018). They started by framing their challenge with a simple, appreciative question (Ludema et al., 2006). Next, they uncovered assets within their networks that they could combine to generate potential solutions. This step is similar to what a company follows to find resources to build a strategy (Wernerfelt, 1984). They then recombined those assets in a process Hargadon (2003) calls recombinant innovation. These recombinations gave rise to new potential solutions to improve their situation. They next developed projects to test their assumptions and see if their projects led to improvements. This practice follows a similar path to a company experimenting with a prototype (Thomke & Manzi, 2012). Experimentation generates data about the complex system from which residents can learn (Liedtka & Hess, 2009). They follow a simple visual model of four questions to structure their conversation, guided by ten rules (see Chapter 4). In sum, the Flint residents are taking steps similar to how entrepreneurial teams follow a "logic of opportunity" to test an idea and learn (Eisenhardt & Bingham, 2017).

Developing potential solutions to these wicked problems moves beyond linear logic. Reducing youth violence is not a technical problem with a straightforward answer. In contrast, consider the situation of filling potholes, the bowl-shaped holes that represent progressive failures in pavement. The causes of potholes are exact (Adlinge & Gupta, 2013). Filling potholes is a technical problem with a technical solution. There can be innovative approaches to filling potholes, such as developing a specialized vehicle for filling them (Bickley & Kleiger, 1993). However, the basic solution is already known: fill the hole with a mixture of gravel and

liquid asphalt.

Heifetz, a professor of leadership, provides a helpful perspective to understand this point. He makes a distinction between technical problems and adaptive challenges. Technical issues, like potholes, have exact solutions. We can address them with established protocols. In contrast, wicked problems, like reducing youth violence, present something new, an adaptive challenge. We have no clear solutions. Indeed, we need to be careful how to frame the situation. Trying to find a technical solution to a wicked problem is a fool's errand; by definition, there is none. Instead, as Alford & Head (2017) point out, we should focus on actions or adaptations that improve our current situation. In sum, adaptive challenges, or wicked problems, present us with the opportunity to learn and adapt. When confronted with adaptive challenges, we are required to think more deeply and more collectively. As this thesis will argue, we need more rigorous, focused conversations to generate and share knowledge. Finding solutions to adaptive challenges falls outside our current patterns, our everyday routines of thinking and doing (Heifetz et al., 2009). To address wicked problems, as our colleagues in Flint are demonstrating, we must learn to experiment and innovate collectively. Recall Schön's words. We must learn how to learn together.

The question now presents itself: how do leaders address these wicked challenges? In the past, leaders turned to strategic management to decide how to allocate resources to achieve an objective (Bracker, 1980; Raritan & Lee, 2017). As the literature review in Chapter 2 reveals, strategic management evolved as a process for leaders to marshal scarce resources to move an organization toward a desired outcome. Our understanding of strategy has deep roots in military thinking. Bracker (1980: 219) explained:

Our word strategy comes from the Greek strategos, "a general," which in turn comes from roots meaning "army" and "lead." The Greek verb stratego means to "plan the destruction of one's enemies through effective use of resources".

Traditional approaches to strategy generally follow a linear logic: first, set a vision of where to go, then execute activities (often called tactics) to get you there. As I learned in my strategy practice, these traditional approaches to strategy are not productive to address wicked problems.

Conventional strategy practices typically begin by setting a "vision." Yet, in a continuously shifting world not open to prediction, it is hard to see through the fog. As anyone caught in a fogbank knows, a thin line separates vision and hallucination. It turns out that in complex environments, being coherent is more critical than being visionary (Lissack & Roos, 2001). Simultaneously, even if we can define a coherence that leads to promising solutions, we face another challenge. We must move a network of loosely joined people from "here" to "there." That is not a trivial problem (McMillan & Overall, 2016; Alford & Head, 2017; Camillus 2008, 2016).

Part of the difficulty arises from a feature of wicked problems: developing solutions for better outcomes is inherently collaborative. No single individual or organization has all the resources to meet the challenge of wicked problems. There are no single right or wrong answers. Instead, we can only judge solutions as better or worse to our current situation. Many solutions may be possible, but they all require the transfer and integration of knowledge across participants (Weber & Khademian, 2008; Edmondson & Harvey, 2017). No single person is in control. Experts and leaders cannot act unilaterally to define the problem or potential solutions, and if they try, they are likely to make the situation worse (Roberts, 2000). Instead, they must confront and attempt to reconfigure an ill-defined system that has given rise to the complex, wicked challenge in the first place (Schad & Bansal, 2018). They must descend into the swampy lowlands of practice.

By the early 1990s, these realities landed on my desktop. Among my clients, it was becoming increasingly clear that conventional strategic planning approaches to complex challenges were inadequate to address their challenges: closed factories, failing school systems, growing structural unemployment, shrinking population, abandoned housing, and stagnant incomes. My conclusion closely tracked the growing doubts in the academic literature about the viability of strategic planning to meet companies' growing volatility (Laurenstein, 1986; Mintzberg, 1994a, 1994b, 1994c). In response, I initiated the research that grounds this thesis. In 1993, in Oklahoma City, I started to design a new approach to strategy, based on the insights from open source software development (Raymond, 1999; Goldman & Gabriel, 2005). A chance conversation with a physicist in Singapore set me on the trail. As I explained the problems of

strategic planning over lunch, he recommended I learn about open-source software. In this approach to software development, an open, loosely connected network of participants comes together to address a complex challenge. The story of Linux, an operating system for computers, provides an iconic example (Moody, 2009). My physicist friend helped me formulate the early questions that guided my thinking: How can people come together to form and execute a complex strategy? How can we meet the challenges of globalization when no one can tell anyone else what to do? How can we transfer open-source software development lessons to the complex challenges facing organizations, communities, and regions? Over time, these initial questions matured to the research question presented in this thesis.

The communities and regions in which I worked needed to design sophisticated strategies that required complex collaboration. Through the 1990s and into the early 2000s, working closely with my clients, I conducted a wide range of experiments into how to develop effective strategies in open networks. I interviewed open-source software developers to learn their approach, and I read about the open-source movement (Levy, 1984; Raymond, 1999). Experiments in Oklahoma City took place over eight years from 1993-2000. Experiments in rural Kentucky took place over six years ending in 2003.

Based on an article that appeared in the Harvard Business Review in 1993 and a second article that appeared in the California Management Review in 1996, I began paying close attention to the nature of the conversations I was guiding in engagements with clients (Webber; 1993; Liedtka & Rosenblum, 1996). In 1999, I had the opportunity to step back and summarize what I was learning. Governors in fourteen southern states across the U.S. appointed the Commission on the Future of the South. They charged the Commission with developing policy prescriptions to address the challenges of globalization. The Commission hired me based on my growing body of work in the field, and I wrote a report called "Southern Connections: Connecting with Each Other, Connecting with the Future" (Morrison, 1999). The report emphasized that we can only meet the challenges of globalization through new collaborations and new networks.

In 2001, I began to distill a model of strategy for open, loosely joined networks, based on the insights from a valuable article in the Harvard Business Review. Eisenhardt and Sull (2001),

reporting on their research with technology companies facing high-velocity markets, suggested that these companies' strategies amounted to distilling a set of simple rules to pursue fleeting opportunities. In 2003, I began referring to this model as "Strategic Doing" to combine two ideas: 1) developing strategy and 2) learning by doing. Chapter 4 on the theory and practice of Strategic Doing details how the model involves a continuous process of strategy development through learning by doing. In 2005, I moved the locus of his work to Purdue University. I accepted an invitation from Sam Cordes, director of the Purdue Center for Regional Development, to validate this strategy model and, if successful, learn how to teach it. Vic Lechtenberg, Purdue's vice provost of engagement, agreed that if the model proved valid, the university would work with me to transfer the underlying intellectual property to a non-profit institute, so that we could widely share it with other universities. I formed the Strategic Doing Institute in 2016 with that purpose.

The Purdue president, Martin Jischke, supported the work based on his long-standing commitment to public land-grant universities in the United States (Jischke, 2004). Jischke was a national leader and member of the Kellogg Commission in the 1990s. The Commission developed recommendations to refocus the land-grant universities on their engagement mission (Byrne, 2006). Jischke advocated that universities sit in a unique position to bring together the resources needed to address complex social and scientific problems. They can play an essential role in growing the "innovation ecosystems" (Curley et al., 2013) required to address increasingly complex challenges within the regional economies they serve. The support of Cordes, Lechtenberg, and Jischke for the development of Strategic Doing aligned closely with positioning Purdue University as a leader in these reforms (Jischke, 2004).

From 2005 to 2019, I managed a Purdue team engaged in a series of testbeds to refine and validate the strategy model more formally. These testbeds included the U.S. Department of Labor; the National Aeronautical and Space Administration; the New Jersey Innovation Institute; Lockheed Corporation; Stanford University; the National Science Foundation; the National Institutes of Standards and Technology; and community groups in Flint, Michigan; Lafayette, Indiana; and Florence, Alabama. Chapter 3 on methodology summarizes my field experiments from 1993-2005 and the testbeds at Purdue University from 2005 to 2019.

The first Purdue testbed involved transforming a workforce system in the region surrounding Purdue. The U.S. Department of Labor awarded Purdue with a three-year, \$15 million grant. Purdue's award represented one of thirteen areas selected nationally. Results from this testbed were promising (Hutcheson & Morrison, 2012). We exceeded our proposed goals by a factor of three. A Department of Labor representative informed us that with 8% of the money awarded nationally, we generated about 40% of the national results across four key metrics (see Section 3.8.6 below for details). Work continued on the model. In 2008, I collaborated with a team from the University of Wisconsin-Milwaukee to launch the Water Council, a cluster of fresh-water technology companies. Ten years later, the cluster continues to thrive (Morrison, 2018b). In 2010, nearly two decades after I began down this path, Oklahoma City gained national recognition. A commentator highlighted the revival of the Oklahoma City economy and called it a national model for transforming a regional economy (Thompson, 2010).

In 2012, I started work with a practitioner-researcher at Michigan State to address the challenges of reducing teenage homicides in Flint, Michigan. The results continued to assist our Purdue team in refining the model (Morrison & Hutcheson, 2014). In 2013, I introduced our initial workforce results to the Australia-New Zealand Regional Science Association (Morrison 2013). In his president's address to the conference, Paul Collits (2013) propelled our work forward in Australia:

Local economic development is the identification of local assets for growth and leveraging them through collaboration. The best methodology I have seen in twenty years for achieving this is called strategic doing and is the brainchild of Ed Morrison who is here with us today.

In 2014 and 2015, at the invitation from Professor Emeritus Mike Hefferan at the University of the Sunshine Coast, I introduced the model to the Sunshine Coast Futures Conference (Wardner, 2014). At the 2015 conference, we conducted a Strategic Doing workshop to illustrate the approach with over two hundred participants. The results appear in the 2015 conference report (Wardner, 2015).

In another large-scale testbed, Stanford University incorporated Strategic Doing into an initiative, funded by the National Science Foundation, to transform undergraduate engineering

education (Nilsen et al., 2016; Nilsen et al., 2017; Sullivan et al., 2016). In 2015, the National Science Foundation awarded Purdue University a \$2.0 million grant to transform undergraduate mechanical engineering education at Purdue University, relying, in part, on the Strategic Doing model. I was a co-principal investigator on this grant (Bajaj et al., 2015). In 2015, the Purdue team began working with the New Jersey Innovation Institute in another series of testbeds. In 2019, the U.S. Office of Minority Health awarded Purdue University a \$1.1 million grant to fund a testbed to develop a community response to opioid addiction. The research teams will be deploying Strategic Doing (Purdue University, 2019). The early work in opioids is showing promising results (Griffin, 2019).

Turning Strategic Doing into a curriculum turned out to be more difficult than I expected. The work started in 2007. By 2010, we launched the first executive education program in Strategic Doing at Purdue. In 2015, I distilled the ten rules of Strategic Doing, and our Purdue team began translating these rules into skills. We revised the executive education curriculum to



Figure 1.3: Strategic Doing Training in the Hague. Prior to the pandemic, we conducted Strategic Doing training in The Netherlands twice a year. This exercise teaches students to be clear in their communications.



focus on developing ten skills needed to follow the ten rules. Professional training in Strategic Doing consists of a 2.5-day training session. Initially taught by my Purdue team, Strategic Doing Institute Fellows, a program managed by the Institute, now direct the curriculum. As of December 2020, the Institute had sixteen fellows available to teach, with another fifteen in training.

Since 2010, our team has updated the curriculum four times based on results in the field. The curriculum is now on a two-year revision cycle, with the next revision due in 2021. Once participants have completed their training, they can participate in a certification program managed by the Strategic Doing Institute. With the onslaught of the pandemic and the College of Business's support at the University of North Alabama, we moved all of our training, including the certification program, on-line. As of 2020, our team has conducted Strategic Doing presentations, workshops, and training sessions across 46 states and seven foreign countries: Canada, New Zealand, Australia, the United Kingdom, Germany, Belgium, and the Netherlands. By October 2020, over 1,300 people have been through the 2.5-day training.

Through this work, I also began sharing the model with practitioners at other universities. These practitioners are both engagement professionals and faculty members. Strategic Doing practitioners represent a wide range of universities: the University of Oregon, the University of Puerto Rico, Colorado State University, New Mexico State University, University of Michigan, Northern Illinois University, The Ohio State University, University of North Alabama, Mississippi State University, New Mexico State University, New Jersey Institute of Technology, East Stroudsburg University, the University of Alaska, and Indiana University. These practitioners have used the model to address wide range of complex challenges, including developing cross-disciplinary research teams (Indiana University, Purdue University, University of Michigan); reducing urban violence (Michigan State University); improving collaborations between universities and industry (Ohio State University, New Jersey Institute of Technology); addressing the complex challenges of rural economies (University of Oregon, Indiana University, Mississippi State University, University of Alaska, East Stroudsburg University); improving collaborations in education and workforce development (Purdue University, Colorado State University, Northern Illinois University); developing regional food systems (New Mexico State University); addressing public health care challenges like opioid addiction (Purdue University), maternal mortality (New Jersey Institute of Technology), and infant mortality (Indiana University); and designing entrepreneurial ecosystems (University of Puerto Rico, University of North Alabama). The Strategic Doing Institute coordinates this work. The Institute has held four annual conferences for practitioners. We completed our latest conference in August, 2020 in



Figure 1.4: The timeline of the development of Strategic Doing. The development of Strategic Doing has passed through four major phases.

Iowa City, Iowa. The University of Oregon is hosting the 2021 conference in Eugene, Oregon in early August.

Developing the Strategic Doing model has led to a small but growing stream of publications in fields such as food systems (Reid, 2016), opioid addiction (Griffin, 2020), engineering education (Berger et al., 2015; Nilsen et al., 2016; Nilsen et al., 2017; Sullivan et al., 2016), workforce development (Hutcheson & Morrison, 2014), digital transformation of manufacturing (Jones et.al, 2021), civic innovation (Morrison & Hutcheson, 2014); entrepreneurial ecosystem development (Morrison et al., 2019), community development (Morrison, 2012), and university engagement (Morrison, 2013, 2015). To expand research into Strategic Doing, the Institute for Policy Research and Engagement at the University of Oregon has volunteered to create a data repository for researchers. In 2019, I led a team to produce a well-received management book

based on the model (Morrison et al., 2019). The book introduces the skills needed to manage the model. In 2019, Soundview Magazine awarded the book a Best Business Book award for 2019. (Soundview Magazine, 2019), and in 2020, the Shanghai Daily listed our book as a top-five business book (Shanghai Daily, 2020). The text of the book appears in Appendix A.

Aside from executive education, the Strategic Doing model is also making its way into undergraduate and graduate education. Based on the model presented in Chapter 4, Purdue University offers ENGT 50700: Fundamentals of Collaborative Leadership and Agile Strategy for Engineering Technology in the Fall 2020 semester. The University of North Alabama integrates Strategic Doing into its Masters of Business Administration and its Executive Doctorate of Business Administration. Figure 1.4 outlines the timeline of the development of Strategic Doing.

1.3 Research problem and its significance

Strategic planning has become a widely accepted management theory and practice (Wolf & Floyd, 2017). The concept of strategy has a long history. However, the modern scholarly study of strategy can be traced to business schools, starting in the 1960s (Kay et al., 2003). Strategic management is now widely shared across organizations in business, government, healthcare, and non-profit organizations (Carter, 2013). Yet, despite its popularity, the effectiveness of the practice is open to question. As initially conceived, strategic planning involves a series of logical, rational steps to position and organization within its environment (Wolf & Floyd, 2017). Determining strategy involved two aspects: strategy formulation and implementation, both occurring within a hierarchical organization. Despite decades of research and refinement, practitioners continue to grapple with whether formal strategic planning can improve organizational performance (George et al., 2019).

Some scholars have maintained that strategy is not the product of logical, rational analysis. Instead, a strategy is more unpredictable, emerging from a pattern of management actions over time. In other words, the strategy process — how a plan comes together — matters (Mintzberg & Walters, 1985; Pettigrew, 1992; Langley, 2015). This concern over process has led some scholars to focus closely on what strategy practitioners do. In about 2001, these scholars began

developing a stream of research called "strategy-as-practice" (Whittington, 1996, 2006; Golsorkhi et al., 2010). Despite efforts to nudge scholarship more closely to practitioners, strategic management scholarship continues to struggle with connecting research to the real-world problems confronting practitioners (Langley, 2015; Drnevich et al, 2020).

Conventional approaches to strategic planning operate with two critical assumptions. First, the organizations which undertake strategic planning are hierarchically organized. In a traditional strategic planning process, top management is responsible for strategy formulation; carrying out the strategy falls to lower-level executives (Chandler, 1962; Whittington et al., 2011). Beginning in the 1990s, practitioners and scholars recognized the need to relax this assumption. Involving middle-level managers in developing strategy can enhance effective execution (Westley, 1990; Schaefer & Guenther, 2016).

Nevertheless, the basic assumption still holds: strategic planning guides hierarchical organizations. Conventional approaches to strategic planning rest on a second fundamental assumption: the environment to which the organization must adapt is relatively stable. Again, in the 1990's, scholars and practitioners relaxed this assumption. They began to explore how the practice of strategy must change if the future is highly uncertain (Land & Maxfield, 1996). Strategy scholars developed the concept of "dynamic capabilities" to suggest that organizations must develop new, dynamic strategy routines to keep pace with more volatile environments (Teece et al., 1997; Eisenhardt & Martin, 2000).

The research problem explored in this thesis emerges when practitioners confront situations that dispense with both of these core assumptions simultaneously. What happens to strategy practice in a network? Networks are a fundamentally different organizational form from hierarchies (Powell, 1990). There are no formal reporting rules within a network. They operate with more everyday routines and governance. While they can be "lighter on their feet," they can also be confusing and ambiguous. Participants rely on each other, the mutuality among members of the network, to provide coherence and direction. Interdependence operates as a fundamental operating principle. Parties to a network continuously explore ways they can mutually benefit by sharing or pooling their resources. As a result, collaboration skills, the skills to create new knowledge, shape key activities inside a network (Schrage, 1990; Nonaka, 1994)., 2000).

In the early 1990s, as scholars were first exploring networks as an organizational form, the environment in which organizations operate was becoming more unstable, as Schön predicted. Some scholars characterize this world as "volatile, uncertain, complex and ambiguous" (Bennett & Lemoine, 2014; Mack et al., 2015). In a continually shifting world, forecasting the future becomes impossible, and traditional approaches to strategic planning can quickly become futile exercises. Another challenge arises for practitioners: how do we think and act strategically when confronted with complexity? (Land & Maxfield, 1996). Two generic situations illustrate the problem. The first involves designing and guiding a business ecosystem (Moore, 1993). Those ecosystems are increasingly critical to understanding the process of innovation, entrepreneurship, and how organizations prosper (Gawer & Cusumano, 2014; Roundy et al., 2018). Yet, in an ecosystem, there is no clear hierarchy, and the environment is continuously shifting. What strategy discipline can managers follow if strategic planning does not work? In 2007, Chesbrough and Appleyard suggested that "open strategy" might emerge from the more established practice of open innovation (Chesbrough & Appleyard, 2007). In 2011, scholars began to recognize this challenge by developing a subfield of "open strategy" within the strategyas-practice literature (Whittingham et al., 2011; Seidl et al., 2019). Common characteristics of these practices are the inclusion of a broader number of parties in the strategy process and an increased emphasis on transparency throughout the process. However, this research stream is young and relatively underdeveloped, and scholars are grappling with its contours (Tavakoli et al., 2017; Saile et al., 2017).

The second situation involves the growing prevalence of "wicked problems." There is no practical strategy discipline designed to address "wicked problems" (Camillus, 2008, 2016). So, for example, how does a company grapple with the unexpected disruption of a pandemic? How does a community deploy its available resources to reduce youth homicides, infant mortality, or opioid addiction? How do researchers across multiple disciplines and universities quickly form collaborations to address complex challenges like climate change, water shortages, or regenerative agriculture? Networks are inherently engaged in the process of dealing with these complex, "wicked" problems (Roberts, 2000; Weber & Khademian, 2008). The reason is straightforward: by definition, wicked problems transcend our current capacity to understand

them and design better solutions. To address these challenges, partners must develop new strategies through collaboration and their networks. Only recently have strategy management scholars turned their attention to the design of processes to address these wicked problems (Roberts, 2000; Ferraro et al., 2015; George et al., 2016). Yet, conventional approaches to strategy do not fit well in the world of wicked problems (McMillan & Overall, 2016). Strategic planning has outlived its usefulness when its two key assumptions — hierarchical organizations operating and relatively stable environments — no longer hold. The core problem research problem, therefore, is to explore a strategy practice that can work within open networks facing wicked problems.

1.4 Research question

How do participants in open, loosely connected networks form, implement and adapt strategies to develop solutions to wicked problems?

1.5 Methodology

The thesis is grounded in pragmatism, reflective practice, and first-person action research (Marshall, 2016). It relies heavily on Schön for guidance. Schön anchored his career in Dewey's pragmatism philosophy; indeed, he wrote his Ph.D. thesis on Dewey's theory of inquiry (Bauer, 1991). As a foundation for research, pragmatism avoids metaphysical debates about the nature of truth and reality. Instead, this philosophical foundation focuses on developing practical understandings of real-world issues through rigorous, empirical inquiry (Morgan, 2014; Kelly & Cordeiro, 2020). As such, pragmatism provides a solid philosophical base from which to develop a new theory of action for strategy (Langley, 2015) and address wicked problems (Ferraro et al., 2015).

In the decades after his Reith lectures, Schön advocated for scholars to expand their viewpoints on generating knowledge. Scholars, Schön believed, can become too quickly trapped by a formal scientific method. He pioneered the idea that practitioners' reflective practice, grappling with messy problems, could generate both valuable insights and new, actionable knowledge. He contrasted reflective practice conducted in the "swampy lowlands" of real-world

issues with the technical-rational inquiries conducted by scholars sequestered in the academy (Schön, 1983, 1995). Schön encouraged practitioners to share what they learned. Recall Schön's quote: "When someone reflects in action, he becomes a researcher in the practice context" (Lynton, 1997). As will become quickly apparent, this research reports on progress following Schön into the swamp, following a path formed from reflective practice. Reflection is a cognitive process that practitioner-researchers can use to make sense of a complex or ambiguous situation (Lyons, 2010). The process explores and synthesizes multiple ideas to create a coherent narrative of the problem. The process is not linear but iterative; it evolves. Finally, reflection is a disciplined way of thinking that involves a conscious effort to make sense of an experience or idea (Marshall, 2019).

Reflective practice falls under the umbrella of action research (Leitch & Day, 2000). It is grounded in a theory of inquiry first developed by Dewey (Schön, 1987; 1992). A practitioner's inquiry follows a path of generating hypotheses to explain confusing experiences and then testing these hypotheses through continuous experimentation. The process relies on abduction, a logical process to form testable hypotheses (Golden-Biddle, 2019). The practitioner-researcher generates implicit or tacit knowledge through this experimentation, a theory-in-use (Argyris & Scön, 1975). To test, validate, and transfer this knowledge, the practitioner-researcher must make their knowledge explicit. In terms outlined by Argyris and Schön, the practitioner-researcher moves from developing theories-in-use to a theory of action. A theory of action represents a sequence of actions that the practitioner follows to achieve intended consequences. In short, a theory of action provides practitioners with a guide to action (Argyris, 1995). A theory of action is also closely connected to the concept of skills. People learn skills to put a theory of action into practice. Skills represent concrete, observable behaviors that practitioners use to convert a theory of action from words into action. Learning the theory of action can happen in a classroom or with a book. However, learning the skills to put a theory of action into action requires experiential learning. (Argyris & Schön, 1975:6-12).

The first person action research presented in this thesis does not involve a traditional research trajectory. The reflective practitioner's journey involves a rigorous but flexible methodology that is a continuous interaction of literature review, field experiments, and theory or model

development (Marshall, 2016). As previously explained, my reflective practice journey took place with over two decades of designing and managing action research projects. Chapter 3 on the methodology explores Schön's guidance in more detail and outlines the research projects that form the foundation for this thesis. Figure 1.4 outlines my research process.

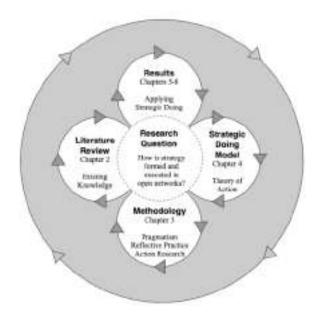


Figure 1.5: The research process presented in this thesis. The research, practice and theory presented in this thesis evolved from a recursive process of engaging in practice, research, theory development, and the extant literature. Adapted from Marshall (2016).

1.6 Research quality, reliability and validity

This research conforms to the guidelines for a quality action research thesis set forth by Zuber-Skerritt and Fletcher (2007). The research confronted a set of complex problems, engaged participants in the research, led to action, generated supportive evidence, and, with this thesis, contributes to both knowledge and practice. The research is both reliable and valid. Reliability refers to the consistency of results over time, the replicability of both process and results. Validity generally refers to the research problem's alignment, the research question, the research method, and the reported results. This research meets both standards. Reliability comes from multiplication. This research demonstrates the consistency of results in diverse settings through multiple case studies that follow a shared theory of action. Chapter 3 outlines these action research projects. Chapter 4, on theory and practice of Strategic Doing, outlines the framework used in this research. All Purdue projects used a similarly structured Strategic Action Pack (Figure 4.4.2) as a protocol for the workshops. Further, all of the components within this research align with a pragmatist framework. Pragmatism provides a firm basis for the mixed methods

applied throughout this research project (Biesta, 2010). The research's validity rests on its close alignment to a pragmatist framework and a rigorous theory of inquiry, guided by reflective practice. Pragmatism also provides an appropriate framework to address both the complexity of the research question (Ferraro et al., 2015) and the practitioner focus of the research (Langley, 2015).

It follows that this research also should be gauged by a pragmatist standard of quality. Here, the standards are different than more conventional positivist research. Pragmatism directs the researcher toward reflective inquiry. The research journey should provide evidence that the researcher engaged in authentic reflection. Since this project reports on multiple action research projects conducted from 1993 to 2019, there is ample evidence to make a judgment. The journey outlined in this thesis reveals the evolution of ideas and categories, the mistakes and failures, and the translation of implicit knowledge (a theory-in-use) to explicit knowledge (a theory of action). The journey of reflective practice is not a straight line. Mistakes and stumbles are common. Yet, these failures also reveal a path forward, revisions in both theory and practice.

One example illustrates the point. The application of Strategic Doing to engineering education underscored the importance of training participants in the theory's implied skills. In a project undertaken in partnership with Stanford University, our research team successfully applied Strategic Doing to stimulate collaborations in undergraduate engineering education (see section 3.8.15 below; Nilsen et al., 2016; Nilsen et al., 2017; Sullivan et al., 2016). Subsequently, I accepted an invitation from a Purdue University team to apply these insights to an engineering school at Purdue (see section 3.8.16 below; Berger et al., 2015). This project largely failed (Rodriguez-Mejia et al., 2020). The insight from this failure was stark: unlike the faculty teams assembled in the Stanford project, the Purdue research team and faculty declined to take the time to learn the skills implied by the theory of Strategic Doing. The purpose of the theory of action is to create self-directed teams. Without the skills needed to manage their direction, the Purdue teams quickly fell apart. They lacked the skills necessary to design and guide their "strategic conversations", a core concept to Strategic Doing. As suggested by Argyris and Schön, teaching these skills both in the classroom through simulations and in workshops is a critical step to apply the theory of action (Argyris & Schön, 1974). The real learning, however,

comes in practice (Schön, 1987). With this failure in the rearview mirror, I focused the last three years of my engagement with Purdue on translating the Strategic Doing theory of action into clearly understandable skills and curricula to teach these skills. Formalizing the model into rules and skills enables practitioners to practice these new skills. Writing a book followed this strategy. The book introduces the reader to the skills needed to apply Strategic Doing to complex, adaptive challenges. It provides a foundation for self-directed learning, a valuable path for individuals to acquire skills (Noe & Kodwani, 2018).

Pragmatism drives the researcher's inquiry toward action. Evaluation of this research's quality should center on the consequences of the knowledge uncovered through this long reflective journey. As discussed above in Section 1.3 (relating to the research context), the research presented in this thesis meets quality standards imposed by pragmatism. Through work with practitioners in seven countries, I have been diffusing my research findings globally, a key measure of its relevance (Czakon, 2019). The work reported here has led to a growing audience of participants learning Strategic Doing theory and practice. These participants are now applying these skills and developing solutions to wicked problems in a wide range of settings: community health, rural development, entrepreneurial and innovation ecosystems, workforce development, and interdisciplinary university research. Each of these examples represents a small win, which is significant in the context of wicked problems; transformation in systems takes place through an accumulation of these small wins (Termeer & Dewulf, 2019).

1.7 Key findings

This thesis makes the following knowledge claims to situations in which participants in an open network seek to form a strategy to address a wicked problem:

- 1. Strategies in open networks emerge from strategic conversations with an underlying structure and trajectory. These strategic conversations have both a divergent phase and a convergent phase. Knowing this structure, practitioners can both design and manage these conversations. Strategy in complex environments involves designing these experiences (Liedtka & Rosenblum, 1996; Liedtka, 2000).
- 2. In a strategic conversation, participants follow a rigorous definition of strategy: deciding where they want to go and deciding how they will get there (Eisenhardt, 1999).
- 3. Productive strategic conversations can only take place in an atmosphere of psychological safety (Edmundson, 1999).

- 4. Productive strategic conversations are framed with an appreciative question to guide the participants in generative dialogue. An adequately prepared strategic conversation guides participants toward opportunities to design solutions to their wicked problems (Cooperrider & Whitney, 2001). These conversations invite participants on a collective prospection journey in which they design a future together (Liedtka, 2000; Seligman et al., 2016).
- 5. These conversations follow simple rules to pursue fleeting opportunities. Participants can structure and manage their strategic conversations by asking four questions and following ten simple rules. This process assembles a coherent set of heuristics that have emerged to manage strategy in complex environments (Eisenhardt & Sull, 2001; Bingham & Eisenhardt, 2011).
- 6. Productive strategic conversations lead participants to commit to continuous experimentation and adaptation with a double-loop learning protocol (Argyris, 1976, 1977).
- 7. The ten rules imply ten skills to put this theory of action into practice (Argyris & Schön, 1974). Skilled practitioners can teach and support others to acquire these skills (Schön, 1987).
- 8. Multiple theories and empirical research across different disciplines appear to support this theory of action. These disciplines include strategic management, behavioral economics, psychology, and organizational development (see Chapter 4).

1.8 Contribution to knowledge

Based on action research projects conducted over two decades, this research contributes a model of how effective strategies emerge from strategic conversations with a predictable underlying structure and trajectory. The study specifies the model in terms of ten rules and ten skills needed by practitioners to move the model from theory to action. The research advances the pivotal role of strategic conversations, first suggested by Liedtka and Rosenblum (1994). It provides practical guidance on how practitioners can manage conversations to distribute, generate, and apply knowledge, a critical perspective suggested by Von Krogh, Ichijo, and Nonaka (2002). The model also advances the strategy-as-learning view offered by Edmondson & Verdin (2018). The Strategic Doing model also fits the various characteristics scholars have suggested a new approach to strategy practices designed for knowledge, learning, and networks.

The strategy process.— Strategy in complex environments should be in continuous motion (Lane & Maxfield, 1996; Beinhocker, 1997, 1999). The strategy process will abandon the traditional view of strategy as a linear process (Lane & Maxfield, 1996; Sull, 2007). To manage this process, practitioners need to develop the skills of routinely sensing and seizing

opportunities (Lane & Maxfield, 1996; Roberts & Eisenhardt, 2003, Teece, 2007, 2012; Teece et al., 2020). They should design a process to accelerate learning in teams (Edmondson, 2008, 2011; Edmondson & Harvey, 2017). This process will likely be composed of simple rules or heuristics that focus on opportunities emerging from a shifting environment (Eisenhardt & Sull, 2001; Bingham & Eisenhardt, 2011; Ott & Eisenshardt, 2020).

Building learning and trust.— To encourage learning and trust, the process is also likely to be more inclusive and transparent (Whittington et al., 2011; Edmondson, 2008; Pregmark & Berggren, 2020). Transparency will play an important role in promoting knowledge sharing (Abrams et al., 2003). The focus will likely be on workshops in which learning can take place, through deeper conversations and trust-building (Shaw, 2002; Kaplan & Beinhocker, 2003; Liedtka, 2001, 2008; Beer, 2020a, 2020b; Pregmark & Berggren, 2020). Attending workshops alone will not build learning and trust. Learning and trust will also emerge through continuous reflection and action (Liedkta & Rosenblum, 1996; Liedtka, 2001, 2008; Edmondson, 2002; Kaplan & Beinhocker, 2003; Pregmark & Berggren, 2020). Skills to design and guide these conversations will emerge through practice (Shön, 1987).

Designing workshops.— Conducting strategic conversations within small teams during dedicated meetings will be central to this process (Senge, 1990, 2014; Kaplan & Beinhocker, 2003; Whittington, 1996; Jarzabkowski, 2005; Bourgoin et al., 2018; Beer, 2020a, 2020b). Strategy practitioners will manage conversations to create and share knowledge (Von Krogh et al., 2000; Beer 2020b). Leaders will focus on creating coherence from these conversations (Lissack and Roos, 2000). These conversations lead to coherence, shared meaning, and clarity (Shaw, 2002; Liedtka, 2008; Pregmark & Berggren, 2020). These conversations will not treat adaptive strategies as technical problems, and they will not rely on tools designed for that purpose (Heifetz et al., 2003). Instead, they will focus focus on answering the central questions of strategy in turbulent environments: deciding where to go and figuring out how to get there (Brown & Eisenhardt, 1998).

Executing a strategy.— Strategy execution will depend on engaging conversations and explicit promises (Sull & Spinoza, 2007). The critical focus will be on teams, the smallest organizational change unit (Senge, 1990; Edmondson, 2002; Sull, 2007). The process will

promote adaptation through double-loop learning, an interactive process of examining assumptions underlying actions (Argyris & Schon, 1974; Argyris, 1993). The process will also encourage continuous experimentation as a learning discipline (Thomke, 1998, 2003; Thomke & Manzi, 2012; Edmondson, 2008; Liedtka & Hess, 2009; Eisenhardt & Bingham, 2017; Liedtka & Kaplan, 2019). Experimentation is important for another reason: transformative solutions to wicked problems will likely emerge from the accumulation of small wins (Weick, 1984; Vermaak, 2013; Termeer & Dewulf, 2019; Termeer & Mertz, 2019).

This research presents a strategy process that conforms to these characteristics. Strategic Doing provides an open, transparent process for conducting strategic conversations by following simple rules. It establishes a reliable protocol for strategy-as-learning in open, loosely joined networks confronting wicked problem. In developing a new strategy model for open, loosely connected networks, my research makes the following additional contributions:

- 1. By developing rigorous specifications for "strategic conversations", the research contributes a potential "microfoundation" to the dynamic capabilities literature (Teece et al., 1997; Eisenhardt & Martin, 2000). To understand dynamic capabilities, scholars have increasingly focused on the microfoundations of strategy, representing the interactions of individuals (Helfat et al., 2009).
- 2. Within the strategy as process and practice literature, this research clarifies the concept of open strategy. The term, first introduced into the literature in 2007, evades clarity (Chesbrough & Appleyard, 2007; Whittington et al., 2011; Tavakoli et al., 2017). For this thesis, open strategy is a process for generating the outcomes and pathways needed for a strategy by relying on networks, transparency, inclusion and double loop learning (Argyris, 1977). The definition adds three important components to provide additional rigor.
 - First, the definition of open strategy used in this thesis is grounded in the definition of strategy put forth by Eisenhardt (1999). Eisenhardt's definition focuses on the development of strategy in turbulent environments.
 - Second, the definition is situated within networks, a condition implied but not expressed by open strategy scholars.
 - Third, the definition embraces the process of learning through interactivity and adaptability, a major promise of open strategy.
- 3. The research provides a teachable, open strategy discipline that practitioners can use to address adaptive challenges (Heifetz, 2003; Heifetz et al., 2009). Because the discipline is teachable, practitioners can scale the discipline within organizations or across interorganizational collaborations.
- 4. This research offers insights in how to address complex, wicked challenges through the formation of networks (Weber & Khademian, 2008).

5. For scholars in transition management for sustainable development, this research suggests a pragmatic, underlying transformative change framework. This research implies Strategic Doing could be a "propelling mechanism" (Termeer & Metze, 2019; Termeer & Dewulf, 2019) to align and accumulate small wins. In doing so, the model has shown the potential to create pathways to larger system transformations.

1.9 Definitions

The thesis adopts the following definitions.

- Asset: Any resource used to create value.
- Collaboration: An uncertain, creative process, powered by trust, through which
 participants discover how to create new, shared value by linking and leveraging their
 resources together.
- Innovating network: A network of participants capable of collaborating to innovate and create new value.
- Model: A theory of action.
- Open strategy: Processes for generating the outcomes and pathways needed for a strategy by relying on networks, transparency, inclusion and double loop learning.
- Strategic opportunity: A hypothesis about how new value can be created from linking and leveraging assets within a network.
- Strategic outcome: A future state that can be specifically described with measurable characteristics.
- Reflection: The iterative examination of evidence and ideas to form new categories, connections, and narratives that make sense of an ambiguous or confusing situation.
- Reflective practice: A professional routine that continuously relies on reflection to learn and adapt.
- Skills: Concrete behaviors that demonstrate an individual's ability to behave in appropriate situations to put a theory of action into practice.
- Strategy: A clear statement that explains where an entity, organization or network is going and how it proposes to get there.
- Strategic conversation: A conversation that is structured and guided to yield a strategy.
- Theory-in-use: An implicit or tacit theory that governs a professional's behavior within a professional setting.
- Theory of action: A set of rules governing a sequence of actions that under relevant circumstances will yield intended consequences.

1.10 Thesis structure

The thesis, structured like a funnel, moves from broad issues of existing knowledge and methodology through a formal presentation of the model and to examples of how I have applied the model. Chapter 2 provides a literature review that situates this research within existing strategic management research streams. Chapter 3 presents the pragmatist methodology

underlying this research, focusing on reflective practice as a theory of inquiry. The chapter also summarizes the action research projects that led to the development of Strategic Doing. Chapter 4 outlines the theory and practice of Strategic Doing. Graphics are a critical component of this type of research (Frankel & DePace, 2012). In addition to a formal specification of the model, the chapter includes an evolving visual language for Strategic Doing. Finally, the chapter also locates scholarship across multiple disciplines that appear to support each of the Strategic Doing rules and explain why they work.

The remaining chapters step through the application of Strategic Doing from increasingly specific perspectives. For reasons outlined in Chapter 5, addressing wicked challenges will most frequently take place within regional economies. The chapter explores the emergence of these economies from three perspectives: business, government, and universities. It argues that these three perspectives converge around key concepts of open networks, ecosystems, and platforms. This convergence suggests that opportunities are emerging to build more productive collaborations to address the growing array of wicked problems. I advance the argument that universities can play a critical role in accelerating this convergence. This chapter sets the stage to define the university's position. It explores the growing importance of both ecosystems and platforms. Because ecosystems are complex adaptive systems, strategy practitioners cannot directly manage them. Instead, we can accelerate their formation and guide them. We can design and oversee the platforms on which they form. Universities are in a pivotal position to develop and guide these platforms within the regional economies they serve. To do that, they must reimagine their engagement mission.

Universities use their engagement activities to apply knowledge to complex social and economic challenges. With Strategic Doing, universities now have a low cost and scalable approach to improving their engagement activities' alignment and productivity. Strategic Doing represents an open-source operating system to power their engagement activities forward. Chapter 6 provides an overview of how several universities have used Strategic Doing in their engagement activities. It argues that, as global markets have grown more connected and networked, new opportunities are emerging for universities to develop productive, network-based engagement strategies within the regions they serve. Following the protocols suggested by

Strategic Doing, universities can move in this more entrepreneurial direction.

Chapter 7 then takes my argument one step further. It presents a more detailed case study of how the University of North Alabama used Strategic Doing to develop a vibrant entrepreneurial ecosystem (Malecki, 2018; Roundy et al., 2018). Creating a more entrepreneurial regional economy presents universities with a wicked challenge. How can they orchestrate a more innovative, entrepreneurial ecosystem in the regions they serve? The chapter walks through how the University of North Alabama used Strategic Doing to address this wicked challenge and accelerate the collaborations needed for a vibrant ecosystem.

Chapter 8 then focuses even more narrowly on the micro-level of the individual. It demonstrates how universities (and other organizations) can move Strategic Doing into action by learning and teaching new design skills and guiding strategic conversations. This chapter includes one chapter of the book, Strategic Doing: Ten Skills for Agile Leadership (Morrison et al., 2019; the entire book is available in Appendix A). A key challenge for moving a theory of action into practice involves teaching the skills implied by the model. As Argyris and Schön point out, skills align concrete behavior with a theory of action. "Skills are dimensions of the ability to behave effectively in situations of action" (Argyris & Schön, 1974: 12). Chapter 8 illustrates the results of leading a team to translate the ten rules of Strategic Doing into skills. This chapter, along with Appendices B and C, provide a glimpse into how we now teach these skills. Through this book, Strategic Doing is starting to enter the mainstream of strategy and leadership education. When we sent the book out to review before publication, we received some testimonials that confirm the quality of this work:

"I've been investigating how organizations' working environments influence a group's ability to achieve their goals for two decades. In my consulting and research I've seen organizations where employees can excel and contribute at their very highest levels - and others in which fear rules the workplace. This book provides insight into the practices and behaviors that help build high-performing groups. Readable and practical guidance for every organization and team."

Amy C. Edmondson, Harvard Business School

"Strategic Doing is THE source to understand how leadership and strategy are changing in this age of speed and complexity. What makes this book more important are the ten practical skills that you and your colleagues can learn to become masterful at leading in a disruptive age."

Jay Conger, Chaired Professor of Leadership Studies at Claremont McKenna College.

"Technology is a primary source of innovation and creates a competitive advantage. As the speed and complexity of technology continues to increase, our approach to strategic execution needs to adapt. It's no longer about individual talent development, it's about our ability as leaders to coach a team to be agile, recognize opportunities, and adjust the course appropriately. This book identifies the skills behind that kind of transformation and how to build a culture of learning and transparency. If you're talking about collaboration, this book provides a foundation - whether you're trying to improve your department, your company, or your community."

Ben Amaba, Chief Innovation Officer for IBM, Industrial Sector, Watson & Cloud Platform

"For those involved in strategic planning and management across corporate, government, universities and community organisations. It addresses the fundamental flaws that have emerged in the application of traditional strategy and planning within a whole new environment. Secondly, it provides a simple, logical, low cost and low risk way of getting the right things to happen quickly and, thirdly, it works."

Emeritus Professor Michael Hefferan, University of the Sunshine Coast, Queensland, Australia.

"Ed Morrison has mastered the art of making progress happen in a complex, change-resistant world. Now he and his colleagues have assembled decades of hard-won lessons into an easy-to-assimilate book—which is great news for every enemy of chaos, confusion, and inertia."

John D. Donahue, faculty chair, Masters in Public Policy program, Harvard University

"This book not only consolidates years of real experience but also is written in a style that is fully consistent with the title: action focused. Not only after having finished the book, but even during the reading, one already has the desire to do something. Because of the integration of the broad base of experience with the science of ecology, cybernetics, and complexity, this book shows a depth beyond expectation considering how hands-on and practical this proven approach is."

Peter Robertson, Executive Lecturer & Research Fellow, Nyenrode Business University (The Netherlands)

"The convergence of the physical and digital worlds, especially in manufacturing, presents unprecedented opportunity for the creation of transformational value. With all the chess pieces on the table, there are a seemingly unlimited number of opportunities in front of us. For organizations to take full advantage of the opportunities this convergence presents, leaders need the skills and insights presented in this book. Strategic Doing should be required reading for every leader charting a pathway forward."

Don Cooper, VP, PTC/Global Rockwell Alliance.

"A lifetime of thought and field experience by Ed Morrison and his colleagues has resulted in an amazing voyage. This book gives us an intimate immersion into the subject of "Strategic Doing." It opens the door to learning how to design and implement effective strategy in some of the most complex and loosely connected networks that often frustrate organizations and institutions. It does this with a *muscular* package of macro and micro strategic insights, along with a *soft* package of skills for ingenious collaboration. It offers a wealth of examples along the way and a credo for practicing Strategic Doing at the end. To top the wonderful package of ideas and advice, it provides a truly diverse bibliography to deepen your continued learning. Many of us will benefit from this superb work."

Alan Beckenstein, Professor, Darden School of Business, University of Virginia

The Appendices support the thesis. Appendix A presents the full text of Strategic Doing: Ten Skills for Agile Leadership. By contract with the publisher, this Appendix provides additional material to evaluate this thesis; readers cannot reproduce this Appendix. Appendix B provides excerpts of training materials used in executive education. This material provides a window into translating a theory of action into clear, measurable skills. Appendix C presents data from the multiple action research projects that gave rise to Strategic Doing. These data focus on the outcomes from each project presented in Chapter 3 on Methodology. The University of North

Alabama is establishing a digital archive for additional files from these projects. This archive is available here: https://ir.una.edu/agile_community/

Chapter 2: Literature Review

This thesis takes pragmatism as the foundation of its approach. It reports on over two decades of action research projects in the field of strategy. Specifically, it explores how strategy can be developed in open, loosely connected networks. This chapter first explains how pragmatism provided the foundation for the research presented in this thesis. The review then situates this research within the strategy literature.

2.1 Overview of pragmatism

Paradigms guide researchers. An accepted model or pattern, paradigms provide an organizing structure and philosophical stance illuminating the research inquiry (Kuhn, [1962] 1996; Guba and Lincoln, 1994). Pragmatism, a philosophy that emerged in the United States after the Civil War, guides this research. Its origins connect to Cambridge, Massachusetts, and the Metaphysical Club's founding (Menand, 2001). Charles Sanders Peirce and William James pioneered its development. They opposed the prevailing notion of absolute truth, what Dewey later called the "spectator theory of knowledge" (Boyles, 2006). While not rejecting the idea of epistemology altogether, pragmatists simply set much of traditional epistemology aside. Rather than get bogged down in unresolvable philosophical debates on the nature of reality, the pragmatist paradigm embraces the notion of utility. Pragmatism holds that effective scientific inquiry solves practical problems in the real world. Early pragmatists felt that a philosophy of science should make a difference, both practically and morally, to improve everyday life. Pragmatism is a problem-solving research orientation that aims to create practical knowledge through rigorous inquiry. It ties a theory of inquiry to action (Morgan, 2014). Heavily influenced by Darwin, the early pragmatists embraced a process metaphysics, the general view that reality can best be understood and explained in terms of processes, rather than objects (Rescher, 1996).

Pragmatism stands apart from the two main paradigms traditionally presented in scholarly research: positivism/post-positivism and constructivism/interpretivism. The positivism paradigm advances the notion of a singular reality. Following this paradigm, research discovers the only truth through objective inquiry. Recall in the literature review, Langley (2015) referred to this

paradigm as a "normal science" orientation. In contrast to positivism, constructivism holds that there is no such thing as a single objective reality. Instead, reality consists of "multiple realities" that people have in their minds. Following this paradigm, research pursues the social construction of knowledge. Each of these paradigms carries implications for methodology. Positivists favor quantitative research methods, while constructivists favor qualitative research methods (Guba and Lincoln, 1994). As an alternative paradigm, pragmatism steps past these contentious issues of truth and reality. It collapses the distinction between epistemology and ontology (Hothersall, 2016). Pragmatists, like Dewey and Schön, are not rejecting the ideals and moral standards of science and rigorous research. In their search for results, they are not abandoning epistemology (Boyles, 2006). Instead, they call for new forms of scholarship and a new epistemology: applied knowledge generated from practice that can be generalized, made explicit, and shared (Schön, 1995). My research responds to this call

Pragmatism generates the knowledge needed to find solutions to complex problems by supporting multiple research methods (Morgan, 2014, 2020; Feilzer, 2010; Biesta, 2010; Mitchell, 2018). Simultaneously, pragmatism intersects with both action research (Oquist, 1978) and grounded theory (Morgan, 2020). Further, in recent years, scholars have seen the value of pragmatism in supporting management research (Simpson, 2017), strategy-as-practice (Langley, 2015), and grand challenges (Ferraro et al., 2015). Strategic Doing developed through a professional practice that embraced many of the core ideas of pragmatism. The remainder of this chapter explains how Dewey, Schön, Argyris, and Pierce's thinking guided my research. It then moves to a discussion of characteristics of action research that provides the foundation for this research. The chapter concludes with a summary of the action research projects that led to Strategic Doing.

2.1.1 Dewey and his theory of inquiry

To Dewey, inquiry generates knowledge. Inquiry is triggered when the practitioner/researcher encounters a situation of perplexity, confusion, or doubt (Dewey, 1910). The practitioner/researcher designs a systematic and protracted inquiry, a process of reflective thinking, to resolve this indeterminacy. Through the process, the practitioner moves to a situation that is more

coherent and understandable. For Dewey, an inquiry is a process of reflective thinking that combines both mental reasoning and action in the world (Schön, 1992). The practitioner/researcher does not stand outside the situation as an observer. Instead, the practitioner/researcher is fully engaged in a process closely aligned with action research. Thinking and doing are joined; knowledge is embedded in action. Through experimental thinking and scientific reasoning, the practitioner develops a working theory to resolve the indeterminacy. In defining his process of inquiry, Dewey distinguished between primary and secondary experiences. The primary experience involves the interaction of the practitioner/researcher with the indeterminate situation. The secondary experience is a reflective experience in which the practitioner/researcher generates a working hypothesis and then tests this hypothesis in action (Miettinen, 2000). This notion of primary and secondary experiences are expressed by Schön (1983) as "reflection-in-action" and "reflection-on-action," discussed below.

Dewey's concept of knowledge deserves further explanation. Dewey stressed that the process of inquiry is fallible; every knowledge claim is open to other exploration and potential criticism. Dewey saw our experiences as embedded in the turmoil of constant change (Lyons, 2010). Within these continuously shifting experiences, Dewey emphasized the experimental nature of the inquiry. He preferred to describe his philosophical orientation as "experimentalism," not pragmatism (Bernstein, 1992). In keeping with the process metaphysics underlying his thinking and rejection of a spectator theory of knowledge, Dewey also preferred the term "warranted assertions" to acknowledge all knowledge's tentative nature. The researcher accepts that every assertion is open to continuing challenge in continuously emerging situations (Simpson, 2017). The solution of a problem gives rise to new issues. Schön steps even farther. He suggests that the proper test of rigorous inquiry is not only, "Have I developed a solution to this problem?", but also "Do I like the new problems I have created?" (Schön, 1995).

In my research, the indeterminate situation arose from the failure of conventional strategic planning tools to enable a loosely connected network of participants to develop an effective strategy. As noted above, strategic planning practices assume that a hierarchical organization is in place and is itself the strategy's focus. However, within an open, loosely joined network, no single organization controls. No pre-existing governance system provides coherence to the

situation; no single person or team can direct outcomes. Consequently, the process of strategy requires a fundamentally different approach, a new solution to the problem of management and governance. Throughout the development of Strategic Doing, each client situation posed additional challenges. Each case generated new insights into how to design an effective strategy process for open networks. As Dewey pointed out, no two situations are identical; each case determines the inquiry's design and details. It is a situated process that takes time to develop. For each project, I designed a method of inquiry aligned with Dewey's theory. As Langley (2015) pointed out, the coherence of this pragmatist approach emerged from a consistent underlying framework from which I could design a theory of action. The major projects are outlined below in Section 3.8.

Here, the term "design" deserves some attention. In this context, "design" is used in its broadest sense as "a process of making things (including representations of things to be built) under conditions of complexity and uncertainty" (Schön, 1995). As Simon (1993) points out, design is inherent in developing and implementing strategy: defining opportunities and possible courses of action. In quoting Simon, Liedtka (2001) provides a pithy summary of this expansive notion of design: "Everyone designs who devises courses of action aimed at changing existing situations into preferred ones." Reflective practice, a topic to which we now turn, is inexorably a design process.

2.1.2 Schön and reflective practice

Dewey suggested that human experience involves reflection, the interpretation of knowledge, and belief that leads to action (Morgan, 2014). He conceptualized epistemology as a theory of inquiry that involves a thoughtful, systematic process of reflection. For a practitioner/researcher, a rigorous inquiry process generates useful, actionable knowledge focused on issues of human significance. In the pragmatist view, experience, knowing, and acting are all part of the research process (Kelly and Cordeiro, 2020).

Schön expressed this idea most clearly in his call for a new epistemology within the university (Schön, 1995). Schön's 1995 article built on his earlier work on reflective practice (Schön, 1983, 1987). Schön structured his argument for the value of reflective practice within the

university as follows. The research university embraces a particular view of knowledge that has placed practitioner/researchers in a bind. They often encounter messy, wicked problems that are confusing but critically important. Schön described these problems as occurring in the "swampy lowlands" of practice.

In contrast, most research universities operate on the high, hard ground overlooking the swamp. Schön argued that the predominant method of discovery within the research university follows "technical-rational analysis". In contrast, problems in the swampy lowlands cannot be quickly resolved this way. The tension between the university's dominant epistemology and the messy issues in the lowlands gives rise to the dilemma of rigor versus relevance (Argyris & Schön, 1989; Schön, 1995; Gulati, 2007; Drnevich et al., 2020). The tension also places practitioner/researchers in a difficult position (Langley, 2015). The technical rational approach to knowledge, rewarded by the research university, provides a marked path to career advancement. It promotes rigor, but at some cost to relevance. At the same time, the process of discovery in the swampy lowlands risks a loss of rigor. Actionable knowledge, generated through practice, cannot sacrifice rigorous validity standards, or it has no place in the university.

Schön sees a resolution of the dilemma through an expansion of action research by practitioner/researchers. The process of reflection during action research is central to the development of both rigorous and actionable knowledge. Knowledge generated through practice is most often tacit; what Schön calls "knowing-in-action." Converting this knowledge into explicit terms involves a process of reflection. Surprise, the perplexing situation Dewey (1910) described, triggers the process. Through a process of reflection, the practitioner/researcher restructures her understanding of the problem. She frames the situation differently. As she does so, she becomes more capable of explaining what is going on. She gradually moves tacit knowledge forward to become more explicit.

In my case, my reflective practice took place in two phases, similar to Dewey's concept of primary and secondary experiences (Dewey, 1910). Reflection-in-action took place during the workshops, in situations in which students or participants raised questions regarding the process I designed. These questions often forced me to reflect quickly on why my explanations, which were clear to me, did not trigger the same reaction with workshop participants. Reflection-on-

action took place later, most often in whiteboard sessions alone or with my colleagues. The distinction between reflection-in-action and reflection-on-action is important. These activities are separate (Lyons, 2010).

Schön anchors his call for expanded action research with a reference to Kurt Lewin, a social psychologist who first proposed this approach (Lewin, 1946). Schön argued that action research could give rise to actionable theory, a verbally explicit theory, derived from particular practice situations. This actionable theory can be generalized and transferred to other problems in a process called "reflective transfer" (Schön, 1995:31). In doing so, the practitioner develops a new theory of action (Argyris & Schön, 1974; Argyris, 1993,1995). Consonant with the principles of pragmatism, the theory's validity depends on how well it transfers to different situations. Within these different situations, a theory of action must produce actionable knowledge. Argyris explained the validity of a theory of action this way:

The same theory should be usable to describe and understand reality, to invent new solutions to problems, and to prescribe what actions are to be taken, how they are to be implemented, and how the effectiveness of the implementation is to be evaluated. (Argyris, 1993:250)

This approach of developing a theory of action and testing it across multiple settings gives rise to reflective practice epistemology. "We should think about practice as a setting not only for the application of knowledge but for its generation" (Schön, 1995: 29). At the same time, Schön warned that introducing this new approach to epistemology will not be easy within the university. "It is a battle of snails, proceeding so slowly that you have to look very carefully in order to see it going on." (Schön, 1995: 32). By introducing a new theory of action covering strategy and open networks, this research follows Schön's logic. I developed this theory through reflective practice and action research. Examining how I evolved the approach and applied it in multiple settings will illuminate the process. The teaching of Strategic Doing, a separate process, also developed through reflection. Section 3.8 below explains the various settings which have given rise to Strategic Doing.

Teaching developed alongside continuing practice. Beginning in 2006 and 2007, I started learning how to teach the underlying principles of Strategic Doing. This work began with

sessions at the Edward Lowe Foundation and the Economic Development Institute at the University of Oklahoma. At first, I conducted these classes as a consultant delivering a report. I structured the presentation with extensive preparatory materials. Only at the end of the presentation did I focus on how Strategic Doing addresses complex problems encountered in open networks. While student responses to the material were positive, there was little evidence that students were moving Strategic Doing into their practice.

By 2014, our Purdue team published the first Strategic Doing Field Guide (Purdue Center for Regional Development, 2014). In 2017, we released the first Practitioner's Field Guide (Strategic Doing Institute, 2017). Specifically focused on practitioners, it explains the underlying conversations and the simple rules that give rise to these complex collaborations. This field guide is now in its second edition, with revisions scheduled every two years (Strategic Doing Institute, 2019). Excerpts of the field guide appear in Appendix B. These materials demonstrate how I encouraged reflective practice and continuous learning across our Purdue team.

At this point, it is helpful to provide more context for my work at Purdue University. Schön wrote his 1995 article in response to a report by Ernest Boyer of the Carnegie Foundation for the Advancement of Teaching (Boyer, 1990). Amid growing complexity, Boyer called for higher education institutions to clarify their missions and rethink their relatively narrow system of faculty rewards. He proposed a broader definition of scholarship. Boyer suggested that the prevailing method of defining, conducting, and rewarding scholarship within higher education focused too much on generating publications in refereed journals instead of developing and disseminating knowledge that benefits society's broader interests.

Boyer's work led to the establishment of the Kellogg Commission on the Future of State and Land-Grant Universities. In particular, the commission focused on extending the university's mission of engagement. The Kellogg Commission report on engagement, "Returning to Our Roots: The Engaged Institution", emphasized the importance of collaboration in strengthening the university role within the regional economy it serves (Kellogg Commission, 1999). Purdue President Martin Jischke served on the Kellogg Commission. Under his Purdue presidency from 2000 to 2007, Jischke put the Kellogg recommendations into practice, and Purdue became a nationally recognized leader in university engagement (Jischke, 2004; Franklin, 2008). Jischke

established the Purdue Center for Regional Development in 2004. In 2005, the center became the home for the continued development of Strategic Doing. During this time, I developed the university context for deploying Strategic Doing by explaining how the university could become a platform for developing both start-up and innovation ecosystems (Morrison, 2018a). Boyer, Schön, and Jischke deeply connect around the concept of a new epistemology for the university (Boyer, 1990; Schön, 1995; Jischke, 2004). Strategic Doing is an expression of that epistemology.

2.1.3 Pierce and abduction

Abduction provides a logical process to explain collected experiences and data when no appropriate explanation already exists. Like inductive and deductive reasoning, abduction works to make logical inferences and construct theory. However, it is a dialectical process of reasoning that avoids the inherent limitations of induction and deduction. Knowledge creation is a dialectical process (Nonaka & Toyama, 2002). Through the process, practitioner/researcher alternates between synthesis and analysis (Barton and Haslett, 2007). In synthesis, the practitioner/researcher draws together previously disconnected ideas and generates a more meaningful explanation. The practitioner/researcher then evaluates whether this new categorization resolves the perplexing situation through experimentation and analysis. This dialectical process closely aligns with how practitioners search for solutions to perplexing problems (Cook & Wagenaar, 2012).

First proposed by Pierce, abduction represents a less formal approach to logic than induction or deduction. However, as Peirce noted, it is the only form of inquiry that generates new knowledge (Sharpe, 1970; Nonaka & Toyama, 2002; Barton and Hazlet, 2007). Through an abductive process, the practitioner/researcher abandons old categories and takes a mental leap that brings together ideas that have never been associated with one another (Reichert, 2007). With abduction, the research process starts with a puzzle, perplexity, confusion, or doubt the triggers inquiry, as explained by Dewey (1910). The practitioner/researcher searches for a coherent explanation of the surprising experience and data. The process of inquiry, as Dewey suggested, involves a purposeful, flexible engagement with the world (Cook & Wagenaar, 2012).

The process is closely associated with action research (Halecker, 2015) and systems thinking (Barton and Haslett, 2007). Table 2-1 outlines the differences between deductive, inductive, and abductive logic. Under each approach, both the researcher's role and the outcome of the research are defined differently.

	Deduction	Induction	Abduction
Logic	In an deductive inference, when the premises are true, the conclusions must also be true.	In an inductive inference, known premises are used to generate untested conclusions.	In an abductive inference, known premises are used to generate testable conclusions.
Frem/To	Generalize from the general to the specific.	Generalize from the specific to the general.	Generalize from the interactions between the specific and the general.
Use of Data	Data collection is used to evaluate propositions or hypotheses related to an existing theory.	Data collection is used to explore a phenomenon, identify themes and patterns and create a conceptual framework.	Data collection is used to explore a phenomenon, identify themes and patterns, locate these in a conceptual framework and test this through subsequent data collection and so forth.
Theory	Theory faisification or verification.	Theory generation and building.	Theory generation or modification; incorporating existing theory where appropriate, to build new theory or modify existing theory.

Source: Nitchell, 2018

Table 2.1: Deduction, induction and abduction compared. The logic of abduction generates "testable conclusions". Through a dialectical process of inquiry, the practitioner/researcher generates what Nonaka and Toyama (2002) refer to as knowledge and what Dewey called "warranted assertions" (Morgan, 2014).

Developing the visual language for Strategic Doing illustrates this process of abduction. A visual language helps explain the complexities of hidden networks (Frankel & DePace, 2012). As I developed the Strategic Doing process, I used the Strategic Doing cycle to describe how to design and guide conversations that lead to an effective strategy in open, loosely connected networks. Each new workshop provided me the opportunity to evaluate the impact of the cycle during the workshop. As I developed the discipline, I was able to clarify and simplify the cycle. Figure 3-1 illustrates evolution. The clarity emerged from my more in-depth understanding of the conversations' underlying structure and trajectory that led to effective collaborations. I also had to develop the appropriate words and phrasing to communicate this underlying structure effectively quickly in a strategy workshop. Finally, the Strategic Doing cycle needed to work effectively among vastly different audiences from NASA life scientists to neighborhood activists.

Through abduction, a process that stretched over a decade, I developed the visual language incorporated in Strategic Doing.

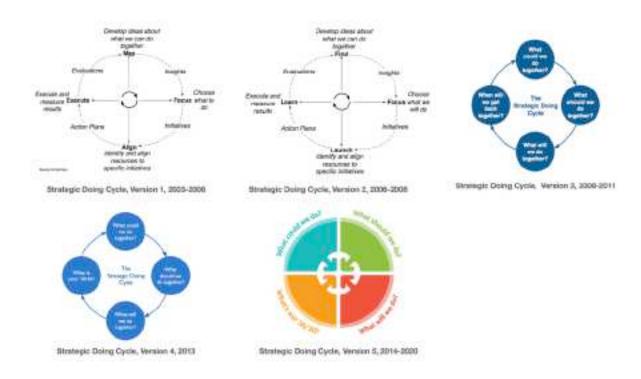


Figure 2.1: Evolution of the Strategic Doing Cycle: The evolution of the cycle illustrates the practice of abduction in the development of a visual language to define the Strategic Doing process.

In the context of strategy research, Duggan (2007) positions the process of abduction as "strategic intuition." Duggan frames his definition of strategic intuition research firmly within the pragmatist tradition. A practitioner's "flash of insight" combines existing elements of knowledge into a new hypothesis. Here's how Duggan (2007: 23) describes the process:

In science, the result of strategic intuition is a strategy, that is, a course of action toward a goal: an experiment to test your new hypothesis. In other fields, the result is the same: a flash of insight gives you a goal and a course of action to reach it. Your goal is a hypothesis: you think it will work, but only the experiment — the course of action — will tell you for sure.

From the pragmatist view, the conclusion of any inquiry, any abductive process, is further inquiry (Schön, 1995). Knowledge is always open to error and revision. Knowledge emerges from this on-going and self-correcting process, of which abduction is a vital part. Science, when

viewed from the pragmatist stance, posits approximations of the truth. These approximations are always open to further evidence from experimentation. Theories and methods are acceptable to the extent that they generate useful solutions for a problem under inquiry. Abduction is how a practitioner/researcher can develop new theories of action and make them explicit. The next section turns to this topic.

2.1.4 Schön and Argyris and theories of action

Theory building occurs when practitioners encounter dilemmas, the situations of perplexity, confusion, or doubt, described by Dewey (1910). Stretching over two decades, I used a series of cases to build the theory of action, now called Strategic Doing (Eisnhardt, 1989). In my situation, the central dilemma emerged when I found that the traditional discipline of strategic planning did not work effectively to develop an effective strategy for complex challenges encountered in open, loosely connected networks. In terms set forth by Argyris and Schön (1974), strategic planning represented an espoused theory, an approach that I would advocate to my clients. An espoused theory represents a set of interconnected propositions that a practitioner communicates to others. It explains how a group of actions, under relevant assumptions, will yield intended consequences. Early in my career as a consultant, I espoused the theory that following traditional strategic planning protocols would deliver solutions to my clients' many complex challenges. These protocols relied on conventional strategic planning tools (Ghemawat, 2002, 2016; Hakala & Vuorinen, 2020). For years, I thought that a traditional strategic planning process could produce expanded investment in a regional economy facing structural unemployment brought on by globalization's intense pressures (Morrison, 1987).

However, my dilemma arose when I understood that strategic planning does not work in the open, loosely connected networks that make up an economy (Saxenian, 1996; Arthur, 1996; Beinhocker, 2006). There is no command-and-control system to create the alignment essential for strategy execution (Beer et al., 2005; Srivastava & Sushil, 2017). Instead, economies can be thought of as integrated, overlapping business ecosystems (Moore, 1993), or, as open systems, nested in other open systems (Beinhocker, 2006), or as open, loosely connected networks (Saxenain, 1996). Networks are a fundamentally different form of collective organizing than

hierarchies (Powell, 1990). These systems are dynamic, not static. That means that the challenge of alignment is also dynamic. As a result, the linear logic and protocols of strategic planning did not address the challenge of strategy execution (Sull, 2007). Other problems arose that fall beyond the scope of traditional strategic planning. These challenges included:

- *Knowledge sharing*.—Addressing wicked problems involves knowledge sharing and cross-boundary collaboration, what Edmondson & Harvey (2017) call "extreme teaming." Developing solutions require knowledge-sharing routines (Argote & Ingram, 2000; Argote & Guo, 2016). Developing knowledge sharing or transfer routines across a network is not a trivial problem (Inkpen & Tsang, 2005; Weber & Khademian, 2008).
- Collaboration.— Collaboration is a process by which partners create value that individual partners cannot produce on their own. It is a process of shared creation that lies outside traditional notions of cooperation and teamwork. (Schrage, 1990). The process requires conversation across multiple parties to share and generate knowledge. The process is complex (Van Tulder & Keen, 2018; Dentoni et al., 2018). Yet, relatively few individuals have the practical skills required to design and guide these conversations in my work. Scholars have reached similar conclusions (Schrage, 1990; Von Krogh et al., 2000; Bourgoin et al., 2018; Beer, 2020b)
- Governance and accountability.— Cross-organizational collaborations require new arrangements to support governance and accountability (Edmondson & Harvey, 2017). When public entities invest resources to support these collaborations, establishing appropriate governance and accountability is critical (Weber & Khademian, 2008).
- Coping with resistance and power dynamics.— Developing solutions to wicked problems often involves disrupting existing power arrangements. As opposed to making incremental changes to existing institutions, these solutions take on the characteristics of large-scale, transformative changes (Waddock et al., 2015). Finding a pathway to this scale of change is challenging (Sharp et al., 2016). The disruptions and barriers inhibiting transformation fall beyond the scope of organizational politics (Ferris et al., 2019). Understanding these obstacles touches more directly on a systems-level analysis of civic institutions and traditions. Putnam provided examples in his early work (Putnam & Leonardi, 1993; Putnam, 1994). Saxenian (1996) also engaged in this type of analysis. She explained how two regions, Boston and Silicon Valley, responded very differently to technology disruptions in the computer industry.

To address the inadequacies of strategic planning, I needed to develop a new theory-in-use. This theory would govern my behavior within the open-loosely connected networks that characterize an adaptive regional economy (Saxenian, 1996). A theory-in-use represents an implicit or tacit theory that governs a professional's behavior within a professional setting. My theory-in-use about how to design and guide strategy in open networks evolved gradually from

1993 to 2005. It emerged as I accumulated tacit knowledge through my practice. Argyris and Schon (1974) explained the notion of tacit knowledge first expressed by Polanyi (1967). Tacit knowledge represents knowledge, skills, and abilities that a practitioner gains through experience, and that is also difficult to put into words or communicate.

While tacit knowledge serves as the basis for theories-in-use, a theory of action is different. A theory of action represents an explicit set of rules or a protocol to guide a sequence of steps that will yield intended consequences (Argyris, 1995). In Whittington's formulation, it is a "strategy practice" (Whittington, 2006). As I moved to Purdue, the challenge involved converting my theory-in-use into an explicit theory of action. As Argyris (1993: 250) explained:

Although theories of action are not theories about some objective truth, they do make claims about how to act effectively — indeed, about what is effective in the first place for a particular individual or group. These claims must be subjected to the most rigorous tests available, not only because that is good science but also because we as researchers owe it to the practitioners who may use the knowledge produced by our research and to the people who receive services from those practitioners. All are owed some assurance that we strive to connect practice with testing, action with learning.

To move toward an explicit theory of action, our Purdue team developed testbeds in a variety of diverse circumstances from 2005 to 2018. When a sufficient number of testbeds convinced me that we had a stable theory of action that we could teach, we organized a team to publish a book on our work. In the book, we focused on individual skills needed to design and manage Strategic Doing as a strategy process. As Simon has pointed out, all learning takes place in the individual (Simon, 1991). With a stable theory in hand, it made sense to focus there. To put a theory of action into practice, individuals must first learn some new skills. Argyris and Schön (1974:12) defined the term:

Skills are dimensions of the ability to behave effectively in situations of action. Skill is a hybrid term that refers both to a property of concrete behavior and to a property of theories of action.

Chapter 4 presents the theory of action for Strategic Doing more formally. It places each rule into a practice context. The chapter also explores the extent to which existing scholarship supports Strategic Doing. In other words, to what extent can scholarly research help explain the

results of Strategic Doing? The book summarizing the skills needed to put this theory of action into practice appears in Appendix A. Excerpts of training materials appear in Appendix B.

2.1.5 Action research

This thesis, grounded in these theories, is based on action research, an approach to inquiry that combines inquiry with action as a means of stimulating and supporting change (Burns, 2007). Action researchers are interested in improving their practice through innovation, but they must also meet the research, writing, and publishing standards of scholarly research. Again, they must provide evidence of learning, reflection, and a contribution to knowledge in both theory and practice (Zuber-Skerritt & Fletcher, 2007). The Handbook of Action Research defines action research in a similar fashion (Reason and Bradbury, 2001:1):

[Action research is] a participatory, democratic process concerned with developing practical knowing in the pursuit of worthwhile human purposes, grounded in a participatory worldview. It seeks to reconnect action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people. More generally, it grows out of a concern for the flourishing of individual persons and their communities.

This definition is insufficiently precise to explain the practice of action research that I followed over two decades. Other sources are more helpful. In the First Symposium on Action Research in Brisbane in 1989, participants developed a working definition of action research, reprinted below (Zuber-Skerritt & Fletcher, 2007: 414-415, italics omitted):

If yours is a situation in which:

- people reflect and improve (or develop) their own work and their own situations:
- by tightly interlinking their reflection and action; and
- also making their experience public not only to other participants but also to other persons interested in and concerned about the work and the situation, i.e. their public theories and practices of the work and the situation;

and if yours is a situation in which there is increasingly:

• data-gathering by participants themselves (or with the help of others) in relation to their own questions;

- participation (in problem-posing and in answering questions) in decision-making:
- power-sharing and the relative suspension of hierarchical ways of working, in a conscious move towards social and industrial democracy;
- collaboration among members of the group as a "critical community";
- self-reflection, self-evaluation and self-management by autonomous and
- responsible persons and groups;
- progressive (and public) learning by doing and making mistakes in a "self-reflective spiral" of planning, acting, observing, reflective planning, etc.; and
- reflection that supports the idea of the "(self-)reflective practitioner"

Then yours is a situation in which action research is occurring.

Elsewhere, Zuber-Skerritt and Fletcher (2007: 414) explain the CRASP model of action research as follows:

- Critical (and self-critical) collaborative inquiry by
- Reflective practitioners being
- Accountable and making the results of their inquiry public
- Self-evaluating their practice and engaged in
- Participative problem-solving and continuing professional development.

This research follows closely the contours of the CRASP model.

Critical (and self-critical) collaborative inquiry.— Each of the action research projects presented in this thesis began with forming a core team, usually consisting of 6 to 8 people. I guided this core team in the design of a strategy process. I would start with a clear understanding of the outcome that we were attempting to achieve. From this outcome, the core team and I would design a series of strategy workshops. Once we launched these workshops, we would evaluate the progress after each workshop and modify our strategy process, if needed.

Reflective practice.— As detailed in the discussion of Schön's reflective practice, reflection took place both during the workshop and sometime after the workshop. As workshops were taking place, I would specifically note where people were having difficulties understanding the evolving process. I would then clarify my thinking, often with different visual models (see Section 4.3: The visual language of Strategic Doing). As Schön (1983) points out, both reflection-in-action and reflection-on-action provide essential sources of insight. The primary experience took place in the workshop, the reflection in practice. The secondary experience, the reflection on practice, took place afterward, as I reflected on making improvements in the

process.

Accountability and public results.— In each of these projects, clients were looking for pragmatic results. All of these projects were accountable to the initial client organization that engaged me as a consultant or, from 2005 onward, our Purdue team. Except for one defense contractor and one pharmaceutical company, all of the action research projects generated public data accessible to other scholars. Further, as the Strategic Doing practice continues to evolve, the Institute for Policy Research and Engagement at the University of Oregon has agreed to become a data repository for Strategic Doing projects going forward.

Self-evaluative.— An important insight has emerged from this research that emphasizes self-evaluation. As this research evolved at Purdue, I was able to articulate ten skills needed to put Strategic Doing into practice. Over a decade of projects, I learned that no one is good at all ten skills of Strategic Doing. In other words, teams that use Strategic Doing to address complex challenges should be cognitively diverse (Page, 2008). Our Purdue team formed a partnership with a research company in the Netherlands, Human Insight, during this research. They have developed a research protocol that enables us to address cognitive diversity issues (Robertson & Schoonman, 2013; Reynolds & Lewis, 2017). In our training, we now begin with a self-evaluation so that participants can gain insight into their strengths. They find where they are most likely to feel comfortable contributing to the process. More importantly, they also identify which skills they are likely to need to improve. Using the Human Insight protocol, I understood the skills that I would teach most effectively.

Participative problem-solving and continuing professional development.— Strategic Doing workshops are designed to promote participative problem-solving. Each workshop begins with a question that frames a more in-depth conversation about solutions designed from the assets shared by participants. Through the course of the workshop, participants learn to refine their ideas. A trained practitioner, acting as an informal instructor, guides the conversation to keep it on track, much like a river guide would lead a group down a river (Arnould & Price, 1993). The workshop ends with participants agreeing on a "Pathfinder Project" and a 30-day action plan. The Pathfinder Project enables them to test the assumptions embedded in the solution they are developing. The participants also commit to come back together to share their

learning. To continue stimulating this professional development, I have led teams at Purdue University and the University of North Alabama to develop a curriculum presented both inperson and on-line. Currently, over 1,300 people have participated in the 2 1/2 day professional training that we have developed. A non-profit institute, the Strategic Doing Institute, supervises this training and awards certifications to training participants who have completed a capstone experience.

Action research and reflective practice are closely aligned (Leitch & Day, 2000). The action research methodology that I pursued follows Dewey's theory of inquiry and the reflective practice articulated by Schön set forth above (see Section 3.3: Schön and reflective practice). This thesis's action research also incorporates systems thinking, closely aligned with action research (Flood, 2010). During this research, I attempted to understand the underlying structure of conversations that lead to complex collaborations and strategies. This approach to understanding hidden system dynamics is guided by Senge's The Fifth Discipline (Senge, 2006, 2014) and system dynamics (Sterman, 1994; Meadows, 2008).

Bradbury and Reason (2003) point out that action research works well in small groups. The experience of small group inquiry promotes the transformation of individual experiences through group reflection. Practitioners design Strategic Doing workshops so that participants can take advantage of cooperative inquiry and group reflection. No matter the overall workshop's size, the conversations occur in small groups of six to eight people sitting at round tables. For example, over 200 people broke into more than twenty tables to conduct conversations at the University of the Sunshine Coast (Wardner, 2015).

Participants at each table engage in a guided discussion with timed intervals. A Table Guide and a Knowledge Keeper lead the discussions at each table. The Table Guide, an informal instructor, manages the conversation and keeps it on track. In guiding the conversation, the Table Guide improves the experience by making it more intense, positive, and enjoyable (Arnould & Price, 1993). Conversations are powerful ways to generate and distribute knowledge (Webber, 1993; Von Krogh et al., 2000). The workshop setting also helps build trust across an emerging network (Pregmark & Berggren, 2020). The Knowledge Keeper captures insights and decisions made during the conversation. First, participants share some tacit knowledge. Next, participants

combine these pieces of knowledge to create new opportunities. Abduction, metaphors, analogies, and visual representations are particularly helpful at this stage. Participants then forge these rough concepts into a shared outcome that synchronizes mental images of a destination. Next, participants generate an experiment, a project, to test their critical assumptions and move into action. Finally, the participants agree to a time and place to reconvene, evaluate their progress, and make adjustments. The Knowledge Keeper tracks the conversation as it progresses through these stages. Chapter 4 provides a more detailed explanation of the theory and practice of Strategic Doing. The critical training components explain the details of a Strategic Doing workshop. The components include The Practitioner's Field Guide, the Strategic Doing Action Pack, and the Strategic Doing Trail Map. Appendix B contains excerpts from these training materials.

2.1.6 Ethical dimensions of action research

Action research performed by a practitioner/researcher poses a range of ethical issues (Morton, 1999). On the one hand, she must address the specific challenges faced by the client and respond pragmatically. On the other hand, she must also meet standards of validity for rigorous action research. Specifically, action research should generate emergent theory applied to multiple situations (Eden and Huxham, 1996). Addressing these ethical challenges involves making choices to achieve scholarly standards of appropriate rigor without sacrificing relevance to the client (Argyris & Schön, 1989). Maintaining this balance can be challenging in addressing wicked problems. Transformative solutions often redefine power and power relationships within the transforming system (Waddock et al., 2015). These political dynamics are impossible to predict, and roles can be both ill-defined and confusing. Conversations can be fraught with hidden agendas, "issue-selling," domineering attitudes, and subtle intimidation (Von Krogh et al., 2000). Establishing psychological safety for these conversations is critical for knowledge sharing and learning to take place (Edmondson, 1999). Yet, it is not always easy. Occasionally, I have had to walk disruptive participants out of a workshop. Practitioners and researchers can resolve these ethical dilemmas if they are clear in their purpose and seek to build quality relationships through the process with participants (Couglan & Shani, 2005).

As Strategic Doing has developed, I have sought to encourage the growing network of practitioners to embrace an ethical stance that supports this work. For over a decade, a core team of practitioners from across the U.S. has been meeting three times a year to share their insights as this discipline has developed. In 2011, I convened this group and addressed these ethical issues. We developed a statement that expresses these values. In all our training and most of our workshops, we share the Strategic Doing credo:

- 1. We believe we have a responsibility to build a prosperous, sustainable future for ourselves and future generations.
- 2. No individual, organization or place can build that future alone.
- 3. Open, honest, focused and caring collaboration among diverse participants is the path to accomplishing clear, valuable, shared outcomes.
- 4. We believe in doing, not just talking and in behavior in alignment with our beliefs.

2.2 Overview: Reviewing the Strategy Literature

To understand whether research is generating new knowledge on the frontiers of existing knowledge, the researcher must first locate the frontier (Xiao & Watson, 2019). The literature review provides the foundation for the research. This review illuminates both the research problem and the research question. Because this review is rooted in decades of reflective practice in which I consulted scholarly literature, it departs somewhat from the traditional doctoral study. At the same time, the review presented in this chapter is similar to a conventional review. It situates the research. It explores the historical development of ideas. It provides a structure for evaluating the thesis's worthiness, and it provides a useful synthesis from my perspective (Hart, 2018).

In preparing this thesis, I conducted a structured narrative, replicable literature review. Replication is one of the dimensions critical to a quality literature review. This review presents a historical review of the strategy literature. The content selection concentrates on central or pivotal articles in the field (Cooper, 1988). Storylines that emerged from the study of these main articles drive the narrative. These storylines emerged from a methodology set forth by Greenhalgh and his colleagues (2005). Finally, this review follows a research methodology in its own right, including research questions, a research design, and a presentation of results (Hart,

2018). The review focuses on the following three goals (Randolph, 2009).

- Is there a supporting framework? The first goal is to determine whether the existing scholarly literature provides a supportive framework for the theory of action I developed. As outlined in Section 1.3, explaining the context for the research, I regularly consulted the scholarly literature during the development of Strategic Doing. This review will highlight key concepts on which I relied to develop the theory of action. The goal is to integrate the insights that took place over my journey and confirm that the extant strategy management literature provides a framework to situate this research.
- Where does this research sit within this framework? The second goal is equally important. If there is a supportive framework for this research, determine where this research sits within the various streams of supportive strategic management research and what it might contribute to knowledge.
- Does the literature illuminate the concept of "strategic conversations"? The third goal is to determine if the existing scholarly literature can offer more in-depth insights into the concept of "strategy conversation," a central idea to the theory. The goal is to determine whether the concept, as applied in Strategic Doing, can make a meaningful contribution to knowledge.

This literature review included the following phases, designed to identify storylines or themes within the strategy literature. It represents a meta-narrative approach to a systematic review of the literature (Greenhalgh et al., 2005).

Phase 1: Planning.-- This step involved consulting literature regarding the conduct of scholarly literature reviews. I reviewed several literature reviews to guide an appropriate approach. I also sought guidance from two handbooks on strategy-as-practice and open strategy (Golsorkhi et al., 2010; Seidl et al., 2019).

Phase 2: Search.-- This phase encompassed four steps. First, I identified literature reviews within the strategy literature. These literature reviews guided the major storylines within both the strategy content and strategy process research. This bifurcation has existed since the early days of strategy research. I explored significant themes in both strategy content and process by identifying highly cited papers within each stream. Second, I explored an emerging research stream within the strategy-as-practice literature. Third, I studied the open strategy theme emerging within the strategy-as-practice (or "strategy as process and practice") literature. Finally, I conducted a broad search for articles that explored the concept of "strategic conversation."

Here, I used search terms, including "conversation," "dialogue," "dialogic," and "discursive" to identify potentially helpful research.

Phase 3: Mapping.-- This phase involved mapping the emergence of fundamental research concepts and research paradigms that flow through the strategy literature. I directed the mapping toward the three goals of the review. These maps included the major concepts, theories, and methodologies that emerged from the development of Strategic Doing. Through this mapping, I was able to identify the significant research streams that helped explain the results I achieved through multiple action research projects.

Phase 4: Appraisal.-- This phase involved evaluating primary studies to assess their relevance to the review's goals and the research question. This stage aligned my theory of action to Penrose's foundational work on the firm's growth. This research falls within mainstream strategy research, the "resource-based view" of strategy, and the concept of "dynamic capabilities." This phase also pointed to this research opportunity to bridge a potential gap in the strategy literature. My focus on strategic conversations could bridge the robust research on "dynamic capabilities" with the nascent exploration of "open strategy." In the coming years, we will see if scholars confirm the opportunity. This phase also included identifying key concepts that could help explain my field results. For example, the ideas of "psychological safety" and "simple rules" play an integral part in explaining the results of the action research projects discussed in Chapter 3. The results of this Phase carry over into Chapter 4 on the theory and practice of Strategic Doing.

Phase 5: Synthesis.-- This phase involved generating a narrative account of the contribution made by different research streams and the studies within those streams. This synthesis illuminated both the research question and my reflective practice. This step pointed me to the pivotal papers authored and co-authored by Eisenhardt, Edmondson, Langley, and Liedtke. The synthesis also integrated the literature on strategic management with a stream of research on transition management toward sustainable systems. This research emerged from scholars based in the Netherlands, disconnected from the strategy literature.

Phase 6: Conclusion.-- Through reflection, I concluded how to present this review and situate this research within existing strategy research. This chapter is the result.

The first three sections of this review focus on well-established research streams within the strategic management literature. These three research streams provide valuable insights into the current research. They establish a broad conceptual framework to validate the research question. These streams include the resource-based view of strategy, the emergence of dynamic capabilities within firms to address volatile markets, and strategy as process and practice. The next section addresses emerging research streams that are less developed and more relevant to this research: open strategy and strategic conversations. Since 2011, scholars have focused on an emerging concept of "open strategy". As the review will reveal, this research is situated squarely within this open strategy subfield. The study makes a significant contribution to the open strategy subfield. The review also explores the concept of "strategic conversation," which scholars have not rigorously addressed in ways helpful to practitioners. The study will reveal that this research fills an important gap in the strategic management literature in the role conversation plays in strategy formation and execution.

2.2.1 The resource-based view of strategy

The literature of strategic management is deeply rooted in industrial economics. The resource-based view is central to this tradition (Wernerfelt, 1984, 1995; Peteraf, 1993; Connor, 1991, 2002). This viewpoint is grounded in work completed in 1959 by economist Edith Penrose, called The Theory of the Growth of the Firm (Penrose & Penrose, 2009). According to Kor and Mahoney (2002), a critical insight into Penrose's work comes in the causal links she draws between resources within the firm and its abundant opportunities for innovation and growth. In other words, these opportunities are defined by how a firm manages its resources. This insight is essential. It suggests that these assets' configuration, not the single assets themselves, defines the firm's strategic opportunities.

Penrose provides another valuable insight for this research. She establishes that the firm is an appropriate unit for economic analysis. Her important contribution is how she views the firm. She defines the boundary of the firm by the limits of communication and control of the managers within the firm. In other words, the firm is not limited to a legal entity but includes the networks of influence that extend beyond its legal boundaries. For Penrose's purposes, a firm's boundary is

porous and continuously shifting. As the discussion of networks will later reveal, she posits an important point: the resources of the firm extend beyond fixed legal boundaries and into networks. So, for example, the firm's resources include its supplier or customer networks that are managed through the skills of an internal management team. These resources include the skills, reputation, experience and trusted relationships embedded in these networks. While the resource-based view implies that resources extend into these networks, this aspect is not well developed in the literature. Only recently have scholars explored the strategic significance of resources within networks external to the firm. My review addresses this issue in the discussion of "open strategy" below.

The resource-based view suggests that any business's vitality emerges from its ability to develop, combine and recombine these resources or "assets" (Barney, 1991; Grant, 1991, 1996; Mahoney & Pandian, 1992). In the resource-based view, the concept of strategic assets is broadly drawn (Michalisin et al., 1997). They can be physical, such as equipment or facilities, or intangible, such as knowledge or reputation. From the perspective of the firm, these resources provide the raw material to structure a strategy. Developing a strategy begins with understanding these assets and exploring how to combine them. Each resource may be valuable standing alone, such as a critical patent. However, strategy more often involves developing unique combinations of assets that are difficult to copy (Amit & Shoemaker, 1993). The firm prospers by matching these assets to its external market opportunities (Grant, 1991). The competitive firm reorganizes these assets as the environment shifts with a continuously moving landscape (Grant, 1996; Bienhocker, 1999). The resource-based view is, however, frustratingly vague from the practitioner's perspective.

Collis and Montgomery (1995) attempted to close this gap by interpreting the resource-based view for practitioners. They structured their argument by focusing on the characteristics of an individual asset. They provided practitioners with a five-point test to determine if a particular resource can serve as the basis for an effective strategy. Is the resource hard to copy? Is it durable? Can the firm capture value from the resource? Is the resource vulnerable to substitution? Is the resource competitively superior? In their attempt to distill the theory, Collis and Montgomery obscure the resource-based view's original richness. They missed an important

point. Their argument ignores a firm's ability to combine and recombine resources that give rise to unique opportunities to create value. Other scholars have referred to this ability to reconfigure assets in response to a shifting environment as one of the "dynamic capabilities" of a competitive firm (Teece et al., 1997; Teece, 2004, 2007). The capability to reconfigure assets is essential in a network-based view of strategy. In Strategic Doing, participants in an open network combine assets they are willing to share to create new strategic opportunities (Chapter 4, Section 4.4.4. below and Morrison, et al., 2019: 65-76).

Collis and Montgomery stepped back in another way, as well. They saw the firm's networks, which are composed of individuals and their relationships, as a liability, not a strength. In discussing leveraged buyout firms' resources, the authors pointed to relationships within the investment banking community. They cautioned that these relationships reside in the individuals; the firm does not own them. This resource walks out the door when individuals leave the firm. They cautioned practitioners not to depend on these network-based resources; they are not "inextricably bound to the company" (Collis & Montgomery, 1995: 146). This conclusion seems wrong-headed, especially in a knowledge economy, where knowledge is embedded in individuals and their networks (Itami & Roehl, 1987; Nonaka, 1994). In an economy driven by knowledge, the central strategic challenge involves uncovering these hidden knowledge assets and managing conversations to integrate them into a strategic framework (Itami & Roehl, 1987; Von Krogh et al., 2000). A strategy process should foster a culture of continuous learning and adaptation, especially in complex environments (De Geus, 1988; Arthur, 1992; Senge, 2006; Edmondson, 2008). Of course, this theme echoes the argument of Schön in his Reith lecture and subsequent writings with Argyris: organizations adapt to increasingly turbulent environments by learning how to learn (Schön, 1970, 1971; Argyris & Schön, 1974).

It may not be surprising that the early expressions of the resource-based view largely ignored these learning and adaptation issues. An outgrowth of industrial economics, early scholars of the resource-based theory relied on quantitative analysis, the disciplinary bedrock of industrial economics. Understandably, industrial economists look at strategy through their disciplinary straw. They focus heavily on quantitative methods and tend to ignore qualitative factors that influence strategy. These blindspots appear in Porter's highly influential work in the strategy

field. In parallel to the resource-based view, Porter, an industrial economist, developed his Five Forces model (Porter, 1980). Porter's approach suffers from some of the same flaws as a static approach to the resource-based view.

According to Porter's model, strategy starts with a search for attractive markets. Strategy practitioners can identify these markets by the five forces that shape them: competitive rivalry, the threat of new entry, buyer power, supplier power, and the threat of substitution. Porter's model guides the practitioner through a logical exercise to gauge the industry attractiveness within which a firm competes (Porter, 1980; Barney, 1991). The resource-based view and Porter's model, both intersect and diverge. They cross in that they both explore ways for a firm to achieve sustainable competitive advantage. They split on where to start the analysis. The resource-based view, as Collis and Montgomery (1995) suggest, promotes starting with assets. Porter is looking for market imperfections, places where a firm can leverage potential market power. He suggests beginning there.

Porter's approach also implies that practitioners can optimize a strategy through quantitative analysis. Yet, shifting environments pose a challenge for optimization. These highly uncertain and complex environments defy optimization (Amit & Shoemaker, 1993). Indeed, McGrath suggests that achieving a "sustainable competitive advantage" through an approach such as Porter suggests, is no longer possible. Porter implies a static view of strategy: competitive advantage is a puzzle to be solved, not a wave to ride (McGrath, 2013). To Porter, top management can design and execute a strategy through data. This quantitative approach to strategy characterizes most of the traditional strategic planning tools (Ghemawat 2002, 2016; Hakala & Vuorinen, 2020). Initially, I used conventional strategy tools to address the more complex challenges of regions facing globalization (Morrison, 1987). Yet, I found that that this approach does not work well in regional economies for two reasons. First, the environment is continuously shifting. A factory that is open one week can suddenly close the next. Second, networks define markets, economies, and opportunities (Saxenian, 1991,1994, 1996; Arthur, 1995, 1999; Beinhocker, 2006). Markets present the practitioner with rugged, dancing landscapes. Continuous searching is the only way to discover the contours of these markets and the opportunities within them (Bauman et al., 2019).

Over time, Porter gradually moved his work to a more dynamic view (De Man, 1994). He included the ideas of networks or clusters later in his work (Porter, 1990). At the same time, Porter continued to rely heavily on quantitative analysis as the path to a successful strategy. Although he has provided approaches to identifying clusters through data, he provides no practical guidance on forming or managing these networks. As such, Porter's work and a static resource-based view are not particularly helpful to provide a framework for the development of Strategic Doing and the research presented in this thesis. Nevertheless, both the resource-based view and Porter have had broad impacts. The resource-based framework has generated a robust research stream (Barney, 1991; Wernerfelt, 1995; Barney et al., 2001). Porter, an academic who moved into consulting, influences both practitioners and business school faculty (Hakala & Vuorinen, 2020). With big data analytics fueling quantitative analysis, there will likely be continued growth of both perspectives. However, a narrow focus on quantitative analysis may move the strategic management field further away from relevance (Drnevich et al., 2020).

To step back, the resource-based view, as initially presented by Penrose, provides a promising a framework for this research. We can draw these important propositions from her work (Penrose & Penrose, 2009):

- 1. A firm is a collection of productive resources.
- 2. Growth depends on a firm configuring these resources into unique patterns that cannot easily be replicated;
- 3. These resources are broadly defined to include tangible and intangible assets; and
- 4. These resources extend beyond a firm's legal boundary and into its networks of relationships.

Before she died in 1996, Penrose did struggle with whether networks represented a new organizational form that requires a theory of the firm that was different from hers (Pitelis, C., 2009). Based on my experience, these same propositions apply to the networks I encountered in practice. From a network-based view of strategy, her insights remain valuable. The next phase in the evolution of the resource-based theory, which took place after her death, provides additional context. This phase involved the development of two key concepts: dynamic capabilities and the microfoundations of strategy. The review moves on to explore both ideas in more depth.

2.2.2 Dynamic capabilities and the microfoundations of strategy

Faced with the growing dynamism of markets in the 1990s, scholars exploring the resource-based view of the firm saw the need to make adjustments. Starting in the late 1990s, they began to incorporate the concept of "dynamic capabilities" into the resource-based view. Although the original work by Penrose included dynamic elements, over time, the resource-based view evolved mostly as a static framework. Teece and his co-authors set out to change that framing (Teece et al., 1997). They succeeded. In subsequent years scholarly work on dynamic capabilities developed into an extensive literature (Albort-Morant et al., 2018; Schilke et al., 2018). First rooted in the literature of strategy, researchers have expanded the concept's applications to other fields, including entrepreneurship and human resources (Schilke et al., 2018). This literature review narrows the relevant research on dynamic capabilities to highly cited papers that illuminate the research question. The dynamic capabilities literature is grounded in three highly cited papers with different definitions of dynamic capabilities (Teese et al., 1997; Eisenhardt and Martin, 2000; Helfat et al., 2009). Although these differences are relatively minor (Schilke et al., 2018), they are worth exploring.

In their 1997 article introducing the concept, Teece and his colleagues described dynamic capabilities at a conceptual level "as the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments" (Teece et al., 1997: 516). This initial definition, while intriguing, gives very little guidance to practitioners. So, it is not clear what a manager should do to design and manage a dynamic capability. Writing three years later, Eisenhardt and Martin moved to fill this gap. They offered a more concrete definition, framed in terms of managerial routines.

Dynamic capabilities are the antecedent organizational and strategic routines by which managers alter their resource base — acquire and shift resources, integrate them together, and recombine them – to generate new value creating strategies. (Eisenhart and Martin, 2000: 1107)

Eisenhardt and Martin include the concept, embedded in Penrose's writings but mostly left unexplored, that recombining assets is a dynamic capability. From my experience working in open networks, this capability to combine assets in new and different ways gives rise to new opportunities to create valuable solutions. Other scholars refer to this capability as "recombinant innovation" (Weitzman, 1998; Henderson & Clark, 1990; Hargadon, 2003; Frenken et al., 2012; Auerswald, 2015; Zhang et al., 2019). This idea is embedded in Strategic Doing and addressed more thoroughly in Chapter 4 on the theory and practice of Strategic Doing (see also Morrison et al., 2019: 65-76).

In their approach to "dynamic capabilities," Helfat and her co-authors emphasize other characteristics. They suggest this definition: a dynamic capability refers to an organization's capacity to create, extend, or modify its resource base. Dynamic capabilities include the ability to identify an opportunity, formulate a response, and implement a course of action (Helfat et al., 2009). By emphasizing the capability to move an idea into action, these authors include a key component of reflective practice and the pragmatist paradigm. This issue is explored in more detail in Chapter 3 on Methodology.

Combining these three definitions, practitioners can begin to see a path forward. Dynamic capabilities involve a process of configuring the firm's resources, as first set forth by Penrose, and working with these resources in new configurations to create new ideas for creating value (or solutions to wicked problems). Dynamic capabilities represent concrete behaviors or skills assembled into specific processes and routines (or theories of action) within the organization (Eisenhardt & Martin, 2000; Argyris & Schön, 1974). Dynamic capabilities include coming up with ideas through creative, divergent thinking, or "brainstorming" (Sutton & Hargadon, 1996). They also include convergent thinking, such as project planning and designing experiments to learn (Thomke, 1998, 2003).

To illustrate, Eisenhardt and Martin point to research by Hargadon and Sutton on a leading product design firm, IDEO (Hargadon & Sutton, 1997). With a simple four-step process model Hargadon and Sutton explained how innovation could take place through technology brokering, a process of recombining existing technologies to create a new product. As IDEO designers developed new products, they acted as idea brokers to recombine promising ideas from many previous projects. In essence, technology brokering is a process of "cross-pollination" (Hargadon & Sutton, 1997: 720). This cross-pollination process represents a dynamic capability or a theory of action that guides behavior (Argyris, 1995).

To provide additional clarity, Eisenhardt and Martin also explained a typical product development process within their studied firms. Firms created the new knowledge needed for new products by crossing the firm's legal or administrative boundaries. Here, they resurrected an essential idea from Penrose, primarily lost in the intervening years. "A common feature across successful knowledge creation processes is an explicit linkage between the focal firm and knowledge sources outside the firm" (Eisenhardt & Martin, 2000: 1109). In short, knowledge creation can involve engaging networks of outside resources. This use of networks constitutes a dynamic capability. It is an idea that Penrose includes in her work but does not explore. Like the Hargadon and Sutton example, the process involves recombining existing resources to create new knowledge of what may be possible. The external linkages necessary for effective knowledge creation can take a variety of different forms, including informal personal relationships. Eisenhardt and Martin also point to more focused activities, such as experimenting, prototyping, and learning by doing. These activities also represent critical dynamic capabilities.

Writing four years after Eisenhardt and Martin, Teece provided additional helpful insights into this process. His 2004 description of dynamic capabilities offers more clarity than his original formulation in 1997 (Teece, 2004). Teece presented his revised formulation with a set of interlocking propositions (Teece 2004: 149).

- 1. The purpose of the firm is to create, transfer, assemble, integrate, and exploit knowledge assets.
- 2. Knowledge assets underpin a firm's portfolio of competencies.
- 3. Competencies underpin the firm's product and service offerings to the market.
- 4. The firm's dynamic capabilities consist of a series of interlocking processes or routines to sense opportunities and reconfigure assets to pursue these opportunities.

Teece provided an important logical link among dynamic capabilities, knowledge assets, and competencies in his formulation. However, there is no further development in his article to defining these competencies more clearly. However, Teece ends his article with a thought that delivers the reader to the doorstep of networks: "New forms of business organization – and new management styles that enable intangibles to be developed and dynamic capabilities to be practiced – are clearly critical" (Teece, 2004:150).

In 2007, Teece, drawing from social and behavioral sciences, introduced the idea of "micro-

foundations" to the dynamic capabilities framework. These microfoundations consist of specific skills, processes, procedures, organizational structures, decision rules, and disciplines. Microfoundations enable a firm to reconfigure its resources and capabilities to sense and seize opportunities (Teece, 2007). Microfoundations focus on shared activities within the firm, such as routines and collective capabilities. Interactions among individuals across the organization are central to the concept (Felin et al., 2012).

From my practitioner's viewpoint, Teece's 2004 and 2007 formulations of dynamic capabilities remain at a frustrating conceptual level. To translate dynamic capabilities more effectively to the practitioner community, Teece and his co-authors have recently put forth a more pragmatic model (Teece et al., 2020). They propose that practitioners implement dynamic capabilities by organizing four types of activities within the firm: sensing, organizing, capturing, and reconfiguring. This model builds from Teece's earlier work in which he identified three dynamic capabilities: sensing, seizing, transforming (Teece, 2012) and an earlier formulation, focusing on two: sensing and seizing (Teece, 2004).

By examining each of these categories in more detail, Teece and his co-authors attempt to provide practitioners with more practical guidance. Sensing activities involve gathering a wide range of information about the continuously shifting environment and then sharing it across the organization. Organizing activities include redesigning the organization with new structures and processes that foster innovation and embrace change. Capturing activities involve reconfiguring the firm's tangible and intangible assets to capture new value. Finally, renewing activities involve the continuous redesign of the organization's more stable dimensions, such as incentive systems, reporting structures, and business processes.

Despite efforts to ground dynamic capabilities into specific firm activities, the model's iteration remains highly conceptual. There is no mention of microfoundations, a promising idea from a practitioner's view. As presented in Chapter 3 on Methodology, this idea of microfoundation aligns closely with Argyris and Schön's concepts of theories-in-use and theories of action (Argyris & Schön, 1974). Further, as discussed below, the idea of microfoundations also appears to align closely with the notion of "strategy praxis," a concept developed by scholars in the strategy-as-practice research stream (Jarzabkowski & Spee, 2009). Further, the

connection between microfoundations and the skills required to design and manage dynamic capabilities is lost. As I have learned in my work in Strategic Doing and as Argyris and Schön emphasize, skills are critical to putting a theory of action into practice (Argyris & Schon, 1974: 12-15). As such, Teece's model of dynamic capabilities adds a few new insights to illuminate the research problem framing this thesis.

In contrast, Eisenhardt and her colleagues' work has created a rich research stream and extensive theory development from case research (Eisenhardt, 1989). The theory of complex adaptive systems (Holland, 1992) provides a foundation for this work (Eisenhardt & Pierzunka, 2011). Eisenhardt and her colleagues paint a more complete and practical picture of the dynamic capabilities framework. In a series of research papers stretching from 2007 to 2020, they argue that dynamic capabilities represent organizational processes characterized by simple rules or heuristics. These dynamic capabilities enable practitioners to position the firm within a flow of opportunities and capture selected options. These papers, taken together, provide a valuable stream of research for this thesis.

The research is deeply grounded in the idea that simple rules provide a foundation for an effective strategy in dynamic markets (Brown & Eisenhardt, 1997; Eisenhardt and Sull, 2001). This focus on simple rules represents a cornerstone for understanding how complex systems and self-organization emerge from simple interactions (Holland, 1992). For example, intricate patterns of behavior among bees, ants, or birds can occur as they self-organize. This self-organization process involves each agent following a simple set of locally defined rules (Camazine et al., 2003). In the late 1990s, this complexity perspective on strategy began to appear in the literature. In 1997, Brown and Eisenhardt explored the idea that adaptive organizations are partially structured and continuously changing (Brown & Eisenhardt, 1997). They outlined ten rules that appeared to govern the successful firms competing in these environments. In 2001, Eisenhardt and Sull put forth a bolder claim. They conjectured that a strategy for adaptive organizations operating in dynamic markets consists of simple rules designed to capture fleeting opportunities. They proposed that these rules or heuristics fall into the following categories: boundary rules to define which opportunities to pursue; how-to rules to explain how to realize opportunities; priority rules to determine a ranking among options; timing

rules to determine the sequence of action steps; and exit rules to determine when opportunities should be abandoned (Eisenhardt & Sull, 2001).

In research presented in 2007, Eisenhardt and her colleagues introduced the idea that firms operate with lower order and higher order heuristics (Bingham, Eisenhardt & Furr, 2007). Lower order heuristics are simpler to implement. They consist of both selection and process heuristics. Selection heuristics determine the focus of the firm on a set of opportunities. They define the boundary of the search for new opportunities. A firm might focus on retail software development, as opposed to business-to-business software. This selection heuristic guides practitioners on where to focus and what to ignore. Procedural or process heuristics represent another low order heuristic. They specify the steps a firm should take to execute on selected opportunities. A procedural heuristic might guide practitioners to move to the next phase of convening a workshop between engineers and marketers to explore a set of possibilities, for example.

Higher-order heuristics, representing either temporal or priority heuristics, are more sophisticated and challenging to implement. A temporal heuristic defines the sequence or pace of a process. For a firm developing a foreign market entry strategy, a temporal heuristic might be "enter the U.K. market first and use that as a launching pad to then enter France and Germany." A priority heuristic involves a protocol for ranking opportunities. Priority heuristics provide criteria by which a firm can decide which option is more attractive to pursue. An example of a priority heuristic might be "enter English speaking markets first."

With this framework in hand, the researchers then examined how small, young, entrepreneurial firms in Finland, the U.S., and Singapore developed foreign market entry strategies. The researchers found that heuristics helped reveal a "strategic logic of opportunity." That is, firms that relied on heuristics were able to position their firms within "abundant and attractive opportunity flows" (Bingham et al., 2007: 42). These firms defined and captured opportunities through an improvisational mix of 1) adhering to the heuristics and 2) taking flexible action. Guiding their actions with heuristics enabled the firms to achieve higher performance.

Two years later, a related research team used simulations to explore under what environmental conditions heuristics improved performance (Davis et al., 2009). The team found

that practitioners must seek a balance between too much and too little structure within highly dynamic environments. The research showed that practitioners within successful firms could achieve this balance by relying on a set of simple rules. In highly dynamic environments, simple rules provide flexibility to explore opportunities with enough structure to give coherence and efficiency.

Davis and his co-authors, Eisenhardt and Bingham, structured their argument as follows. First, the authors clarified the nature of the trade-off between flexibility on the one hand and structure and efficiency on the other. Flexibility opens the door to opportunities, but it can also reduce the firm's capability to exploit any single option. Without enough structure in place, following through on an opportunity becomes difficult. Simultaneously, while it can improve efficiency, it can also narrow the window to sense new opportunities. A tight focus on the process reduces the prospect for improvisation and serendipity. Second, the authors ran their simulations and demonstrated the risks of too much flexibility or too much structure. Increasing structure gradually degrades a firm's performance, but too little structure has a catastrophic impact on performance. The message is clear: when in doubt, practitioners should err on the side of too much structure, not too much flexibility. Finally, the authors concluded that simple rules work in all environments, not just the more dynamic environments. Again, the message is clear: practitioners should strive to develop simple rules to pursue opportunities. These rules should provide enough management structure without stifling the flexibility needed for innovation.

In research beginning in 2010, Eisenhardt and her colleagues take up Teece's challenge to explore the microfoundations of dynamic capabilities more fully (Teece, 2007). This research stream is valuable to follow because it offers insights into learning guided by Strategic Doing. The balance of this section explores this stream. Eisenhardt and her colleagues define microfoundations as the "underlying individual level and group level actions that shape strategy, organization, and, more broadly, dynamic capabilities, and lead to the emergence of superior organizational level performance" (Eisenhardt et al., 2010:1270). They maintain that these microfoundations should establish a balance between flexibility and efficiency. In balancing between flexibility and structure, the researchers find that companies naturally drift toward structure. To maintain a balance between efficiency and flexibility, practitioners need to err on

the side of flexibility. This course correction will counter the organization's natural drift toward increased structure.

Interestingly, this guidance runs counter to the findings presented by running computer simulations (Davis et al., 2009). In that research, simulations suggested that when in doubt, practitioners should lean toward structure over flexibility. The simulations pointed to the increased risks of a precipitous drop in performance with not enough organizational structure. This tension in findings is left unaddressed in the 2010 article. In subsequent research, Bingham and Eisenhart find that firms learn and develop a portfolio of heuristics (Bingham and Eisenhart, 2011). A well-designed portfolio addresses the underlying problem of capturing opportunities in dynamic environments. Practitioners confront many complex and ambiguous possibilities. Heuristics help them select and prioritize these possibilities to focus on the options with the highest probabilities of success.

Using a case method research design, the authors presented six entrepreneurial firms in the information technology industry. They confirmed that firms learn heuristics in a specific developmental order. They start with selection and procedural heuristics. In earlier research, these heuristics represent "lower-order heuristics" (Bingham et al., 2007). These heuristics guide the selection of opportunities and the execution of a selected opportunity. They then learn temporal and priority heuristics, or "higher-order heuristics." Temporal heuristics guide the sequencing of activity. Priority heuristics provide rules of thumb for ranking priorities among opportunities.

Increasingly, there is an overlap between research activities in entrepreneurship and strategic management (Hitt et al., 2002; Hitt & Ireland, 2017). In 2017, Ott, Eisenhart, and Bingham extended this research line by exploring how strategy emerges in entrepreneurial settings (Ott et al., 2017). In doing so, they directed this line of research even closer to the research presented in this thesis. They explored the following question: how should executives form a strategy in entrepreneurial settings? In their definition of entrepreneurial environments, the authors include both young firms competing in emerging are highly unpredictable markets and established firms competing in these markets or with strategies focused on innovation. As Teece has pointed out, entrepreneurial management is critical for small, emerging firms and large, established firms to

develop dynamic capabilities (Teece, 2007, 2012). Within these settings, the authors outline three different types of strategy formation: 1) strategies developed by doing and learning from experience; 2) strategies developed by thinking and creating holistic understandings of opportunities; 3) strategies developed by combining both thinking and doing. The insights from this research have illuminated how Strategic Doing triggers different types of learning.

Strategizing by doing.— Strategizing by doing involves four different types of learning: trial and error, bricolage, improvisation, and experimentation. In each, the firm follows other protocols to generate new knowledge about potential opportunities. Strict boundaries do not separate each type, but each has distinctive characteristics. Trial and error learning is grounded in existing organizational, task-specific routines (Rerup & Feldman, 2011). This type of knowledge leads to strategies that develop incrementally. When practitioners engage in routines that lead to promising outcomes, they continue with this pattern of behavior. If the practitioner sees negative results from a pattern of behavior, practitioners alter their routine.

Bricolage is a learning process prevalent in the entrepreneurship literature. With bricolage, practitioners improvise to configure their available resources and develop new solutions (Miner et al., 2001). This idea closely aligns with the reconfiguration of assets, an idea that stretches back to Penrose. The learning process is commonly distributed across many agents (Garud & Karnoe, 2003). Improvisational learning involves the fusion of design and action without planning. Strategies emerge "on the fly" (Miner et al., 2001). Experimentation involves learning through controlled trial and error activities designed to test hypotheses. These experiments generate new information and knowledge about what works and what does not. The ability to experiment quickly drives innovation (Thomke, 1998, 2003; Thomke & Manzi, 2014). Each of these four learning processes generates new knowledge that forms the basis for an emerging strategy.

Strategizing by thinking.— Strategizing by thinking involves developing shared mental models within the firm and developing useful analogies for tricky situations. These mental models represent simplified cognitive structures that provide a map to both the competitive landscape and opportunities (Senge, 1990; Hodgkinson & Johnson, 1994). Through a strategy process, practitioners can develop more holistic, shared mental models to align their thinking and

interpretations. This focus on mental models aligns closely with a stream of research that connects strategy to framing new narratives, a vital process within Strategic Doing (Logemann et al., 2019).

Developing appropriate analogies is another method for forming strategies by thinking. Through metaphors, strategy practitioners can draw on their own experience to understand a complex environment. Analogies can speed strategy formation by shaping shared mental models. To illustrate, Ott, Eisenhardt, and Bingham refer to the design firm IDEO, as presented in research by Hargadon and Sutton (1997). Designers were struggling with how to design an electric door opener. They reformulated their strategy when they thought of an analogous situation: how pistons powered a station wagon's rear windows.

Strategizing by thinking and doing.— The authors point out that few studies have explored how the combined process of strategizing by thinking and doing unfolds. The strategy practices for integrating thinking and doing presents a promising area of strategy formation research. The development of simple rules to guide this process of alternating doing with thinking presents the central challenge. By relying on simple rules, practitioners can save time and effort by focusing their attention and simplifying the process of both collective thinking and the translation of promising ideas into action. Practitioners will likely develop these heuristics through their own experience (Eisenhardt and Bingham, 2011). In a later paper, Ott and Eisenhardt explore how six ventures in entrepreneurial settings manage to address the tension between thinking (managerial cognition) and doing (experimentation leading to learning) (Ott and Eisenhardt, 2020). In a theoretical framework that they call "decision weaving," the authors add to the literature on dynamic capabilities and strategy's microfoundations. The framework seeks to explain how managers continuously update their mental models to learn new lessons from experiments in evolving markets.

This research linking entrepreneurship with strategic management offers three additional, essential insights into how learning occurs in complex environments. The first is the importance of strategic focus, or what the authors call "sequential focus." Developing strategies in complex environments can be overwhelming. Practitioners need to select strategic focus areas (or "domains") and address each focus area sequentially. Breaking a complex strategy problem into

focal areas enables practitioners to concentrate on learning. Focus aligns resources, increases effort, and promotes persistence. Practitioners move sequentially from one focus area to another. When practitioners hit a "learning plateau," they switch to the next focus area.

Second, the concept of a "learning plateau" is critical to the sequencing. Practitioners hit a learning plateau when learning is "good enough" to move on. They have spent enough resources within the focus area to convert their learning into simple rules and processes. This process of simplification distills information and makes the generated knowledge more explicit. By focusing on simplicity, practitioners can increase the probability that this knowledge will be retained and shared. The clarity also helps practitioners integrate their learning and make their strategy more coherent.

Third, while concentrating on their primary area of strategic focus, firms can make progress in their background focus areas ("background domains") with "stepping stones." These initiatives are "incremental, easy, and inexpensive actions" that make progress in these areas of secondary focus (Ott and Eisenhardt, 2020: 22). Stepping stones accelerate learning in both the primary strategic focus area as well as background areas. These stepping stones are valuable for three reasons. First, they improve learning with easy, inexpensive activities. Second, they support the formation of coherent, complex strategies by promoting integrative thinking. They provide an understanding of how strategic activities can fit together. Finally, stepping stones increase creativity. Because they include both time and resource constraints, stepping stones force creative thinking. This strategic approach enables practitioners to update their shared mental models continuously. By breaking their strategic problems into focus areas and moving through them sequentially, practitioners improve their peripheral awareness of background focus areas. Also, by relying on stepping stones, they generate creative and integrative thinking that adjusts their shared mental models to the complexity they confront.

Finally, in another paper examining entrepreneurial firms, Bingham, Howell, and Ott (2019) argue that the capability to form heuristics is a central microfoundation of strategy in dynamic markets. In examining the heuristic formation process in six entrepreneurial firms across three culturally distinct countries, they propose a three-phase methodology for developing these heuristics. They describe a process of continuous refinement. Rough heuristics, connected to

prior experience and logic, provide a starting point. These heuristics begin to give coherence to a complex environment. They also provide initial guidance on how to act: what to do and how to do it. These rules of thumb are then corrected and refined through a process of elaboration. The further abstraction of these heuristics provides broader, more practical guidance across the firm. In other words, according to this research, heuristics develop over time in an iterative process of thinking and doing.

This research stream, led by Eisenhardt and her colleagues, has made significant progress in demonstrating how coherent strategies form in complex environments. The research conducted to support the development of Strategic Doing may help extend this research stream's reach. As both Schön and Langley make clear, it is challenging to conduct research that tightly integrates practice and research. Research that focuses on what practitioners do is inherently tricky (Schön, 1995; Langley, 2015). It poses unique challenges to academic research, a topic to which this review now turns.

2.2.3 Strategy as process and practice

Since the inception of strategic management as an academic discipline beginning in the 1960s, scholars have distinguished between two perspectives: strategy content and strategy process (Chakravarthy & Doz, 1992). Researchers who focus on strategy content explore how competitive advantage and optimal performance results from specific characteristics of a strategy relating to resources, competitors, customers, and markets. The content of the strategy determines its success (Hutzschenreuter & Kleindienst, 2006). The focus is on the interface between the organization and its environment, how well the organization "fits" its environment. Porter and the resource-based view generally fall into the content category. In contrast, researchers who adopt a process perspective focus on how strategies come about. The characteristics of the process determine the quality of a strategy. The process researcher's task involves trying to capture the dynamics of the strategy process by identifying patterns over time (Pettigrew, 1992).

The scholarly boundaries between these two streams of research tend to blur. Research on dynamic capabilities, an outgrowth of the resource-based view, wanders from the content category into the process category. At the same time, strategy processes occur within an environmental and organizational context (Pettigrew, 1992, 1997). It is challenging to isolate the process (how the strategy comes about) from its content (what the strategy is). The primary distinctions between the two perspectives of content and process are most firmly grounded in methodology and disciplinary focus. The content perspective, closely tied to industrial economics, tends to attract quantitative researchers. In contrast, process researchers rely more heavily on qualitative research from multiple, different disciplines (Chakravarthy & Doz, 1992; Van de Ven, 1992). Time perspectives also differ. While content research often provides a snapshot in time, process research tends to be longitudinal (Pettigrew, 1992; Langley, 2007). Given its disciplinary and methodological diversity, the process stream does not fall into a single paradigm. It is difficult to characterize.

Nevertheless, Hutzschenreuter and Kleindienst (2006) took on the task. They found that the strategy process research stream evolved into at least six different perspectives: rational-mechanistic, cognitive, upper-echelon, middle-management, organic, and micro. The last perspective, the micro view, is similar to the microfoundations concept discussed above in the context of dynamic capabilities. It also aligns with a strategy-as-practice perspective, discussed below, that emerged in the literature about this time. Hutzschenreuter and Kleindienst explain that the micro-perspective focuses on understanding the "micro activities that makeup strategy and the strategizing process" (Hutzschenreuter & Kleindienst, 2006: 703). Hutzschenreuter and Kleindienst call for multiple case design studies that concentrate on specific aspects of the strategy process within this perspective. They also recommend research that puts theoretical constructs into practice (Hutzschenreuter & Kleindienst, 2006: 708). The research presented in this thesis meets this call. As detailed in Chapters 3 and 4, the development of Strategic Doing as a theory of action relied on multiple case studies, the formation of strategy through rigorous, guided conversations, and the conversion of a theory of action into practice.

While potentially meaningful for scholars, this distinction between strategy content and strategy process is artificial from a practitioner's viewpoint. The different perspectives should not be surprising. Scholars and practitioners view the challenge of strategy differently. They follow different logic, move on different time scales, and respond to different incentives (Bartunek &

Rynes, 2014). Within a hierarchical organization, the distinction between content and process is easy to understand. Top management generates the content of strategy, while lower levels focus on implementing strategy (Beer 2020b). However, as strategy practice moves toward networks, the distinction becomes harder to maintain. With a network-based strategy perspective, content, and process blur together.

Beginning in the early 2000s, a small group of scholars based in Europe concluded that neither the content nor process perspectives on strategy explored practitioners' activities sufficiently. They began to develop a newer stream of research, strategy-as-practice, to focus on the activities that practitioners undertake as they form strategies. Rather than thinking about strategy at the organization level, this research stream focuses on what practitioners do (Whittington, 1996, 2003, 2006; Jarzabkowski, 2004, 2005; Jarzabkowski et al., 2007; Jarzabkowski & Spee, 2009). This strategy-as-practice stream overlaps with the concepts of dynamic capabilities (Regnér, 2008). It also parallels the older strategy process research

Whittington, one of the strategy-as-practice stream leaders, makes an essential distinction between strategy practitioners, strategy praxis, and strategy practice (Whittington, 2006). Strategic practitioners represent professionals who do the work of creating, shaping, and executing strategies. Strategic praxis refers to the activities in which strategic practitioners engage while they are developing and implementing strategies. Strategic practice refers to the shared routines that practitioners follow. This formulation aligns closely with the suggestions of Argyris and Schön, who distinguish between theories-in-use (praxis) and theories of action (practices) (Argyris & Schön, 1974).

The research presented in this thesis most clearly sits within the strategy-as-practice stream. It describes my development of a strategic praxis and the conversion over several years of this praxis into a theory of action, a strategy practice. In developing the strategy-as-practice research stream, Whittington outlined six research questions to build the practice perspective (Whittington, 2003). The research presented in this thesis touches on each of these questions.

- 1. How and where is strategizing and organizing work actually done?
- 2. Who does the formal work of strategizing in organizing and how did they get to do it?
- 3. What are the skills required for strategizing and organizing work and how are they acquired?

- 4. What are the common tools and techniques of strategizing and organizing and how are these used in practice?
- 5. How is the work of strategizing and organizing organized itself?
- 6. How are the products of strategizing and organizing communicated and consumed?

These questions all involve generating new knowledge from strategies-as-practice research. In discussing how knowledge develops within strategies-as-practice research, Langley (2015) highlighted the difficulties of generating knowledge to answer these questions. To study strategic praxis closely, researchers must overcome the chronic gap between research and practice. Langley suggested three approaches to developing knowledge within the strategy-as-practice stream: "normal science"; a "practice-theory-based" view; and pragmatism. Exploring each of these perspectives in more depth provides insights into the research's value presented in this thesis.

Langley made a convincing case that approaching strategy-as-practice from a "normal science" orientation will not likely be successful. This perspective leads to a conception of knowledge that is firmly positivist and more quantitative. Researchers focus on establishing relationships between variables, with the dependent variable represent representing some measure of performance. Strategy-as-practice researchers, who tend to prefer social constructivist assumptions and qualitative methodologies, are not likely to find much value in this perspective.

Langley outlined a second approach that involves applying existing social theory to strategy practice. This approach starts with an established theoretical lens with which to view strategy praxis. Langley pointed to the work of Jarzabkowski (2005) to illustrate. While some scholars have approached this field the strategy research with this perspective, it tends to lead to fragmentation and coherence loss. This "practice-theory-based view" of knowledge generation leads to applying multiple theories, which may yield some helpful insights. However, Langley cautioned, this approach comes at a cost. It will not likely lead to a single integrated theoretical frame that might be useful to practitioners. Research projects may not build on one another.

Langley preferred a third approach: the pragmatic. Following this approach, researchers adopt a pragmatist approach to knowledge, which directly ties to practice. The challenge of this approach involves the tight alignment of researchers to practitioners. Here, it makes sense to

draw from Langley's writing (Langley, 2015: 120). Langley pointed out that practitioners possess "deep reservoirs of tacit knowledge about strategy." The central task for research comes in uncovering this tacit knowledge. Langley underscored, however, an apparent paradox in this approach. "If practice is needed to learn about practice, then the academic researcher may simply be a redundant intermediary". Langley suggested that scholars can avoid redundancy by helping practitioners uncover this knowledge through a process of abduction. Researchers could become an apprentice to a master "a recognized strategy expert or consultant" and commit the cumulative learning to writing. While many academics are strategy consultants, Langley dismissed this pathway. "[T]heir writings usually emphasize formal techniques and not the everyday experience of doing strategy." Langley suggested that some strategy practitioner-researchers can render their practical learning in accessible written form, but this approach is relatively rare. It represents a form of action research, which is mostly missing from the strategy-as-practice literature. "Action research is not currently a central focus of those interested in strategy-as-practice" (121). She concluded by explaining how hard it will be for strategy-as-practice scholars to generate useful, widely shared knowledge. The pull of consulting and its financial rewards will discourage researchers from developing more formal models and sharing them (122):

I believe that there is some doubt as to whether strategy as practice is currently heading in a direction of developing knowledge that will improve practice through the concrete instrumental use of research findings. To achieve this, more researchers would have to invest in action research adopting what I have called the pragmatic perspective. Moreover, for those who do invest in this way, the rewards of consulting and the localized benefits that this brings may divert attention from any kind of formalization of the resulting practical knowledge. The result is that, while individual organizations may benefit from the learning, the wider community may not.

Clearly, Langley echoes Schön, who called for a new epistemology of practice within the academy (Schön, 1995). The research presented in this thesis contributes to filling this gap and demonstrates what can be achieved with a pragmatic approach to strategy-as-practice.

One final note on the strategy-as-practice research stream is in order. More recently, Burgelman and his co-authors have suggested integrating the strategy process and strategy-as-practice research streams into what they call "strategy process and practice" (Burgelman et al.,

2018). This integration sets forth vital components: actors, strategy formation, strategic issues, and strategizing episodes. The logic for integrating the strategy process and strategy-as-practice runs as follows. Actors who engage in strategy formation define strategic issues and engage in formal strategizing episodes. During this process, they integrate practices that represent more formal routines ("theories-in-action") seen by the broader community of practitioners as shared and legitimate ways to do strategy work. These strategy practices can be either "macro" practices or "micro" practices. An example of a "macro" practice might be conducting strategy retreats, in which a team isolates itself away from day-to-day pressures to develop a strategy. organization that shares knowledge through social media provides an example of a "micro" practice (Neeley & Leonardi, 2018). From a practitioner viewpoint, this "micro" and "macro" distinction appears of questionable value. Both types of practices appear to align closely with the microfoundations of dynamic capabilities, as outlined by other scholars (Teece, 2007; Bingham et al., 2019). The research presented in this thesis suggests that scholars have not focused sufficiently on a potentially critical microfoundation of strategy practice: designing and guiding strategic conversations. Langley offers a significant reason. This type of knowledge is challenging for researchers to accumulate and formalize. The literature review next turns to evaluate an emerging stream within the strategy process and practice research: open strategy and strategic conversations. As it does, the contribution of this research into Strategic Doing becomes clear and concrete.

2.2.4 Open strategy and strategic conversations

The emergence of open strategy.— In 2003, Chesbrough introduced the concept of open innovation to explain an important phenomenon that was taking place within companies (Chesbrough, 2003; Chesbrough & Bogers, 2014). With the advent of the Internet, the corporation's boundaries became more porous, and knowledge became more extensively distributed. In response, companies opened their previously closed innovation processes to outside partners. Companies like Procter & Gamble learned how to improve research productivity by connecting the company's resources with external partners' resources (Huston & Sakkab, 2006; Dodgson et al., 2006). As the idea of open innovation quickly matured, scholars

began documenting how companies used networks to advance their strategies (Hakansson & Snehota, 2006; Vanhaverbeke & Cloodt, 2006; Bughin et al., 2008; Fichter, 2009; Leimen et al., 2012). More recently, scholars have extended the open innovation literature into the concept of open innovation taking place within ecosystems. The idea of ecosystems entered business literature in 1993 (Moore, 1993). The argument holds that the environment in which businesses compete consists of a system of interacting agents. They have labeled this concept Open Innovation 2.0 (Curley, 2015, 2016; Curley & Salmelin, 2017).

The development of the open innovation literature carried implications for both strategic management and the design of appropriate business models to harness the potential of open innovation (Chesbrough, 2006). Chesbrough and Appleyard (2007) started down the strategy path by suggesting that open innovation practices challenge traditional business strategy approaches. Open innovation creates transparency and invites outside partners to share in a previously closed, proprietary strategy process. Engaging partners from outside its (legal) boundaries, the process of open innovation suggested that a firm's strategy was no longer the product of a rigorous top-down analytic process. Innovation performance depends instead on initiatives that are capable of attracting resources embedded in outside networks.

At about the same time, Adner advanced a similar argument. Businesses seeking to achieve superior performance should begin shifting their thinking from innovation initiatives centered on internal resources to initiatives focused on external networks. He advocated that firms start to map their business strategies to their ecosystem (Adner, 2006). Ecosystems are composed of networks of outside firms and organizations, such as universities. These networks enable firms to attract new resources to support innovation. Through their networks, firms draw resources from investors, technology partners, suppliers, and customers (Moore, 1993). With this background, scholars began exploring how firms develop their innovation ecosystems. Dhanaraj & Parkhe proposed that firms learn to "orchestrate" their innovation ecosystems. These ecosystems represent loosely coupled systems of independent firms. Orchestration means activities through which the firm creates and extracts value in the absence of hierarchical authority (Dhanaraj & Parkhe, 2006; Nambisan & Sawney, 2011). In sum, by 2006 and 2007, scholars began to explore how firms move away from a narrow focus on internal resources to pursue their growth. They

began to explore how external networks, over which firms have little or no direct control, could be integrated into their strategies.

To capture these developments, Whittington and his co-authors introduced the concept of "open strategy" to the strategy-as-practice research stream (Whittington et al., 2011). The authors positioned open innovation as a subset of open strategy. They pointed to the fact that, as a concept, open strategy is both broader and more ambiguous. It is more expansive because open strategy is not merely focused on engaging outside participants. By its nature, open strategy expands participation in the strategy process to internal audiences at different levels within the organization. The research stream is early in its development, and open strategy remains an ambiguous construct. Scholars have only "scratched the surface in the exploration of what strategy represents" (Sunner & Ates, 2019). Two prevailing characteristics are typically present in "open strategy," according to scholars: transparency and inclusion (Whittington et al., 2011; Hautz, 2017; Hautz et al., 2017). Any strategy process that is more inclusive and more transparent than traditional approaches to strategy appears to qualify. For example, Beer, an organizational development scholar, recommends that top management engage in conversations to streamline strategy implementation (2020a, 2020b). Under the prevailing definition, Beer's approach falls into open strategy.

While current scholarship in open strategy has accelerated rapidly, scholars have struggled with this ambiguity, as they have sought to build on the framework set forth by Whittington and his co-authors (Hautz, 2017; Hautz et al., 2017; Tavakoli et al., 2017; Saile et al., 2017; Sunner & Ates, 2019). The development of Strategic Doing and the exploration of how strategy can emerge from open, loosely connected networks fall within the open strategy research stream. Strategic Doing focuses on a rigorous definition of strategic conversation and a set of simple rules for designing and guiding strategic conversations. This research leads to a somewhat tighter definition: open strategy represents processes for generating the outcomes and pathways needed for a strategy by relying on networks, transparency, inclusion, and double-loop learning.

The research presented in this thesis also advances strategic conversation as a strategy practice within open strategy. As Whittington and his co-authors pointed out, opening strategy includes expanding participation in an organization's "strategic conversation." The authors

define strategic conversations as "the exchanges of information, views, and proposals intended to shape the continued evolution of the organization's strategy" (Whittington et al., 2011: 536). This definition borders on the tautological: a strategic conversation is any conversation about strategy. Looking outside the open strategy research stream offers little guidance. The term, strategic conversation, appears in other research streams but with no more precise definition. For example, scholars examining scenarios as a tool to advance strategic thinking have used the term (Van der Heijden, 2011; Ratcliffe, 2002). Other scholars use the term strategic conversations to explain how practitioners include middle managers in the strategy process (Westley, 1990) or how corporations engage their stakeholders (Miles et al., 2006).

Tavakoli, Schlagwein, and Schoder (2017) take a more practical turn. To characterize open strategy more clearly in terms of strategy practices, the authors introduce the concept of "transparent discourse". The authors maintain that open strategy involves practitioners engaging in strategic discourse that is open, interactive, and public. An open strategy process invites large groups of internal and external practitioners to join, participate, and follow strategic discussions. These transparent discourses lead to collaborative strategy work and the joint creation of strategy. The authors suggest this approach contrasts with traditional strategy methods in which strategic conversations take place behind closed doors. Again, however, scholars are bordering on the tautological. To be a meaningful construct, open strategy must be more than conversations about a more open strategy process.

Practitioners need strategy practices and tools to improve their strategy praxis or the "strategic doings," the actual activities that practitioners perform in a particular context (Tavakoli et al., 2017: 169-170). Strategy practices describe the routines and tools for performing strategy (Whittington, 2006). A strategy tool is a framework, process, protocol, or set of heuristics used by practitioners to do strategy work (Hakala & Vuorinen, 2020). With their framework, strategy-as-practice scholars aspire to improve tools, frameworks, and practices (Whittington, 2006; Jarzabkowski et al., 2007; Tavakoli et al., 2017). The demand is growing if for no other reason that the number of strategy practitioners, the people who do strategy, is growing. As organizations become flatter, more open, and more networked, this pool of people is expanding. Potential strategy practitioners can come from a wide range of people, including top

management, middle management, consultants, and outside parties.

The significance of conversations to strategy.— Conversations provide a microfoundation of the open strategy process that deserves further, more in-depth, and more practical exploration (Hautz et al., 2017). Scholars have long recognized that conversations represent the microfoundation of the organization (Collins, 1981). Conversations also represent critical activities through with tacit knowledge is transferred (Zack, 1999). Writing in 1993, Webber argued that "the most important work in the new economy is creating conversations." Further, "conversations are the way knowledge workers discover what they know, share it with their colleagues, and in the process, create new knowledge for their organizations" (Webber, 1993: 28). Writing three years later, Liedtka and Rosenblum argue that the challenge of strategy involves shaping coherent patterns of conversations among widely distributed individuals. These conversations give rise to the shared meanings that underly strategy and can power the organization to confront complex, shared challenges.

Innovation is enhanced when participants who are skilled at managing conversations bring diverse perspectives and backgrounds to bear on shared challenges. Thus, the strategy that is co-invented within a more inclusive conversation reflects a more complex and multi-faceted view of reality. (Liedtka & Rosenblum, 1996: 148-149).

Liedtka and Rosenblum suggest that managing conversations represents a "meta-capability" of the firm that is inseparable from other meta-capabilities. A capability means skills and knowledge linked to an underlying process to produce a valuable outcome (Liedtka, 1996). A meta-capability is a capability of an organization or system (such as a network) to generate individual capabilities (Liedtka, 1996; Hazy, 2004; Termeer et al., 2013). Liedtka and Rosenblum suggest that the ability to learn, collaborate, redesign processes, and manage conversations are inseparable meta-capabilities in practice. While focusing on the critical role that conversations play within the organization's strategy, Liedtka and Rosenblum do not explicitly define the term strategic conversations. The same tautology appears: strategic conversations are conversations about strategy. Further, they offer no strategy practice or strategy tools for designing and guiding these conversations.

Von Krogh, Ichijo and Nonaka (2000: 125) advance our understanding a step. They suggest that conversations play a vital role in sharing and creating knowledge:

We cannot emphasize enough the important part conversations play. Good conversations are the cradle of social knowledge in any organization...Each participant can explore new ideas and reflect on other people's viewpoints. And the mutual exchange of ideas, viewpoints, and beliefs that conversations entail allows for the first and most essential step of knowledge creation: sharing tacit knowledge within a microcommunity.

They point out that, despite the potential power of conversations to mobilize and create knowledge, conversational skills are both "a lost art" and a neglected area of scholarly research. (Von Krogh et al., 2000: 127). They suggest four principles for good "knowledge-creating" conversations:

- Principle 1: Actively encourage participation. This step includes creating inclusive conversations rituals.
- Principle 2: Establish conversational etiquette. This step involves setting rules, such as "avoid intimidation" and "avoid exercising authority".
- *Principle 3: Edit conversations appropriately.* This step involves creating coherence from conversational patterns and fragments.
- *Principle 4: Foster innovative language*. This step involves creating words, metaphors and visualizations that capture the knowledge generated from the conversation.

These principles, while important, remain frustratingly vague. Von Krogh and his co-authors do not translate these principles into frameworks, processes, protocols, or heuristics that practitioners can apply to their strategy praxis.

The observation Von Krogh and his co-authors made in 2000 remains true today. From a practitioner's viewpoint, scholars have not paid much attention to helping practitioners understand how to design and guide strategic conversations. Ford and Ford (1995) established a solid case that change in organizations occurs through the medium of conversation. The logic extends to networks. But few strategy scholars have pursued this line of research. Perhaps, conducing this line of strategy-as-practice research runs into the barriers that both Schön (1995) and Langley (2015) have set forth: the gap between practice and research is real and difficult to bridge. Beer's work is the closest that current scholarship comes to answering the challenge of

strategic conversations set down by Liedtke and Robinson. An organizational development scholar and consultant, Beer and his colleagues have developed a Strategic Fitness Process (Beer, 2013, 2020a, 2020b). The model focuses on helping hierarchical organizations implement a pre-existing strategy through "honest conversation." The process takes six to eight weeks and improves leadership effectiveness (Beer, 2020b). However, because of its orientation toward hierarchical organizations, the Strategic Fitness Model appears of limited use in networks. It fails to shed much light on the research question presented here.

Liedtka and Rosenblum have put forth a more profound challenge. They suggested a more significant, more fundamental change in the way practitioners can form and implement a strategy. Liedtka has provided additional contours to the challenge (Liedtka, 2001, 2008, 2016). Strategy development and execution is a learning process that resembles a continuous design process. A design process is both generative and experimental. The needed meta-capabilities to treat strategy as a design process relies on developing habits of strategic thinking. This meta-capability includes individuals' ability to think at a systems level, see their role as embedded in a broader system, and a willingness to experiment and search for solutions through a process of trial and error. Liedtka also suggests that designing and guiding these conversations requires a new set of skills representing a widely distributed capability. The next chapter explores my response to the challenge set down by Liedtke and Rosenblum. My answer takes the form of a new strategy practice and a set of simple rules to design and guide strategic conversations.

2.2.5 Summary of Strategy Literature

This literature review positions Strategic Doing within the scholarly research on strategic management. The study leads to the following conclusions, based on the presentation of the theory and practice of Strategic Doing presented in Chapter 4 below:

1. This research aligns with the broad themes of the resource-based view of strategy scholarship.— The resource-based view represents the mainstream of strategy research (Connor, 2002). As Chapter 4 explores, Strategic Doing relies heavily on uncovering hidden knowledge assets within open networks and re-combining these assets to generate new opportunities. Scholars have applied the resource-based view to firms, but the concept

- applies to teams and networks (Gardner et al., 2012
- 2. This research can be considered as a further exploration of the microfoundations of dynamic capabilities.— Dynamic capabilities represent a research stream grounded in the resource-based view. The concept of dynamic capabilities describes how practitioners must continuously adjust strategies to accommodate increasingly turbulent environments (Teece, 2007, 2012). The process of adjustments takes place within the "microfoundations" of dynamic capabilities. These microfoundations represent communications that are a vital component of most dynamic capabilities (Eisenhardt & Martin, 2000). To manage these dynamic capabilities, practitioners develop and rely on heuristics to manage this complexity (Eisenhart et al., 2010; Bingham et al., 2019). Strategic Doing focuses on rigorously designing and guiding strategic conversations in open, loosely connected networks. As Chapter 4 examines, Strategic Doing relies on a set of heuristics, or simple rules, to manage these conversations. The research presented here could help extend scholarship in dynamic capabilities.
- 3. The research presented in this thesis fits directly within the strategy practice and process research stream.— The microfoundations of dynamic capabilities align closely to two other research streams: strategy process and strategy-as-practice. Scholars have recently moved to align these to research streams under the umbrella term strategy process and practice (Burgelman et al., 2018). The research sits here.
- 4. This research contributes to the concept of open strategy within the strategy process and practice research stream.— Open strategy research is an emerging and dynamic area of practice, and the research is underdeveloped (Tavakoli et al., 2017). This research offers a field-tested approach to open strategy that practitioners can use to address complex problems.
- 5. Within open strategy, this research focuses on a promising but largely unexplored management practice, strategic conversations.— Scholars have suggested that managing strategic conversations is a potentially valuable strategy practice (Webber, 1993; Liedtka & Rosenblum, 1996; Liedtka, 2001; Whittington et al., 2011; Hautz et al., 2017; Bourgoin et al., 2018). The view of Liedtka and Rosenblum is beneficial. They see the

creation and execution of strategy as a conversation, in which practitioners take an active role in shaping these conversations into a coherent pattern. Scholars have provided various ways to describe designing and guiding strategic conversations: a dynamic capability, a microfoundation of open strategy, or a meta-capability of an adaptive organization. Langley (2015) outlines the barriers between research and practice. It is no surprise that scholars have not developed a strategy practice or a set of strategy tools to implement a strategy conversation. Many executives simply do not know how to conduct a strategic conversation (Von Krogh et al., 2000; Bourgoin et al., 2018). This research fills that gap on both a theoretical and practical level. It develops a theory of action for designing and conducting strategic conversations within open strategy. By following simple rules, Strategic Doing helps practitioners manage complexity (Eisenhardt & Sull, 2001; Bingham et al., 2007; Bingham & Eisenhardt, 2011). Further, this research extends a theory of action into a visual language, a teachable protocol, and a set of skills that practitioners can practice and master. It offers a replicable and scalable strategy discipline.

- 6. By focusing on strategic conversations, this research provides a bridge between two previously disconnected streams of research: dynamic capabilities and open strategy.
 - Figure 2.1 illustrates the point. Drawing A shows that dynamic capabilities scholars have primarily focused on how organizations can develop these capabilities to adapt to dynamic environments. Drawing B demonstrates how open strategy scholars have focused on increasing inclusion through a more network-based approach to strategy. Drawing C illustrates that Strategic Doing addresses both of these dimensions and should serve as a useful bridge between these two research streams.
- 7. The pragmatist stance presented in this research provides the methodological grounding to unite research and practice.— The knowledge to design and guide strategic conversations will most likely emerge from a pragmatist stance and reflective practice (Liedtka & Rosenblom, 1993; Langley, 2015). The next chapter sets forth the pragmatist stance and reflective practice that guided the development of Strategic Doing.

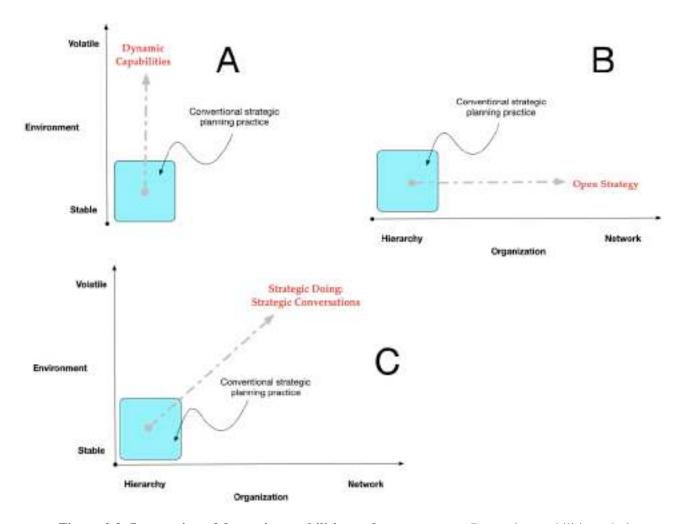


Figure 2.2: Integration of dynamic capabilities and open strategy. Dynamic capabilities scholars have focused on the connection of the organization to the environment (A). Open strategy scholars have focused on the changes taking place within the organization (B). By focusing on the strategic conversation, this research includes both developments (C). It provides a bridge between these two previously disconnected streams of research.

Chapter 3: Theory and Methods

This chapter summarizes the action research projects that I used to develop Strategic Doing. From 1993 to 2005, as a private consultant, I designed these action research projects to achieve a specific client objective. After 2005, grant-funded projects included more systematic data gathering. Appendix C summarizes the available data on the projects. An archive established at the University of North Alabama's College of Business will contain all available data on these projects.

3.1 Oklahoma City Chamber of Commerce

Time Frame.— 1993-2000

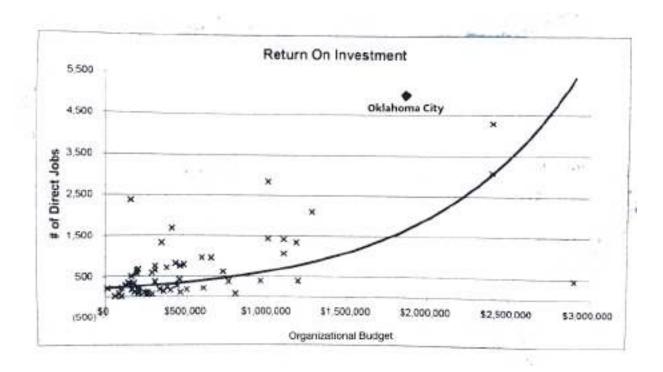


Figure 3.1: Performance of Forward Oklahoma City, 1996-1990 Economic Strategy Center compared Oklahoma City's performance to approximately one hundred other communities. The performance significantly exceeded national averages. Economic Strategy Center, Inc. (1999), 22.

Reference Materials.— Appendix C-1

Context.— Collapsing oil prices and a banking scandal led to over a decade of slow growth in Oklahoma City. I was engaged to develop a strategy for the business community to address the

economic transformation needed to move Oklahoma City's regional economy forward.

Intervention.— Over two years, using a new approach to strategy based on open source software development, I designed and guided a strategic action plan for the business community. Called Forward Oklahoma City, the five-year action launched in 1994. The strategic action plan

	Forward Oklahoma City Strategic Doing prototype Actual 1996-1999	National Average
Cost per job	\$373	\$1,200-\$2,000
Cost per impact job	\$187	\$500-\$960
Annual earnings injected per dollar spent	\$78	\$40-\$52
Net Present Value projected for ten years from date Forward OKC began	\$1.35 billion	N/A
Internal Rate of Return projected to 2005, based on activities 1996-1999	6,350%	N/A

Table 3.1: Performance metrics for Forward Oklahoma City, 1996-1999. In terms of costs per job, the Forward Oklahoma City initiative significantly outperformed national averages. Source: Economic Strategy Center, Inc. (1999), 20.

included seven collaborative investment initiatives. I continued through the first five year cycle and guided the development of the second five-year cycle launched in 1999.

Outcome.— The five year action was launched in 1994 with a \$10 million budget over five years. In 1999, the Chamber of Commerce hired an outside evaluator for the initiative. The evaluator found that the productivity performance, measured as return on investment, far exceeded national averages for economic development investment (Economic Strategy Center, 1999). Twenty-five years on, Forward Oklahoma City continues to develop: the fifth five year cycle ended in 2019, and a sixth is underway. Oklahoma City is now a national model of economic transformation (Thompson, 2010).

This project resulted in a prototype for the theory of action that became Strategic Doing. Impressive results motivated me to continue this work. In 1999, The Oklahoma City Chamber of Commerce engaged Economic Strategy Center (1999) to evaluate my prototype strategy process's success. As Figure 3.2 shows, they found that Forward Oklahoma City far outperformed other communities. At the same time, they calculated that the project generated significant economic returns to Oklahoma City. Table 3.2. presents these calculations.

Implications for Strategic Doing .— Oklahoma City enabled me to design a prototype strategy process for open networks. As a reference, I studied open source software development and used it as a template. Features of Strategic Doing that were designed and piloted in Oklahoma City include:

- **1. Forming a core team to guide the strategy.** Complex transformations are beyond the capabilities of a single leader. Core teams provide the cognitive diversity needed to address complex challenges (Page, 2008).
- 1. Making regular adjustments to the strategy.— We adjusted the strategy continuously as we learned by doing. This approach parallels the process of entrepreneurial teams (Ott & Eisenhardt, 2020).
- 2. Focus on implementation from the beginning. We guided the development of our strategy by the principle of "doing the doable." If we could not see a practical path forward for a proposed initiative, we discarded it. This insight aligns well with the importance of experimentation in uncertain environments (Nichols-Nixon et al., 2000; Liedtke & Hess, 2009; Thomke & Manzi, 2012; Eisenhardt & Bingham, 2017).
- 3.**Creating a 30/30 check-in meeting to embed double-loop learning.** Regular meetings with the core team took place every month at 7 AM for an hour. We called these meetings our "30/30" meetings, and we followed a clear agenda. Review what we had accomplished in the last 30 days and set a plan for the next 30 days. This practice follows Argyris (1977) and double-loop learning.
- 4. Connecting assets to uncover opportunities. Oklahoma City had many assets on which we could build a strategy. These assets included an architecturally compact downtown, a biomedical research Institute, an extensive Air Force installation, a strong history of entrepreneurship (although tied almost exclusively to the oil industry), and a relatively robust set of existing companies. This process is similar to "dynamic capabilities" described by Eisenhardt & Martin (2000).
- 5.Setting priorities among opportunities by balancing impact with the probability of short-term success.— This idea has developed into a simple prioritization process. This step is similar to the development of "higher-order heuristics," described by Bingham and Eisenhardt (2011).
- 6.**Developing outcomes with clear success metrics.** The core team focused intensively on measurable results. We made no investments until we clearly defined these outcomes.

7.**Designing practical investment initiatives.**— This idea became Pathfinder Projects. Although we did not call our initiatives "Pathfinder Projects," we consciously developed a portfolio of initiatives that had clear guideposts to define them. In our 30/30 meetings, we tested the assumptions of these initiatives.

8. Developing a portfolio of initiatives.— Before the fact, no one knew which investment initiatives would be successful and which would fail. In the face of this uncertainty, developing a portfolio of projects with different time horizons can manage the risk of failure.

3.2 Kentucky Cabinet for Economic Development

Time Frame.— 1998-2003

Reference Materials.— Appendix C-2

Context.— Globalization has created significant geographic inequities between urban and rural regions (Scott & Storper, 2003). Not surprisingly, like other states across the U.S., Kentucky faces significant geographic inequality in economic growth. While metropolitan regions have managed to adjust to globalization pressures, many rural counties in Kentucky have not been so fortunate. The challenge facing policy makers was how to address the economic dislocations in these counties.

Intervention.— The Kentucky Cabinet for Economic Development contracted with me to design and conduct strategy sessions in three to four depressed rural counties each year. The experiment focused on aligning state and local resources to a strategy quickly. The intervention in each county consisted of developing a strategic action plan over a period of two days. I led a team of five to six volunteer economic and workforce development professionals for each engagement. During the first day, each member of the team conducted interviews following a protocol I established. At the end of the first day, the team reconvened to summarize their findings. In the evening, I drafted a strategic action plan which we presented to the community on the morning of the second day. This "beta draft" then led to an open tow to three hour discussion with the community. Once we reached a consensus to move forward, members of the community then made commitments to implement the strategic action plan. The Cabinet also made commitments to support the action plan. Based on these discussions on the second day, I revised the strategic action plan and presented it back to the community and the Cabinet within one week. The Cabinet then established a date to returning to the community within six months to measure progress.

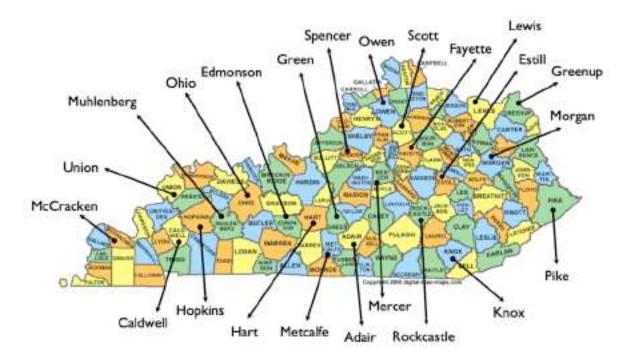


Figure 3.2: Kentucky Community Assessment program, 1997-2003. Twenty-three counties participated in this initiative organized by the Kentucky Cabinet for Economic Development.

Outcome.— After five years, the Cabinet conducted an assessment found that eighteen of the twenty-three counties made measurable progress within six months of the launch of their strategic action plan. However, a new governor came into office from the opposing political party and terminated the initiative.

Implications for Strategic Doing.— I demonstrated the possibility of developing an actionable strategy within two days. The development of short strategic action plans provided the essential action steps to move forward. Also, this initiative underscored the value of making clear, transparent commitments to move ideas into action. Finally, we established a check-in within six months to keep everyone focused on their action steps and accountability for following through. This discipline of accountability and learning represented a modification of the 30/30 meeting protocol established in Oklahoma City.

3.3 Ascension Parish Council

Time Frame.— 1999-2003

Reference Materials.— Appendix C-3

Context.— Ascension Parish, Louisiana, is located just south of Baton Rouge on the Mississippi River. The parish (or county) is also the site of major, potentially dangerous chemical plants. In the 1990s, this rural parish began to see strong residential growth. In the twenty years from 1990 to 2010, the population nearly doubled from 58,000 to 108,000. This project took place amid this population boom. Without a zoning ordinance in place, residential development began dangerously encroaching on the chemical plants. Conservative politics made passing zoning ordinance politically treacherous. However, safety managers at the chemical plants insisted on having some control of residential development. A citizen planning commission contacted me to develop the citizen support needed to pass a comprehensive development code.

Intervention.— Over two years, I designed a civic process to develop a comprehensive development code. This process involved monthly workshops in which citizens explored the challenges of restricting development to promote public safety and preserve the parish's rural character. At the end of the process, I drafted the code; the table of contents appears in Figure 3.4.

Outcome.— Before the intervention, the Ascension Parish Council had unanimously turned down a previous effort to pass zoning 0-8. After I drafted an ordinance that reflected the participants' view in our workshops, the development code passed the council 8-0. The code was enacted in 2003 and revised three years later. It has been updated and remains in force (Ascension Parish Office of Planning and Development, 2015). Appendix C-3 contains the original code.

Implications for Strategic Doing.— This project demonstrated three critical insights into Strategic Doing. First, engagement is driven in part by the quality of the process. If participants can understand the process and perceive it as fair, they will participate. Transparency plays an essential role in building this trust. Second, the quality of the process is directly dependent on maintaining rules of civility. These rules must be clearly stated and enforced. Without an atmosphere of civility, complex strategic thinking is impossible. Third, participants need to

visualize the future that they would like to see. Driving conversations to deeper levels of detail so that participants can share their visualizations improves engagement and leads to consensus. This process of visualization appears to trigger the emotional engagement needed to sustain the process. The development code introduced "Commentary" sections to capture citizen views from the extensive civic consultation process.

3.4 Charleston Digital Corridor

Time Frame.— 2000-2001

Reference Materials.— Appendix C-4

Context.— Ernest Andrade, a city economic development employee in Charleston, South Carolina, wanted to implement a high technology district. He called at the Charleston Digital Corridor. However, Ernest did not have a significant budget. He wanted to know how to develop networks effectively on the cheap.

Intervention.— I taught Ernest how to build a portfolio of collaborations to form an ecosystem. This portfolio mirrored the work I completed in Oklahoma City. Over the years, I have continued to develop this portfolio approach that uses Strategic Doing. Chapter 7 illustrates how I used this model to guide the development of an ecosystem in North Alabama. As a centerpiece of this strategy, I taught Ernest the importance of "changing the conversations" within the region. Conversations can lead to collaboration. I designed a regular monthly convening, called Fridays at the Corridor, to model these new conversations and strengthen the Charleston Digital Corridor networks.

Outcome.— Fridays at the Corridor is continuing into its 19th year. The Charleston Digital Corridor has become a nationally recognized high technology hub (Snow, 2012).

Implications for Strategic Doing.— Working with Ernest, I coached him in the model I had been developing in Oklahoma and Kentucky. His successful implementation of the model convinced me that I could teach the model to another person. The forum of Fridays at the Corridor demonstrates one of the key insights: to move toward more collaborative strategies, change the prevailing conversations. Forums can frame generative conversations. These forums attract people and strengthen their networks. I codified these lessons in the first two rules of

ASCENSION PARISH DEVELOPMENT ORDINANCE

Be it ordained that the Ascension Parish Governing Authority hereby enacts the following ordinance: Chapter 17, Planning and Development, of the Code of Ordinances of Ascension Parish Louisiana is amended as follows. After Section 17.11 add the following new articles:

Article I: GENERAL PROVISIONS OF DEVELOPMENT AND ZONING

Section 17-101. Short title and organization.

The regulations contained in Articles 1 through 5 of this Chapter shall be known as and may be cited as the Ascension Parish Development Ordinance of 2003. This ordinance is organized as follows:

Article I: General Provisions of Development and Zoning

Article II: Zoning Districts and Overlay Zones

Article III: District Development Standards

Division 1: Development Framework

Division 2: Use Requirements by District

Division 3: Structure Requirements by District

Division 4: Site Requirements by District

Division 5: Business Park Development Standards

Division 6: Flood Hazard Overlay Zone Requirements

Division 7: Development Standards for Airport Overlay Zones

Division 8: Development Standards for Other Overlay Zones

Division 9: Contract Agreements

Article IV: Other Development Requirements

Division 1: Offstreet parking Requirements

Division 2: Landscaping for Offstreet Parking

Division 3: Commercial Property Landscaping Standards

Division 4: Bufferyard Requirements

Division 5: Street Access Standards

Division 6: Commercial and Industrial Storage Standards

Division 7: Manufactured Housing and Mobile Home Standards

Division 8: On Premises Sign Standards

Division 9: Off Premises Sign Standards

Division 10: Lighting Standards

Division 11: Waste Discharge Standards

Division 12: Group Home Standards

Division 13: Home Occupation Standards

Division 14: Adult Business Standards

Division 15: Alcohol Beverage Business Standards

Effective 1 April 2, 2003

Figure 3.3: Ascension Parish Development Code cover page, 2003. Using an early version of Strategic Doing, I drafted a development code for Ascension Parish, Louisiana. A key insight emerged in the power of visualization and what scholars came to see as prospection (Gilbert & Wilson, 2007).

Strategic Doing. These two rules relate to the creation of a boundary and direction for a strategic conversation.

3.5 Purdue: Strategic Doing Testbeds

Time Frame.— 2005-2016

Reference Materials.— Appendix C-5

Context.— Under Purdue President Martin Jischke, Purdue established the Purdue Center for Regional Development in 2004. The center pioneered the development of new disciplines and tools to expand university engagement by following the Kellogg Commission's guidance (1999). The initial directors, Vic Lechtenberg and Sam Cordes, recruited me to come to Purdue to continue the development of Strategic Doing.

Intervention.—Within PCRD, we set up a team of three people to develop Strategic Doing with a series of testbed projects. Through these testbeds, Strategic Doing development continued within the center until both Lechtenberg and Cordes retired. Subsequently, I moved the team to an Agile Strategy Lab at Purdue.

Outcome.— We conducted workshops on Strategic Doing in over 30 states and three foreign countries. We developed a more rigorous process and pedagogy to teach skills needed to design and guide Strategic Doing workshops. We generated several publications updating our work. (Morrison, 2012, 2013, 2015, 2018; Morrison & Hutcheson, 2014; Morrison, Barrett & Fadden, 2019; Morrison, Hutcheson, Nilsen, Fadden & Franklin, 2019; Nilsen, Morrison, Ascencio, & Hutcheson, 2017; Nilsen, Monroe-White, Morrison & Wellerstein, 2016; Sullivan, Pines & Morrison, 2016; Berger, Wirtz, Goldenstein, Morrison & Briody, 2018). We also developed teaching materials (Purdue Center for Regional Development, 2014).

A strong partnership formed between Purdue and the University of Puerto Rico. We introduced Strategic Doing to Puerto Rico through the Pathways project, involving undergraduate engineering education (see Stanford-VentureWell, Section 3.8.15, below). After Hurricane Maria hit the island, our colleagues at the University of Puerto Rico reached out to our Purdue team for assistance. We introduced Strategic Doing to forty professionals from across the island in a 2.5-day training. This training led to the diffusion of the discipline (see Section

4.3.11). This diffusion process is continuing in 2021 under a grant from the Economic Development Administration, U.S. Department of Commerce.

During this period, we also launched numerous testbeds: Michigan State University to address challenges facing neighborhoods in Flint, Michigan (see Section 3.8.12 below); the U.S. Department of Labor (Section 3.8.6); the Water Council (Section 3.8.9); the Space Coast in Florida (Section 3.8.10); Medora, Indiana (Section 3.8.11); Fraunhofer IAO (Section 3.8.13); New Jersey Innovation Institute (Section 3.8.14); Purdue's School of Mechanical Engineering (Section 3.8.16); NASA (Section 3.8.17); National Institute for Standards and Technology (Section 3.8.18); and Shoals Shift (Section 3.8.19).

Implications for Strategic Doing.— Purdue served as the incubator for the development of Strategic Doing. Upon publication of our book, Jischke, Lechtenberg, and Cordes, the Purdue administrators that supported the development of Strategic Doing for over a decade, providing an endorsement of our team's work (Morrison, Hutcheson, et al., 2019).

Jischke offered these comments:

An important evolution is taking place among U.S. land-grant universities. These universities helped spark the industrial development that swept through the 20th century. The learning, discovery, and engagement taking place on our campuses today is now pointing us to new approaches to the economic challenges facing society. This valuable book builds on that land-grant tradition through the new discipline of Strategic Doing to achieve higher and more productive levels of collaboration to solve today's increasingly complex economic problems. Anyone interested in solving such problems more effectively, faster, and more collaboratively will find this book a welcome treasure.

Lechtenberg offered these comments:

Today's communities, geopolitical regions, economies and societies face many highly complex challenges. Effective solutions to these challenges require that the leaders of organizations charged with addressing them—be they educational, governmental, non-governmental, or private—must work across traditional organizational, cultural, and geopolitical boundaries. Strategic Doing, with its ten skills to developing effective networks, is a much-needed 'perspective changer' on strategy and leadership.

Cordes offered these comments:

Everyone agrees that 'complex problems require complex solutions'. By implication, complex solutions typically require deep and serious collaboration that goes far beyond networking and cooperation. Deep collaboration is easier said than done. How ironic is it that the answer to this collaboration-complexity nexus is something very *simple*: the ten skills of Strategic Doing (SD). SD takes an asset-based approach. However, the identification of assets is a hollow victory if those assets are not mobilized. SD provides the skills to catalyze this mobilization, leading to two important outcomes: problems are solved and the human capital of the participants is simultaneously enhanced. Can there be a better win-win scenario?

3.6 U.S. Department of Labor: Workforce Innovation

Time Frame.— 2005-2008

Reference Materials.— Appendix C-6

Context.— In 2005, during the Bush administration, the U.S. Department of Labor launched an experiment to promote collaboration in the development of regional workforce systems. The initiative was called Workforce Innovation in Regional Economic Development (Almandsmith et al., 2008). At the time, the federal government invested over \$14 billion in talent development through the public workforce system. However, the system was (and is) characterized by fragmentation (Andreason & Carpenter, 2015). The Department of Labor requested proposals to improve the productivity of the workforce system.

Intervention.— Our Purdue team submitted a proposal, and the Department of Labor awarded us a three-year grant. We were one of thirteen grantees nationally. Each grantee received \$15 million, or about 8% of the total money awarded. We used the principles of Strategic Doing to design and guide our collaborations across a fourteen county region in north-central Indiana.

Outcome.— We managed over sixty collaborations in four focus areas with over one hundred partners at the end of three years. In a private communication, a Department of Labor representative informed us that our region, with 8% of national funding, produced 40% of the national results in four core metrics.

Two years after the funding ended, 80% of our initiatives were continuing. Some of these initiatives grew into national programs, such as the National STEM Guitar Project, now funded

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by the National Science Foundation (http://guitarbuilding.org). Purdue anchors other initiatives, such as Purdue Healthcare Advisors (https://pha.purdue.edu). Purdue Healthcare Advisors continue to use Strategic Doing (Purdue University, 2019). Another initiative, the Energy Systems Network, is based in Indiana (https://energysystemsnetwork.com).

We also streamlined the training of workforce development professionals. Colorado State University uses these insights, as the university works with the Colorado Department of Labor and Employment to train workforce professionals. Our progress led Paul Collits, then president of the Australia New Zealand Regional Science Association International, to study our approach and invite us to present to the ANZRSAI annual meeting (Collits, 2013).

Implications for Strategic Doing.— We adopted several innovations to scale Strategic Doing across a large region. We embraced and applied the insights of Malone's work in organizations to design a governance structure (Malone, 2004). Specifically, we created a managed network, what Malone refers to as a "loose hierarchy." We hired one person to manage the network. We developed and deployed the concept of an "opportunity fund" as a blind venture pool to invest in collaborations that offered the promise of being replicable, scalable, and sustainable. In this way, we piloted an incentive program to stimulate collaboration. We also sharpened our thinking about the roles both civility and transparency play in complex collaborations.

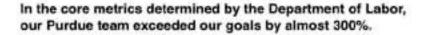




Figure 3.4: Summary results North Central Indiana WIRED, 2005-2008. By using Strategic Doing, the Purdue team far exceeded the goals set forth in its project proposal.

3.7 Economic Development Institute, University of Oklahoma

Time Frame.— 2001-2006

Reference Materials.— Appendix C-7

Context.— The Economic Development Institute at the University of Oklahoma provides advanced training to economic development professionals in the United States. They teach curriculums that are certified by the International Economic Development Council.

Intervention.— For six years, I experimented with offering Strategic Doing in a three hour strategy lab in outside of the Institute's strategic planning curriculum.

Outcome.— The student reviews of my course we are uniformly positive. The 2004 review (provided in the Appendix C-7) is representative. It included 72 student responses. Participants were asked to rate the Strategic Doing course on a five point scale.

Evaluation Metric	Score 1=low; 5=high n=72
Q. 1: Course has met the objectives	4.7
Q. 2: Course provided information that was relevant to your job	4.8
Q. 3: The course materials were helpful	4.7
Q. 4: You were satisfied with this course	4.7
Q. 5: The instructor had a thorough knowledge of the subject	4.8
Q. 6: The presentation was well organized	4.6
Q. 7: The instructor effectively promoted class participation	4.7
Q. 8: Questions were answered to your satisfaction	4.7
Q. 9: You were satisfied with the instructor	4.8
Q. 10: The level of course difficulty was appropriate	4.7
Q. 11: The amount of time allowed for this course was adequate	4.4
Q. 12: The course topic was covered in sufficient depth	4.5

Table 3.2: Student assessments of Strategic Doing Lab. Students participating in the Economic Development Institute, 2004 delivered these assessments. Source: Economic Development Institute.

Implications for Strategic Doing .— The student responses pointed to a significant weakness: I was still learning how to engage the class in experiential learning instead of a lecture. My presentation of the material needed improvement (Question 6). Also, I realized that a three-hour time block was insufficient to cover all of the material (Questions 11 and 12). The experience underscored that learning to teach Strategic Doing would be a more involved and complicated assignment than expected. From this experience, I learned the importance of understanding how adults learn. I began to see this learning's multidimensional character, the importance of stories, and the value of reflection and dialogue in class.

3.8 Edward Lowe Foundation: Executive Education

Time Frame.— 2006-2010

Reference Materials.— Appendix C-8

Context.— The Edward Lowe Foundation provides executive training to entrepreneurs. In 2006, they reached out to support Strategic Doing on their campus.

Intervention.—Through a series of retreats completed over three years, I began the development of the teaching materials for Strategic Doing. Their training staff assisted me in designing a two day training that we could pilot.

Outcome.— I conducted five two-day retreats involving over 40 professionals. The training got generally positive reviews, similar to those with the Economic Development Institute. The Lowe Foundation staff introduced me to experiential learning through the different games that we presented. We have integrated the "point the finger" exercise into all our training. This exercise provides a powerful experience for participants to understand a complex system.

Implications for Strategic Doing .— The Lowe Foundation set me on the path of consulting about a strategy to teaching Strategic Doing through powerful experiential learning exercises. The Lowe Foundation staff began showing me how to design learning experiences that were more interactive and reflective. With their guidance, I was starting to learn the discipline of teaching adults. We continue to integrate the "point the finger" exercise in all our in-person training.

3.9 Milwaukee Water Council

Time Frame.— 2008

Reference Materials.— Appendix C-9

Context.— In 2007, civic leaders and Milwaukee came up with an idea: develop a new economic cluster around freshwater technology. A report by a local engagement scholar, Sammis White, provoked the discussion (White, 2008). In 2007, civic leaders held a workshop and confirmed some of White's initial paper; he then revised it. In 2008, White and others contacted our team at Purdue. Their question: using Strategic Doing, could we help them design a workshop to move this idea of cluster development forward in Milwaukee?

Intervention.— Collaborating with representatives of the University of Wisconsin-Milwaukee and the Greater Milwaukee Committee, I designed a three-hour workshop on July 14, 2008. Approximately 60 people attended. The participants included representatives from government, business, local community colleges, and universities. After introducing Strategic Doing with a brief presentation, we began the workshop with exercises that guided participants through the Strategic Doing cycle. We assigned people to tables to get the right mix of participants from different sectors. Each table had six to eight participants. At the end of the workshop, each table representative reported on one project that they would move forward.

Outcome.— The workshop yielded immediate initiatives to move the emerging cluster forward. The most significant was a project to establish an incubator in freshwater technology for start up companies. The chief executive officers from two companies, Badger Meter and A.O. Smith, committed to open their research labs to the start up companies.

By October, three months after the workshop, our colleagues at the University of Wisconsin-Milwaukee summarize the formation of the cluster in Figure 3-6. The Strategic Doing workshop provided coherence that led to the generation of four strategic focus areas. Participants from the workshop began working on specific initiatives within each focus area.

The Water Council has gone on become a global leader in freshwater technology (Morrison, 2018b). The symbolism of the first collaboration between A.O. Smith and Badger Meter has become an important part of the transformation story. When visitors now enter the World Water

Center in Milwaukee, they will see on the first floor a hot water testing lab supported by A.O. Smith and a cold water testing lab supported by Badger Meter.

Implications for Strategic Doing.— The Water Council provided an essential testbed for the development of Strategic Doing within the cluster development. We worked directly with companies to accelerate collaborations. However, because the Water Council's workshop was so quickly successful, it carried a downside. I underestimated the challenge of teaching these skills to others. As it turned out, developing a curriculum required far more work.

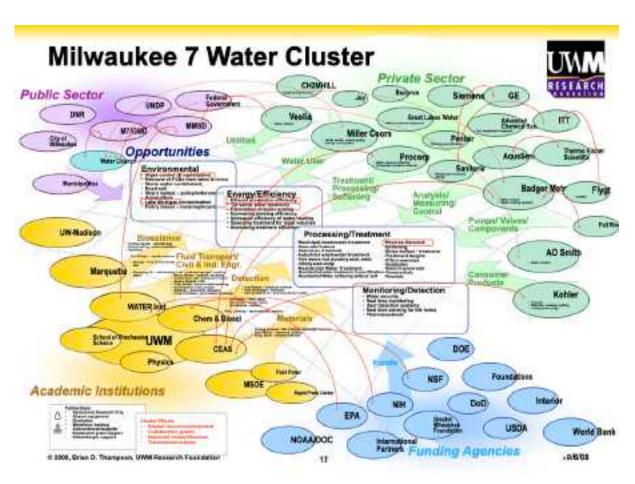


Figure 3.5: Connections forming in the Milwaukee Water Council. Graphic demonstrating connections in emerging water cluster from July to October, 2008, after Strategic Doing workshop held in Milwaukee, July 14, 2008. Drawing completed by Brian D. Thompson, University of Wisconsin-Milwaukee Research Foundation, October 6, 2008.

3.10 Brevard Workforce Development Board

Time Frame.— 2010

Reference Materials.— Appendix C-10.

Context.— Brevard County is Florida's 10th most populous county and the home of the Kennedy Space Center. With the retirement of the NASA shuttle program, the county was facing



Figure 3.6: Space Coast testimonials. Brevard Workforce prepared a video after our Strategic Doing workshop on the Space Coast. It includes testimonials from companies participating in the process. It is viewable YouTube here: https://youtu.be/dZmUGzJFuOc

major economic dislocations. The workforce development board in the county contacted Purdue to develop a strategy to address this dislocation. Civic arguments broke out and disrupted past efforts.

Intervention.— I designed a half-day Strategic Doing workshop with open participation. The workshop centered on eight focus areas. Over 150 people attended the workshop. Each table completed a set of timed exercises with a Strategic Doing action pack.

Outcome.— The most promising focus area turned out to be renewable energy. The workshop led to the formation of the Space Coast Energy Consortium. We posted a video taken after one of the workshops, and it is available at https://youtu.be/dZmUGzJFuOc.

Implications for Strategic Doing.— I learned that Strategic Doing is a scalable process that could include many people, provided, however, the conversations focused on eight to ten people sitting at round tables. This experience showed how guiding these conversations with workbooks, consisting of a series of timed exercises, could be improved with training for the guides at each table. Guides are informal instructors who lead each table conversation.

3.11 Medora, Indiana: National Maple Syrup Festival

Time Frame.— 2010

Reference Materials.—Appendix C-11

Context. – Medora is a small town in southern Indiana with a population of about 700 people. Like many rural towns, they have not adjusted well to the challenges of globalization. In 2012, town leaders contacted our Purdue team with a question: could we help the town find tenants for a vacant strip shopping mall?

Intervention.— We told the Medora town leaders that we do not resolve such a narrow problem of commercial real estate. However, we would be willing to come to Medora to run a Strategic Doing workshop. Scott Hutcheson, a member of our Purdue team, guided about 15 citizens from Medora in a 2 1/2 hour workshop session. The session followed the Strategic Doing protocols.

Outcome.— Out of the session, the citizens could link and leverage some significant unique, and previously hidden, assets. In particular, unknown to many, a software developer was advancing a new maple syrup production hobby. By combining this asset with some others represented in the room, the strategy created a festival. Out of this initial workshop, the National Maple Syrup Festival was born. This festival has now gotten so big that it has expanded to a regional festival with national corporate sponsors. Tim Burton, founder of Maplewood Farm and the National Maple Syrup Festival, wrote us:

Following the principles of Strategic Doing, you can grow both communities and businesses. A small group of folks established Medora, Indiana (population 631) as the birthplace of the National Maple Syrup Festival and no amount of strategic planning could have helped my business, Burton's Maplewood Farm, launch a collection of artisan syrups,

favorites of America's top chefs, and sold at exclusive farmers markets and other discriminating outlets across the U.S. It took Strategic Doing.

Implications for Strategic Doing.— The Medora case study emerged from the work of my colleague, Scott Hutcheson, at Purdue. The success of this case marked another milestone in the development of Strategic Doing. Medora illustrated that it was possible to take a theory-in-use and teach it to a colleague to manage a network-based strategy process. Medora marked an essential step in converting a theory-in-use to a replicable theory of action (Argyris & Schön, 1974). Hutcheson had achieved a mastery level in Strategic Doing that he designed and guided this engagement without my assistance. Medora marked the first of what has become a long line of Hutcheson's engagements. He now leads Strategic Doing at Purdue.

The Medora case study also illustrates the importance of the framing question. Often, communities frame their challenges in terms of problems, such as a vacant shopping mall. However, by reframing the strategy conversation to explore set potential opportunities, the session uncovered hidden community assets. Further, Strategic Doing promotes action quickly. In this case, the workshop participants realized that no one reserved the URL for the national maple syrup festival. They moved quickly to secure the URL during the workshop (https://nationalmaplesyrupfestival.com). We now use the Medora case study to illustrate the value of framing the strategy conversation in rural communities.

3.12 Flint, Michigan: Youth Violence

Time Frame.— 2013-2020

Reference Materials.— Appendix C-13

Context. – Flint, Michigan, is the former birthplace of General Motors. However, the community has lost population as the auto industry has restructured. In 2012, a member of the Michigan State University engagement team attended one of my workshops in Washington, DC. Excited about the potential, he shared the Strategic Doing approach with his colleagues. Bob Brown, Associate Director, Center for Community and Economic Development at Michigan State University, called me to see if Strategic Doing would help reduce teenage homicides within Flint's neighborhoods. We conducted two demonstrations of Strategic Doing in 2012 and 2013.

These demonstrations consisted of walking through a Strategic Doing workshop with framing questions, such as, "What would it look like if we improved the collaboration among neighborhood groups in Flint?" And "What would it look like if Michigan State University improved the collaborations among its engagement initiatives in Detroit?"

Intervention. – In 2014, based on these demonstration workshops, we conducted a 2 1/2 day training for approximately twenty of Flint's neighborhood leaders. Based on this training, a faith-based group, WOW Community Action Group, made Strategic Doing a core part of their engagement strategy. The mission of WOW is "to create a community with ZERO tolerance for violence."

Outcome. – The initial work by WOW has led its leaders to embrace Strategic Doing. They have recorded two videos. The first represents the core team in Flint. (Flint core team video is available here). The second focuses on Bob Brown's reflection on the impact of Strategic Doing.



MICHIGAN STATE

Figure 3.7 Bob Brown testimonial: A short video by Bob Brown is available on Vimeo here: https://vimeo.com/301366831

(Bob Brown video is available here). At the same time, WOW has collaborated with other community groups in Flint to apply the disciplines of Strategic Doing to address other challenges, such as the collapse of the city's water system. In the wake of the lead poisoning crisis in Flint, other civic leaders trained in Strategic Doing formed a new food hub in downtown Flint. This food hub provides access to fresh fruits and vegetables to neighborhood citizens (Carey, 2018). Fresh fruits and

vegetables can mitigate the impact of lead poisoning on children. .

Implications for Strategic Doing.— Every year, we conduct further Strategic Doing training in Flint. We have also worked with the core team in Flint to research the characteristics of an effective core team leadership. Further, our colleagues in Flint have become strong advocates for Strategic Doing. When I asked one leader, Tendagi Ganges of the University of Michigan-Flint, why, he told me, "Strategic Doing broke our grant addiction. Before we learned

this practice, we did not believe that we could do anything without a grant." Asked to evaluate the impact of Strategic Doing on the neighborhoods, Bob Brown wrote,

Strategic Doing gives us the power to change our lives, our neighborhoods and our communities. Authentic collaboration always creates action from our conversations and dialogues. We waste our resources and time when we engage in conversations that don't lead to action. We have found that Strategic Doing is a highly useful method for moving conversation to action.

3.13 Fraunhofer IAO: Technology and Innovation Management

Time Frame.— 2013-2020

Reference Materials.— Appendix C-13

Context. – In 2013, the head of the Department of Technology Leadership and Innovation at the Purdue Polytechnic Institute approached me about developing a partnership with the Fraunhofer-Gesellschaft in Germany. After conducting research, I located a technology and innovation management team at Fraunhofer Institute for Industrial Engineering (Fraunhofer

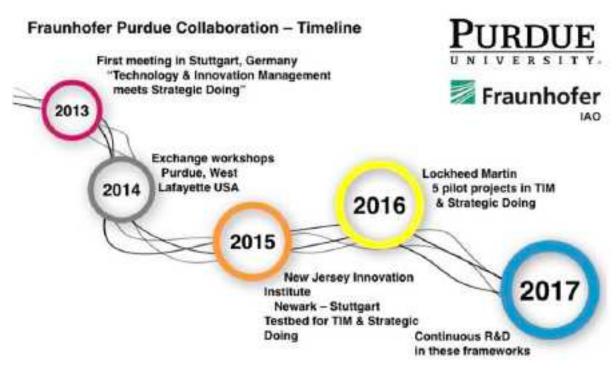


Figure 3.8: **Timeline of Fraunhofer IAO-Purdue collaboration.** Strategic Doing provided the protocols to develop the Purdue-Fraunhofer IAO partnerships. The Purdue-Fraunhofer team partners with the New Jersey Innovation Institute to complete testbeds for integrating Fraunhofer's Technology and Innovation Management frameworks with Strategic Doing. Source: Antonino Ardilio, Fraunhofer IAO, Stuttgart, Germany.

IAO) in Stuttgart, Germany.

Intervention. – In 2013, I arranged a two-hour meeting in Stuttgart with Joachim Warschat and Antonino Ardillio, the Technology and Innovation Management team leaders at Fraunhofer IAO. During the session, I guided the agenda using the principles of Strategic Doing. We spent approximately thirty to forty minutes, exploring what we could do together. In this portion of the conversations, we developed a clearer idea of our knowledge assets. By asking questions, I also learned more about how Fraunhofer IAO measures its management units' success. We explored how the integration of our frameworks and tools would provide different opportunities to generate revenue. We then spent about forty to fifty minutes ranking our options and deciding where to focus: what we should do together. We spent about twenty minutes identifying a project and action steps—the project involved having the Fraunhofer team come to the Purdue campus. Finally, we spent about ten minutes committing to assessing our progress. After the meeting, I completed a strategic action plan presented in Appendix C-13.

Outcome. – The strategic action plan served as a basis for the strategy that the actual strategy lab has developed with Fraunhofer IAO. The Purdue-Fraunhofer team generated over \$200,000 in guiding the New Jersey Innovation Institute's development and providing executive education in technology and innovation management. Efforts to develop a campus-wide innovation certificate at Purdue foundered on internal politics at Purdue. This collaboration continues today. The Agile Strategy Lab at the University of North Alabama is currently working with Fraunhofer IAO to develop on-line courses that integrate Strategic Doing with the technology and innovation management frameworks and tools developed by Fraunhofer.

3.14 New Jersey Innovation Institute: Condition-based Maintenance

Time Frame.— 2016-2018

Reference Materials.— Appendix C-1

Context.— The New Jersey Institute of Technology is a public research university with 11,000 students. In 2014, the University established the New Jersey Innovation Institute (NJII). The Institute focuses on the engagement mission of the University. Leaders of the Institute approached me at Purdue to develop a platform that would use Strategic Doing to engage

I've worked with large companies trying to do open innovation, but the Strategic Doing process is unique. This is the most clear an concise open innovation process I've seen.



Mark Scotland, CEO 4.0 Analytics

Strategic Doing allows a business to quickly identify an interested ecosystem of local businesses that have a collective interest in and capability to solve a defined customer problem.



Todd Tangert, Former Combat Systems Architect, Lockheed Corporation

Figure 3.9: Condition-based maintenance strategy process. At the end of the process to develop

a technology roadmap for condition-based maintenance, we received these comments from participants as part of our evaluation. 4.0 Analytics is a small high technology company that manages condition-based maintenance across truck fleets.

companies in collaborative partnerships with the University. Specifically, they wanted to create a collaboration with Lockheed Corporation.

To begin, Lockheed executives posed a problem that they were unable to solve. The U.S. Navy had asked Lockheed for a technology roadmap to deploy condition-based maintenance across the Aegis destroyer fleet. Lockheed did not have access to the latest technologies in machine learning, sensors, and augmented reality. Without access to these latest technologies, Lockheed could not develop the roadmap. To develop a roadmap, they would need outside technology partners.

Intervention.— Working with NJII, our Purdue team and I developed a series of four workshops over six months. With these workshops we developed an ecosystem quickly and drafted a technology roadmap.

Outcome.— We started with an initial group of eighty outside companies. This initial group shrank to a core of twenty companies that worked on the roadmap with Lockheed. We began the process in January and completed it by July. Asked to evaluate the process, Todd Tangert, a combat systems architect with Lockheed, and Mark Scotland, CEO of a small technology firm that participated in these workshops, provided testimonials outlined in Figure 3.10.

Implications for Strategic Doing.— In this testbed, we adapted Strategic Doing principles to open innovation challenges in complex and sophisticated corporate settings. At least twice during the process, our Purdue team felt a bit lost in the complexity of developing a technology roadmap. We have no technical expertise in condition-based maintenance, and the details can be overwhelming. We relied on the Strategic Doing process principles, however, and we learned that by following these simple rules, we could manage the complexity.

3.15 Stanford-VentureWell: Pathways to Innovation

Time Frame.— 2013-2016

Reference Materials.— Appendix C-15

Context.— Under a grant from the National Science Foundation, Stanford University and a non-profit organization, VentureWell, proposed transforming the undergraduate engineering curriculum at 50 universities. Under their proposal, faculty and staff teams from these universities would implement new approaches to expanding innovation and entrepreneurship training among undergraduate engineering students. One year into the grant, however, progress stalled with only a handful of universities engaged. A representative from VentureWell approached our Purdue team to see if Strategic Doing could be used to accelerate the deployment of innovation and entrepreneurship training across fifty universities.

Intervention.— Working with VentureWell, we developed a series of three cohorts. Year 1, we introduced Strategic Doing to 12 teams that started in late 2014. An additional 25 schools



Figure 3.10: Inside the Pathways workshop. In 2014, my colleague Scott Hutcheson explained our Pathways workshop in a video that appears here.

joined the Pathways initiative in late 2015, and 13 schools begin the program in 2016. I designed an intervention that consisted of three parts. First, leaders of each university team learned the basics of Strategic Doing in a retreat at Stanford. During this retreat, we introduced Strategic Doing by playing a simulation game. Second, the university teams convened in Phoenix for a two day

retreat. Each team consisted of between four and six faculty and staff. VentureWell guided each university as they organized their team. During the two-day retreat, we led two 2.5-hour Strategic Doing workshops. In the first workshop on the first day, the team developed an initial strategic action plan. In the second workshop on the second day, they refined their strategic action plan and presented it to the other teams. After the Phoenix workshops, I worked with VentureWell to assist each team report their progress in the following year.

Outcome.— These fifty university teams generated over 500 collaborations to improve undergraduate engineering education by increasing experiential learning in innovation and entrepreneurship. Thee collaborations ranged widely from new maker spaces, new courses, new certificate programs, and new competitions. In subsequent research, we found that the most productive teams followed on average eight of the ten rules of Strategic Doing. The least productive teams followed on average only two of the rules (Nilsen et. al., 2017).



Figure 3.11: Presentations of strategic action plans at Pathways. After competing their Strategic Doing workshop, each team presented their strategy in a two minute presentation.

Implications for Strategic Doing.— The Pathways program advanced Strategic Doing in a number of ways.

- First, it demonstrated that we could use a simulation game to introduce the basic concepts of Strategic Doing with experiential learning.
- Second, the Pathways program demonstrated that we could work with a large number of teams at the same time. In other words, we can scale the impact of Strategic Doing.
- Third, we innovated in the presentation of results within the Phoenix workshops. To reduce the amount of time each team had to report their strategy, we developed a strategy map. We gave representatives from each team two minutes to present the narrative of their strategy: where they were going and how they would get there.
- Fourth, we demonstrated we could use virtual check-ins to provide accountability and share learning.

3.16 Purdue: Revolutionizing Engineering Departments

Time Frame.— 2015-2018

Reference Materials.—Appendix C-16

Context. – Based on the Stanford VentureWell Pathways to Innovation initiative's success, a professor in Purdue's School of Engineering Education suggested that we prepare a proposal for a National Science Foundation's Revolution in Engineering Departments initiative. He recommended that we focus on the School of Mechanical Engineering.

Intervention. – I assisted in the preparation of a proposal to transform the School of Mechanical Engineering at Purdue. I became a co-principal investigator on the grant (Berger et al., 2018). The research team spent most of the first year gathering baseline date. We launched a series of initiatives in an effort to replicate the Pathways' success. We encouraged faculty to lead teams of staff, faulty and students to transform the student learning experience.

Outcome. – We received nearly \$2 million for a three-year initiative to transform the school. However, from the standpoint of developing Strategic Doing, the grant was mostly a failure. Aside from a few successful initiatives, such as an improved cooperative education program and a staff-directed initiative to reduce the social distance between students and professors, the grant did not lead to the transformation we proposed. The grant largely failed (Rodriguez-Mejia et al., 2020).

Implications for Strategic Doing.— I learned the following lessons from this grant:

- 1. All members of the intervention team need to be fully conversant with the discipline of Strategic Doing. These skills appear simple, but they are not easy to master. We were unable to get our research team to complete the Strategic Doing training. As a result, they misunderstood many of the skills needed to transform their conversations to make them more actionable. These misunderstandings are apparent in a late-stage summary of the project written by some members of the intervention team, all of whom declined the opportunity to go through Strategic Doing training (Rodriguez-Mejia et al., 2020). In contrast, we trained the Stanford/VentureWell team (Section 3.8.15.) in the Strategic Doing protocols. We then expanded the circle of training through playing a simulation game. Due to faculty resistance, we replicated none of these practices at Purdue.
- 2. In university settings, leadership provides critical support. Administrative leaders must send clear signals to the faculty in order to transform a university department. Beyond words, top level support must likely include incentives. The head of the school, although he was a co-principal investigator on the grant, played a passive role in the grant, a problem we never overcame. In contrast, the Stanford-VentureWell project directed the composition of teams to include top administrators committed to the process (Nilsen et al., 2015; Nilsen et al., 2016; Nilsen et al., 2017).
- 1. The theory of change needs to be simple; the path to small wins needs to be short. As Figure 3.13 illustrates, the theory of change underlying the Purdue project was unnecessarily complex. System level transformation takes place through the accumulation of small wins (Termeer & Dewulf, 2019). With this level of complexity, creating small wins to build momentum proved difficult.
- 2. In the university context, establishing psychological safety (Edmondson, 1999) is a subtle and difficult task. Psychological safety flattens the perceptions of hierarchies within a team and helps neutralize power imbalances (Edmondson, 2002). Our intervention team completely underestimated this obstacle. We thought initially that our network-based approach could overcome the school's power dynamics. (Berger et al., 2018). Our experience proved us wrong. These dynamics within the faculty undercut the initiative.

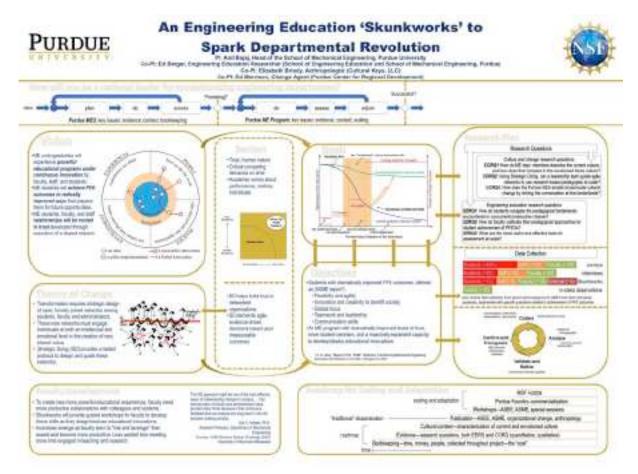


Figure 3.12: Purdue poster for Revolutionizing Engineering Departments. Unlike the Stanford project, we proposed a more complex transformation process at Purdue. The project foundered when not enough faculty and staff invested the time and effort to learn the necessary skills. In the Purdue project, our failure to budget payments for faculty and staff also undermined the project.

- 3. Faculty need incentives to participate in a transformation initiative. Generally, faculty are very busy. They showed little interest in learning new skills. The budget for the grant did not provide any incentives for faculty to participate. This lack of support created a problem. For example, one initiative focused on holding dinners, so that Mechanical Engineering faculty could meet and discuss classroom strategies with the leading teachers in Purdue's College of Liberal Arts. Purdue engineering faculty would not attend these dinners unless they were paid to do so.
- 4. Staff provided the most promising avenue to transformation. Our effort to transform the School of Mechanical Engineering focused on encouraging faculty to adopt innovations

in the way they teach (Berger et al., 2018). These efforts failed. Later in the grant process, we changed our focus to the learning experience of students outside the classroom. The staff proved far more open to learning new skills and experimenting with Strategic Doing. Ultimately, the path to transforming the learning experience within academic departments may run through stuff and students, as opposed to faculty.

3.17 National Aeronautic and Space Administration: Life Sciences

Time Frame.— 2017

Reference Materials.— Appendix C-17

Context. – Within NASA, a range of life scientists explores important scientific questions relating to spaceflight. Although these life scientists know each other, they operate within different disciplines, and they are located in NASA research centers nationwide. A manager within biological life sciences approached me to explore whether we could build collaborations across NASA's life sciences by using Strategic Doing.

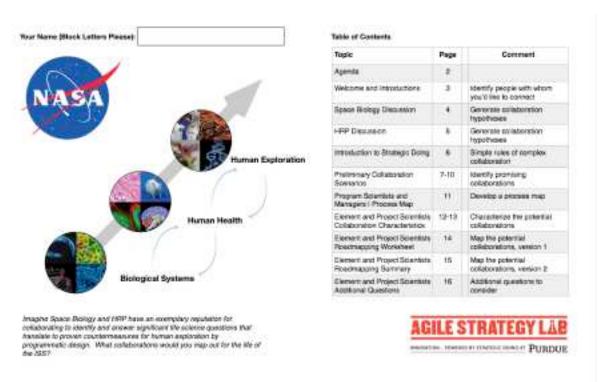


Figure 3.13: NASA Strategic Doing action pack. Each Strategic Doing workshop includes an actin pack of workshop exercises. These exercises walk participants through the stages of a strategic conversation. For the NASA project I developed a specialized set of exercises. The question framing the strategic conversation is located in the lower left.

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Intervention. – Working with a team from our lab and a small team at NASA, we designed a two day Strategic Doing workshop that was held at the Ames Research Center in California.

Outcome. – The scientists developed twenty collaboration opportunities, and they began implementing seven of these opportunities. One team began developing an "uber mouse", a genetically identical mouse model that could be used across all life sciences. The uber mouse would facilitate the sharing of data from different experiments using mouse models.

Implications for Strategic Doing.— This NASA engagement posed complexities that we had never confronted before. Identifying opportunities involved evaluating a wide range of complex factors, including budget burn rates, allocating scarce astronaut time to manage experiments aboard the International Space Station, and weight limits for these experiments. This experience demonstrated that we could adapt the rules of Strategic Doing to highly complex situations.

3.18 National Institute of Standards and Technology: R&D Commercialization

Time Frame.— 2016

Reference Materials.—Appendix C-18

Context.— Under the Obama administration, the National Institute for Standards and Technology conducted a program to accelerate the commercialization of research funded at universities by the federal government. Called the Lab-to-Market initiative, this effort brought together representatives from universities and government to explore how federal research dollars could generate more impact. As part of this initiative, NIST invited the Purdue Agile Strategy Lab to conduct two Strategic Doing workshops in Washington, DC.

Intervention.— I designed two six-hour workshops at the headquarters of the Association of Public and Land-grant Universities. At each workshop, we divided approximately 20 participants into three tables. These participants came from federal agencies, universities, and associations that promote University research. After a brief introduction of Strategic Doing, the workshop focused each table on generating new potential collaborations that could improve the productivity of federal research investments. I divided these impacts into three categories: legislative, administrative, and voluntary. At the end of the workshop, the participants chose

whether to continue with their initiative. However, since we designed this project as a demonstration, we did not expect the participants to implement their strategies.

Outcome.— Notably, one table did move forward. The Small Business Innovation Research program of the federal government is a major strategy that the federal government uses to incubate the formation of new companies based on federal research. The National Science Foundation anchors the SBIR program, and all federal agencies with a research budget participate. The program includes three phases. Successful companies moving through all three phases find private investment. However, the NSF had been exploring for a number of years the possibility of creating a Phase 0 to the SBIR program. One of the Strategic Doing sessions broke the administrative logiam and led directly to the launch of this SBIR Phase 0 program.

Implications for Strategic Doing.— Breaking the public policy challenge into three focus areas of legislative, administrative and voluntary opened the door to new ways of thinking about complex policy design. This use of focus areas is similar to the focus areas Ott and his co-authors saw used in entrepreneurial settings (Ott et al., 2017). However, since this initiative Lab-to-Market initiative launched at the end of the Obama administration, no momentum carried these ideas forward.



Figure 3.14: Phase 0 of SBIR. A Strategic Doing workshop with representatives from the national Science Foundation and universities in 2015 led to the development and launch of a Phase 0 initiative for the Small Business Innovation Research program.

3.19 Shoals Shift: Entrepreneurial Ecosystems

Time Frame.— 2014-2020

Context.— The University of North Alabama is a regional university with approximately

9,000 students. In 2014, representatives from the College of Business approached me to provide

Strategic Doing training to participants form the university and to civic leaders in the north

Alabama community.

Intervention.— We conducted two rounds of Strategic Doing practitioner training at the

University of North Alabama. We also trained three members of the faculty and staff to teach

Strategic Doing through the University. (A video summarizing the first training session appears

here.)

Outcome.— The University launched a start-up ecosystem initiative, called Shoals Shift.

This initiative won a national award, presented by the University Economic Development

Association. Shoals Shift also landed a 2019 Deshpande Rising Star award, an international

recognition. Over sixty faculty and staff at the UNA have completed the 2.5 day Strategic Doing

practitioner training.

Implications for Strategic Doing.— The University of North Alabama now serves as an

anchor for continued Strategic Doing curriculum development. The College of Business faculty

has integrated Strategic Doing into the Master of Business Administration and its new Executive

Doctor of Business Administration degree, launching in January 2021. The university now offers

a range of on-line Strategic Doing courses.

3.20 Kauffman Foundation: Entrepreneurial Ecosystems

Time Frame.— 2019-2020

Reference Materials.—Appendix C-20

Context. – The Kauffman Foundation, based in Kansas City, Missouri, is a significant

funder for entrepreneurial research and practice in the United States. Three years ago, the

foundation began a new initiative to develop a new professional discipline of ecosystem builders.

Each year, a convening of ecosystem builders takes place in Kansas City at the ESHIP Summit.

Two of Kaufman's professional staff came to Purdue to complete the 2.5-day Strategic Doing

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practitioner training. After this training, these program officers approached us to integrate Strategic Doing into their ecosystem development work.

Intervention. – We conducted to two day workshops in Kansas City for a core team of 10 to 12 ecosystem builders. This core team is focused on developing a national center for ecosystem development.

Outcome. – We continue our work with the Kaufman's core team. We are now exploring how we can offer Strategic Doing training nationally to the ecosystem builder community.

Implications for Strategic Doing.— Potentially, our engagement with Kaufman could continue by embedding Strategic Doing as an open-source operating system for ecosystem builders. Andy Stoll, leader of the Kaufman ecosystem team, wrote to us:

"I have spent the last 15 years of my career — including four years at the Kauffman Foundation — exploring and trying to better understand how we build more inclusive entrepreneurial ecosystems that can unlock local entrepreneurial talent in all people. The Strategic Doing methodology is so far the most clearly articulated ecosystem building process that I have found to date. The most important aspect it addresses is the need for complex collaboration across an entire community in order to increase entrepreneurial starts and successes. Ecosystem building cannot be done without many players in the system working together in new and collaborative ways. Ed and his team have spent more than a decade now developing a curriculum to teach that process and have refined it over the years to make it even more effective."

3.21 Summary

The research presented in this thesis follows a pragmatist paradigm. Pragmatism holds that understanding our experiences in the world can enable us to address the problems we confront. To do that, we must engage in a process of inquiry to generate meaning and understanding through experimentation. In the course of this inquiry, we generate knowledge, or what Dewey preferred to call "warranted assertions" (Dewey, 1941). To the pragmatist, knowledge is always open to revision, a state that philosophers prefer to call fallibilism. Although tentative, these warranted assertions can be useful tools, if they produce a desired outcome.

The general tenets of pragmatism meet the practicalities of scholarship with action research. Here, Schön and Argyris have been reliable guides. The discipline of reflective practice can reframe our experiences and give rise to new insights. Initially, these insights are largely tacit. That is, they are hard to express. Through continuous reflection, however, these insights can harden into explicit knowledge, a new theory of action. Schön and Argyris have articulated a process that accurately reflects how I developed Strategic Doing through action research projects stretching over twenty-five years. The projects I undertook all involved complex, wicked problems that follow the typology set forth by Alford and Head (2017). For the reader's convenience, the graphic introduced in Chapter 1 (Figure 1.2, page 8) is reprinted here. The action research presented in this thesis falls into these quadrants, although not always cleanly. The Alford-Head typology is helpful in isolating the dimensions of complexity. In an effort to advance Alford and Head's research, I have classified the action research presented in this chapter according to this typology. Four projects illustrate how Alford and Head's logic applies to this research.

Complex problem (Position 1).— Designing a technology roadmap for the deployment of condition-based maintenance across the Aegis destroyer fleet presented an exact problem with no clear solution (Section 3.8.14). Multiple parties had to come together, each with a piece of the puzzle. The primary Navy contractor clearly understood the fleet dynamics and the details of potential deployment of condition-based maintenance aboard a ship. However, this company did not have all the expertise needed to develop a technology roadmap. Outside companies

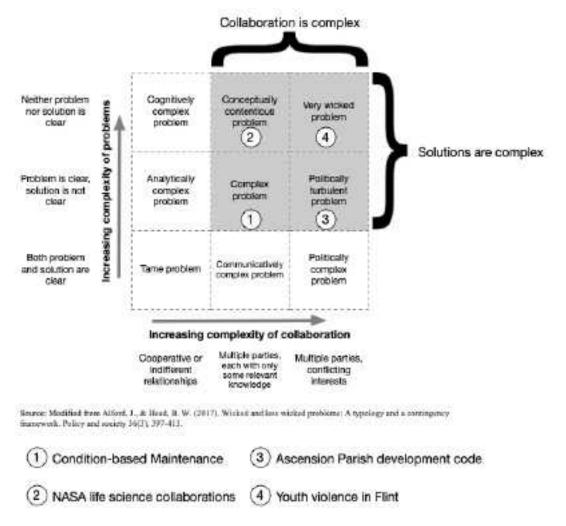


Figure 3.15: Classification of research by the Alford-Head typology. The action research projects that gave rise to Strategic Doing fall in to the four quadrants of wicked problems.

contributed their expertise in matching learning, artificial intelligence, user-interface design, augmented and virtual reality, fleet management, and sensors to complete the roadmap.

Conceptually contentious problem (Position 2).— Encouraged by NASA management, life scientists within NASA came together with no clear understanding of their workshops' outcomes (Section 3.8.17). Budget pressures from NASA management have been colliding with ambitious goals: sending man voyages to Mars. The mission's complexity suggested that life scientists should find new ways to collaborate, but no one was quite sure what that meant. Although these life scientists generally knew each other, they range across various disciplines from molecular

science to human physiology.

Politically turbulent problem (Position 3).— In Ascension Parish, Louisiana, development pressures in the late 1990s gave rise to a series of problems, including residential encroachment on potentially dangerous chemical plants (Section 3.8.3). Controlling both the level and pattern growth was the problem, but no one was sure how to enact a comprehensive development code in a politically conservative parish. Civic meetings were sometimes contentious, and the risk of political breakdown was constant.

Very wicked problem (Position 4).— On the surface, reducing teenage homicides in Flint might appear to be a politically turbulent problem (the problem is clear; the solution is not; multiple parties involved with conflicting interests). But this issue touches on far deeper challenges of systemic racism in Flint (Section 3.8.12). These systemic racism issues, the legacy in the city of segregation and discrimination, surfaced dramatically in the Flint water crisis (Mohai, 2018). The discipline of Strategic Doing emerged through a series of action research projects. This design followed a replication logic to yield new insights into both theory and practice (Eisenhardt, 1989; Yin, 2017; d'Ippolito et al., 2014). The projects align closely with the action research model outlined by (Zuber-Skerritt & Fletcher, 2007). The success of the Oklahoma City pilot indicated that a new approach to strategy was possible. Each of the subsequent projects contributed some dimension to the development of Strategic Doing. Table 3.4 below outlines how the action research projects presented in this thesis fall into the Alford-Head typology. The next chapter turns to a more detailed understanding of both the theory and practice of Strategic Doing.

Table 3.3: Action research projects classified by the Alford-Head typology.

	Complex Problem	Politically Turbulent Problem	Conceptually contentious problem	Very Wicked problem
Oklahoma City				х
Kentucky County Assessments		Х		
Ascension Development Code				х
Charleston Digital Corridor	х			

Table 3.3: Action research projects classified by the Alford-Head typology.

	Complex Problem	Politically Turbulent Problem	Conceptually contentious problem	Very Wicked problem
Purdue Center for Regional Development (development of Strategic Doing)			х	
Department of Labor (WIRED)		x		
Economic Development Institute	х			
Lowe Foundation	X			
Water Council		Х		
Brevard Space Coast				х
Medora			х	
Flint				х
Fraunhofer IAO	Х			
New Jersey Innovation Institute	х			
Stanford VentureWell			x	
Revolutionizing Engineering Departments				х
NASA Life Sciences			x	
NIST				х
Shoals Shift			х	
Kauffman Entrepreneurial Ecosystems				х

Chapter 4: Theory and Practice of Strategic Doing

4.1 Overview

This chapter presents the theory and practice of Strategic Doing, organized as follows. The next section formally presents the model as a series of four propositions. To orient the reader to the model, Section 4.3 explores the visual language I have developed to explain Strategic Doing. These visual representations vary depending on the audience, but the model's basic logic and structure, presented in Section 4.2, does not change. Section 4.4 offers each of the ten rules that provide the foundation for the model. For each rule, the section explores four characteristics:

- The statement of the rule
- Scholarly concepts implied by the rule
- The practice context or how practitioners deploy the rule in a Strategic Doing workshop
- Scholarly research that appears to align with the rule and explain why the rule works in practice

Finally, Section 4.5 provides a summary of the chapter.

4.2 Specifications of Strategic Doing

The Strategic Doing model can be described in a series of four interlocking propositions.

Proposition 1.— Defining a strategy: Potential solutions require a strategy that focuses our limited resources. A strategy answers two questions: Where are we going? How will we get there?

Commentary: Strategic Doing adopts a simple but powerful definition of strategy suggested by Brown and Eisenhardt (1998). Brown and Eisenhardt researched dynamic markets, and Eisenhardt is a leading scholar exploring dynamic capabilities from a complexity perspective (Brown & Eisenhardt, 1997; Eisenhardt, 1999; Eisenhardt & Martin, 2000; Eisenhardt & Sull, 2001; Ott & Eisenhardt, 2020).

Proposition 2.— Defining a strategic conversation: To answer these strategic questions, practitioners design and guide a "strategic conversation". Practitioners create the boundaries of the strategic conversation by drafting a framing question and setting rules of civility to establish psychological safety. A practitioner then guides the strategy conversation with four questions:

- What could we do? -- To explore opportunities from linking and leveraging available and previously hidden assets.
- What should we do? -- To identify a high priority opportunity and translate it into an outcome with measurable characteristics.
- What will we do? -- To design one or more projects to move toward the outcome and develop a short-term action plan with clear deliverables.
- What's our 30/30?-- To commit to a process of continuous learning and adjustment.

Commentary: As practitioners answer these four questions in a guided conversation, they generate all the content needed for a strategic action plan. The first two questions of a strategic conversation -- What could we do? What should we do? -- provide an outcome with measurable characteristics. The second two questions -- What will we do? What's our 30/30? -- create a starting pathway toward this outcome. This definition brings practical clarity to the role that strategic conversations play in developing strategy (Liedtka & Rosenblum, 1996). The definition also can sharpen the research into open strategy.

Proposition 3.— Simple rules for conducting a strategic conversation: To design and guide strategic conversations, practitioners follow ten simple rules. These rules guide the participants through the strategic conversation:

- Rule 1: Create and maintain a safe space for deep, focused conversation.
- Rule 2: Frame of conversation around an appreciative question.
- Rule 3: Uncover hidden assets that people are willing to share.
- Rule 4: Link and leverage these assets to create new opportunities.
- Rule 5: Rank all the opportunities to find a "Big Easy".
- Rule 6: Convert the "Big Easy" into an outcome with martial characteristics.
- Rule 7: Define at least one Pathfinder Project with guideposts to measure progress.
- Rule 8: Draft a short term action plan with everyone taking a small step.
- Rule 9: Set a 30/30 meeting to review progress and make adjustments. (The "30/30 meeting", explained below, represents a review meeting scheduled about 30 days from the workshop, in which participants review what they learned the past 30 days and what they will do the next 30 days.)
- Rule 10: Nudge, connect, and promote relentlessly to build new habits of collaboration.

Commentary: The simple rules walk practitioners through the protocol of designing and guiding a strategic conversation. At the end of the conversation, participants will have all the components they need to guide a new collaboration with a strategic action plan.

Proposition 4.— Skills needed to follow the simple rules: To implement these ten rules, practitioners acquire and practice a set of skills for each rule. These rules can be taught and practiced in different languages. The Strategic Doing model is both replicable and broadly scalable.

Commentary: Each rule requires one or more skills to be acquired and practiced by practitioners. These skills are now taught in 2.5 day master classes and on-line. Appendix B includes a sample of the training materials. These skills are also summarized in Strategic Doing: Ten Skills for Agile Leadership (Morrison et al., 2019). An excerpt of the book appears in Chapter 8. The complete book appears in Appendix A.

4.3 The visual language of Strategic Doing

Strategy in open networks is complex, and Strategic Doing gives rise to several different visual representations. Practitioners use these representations to explain the process to diverse audiences. Strategic Doing encourages systems thinking to promote learning (Senge, 2006; Richmond, 1993; Meadows, 2008). A simple, visual language helps practitioners understand and talk about strategy in networks. Pictures elevate the description of Strategic Doing beyond words. The graphics help people distinguish this approach from the conventional descriptions of strategic planning. Graphics are a critical support to this type of research (Frankel & DePace, 2012). The visualizations follow.

4.3.1 High level model

This high-level model provides an overview of the Strategic Doing strategy process. It explains how a group of disconnected individuals can generate a strategy and form a network to implement a strategic action plan. The Strategic Doing workshop lasts about three hours. At the end of the workshop, the participants have all the components they need to begin implementing a strategy that tests a new solution to their challenge.

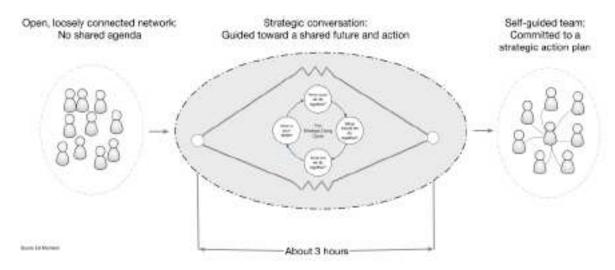


Figure 4.3.1: The high level model. In a three hour workshop a group of disconnected participants can engage in a strategic conversation to create a self-guided team with a strategic action plan.

Before the workshop, one or more practitioners design the workshop in conformance with Rule 1 (relating to psychological safety) and Rule 2 (relating to the Framing Question). The participants are invited to the workshop to explore solutions to the Framing Question. During the workshop, the participants are seated at round tables with between six to eight people at a table. A Table Guide, trained in Strategic Doing, serves as an informal instructor and guides the participants through a series of timed exercises involving Rules 3 to 10. During the workshop, each participant writes ideas in a Strategic Doing Action Pack. The pack contains activities and a brief explanation of each step (see Figure 4.4.2: Strategic Action Pack). The conversation involves both a divergent (design) phase and a convergent (experiment) phase. The pivot point comes when the participants in the conversation select one opportunity to focus (Rule 5). A Knowledge Keeper, also trained, typically sits next to the Table Guide. The Knowledge Keeper participates in the conversation and provides a record of the conversation by writing in the Action Pack. All participants are also encouraged to write in their Action Packs to keep a more comprehensive description of the knowledge generated during the conversation (Von Krogh et al., 2000). After the workshop, the Table Guide, working with the Knowledge Keeper, can distill the conversation into a strategic action plan. This process replicates the steps I learned to take from my Kentucky experiences (see Section 3.8.2, page 90).

4.3.2. Four question model

Practitioners use the Four question model to remind themselves to guide a conversation with four questions. Practitioners also use the drawing below to explain the connection between strategy and Strategic Doing.

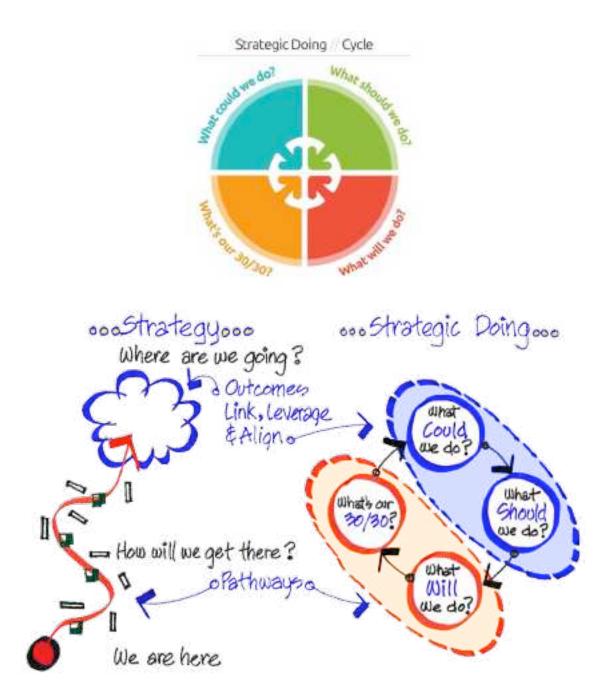


Figure 4.3.2: Four question model. To introduce a workshop, practitioners often make use of this visual. It explains the connection between strategy and Strategic Doing. Drawing by Kim Mitchell. Strategic Doing graphics by David Moss.

4.3.3. Four Questions and Ten Rules

Practitioners use various drawings to explain the connection between the two questions of strategy, the four questions of a strategic conversation, and the ten rules to design and guide a strategic conversation. Ordinarily, we use this drawing for training practitioners in the ten rules and how they fit together. During the workshop, participants will proceed through the rules as a series of timed exercises. Participants typically spend between ten and thirty minutes on each of the rules from Rules 3 through 10. Rules 1 and 2 govern the design of the workshop. A core team of practitioners follows these rules before the workshop begins. These first two rules (Rule 1 relating to psychological safety and Rule 2 relating to framing the strategic conversation) defines the boundary of the strategic conversation taking place in the workshop.

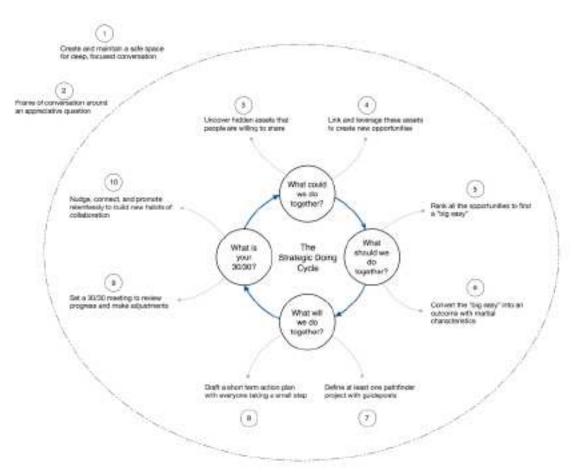
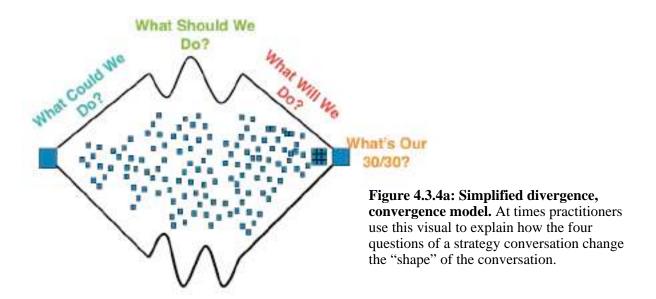


Figure 4.3.3: Four questions and ten rules. The ten rules provide a protocol to answering the four questions of a strategic conversation.

4.3.4. Divergence, convergence and the ten rules

Some practitioners are more comfortable with another approach to understanding the dynamics of the ten rules. The strategic conversation that takes place in a workshop has both a divergent phase and a convergent phase. Practitioners in the workshop spend their initial time uncovering assets that could generate a solution to their Framing Question (Rule 3). In linking these assets together in a process similar to recombinant innovation (Hargadon, 2003) or bricolage (Baker & Neson, 2005; Ott & Eisenhardt, 2020), they create new opportunities (Rule 4). They must then focus on a high probability opportunity. The Strategic Doing process calls this step finding a "Big Easy" or an opportunity that offers a relatively high payoff with a relatively low cost. From this point forward, the conversation enters a convergent phase. Practitioners focus on defining an outcome with measurable characteristics (Rule 6). Once they have determined an outcome, their focus shifts to a shorter time frame of 90 to 120 days, they define a Pathfinder Project that can test their emerging strategy's fundamental assumptions. They describe this project clearly with a handful of guideposts to measure their progress (Rule 7). Next, they shift their time frame even closer to the next 30 days and decide what action they can take to begin executing their project (Rule 8). Finally, they set a time in about 30 days to measure their progress (Rule 9), and they agree to nudge each other to build habits and grow their network (Rule 10). Participants complete these last two commitments after the workshop is over.



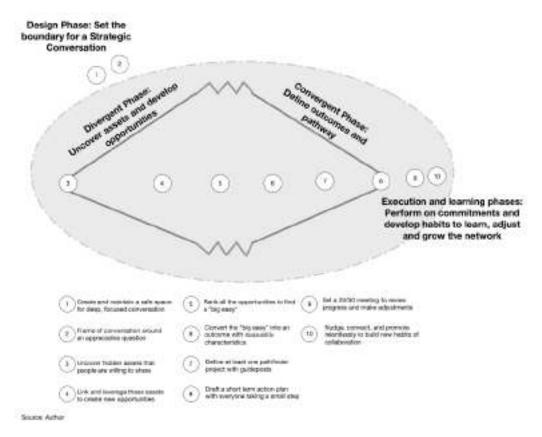


Figure 4.3.4b: Divergence, convergence and the ten rules. Some practitioners find it useful to visualize the ten rules as a divergent, then convergent conversation.



Figure 4.3.4c: Ten rules presented as a student poster. When moving Strategic Doing into a classroom, we found it helpful to create a poster for students.

4.3.5. The Strategic Doing iceberg model

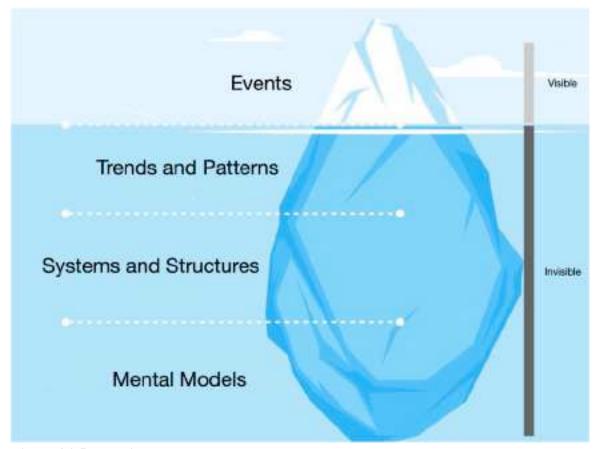


Figure 4.3.5a: The iceberg model. The iceberg model suggests four levels of thinking to understand complex socio-technical subsystems (Monat & Gannon, 2015; Blokland & Reniers, 2020).

The iceberg model is a standard system thinking tool to understand socio-technical systems (Monat & Gannon, 2015; Blokland & Reniers, 2020). The iceberg serves as a useful metaphor to clarify thinking (Lakoff & Johnson, 2008). The model promotes an understanding of how mental models can give rise to systemic structures, which, in turn, yield patterns of behavior or events that are visible. The iceberg model posits four levels of thinking. Each level explores a deeper understanding of the behavior of systems and the outcomes they produce. The four levels of thought include: 1) visible events or directly observable facts; 2) trends and patterns that emerge from these events; 3) the system structure that gives rise to these patterns by determining how interactions are structured; and 4) mental models that power the system structure. Mental models reflect the values, beliefs, and assumptions that explain why and how individuals behave



Figure 4.3.5b: The Strategic Doing iceberg model. The iceberg model may suggest a theory of change based on positive deviance. Participants in a Strategic Doing workshop may behave their way into new ways of thinking.

(Converse et al., 1993). When mental models are not aligned across an organization or network, collective understandings of complex issues are challenging to develop. Confusion and conflict disrupt communication, and the development of aligned actions becomes difficult, if not impossible (Blokland & Reniers, 2020).

The iceberg model may also help explain a theory of change potentially embedded in Strategic Doing. The Strategic Doing model aligns closely with a logic of social change called positive deviance. The concept emerged from child nutrition and public health in the 1970s. Practitioners identified the idea and then replicated it in several settings in the 1990s to improve child nutrition. In many communities of at-risk populations with malnourished children, a few individuals followed unusual and beneficial practices to achieve better outcomes (Zeitlin, 1991;

Marsh et al., 2004; Pascale et al., 2010).

An important insight has emerged from this work on positive deviance. Practitioners found that the process of behaving differently in front of peers is the most efficient way to introduce new ways of thinking into a community. This approach suggests that community members can act their way into new ways of thinking (Pascale et al., 2010). Research supporting positive deviance, primarily in organizations, is continuing to develop. At the same time, it has potentially useful lessons for organizations and for promoting more extensive social changes (Sternin & Choo, 2000; Mertens et al., 2016; Albanna & Heeks, 2019).

The iceberg model potentially demonstrates how positive deviance can explain the changes in behavior brought about by Strategic Doing. The model applies most directly to the following projects: Strategic Doing practitioners in Flint (Section 3.8.12, above), the most successful teams in the Pathways Project (Section 3.8.15; Nilsen et al., 2017); and the emergence of an entrepreneurial ecosystem in North Alabama (Section 3.8.19; Morrison et al., 2019). The logic of applying the iceberg model is as follows. In guiding participants through a strategic conversation with four questions (a clear pattern), governed by a structure (simple rules), Strategic Doing practitioners produce a clear strategy (an observable event) and introduce a new approach to thinking about collaboration and strategy (a shared mental model). Participants behave their way into new ways of thinking.

4.3.6 The strategy as process and practice model

Strategy-as-practice scholars have used a diagram first proposed by Whittington (2006) to explain how strategy-as-practice evolves. The logic of the diagram centers on three concepts: practitioners, praxis, and practices. Strategy practitioners are those who make, shape, and execute strategy. Praxis, derived from the Greek, refers to what practitioners do. Praxis includes all the deliberate actions that practitioners take as they develop and implement a strategy. Practices represent routines, operating procedures, and cultural norms that shape the strategy process. Applying insights from Argyris and Schön (1974) can help clarify Whittington's definition of practices.

Strategy practices include what Argyris and Schön would call theories-in-use, as well as espoused theories of action. Both implicit and explicit theories to which the practitioner gives allegiance guide strategy practices. A practitioner's espoused theory of action represents an explicit theory which she communicates to others. A practitioner's theory-in-use represents the practices that the practitioner follows or her praxis. A practitioner's theory-in-use governs the practitioner's action. Ideally, a practitioner's theory-in-use and espoused theory are aligned, but, as Argyris and Schön point out, that is not always the case. Researchers may need to construct a theory-in-use by observing a practitioner's behavior. From this perspective, this research clarifies strategy practice for open, loosely connected networks. It explains how my theory-in-use evolved into an explicit theory of action supported by research and scholarship.

Liedtka and Robinson (1996) inspired Strategic Doing. They proposed that strategy is created through a pattern of conversations. Understanding this insight, Strategic Doing practitioners

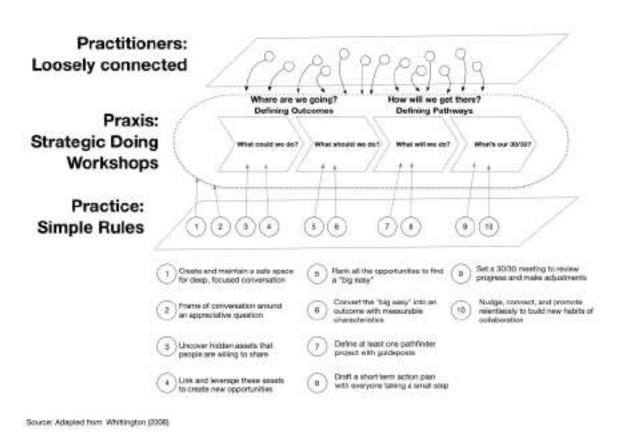


Figure 4.3.6: Strategic Doing as a process and practice model. Previously disconnected or only loosely connected practitioners, follow a practice of simple rules to produce a strategic action plan.

design and guide strategy conversations by following simple rules. They establish and maintain psychologically safe spaces for these strategic conversations (Rule 1). With a framing question, they pose an appreciative strategic question to engage participants in a deeper, generative conversation (Rule 2). Next, they uncover hidden knowledge resources embedded in the networks of the participants (Rule 3). They follow a process of recombinant innovation or bricolage to generate new opportunities by combining and recombining these resources. These opportunities represent potential solutions to the framing question (Rule 4). Strategy involves making decisions, and practitioners lead the conversation through a simple, transparent process to identify the most promising opportunities on which to focus (Rule 5). Next, they guide the conversation to deeper levels of specificity to generate a clear, measurable outcome (Rule 6). To design a pathway to this outcome, practitioners stimulate continuous experimentation through projects (Rule 7) and clear action plans (Rule 8). Double loop learning embedded in the process (Rule 9) promotes adjustments, as practitioners learn by doing. Nudging, connecting and promoting (Rule 10) build habits of collaboration and lead to the continued development of both the strategy and the networks to support it.

4.3.7 Mapping a Strategic Doing process

Practitioners have used several different types of drawings to map a Strategic Doing strategy process. Figure 4.3.7a outlines how strategic planning compares to Strategic Doing.

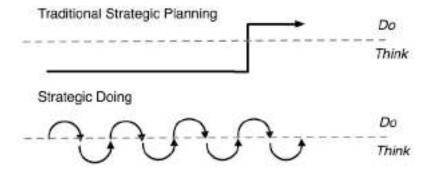


Figure 4.3.7a: Strategic planning compared to Strategic Doing. In contrast to the linear process of strategic planning, Strategic Doing relies on fast, iterative cycles of thinking and doing.

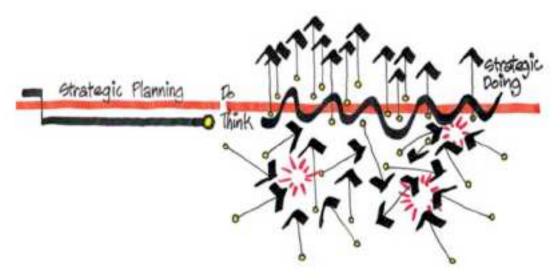


Figure 4.3.7b: Strategic Doing and alignment. This drawing helps participants to understand that strategic planning is a liner process, while Strategic Doing is an iterative process to achieve alignment, a key factor in strategic execution (Srivastava & Sushil, 2017).

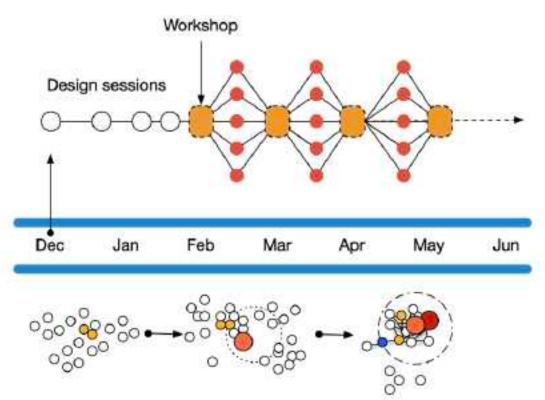


Figure 4.3.7c: Strategic Doing as a process. Strategic Doing is an interactive process typically composed as a series of workshops. Between workshops, participants complete action steps. The design is customized to each situation with design sessions. The design session include drafting the Framing Question (Rule 2) and defining other specifications of the process. This design is typically completed by the Strategic Doing practitioner in collaboration with a small core team.

Figure 4.3.7b. illustrates how Strategic Doing works to achieve alignment across different participants. Figure 4.3.7.c outlines a Strategic Doing process. Practitioners design the process around strategy workshops, a good vehicle for building trust (Pregmark & Berggren, 2020). These strategy workshops focus on conducting strategic conversations following the ten rules of Strategic Doing. At the conclusion of the workshop, practitioners disperse, each with a commitment to act prior to the next workshop. As the series of workshops unfold, the strategy emerges from these strategic conversations. The strategic action plan at the conclusion of the first workshop is often labeled version 1.0. The version after the second workshop is version 1.1, and so on. As the process proceeds, the networks become more coherent, focused and aligned.

4.3.8 Strategic Doing, managed networks and platforms

Large scale deployments of Strategic Doing require a managed network. Our Purdue team pioneered the development of a managed network in the \$15 million, three-year project to promote workforce innovation (Section 3.8.6). In designing this managed network, I followed the guidance of Malone (2004). A core team of six to eight people is the central feature feature of a managed network. The core team divides strategic activity into focus areas. Within each focus area, project teams develop collaborative projects with clear success metrics. Information is openly shared across the network. Each team sets different schedules for review. The core team prepares performance reports that are delivered to the sponsoring organizations. With this structure in place, the core team managed a strategy with four focus areas and over sixty projects.



Figure 4.3.8: Strategic Doing and managed networks. Large scale deployments of Strategic Doing can be managed through the development of managed networks.

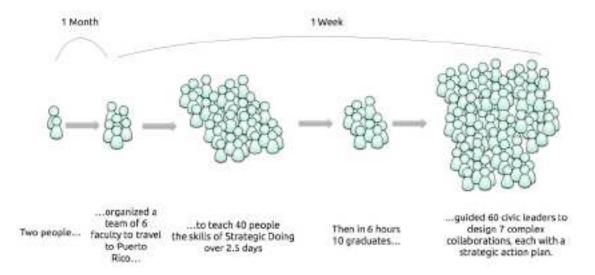


Figure 4.3.9: Strategic Doing and community diffusion. After hurricane Maria, a team from Purdue and the University of Puerto Rico trained 40 professionals in Strategic Doing. Some members of that class then guided a Strategic Doing workshop with civic leaders from across the island. This workshop led to the launch of seven collaborative projects. The diffusion of Strategic Doing through the University of Puerto Rico is continuing in 2021 under a grant from the Economic Development Administration, U.S. Department of Commerce.

4.3.9 Strategic Doing and community diffusion.

Introducing Strategic Doing to Puerto Rico in a partnership with the University of Puerto Rico gave rise to another process map. This map showed how a group of Strategic Doing practitioners received training in a 2.5 day master class. They then applied their training within days to convene a larger community-based workshop. This example illustrates how the discipline can diffuse rapidly through networks.

4.3.10 Strategic Doing, open innovation, platforms and ecosystems

In the series of workshops addressing a technology roadmap for condition-based maintenance (Section 3.8.16), I presented a process map similar to Figure 4.3.7b above. The collaboration emerges through a series of stages, similar to the "learning plateaus" described by Bingham and Eisenhardt (2011). This map emphasizes that strategy in open, loosely connected networks emerges over time. As members of the network develop trust, they become more willing to share their assets. This finding aligns with recent research on collective prospection,

discussed below (Sjåstad, 2019). This process map also explains the evolution of the entrepreneurial ecosystem in North Alabama (Morrison et al, 2019).

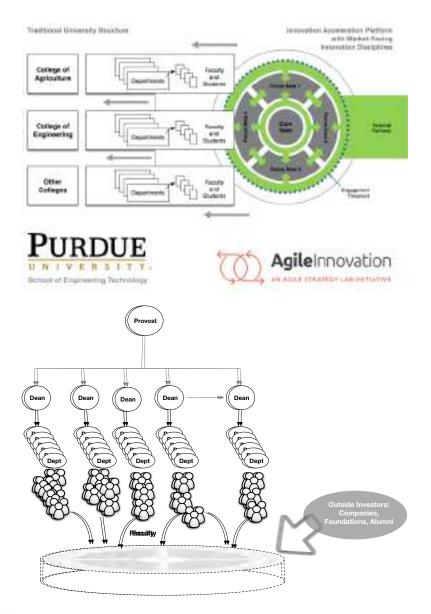


Figure 4.3.10a:

Figategic DringStrategic Doing and platforms within the university. Introducing Strategic production and platforms within the university. Introducing Strategic production of Strategic Doing and platforms within the introduction of Strategic Doing is less threatening to power structures inside the university.

How Innovation Ecosystems Form

Innovation occupations represent open networks that transform regional economies by accolerating innovation. They are vital to economic development, but there are challenges associated with their development. These issues include how to accolerate their formation, simplify complex strategic issues into measurable outcomes, align removed members, and translate ideas into action quickly. Strategic Duing addresses these challenges and helps achieve breakthrough results by generating 'link and investige' strategies for these chasters. Research universities — through their engagement mission — play a vital role in promoting invovation ecosystems.

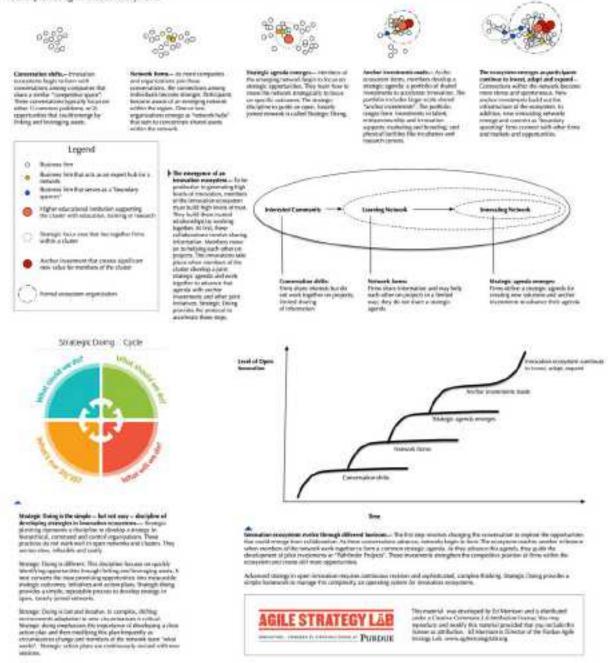


Figure 4.3.10b: Strategic Doing and ecosystems. Strategic Doing provides an operating system to design and guide the formation of ecosystems on platforms. The Shoals Shift project (Section 3.8.19 and Chapter 7 below) illustrates these models. The plateaus are similar to the learning plateaus Ott and his co-authors found in entrepreneurial settings (Ott et al., 2017).

Introducing network-based strategy within a hierarchical organization can set off defensive behaviors that limit learning and innovation (Argyris, 1993). This issue presents itself in university settings where cross disciplinary collaborations are often difficult to form. University administrative units are organized vertically, and most resources and incentives flow vertically through the university. This structure often frustrates efforts to develop cross disciplinary teams to address complex challenges (Boyer, 1990, Walshok, 1995). I developed both Figure 4.3.10a and 4.3.10b to introduce the concepts of platforms and ecosystems to Purdue.

4.4 Theory supporting the ten rules of Strategic Doing

This section explores the underlying structure of Strategic Doing by examining the ten rules that govern its theory and practice. Recall that the logic underlying Strategic Doing runs as follows:

- Participants in an open, loosely connected network need a strategy to focus their resources on solutions to wicked problems.
- To define this strategy they need to answer two questions: Where are we going? How will we get there?
- To answer these two questions, they need to conduct a strategic conversation. This conversation can be designed to answer four questions. What could we do? What should we do? What will we do? What's our 30/30? Answers to the first two questions provide an outcome. Answers to the second two questions provide a pathway.
- To design and guide a strategic conversation, practitioners need to follow ten simple rules. To follow these ten rules, they need to develop a set of corresponding skills.

As detailed in Chapter 3, the theory underlying Strategic Doing emerged from multiple case studies involving action research. Numerous cases can provide a firm foundation for building theory (Eisenhardt, 1989; Eisenhardt and Graebner, 2007; Yin, 2017). With this approach, each case serves as an experiment, similar to a laboratory experiment. (Eisenhardt and Grabner, 2007). The development of theory emerges from replication (Eisenhart, 1989). The theoretical foundation for Strategic Doing emerged from a recursive process that moved through case data, emerging theory, and the existing literature (Eisenhardt and Grabner, 2007; see Figure 1-4, page 18). With action research grounded in a pragmatist framework, Strategic Doing interventions followed an evolving theory of action (Argyris & Schön, 1974). The theoretical framework

represents a set of simple rules or heuristics that evolved through practice (Bingham & Eisenhardt, 2011). Bias is inherent in the process (Eisenhardt and Grabner, 2007; Yin, 2017). To guard against this risk, the testbeds at Purdue from 2005 to 2019 followed the same theory of action in widely varying contexts. The current state of the theory, as well as the practice context, is set forth below.

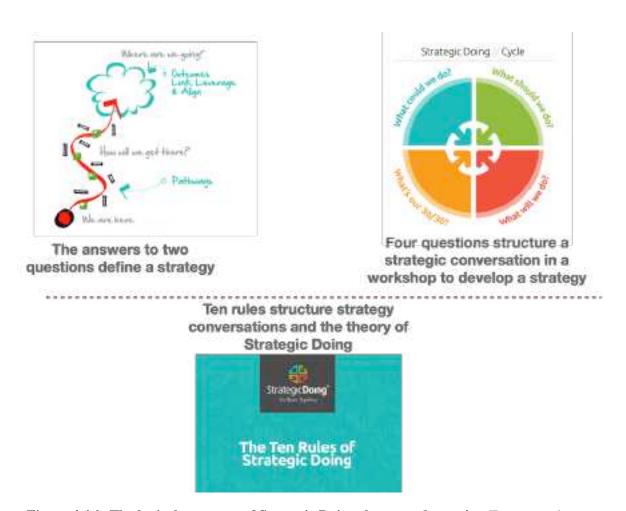


Figure 4.4.0: The logical structure of Strategic Doing theory and practice. To answer the two questions of strategy (Brown & Eisenhardt, 1998; Eisenhardt, 1999), practitioners guide a strategic conversations focused on answering four questions. To design and guide the strategic conversation, practitioners follow ten rules and develop ten corresponding skills. The ten rules provide the theoretical foundation for Strategic Doing. They explain how a complex strategy can emerge from these conversations.

The discussion of each rule includes the following components:

- A statement the rule;
- Scholarly concepts implied by the rule;
- The practice context within which the rule is applied,
- Scholarly research aligned with the rule.

The last component deserves an explanation. Bridging the world between mainstream academia and strategy practitioners can be tricky (Schön, 1995; Langley, 2015; Drnevich et al., 2020). One of the obligations of a practitioner/researcher involves consulting scholarly literature to explore why a particular practice or theory of action appears to be effective in producing desired results (Argyris, 1993). Strategic Doing implies a wide range of scholarly theories across several disciplines. Validating the connection of these existing theories to the Strategic Doing theory of action falls outside this research scope. I leave this work to others. The section on 'scholarly research implied by the rule" serves two purposes. First, these sections indicate that Strategic Doing draws strength from a wide range of scholarly theories and concomitant empirical research. Second, these sections suggest future directions for research.

4.4.1. Rule 1: Create the space

Statement of the Rule.— Create and maintain a safe space for deep, focused conversation. **Scholarly concepts implied by the rule.**— The following scholarly concepts are implied by the rule:

- psychological safety,
- engagement,
- cognitive diversity,
- extreme teaming,
- experimentation,
- equity of voice, and
- ba.

Practice context for the rule.— The practice of Strategic Doing takes place most often in the context of strategy workshops. A common feature of strategy praxis, workshops provide the opportunity for more in-depth, more focused conversations (Hodgkinson et al., 2006; Pregmark & Berggren, 2020). A core team of practitioners of between two and six people designs and guides a Strategic Doing workshop in most situations. Typically, the participants attending a

workshop have never worked together before on a complex project. Often participants come from many different organizations, a situation Edmondson and Harvey (2017) refer to as "extreme teaming" and explored in more detail below. Even when participants are part of the same organization, they may not have worked closely together. In these situations, pre-existing trust relationships are often absent, and barriers, such as hidden agendas or intimidation, disrupt meaningful conversations (Von Krogh et al., 2000). Status and power differences among participants are also often prevalent (Van Quaquebeke & Felps, 2018). The challenge for practitioners involves creating a space where more in-depth conversations and more complex, shared thinking can occur (Edmondson, 1999; Edmondson & Harvey, 2017).

Scholarly research aligned with the rule.— Within teams, psychological safety refers to a situation in which team members believe that their interactions are safe for interpersonal risktaking (Edmondson, 1999). A climate of psychological safety describes an environment in which people feel safe to speak up without being rejected, criticized, or seen as ignorant. In their review of the literature, Edmondson and Lei (2014) underscore a research pattern supporting the finding that psychological safety enables team performance. Psychological safety accelerates innovation, learning, and creativity within teams (Edmondson, 1999; Baer & Frese, 2003; Kark & Carmeli, 2009; Edmondson & Lei, 2014). Further, psychological safety promotes experimentation, a fundamental practice in Strategic Doing (Lee et al., 2004; Edmondson & Lei, 2014). Finally, psychological safety may be a critically important dimension for promoting productivity among cognitively diverse teams (Reynolds & Lewis, 2017). Research has shown that cognitively diverse groups can address complex challenges more productively (Page, 2008; Robertson & Schoonman, 2013; Reynolds & Lewis, 2017). In the absence of psychological safety, individuals are likely to avoid the risks of disapproval and withdraw from the interpersonal engagement. This problem can be acute when there exists power differentials within the team and an implicit threat of evaluation. This dynamic appeared, for example, in the effort to conduct strategy workshops within a university, where hierarchical mindsets dominate the culture (Briody et al., 2019; see Section 3.8.16. Purdue: Revolutionizing Engineering Departments).

Initially viewed as an individual concept, Edmondson (1999) extended the psychological safety construct to teams, while Baer and Frese (2004) extended it to organizations. The idea has

become increasingly important in recent years because of the growing pressure within organizations to accelerate learning and innovation. It will be an essential dimension of cross-disciplinary or cross-boundary teams engaged in addressing wicked challenges, a process that Edmondson and Harvey (2017) call "extreme teaming". In the case of Strategic Doing,

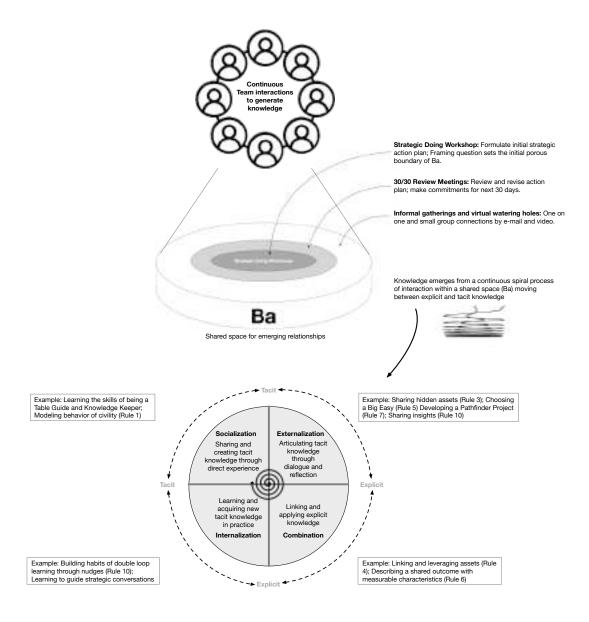


Figure 4.4.1: Components of ba. The concept of ba appears to provide a useful concept to explain how participants generate knowledge in the Strategic Doing process, a variant of "extreme teaming". Ba is anchored to the concept of psychological safety. (Sources: Edmondson & Harvey, 2017; Nonaka & Konno, 1998; Nonaka & Toyama, 2002, 2003; Nonaka et al., 2000, Nonaka, et al., 2001).

practitioners apply psychological safety to the design and management of strategy workshops. Creating this environment is critical so that participants feel comfortable asking a question, providing a critique, proposing a new idea, or sharing their resources. The concept of "equity of voice" is implicated in this rule. Scholars have found that equity of voice leads to more productive and engaged teams. Equity of voice may also diminish the power differentials within a group (Keil et al., 2015; Richardson Garcia, 2019; Rodriguez et al., 2020).

Psychological safety is closely related to a more nuanced concept of "ba" (Nonaka & Konno, 1998; Nonaka et al., 2000; Nonaka et al., 2001). Drawn from Japanese management practices, ba refers to the context in which knowledge is created, a "shared space for emerging relationships" (Nonaka & Konno, 1998: 40). As a concept, ba integrates physical space (a location), virtual space (the internet), and mental space (mental models). Ba is a space of shared emotions in which people gather, communicate, discuss, collaborate, and share everyday experiences (Komatsu & Sukuki, 2017). Edmondson and Harvey (2017) introduce the concept of "extreme teaming" to explain how interdisciplinary teams of experts can come together to address wicked challenges. Extreme teaming builds on Edmondson's earlier work on teaming (2012). In that work, she suggests that practitioners focus on teaming's underlying processes — that successful teams follow. Extending this analysis, Edmondson and Harvey define extreme teaming as effective teaming in situations in which participants innovate by crossing organizational, disciplinary, and functional boundaries. They suggest that ba provides a useful concept to explain how these extreme teams become active participants in knowledge creation (Edmondson & Harvey, 2017: 18).

Extreme teaming leverage is the opportunity for active boundary-crossing dialogue and inquiry that allow people to adjust and reframe their own knowledge, to examine their own perceptions in a different light, and reflect on experience to generate ideas and produce innovation.

A review of the model of knowledge creation first proposed by Nonaka and Takeuchi (1995) helps to clarify the concept of ba. Nonaka and his co-authors have visualized the creation of knowledge as a spiral process of interactions between tacit and explicit knowledge. These insights are summarized in their SECI model of knowledge creation, presented in Figure 4.4.1. above. Participants in knowledge creation share tacit knowledge through a socialization process.

They convert implicit knowledge to explicit knowledge through externalization. They reconfigure explicit knowledge through combination, and they convert explicit knowledge to implicit knowledge through internalizations. These processes occur within a shared space or platform ba (Nonaka & Konno, 1998; Nonaka et al., 2000; Nonaka & Toyama, 2003). Four specific interactions in the SECI model provide valuable insights into the dynamics of Strategic Doing. Nonaka's SECI model has become a well-known approach to understanding how organizations generate knowledge (Farnese et al., 2019). While Figure 4.4.1 provides an overview of the SECI model, it is worth time to explore these phases in more depth. This exploration offers insights into the intersection of ba and Strategic Doing. These insights focus on how more in-depth conversations, designed by following a set of heuristics or rules, can generate new knowledge. The SECI model and ba provide a helpful explanation of how this process takes place.

Socialization.-- Individuals interact and transfer implicit knowledge between themselves. This process requires close physical proximity. Modeling behavior is a common form of socialization. In the practitioner training for Strategic Doing, we talk about the importance of thinking differently, behaving differently, and doing our work together differently. The socialization process in Strategic Doing takes place inside the workshop. In Strategic Doing, the role of Table Guide, an informal instructor, is designed to model the behavior needed to participate in deep, focused strategic conversations (Rule 1). Table Guides learn their skills from both practice and observing other Table Guides. The nudging, promoting, and connecting behaviors outlined in Rule 10 represent further socialization that takes place mainly outside the workshop. This socialization process is similar to the change process described by advocates of positive deviance (Zeitlin, 1991; Marsh et al., 2004; Pascale et al., 2010). People learn to behave their way into new ways of thinking. Section 4.3.5 above explores this issue.

Externalization.-- The conversion of tacit knowledge to explicit knowledge involves articulating tacit knowledge clearly and consistently. When participants share their assets in a Strategic Doing workshop (Rule 3), they are typically taking tacit knowledge and making it explicit and more usable. Knowledge assets are mostly hidden from view (Itami & Roehl, 1987). Participants are also engaged in externalization, as they share their intuition about where to start

their strategy (Rule 5); visualize a shared outcome with enough specificity to make the outcome measurable (Rule 6); make explicit commitments of what they can do (Rule 8), and; share what they have learned from their experience (Rule 9).



Figure 4.4.2: Strategic Doing Action Pack. A Strategic Doing workshop follows a protocol defined by a series of exercises. These exercises, assembled in an ActionPack step through a strategic conversation. As participants complete the ActionPack, they are generating both knowledge and the components of a strategy. A Knowledge Keeper takes responsibility fro compiling the master pack for the table. All participants are encouraged to write in their pack in order to capture as much knowledge as possible, generated by the conversation.

Combination.-- The conversion and reconfiguration of explicit knowledge into new explicit knowledge is a process of combination. When practitioners encourage participants to link and leverage their assets to define new opportunities (Rule 4), they follow a process of combination. The Framing Question (Rule 3) provides the context in which this process of knowledge creation

takes place. Testing hypotheses generated by combination takes place outside the workshop through Pathfinder Projects (Rule 7)

Internalization.-- The conversion of explicit knowledge into implicit knowledge occurs when individuals understand and incorporate explicit knowledge into their praxis. When Strategic Doing practitioners develop their skills of guiding a strategic conversation, they are typically taking the explicit knowledge they learned in classes and internalizing this knowledge. The process of nudging (Rule 10) helps to accelerate this process.

In sum, both the extensive literature on psychological safety and the literature on knowledge creation, especially the theory of dynamic knowledge creation within ba, presented by Nonaka and his colleagues, appears to explain why Rule 1 works to advance strategy in open networks.

4.4.2. Rule 2: Frame the conversation

Statement of the Rule.— Frame of conversation around an appreciative question.

Key concepts implied by the rule.— The following scholarly concepts are implied by the rule:

- framing,
- appreciative inquiry,
- prospection, and
- generative dialogue.

Practice context for the rule.— Developing and implementing a strategy remains a challenging enterprise with uncertain prospects (Mintzberg, 1994b; Cândido & Santos, 2015). Within a strategy workshop, the practitioner must design an experience that promotes engagement among the participants. It is no simple task. Engagement is a complex phenomenon with cognitive, emotional, and behavioral dimensions (Johnston, 2018). Also, practitioners should design the workshop experience so that participants can work together to generate solutions to their wicked challenges while at the same time building trust (Pregmark & Berggren, 2020). Progress on developing these solutions must take place within the time constraints of the workshop. Based on my experience, these time limits focus the conversation and serve as design constraints to stimulate creativity (Caniëls & Rietzschel, 2015). A Strategic Doing workshop experience should also lead to implementation, what scholars often refer to as "strategic

execution" (Srivastava & Sushil, 2016). Finally, to develop effective learning and practical heuristics to address complex challenges, the workshop experience should introduce a process of continued experimentation (Bingham et al., 2019). For the practitioner, the threshold question involves how to frame the strategic conversations to engage participants in the workshop.

Scholarly research aligned with the rule.— Wicked challenges arise in an environment with complex and ambiguous information flows with various parties involved (Rittel & Webber, 1973). Making strategic decisions in these bewildering environments is not a trivial problem. To make sense of these situations, practitioners employ knowledge structures or frames to transform complex information environments into more tractable ones. According to Walsh (1995: 281), frames are "mental templates that individuals impose on an environment to give it form." The framing construct has stimulated both diverse and deep research streams (Cornelissen & Werner, 2014). Framing is a central challenge for leadership in meeting adaptive challenges. As Heifetz and Laurie point out (1999:127), "A leader provides direction by identifying the organization's adaptive challenge and framing the key questions and issues." Reframing can move conflicts into a more in-depth conversation so that participants move past superficial interactions and potentially polarizing positions. This reframing process can shift perceptions of a wicked problem from intractable to actionable (Schön & Rein, 1994; Reinecke & Ansari, 2016). By posing a framing question, Strategic Doing practitioners actively shape the "strategic playing field" on which they can design and test solutions. This practice follows the example of what superior strategists do in complex, shifting environments (Eisenhardt & Bingham, 2017).

Besides, asking open-ended questions, followed by respectful listening is a powerful leadership skill (Schein, 2013; Gregersen, 2018). Van Quaquebeke and Felps (2018) refer to this practice as "respectful inquiry." Framing these open-ended questions, combined with respectful listening, represents another set of communication skills. These skills shape both the meaning of a conversation and the motivation of participants. Framing questions provide a way to introduce new ways of thinking or to extend current thinking further. Frames offer a shortcut to understanding complex information (Schön & Rein, 1994; Fairhurst, 2005; Fairhurst & Sarr, 1996). Scholars have found that framing represents a practical communication skill for shaping strategic issues coherently (Kaplan, 2008; Mukherjee et al., 2020), and it is a teachable skill

(Fairhurst, 2005). In complex environments, using a framing question to provide coherence is likely to be far more important than providing a vision of an uncertain future (Lissack & Roos, 2001). Recently, scholars are turning their attention to how strategic coherence develops as a socially constructed process or, in other words, how it emerges from a conversation. As Lusiani and Langley (2019) point out, however, few studies examine in detail how conversations and related actions create shared meaning around strategy.

Scholars in organizational development in the emerging field of dialogic organizational development provide valuable guidance. (Bushe & Marschak, 2014, 2015). Bushe and Storche (2015) explore "dialogic process design," focusing on generative questions. Drawing on Bushe (2007), they recommend characteristics of generative questions that my Purdue team integrated into the design of Framing Questions. Generative questions are surprising. They touch on personally meaningful issues, and they invite us to look at reality a little differently. Insights from the development of Appreciative Inquiry amplify these insights. Appreciative Inquiry is a model and protocol for large group interventions to stimulate transformational change in organizations. Interventions focus on creating a safe space for people to express and explore their values, shared meanings, and accomplishments by focusing on positive, asset-based conversations (Cooperrider & Whitney, 2001; Stavros et al., 2015; Wall et al., 2017).

For strategy scholars, these lines of research provide helpful guidance in framing effective strategic conversations. Generative questions trigger generative conversations (Bushe, 2007). Through their interactions in generative conversations, participants create multiple dimensions of an experience. They discover new meaning, share knowledge, generate new knowledge, and create coherence. Beyond that, they accelerate shared learning and address their differences productively. (Von Krogh et al., 2000; Shaw, 2003; Gergen et al., 2004; Gunnlaugson, 2006; Bushe, 2007; Hirvnon, 2019). This logic lines up well with organizations' resource-based view, which suggests that transformational strategies emerge from dynamically rearranging and realigning resources (Rugman & Verbeke, 2002). Researchers have found that combining appreciative inquiry with action research leads to more collaborative ways of working together (Ludema et al., 2005; Sharp et al., 2018). Researchers have also found that Appreciative Inquiry principles are flexible. Practitioners can adapt them to different situations (Wall et al., 2017).

Strategic Doing applies these principles in developing a framing question to create both boundaries for a strategic conversation and focus on a strategy workshop. Finally, Rule 2 finds support in the rapidly emerging research stream on prospection, the human ability to simulate the future (Gilbert & Wilson, 2007). Evidence accumulates that prospection is a driving force in human action (Seligman et al., 2013; Seligman et al., 2016). By pointing to the future, the Framing Question invites participants in a Strategic Doing workshop to explore a shared future through collective prospection (Seligman et al., 2016). Recent research also suggests that the process of collective prospection — designing a future together — appears to encourage participants to share their assets, an essential step in knowledge creation (Sjastad, 2019). Prospection is explored more fully in the discussion on Rule 6 (relating to defining an outcome with measurable characteristics, Section 4.4.6, below).

4.4.3. Rule 3: Uncover hidden assets

Statement of the Rule.— Uncover hidden assets that people are willing to share.

Key concepts implied by the rule.— The following scholarly concepts are implied by the rule:

- resource-based view.
- knowledge assets,
- knowledge sharing, and
- equity of voice.

Practice context for the rule.— A Strategic Doing workshop starts with Rule 3. Usually, a core team of practitioners reviews both the rules of behavior that govern the workshop (Rule 1) and the Framing Question (Rule 2). If participants are unfamiliar with the process of Strategic Doing, the practitioner may also provide a brief overview of the strategy process. Workshop participants are seated at round tables with between six and eight people at each table. A Table Guide convenes the table. The Table Guide guides the strategy conversation through the exercises in the workshop. In addition to the Table Guide, each table has a Knowledge Keeper. During the workshop, the Knowledge Keeper captures the knowledge generated by participants at the table by writing in a Strategic Doing Action Pack (see Figure 4.4.2 and Appendix B).

The Table Guide distributes workshop exercises that will walk participants through the

remaining rules of Strategic Doing. The Table Guide times each workshop exercise. Approximately 70% of the workshop is devoted to Rule 3, 4, 5, and 6. These rules lead the participants to a measurable outcome. The remaining rules create a pathway to that outcome. Rule 3 starts the workshop exercises. The Table Guide asks each participant to share at least one asset that might help the team develop a solution to the framing question. The Table Guide introduces the concept of assets with some examples. Typically, we define these assets in practical terms as physical assets (access to physical facilities), social network assets (access to other people through social networks), skill assets, or capital assets. As participants reveal them, these assets become the resources for developing a strategy to address the Framing Question. In the abstract, all of these assets are knowledge assets, in that they represent knowledge that participants are sharing bout how to access "actionable" assets. In this context, an actionable



Figure 4.4.3. Strategic Doing Trail Map. A Trail Map provides Table Guides and Knowledge Keepers quick reference guide to the process. Practitioners certified by the Strategic Doing Institute can access on-line training for Table Guides and Knowledge Keepers. This step in important in large scale deployments of Strategic Doing. Liz Nilsen at the Purdue Agile Strategy Lab, developed this innovation.

asset lies in the mind of the participants. We teach Table Guides to question each asset: Is it an asset, stated with sufficient specificity, that the participants could use to develop a solution to the brain question? So, for example, "I have contacts at the university that might be helpful" is not as actionable an asset as "I know the dean of the engineering school who can put us in touch with researchers focused on our problem." One of the tasks of the Table Guide involves guiding the conversation around assets to a level of specificity that people can begin to imagine how they might recombine these assets to develop innovative opportunities with Rule 4.

Scholarly research aligned with the rule.—
Scholars of the resource-based view of the firm see resources as the main determinant of

an organization's performance, the driving force of value creation and competitive advantage. However, they offer different approaches to categorize these resources. Barney (1991) starts with an expansive approach as assets, capabilities, organizational processes and knowledge controlled by a firm. He then goes on to categorize resources as physical capital resources, human capital resources, or organizational capital resources. These resources are "strategic assets" if they are simultaneously valuable, rare, and hard to imitate, and difficult to substitute.

Michalisin and his co-authors (1997) explore the notion of strategic assets in more detail. They point out that most strategic assets are intangible, such as organizational culture, employee know-how, and social relationships. Even physical assets, such as technology, patents, or equipment, can be thought of as intangible resources since the firm can deploy the resource, not the physical form of the resource, representing the strategic asset (Amit & Shoemaker, 1993). A key feature of strategic assets is that they are intangible or, as Itami & Roehl (1987) point out, hidden. Uncovering these hidden assets becomes critical to revitalizing the corporation. Consultants often focus on finding these hidden assets as an early step in defining new opportunities (Schädler & Oschlies, 2012). Uncovering assets is also an important starting point for a long-standing community development model: Asset-based Community Development (Kretzmann & McKnight, 1996; Mathie & Cunningham, 2003).

In Strategic Doing, practitioners focus on uncovering the hidden assets of the participants at the table. These assets are hidden in that they are embedded in the participants' networks and unknown to the other participants. The assets represent tacit knowledge that the Table Guide encourages participants to make explicit by writing down and sharing with others at the table. In the context of Strategic Doing, I define tacit knowledge by following Leonard and Sensiper (1998:113). Tacit knowledge is "information that is relevant, actionable, and based at least partially on experience." In Nonaka's SECI model of knowledge creation, tacit knowledge plays a vital role in knowledge creation. Tacit knowledge is shared through a socialization process and becomes explicit through externalization (Nonaka & Toyama, 2002).

Uncovering hidden assets in the Strategic Doing process touches on another stream of research: knowledge sharing. Scholars see this step as the most difficult challenge of knowledge management. Knowledge sharing behaviors are embedded in a complex web of interactions

defined by structures, relations, and cognitions (Akhavan & Mahdi Hosseini, 2015). Developing and implementing an open strategy process is a social process (Hautz, 2019). Strategic Doing encourages knowledge sharing with practical steps that scholars have found will likely promote knowledge sharing behaviors. First, by establishing clear rules to promote psychological safety, Strategic Doing, practitioners create an atmosphere for learning (Edmondson, 1999). Psychological safety is critical to Strategic Doing because, in most cases, participants are coming from different organizations, the "extreme teaming" described by Edmondson & Harvey (2017). Workshop participants often do not have "relational resources" on which to draw in these situations (Gardner et al., 2012).

Second, the protocols of Strategic Doing, including establishing psychological safety, can create a stable pattern of reliable communication within the team, a critical factor in promoting knowledge-sharing behaviors (Siemsen et al., 2009; Edmondson & Harvey, 2017, 2018). Third, designing the workshop around a Framing Question provides a clear context and purpose to the workshop. Positioning the workshop in terms of a greater common good may also increase knowledge-sharing behaviors (Akhavan et al., 2015). However, the scholarly research on knowledge sharing -- and the opposite "knowledge hiding" (Connelly et al., 2019) -- are not well-developed, and there is a need for further research (Edmondson & Lei, 2014; Newman et al., 2017). For example, as previously mentioned, recent research suggests that as a group of participants works to envision a shared future, they may be more willing to share their assets to achieve that future (Sja°stad, 2019).

4.4.4. Rule 4: Link and leverage assets

Statement of the Rule.—Link and leverage these assets to create new opportunities.

Key concepts implied by the rule.— The following scholarly concepts are implied by the rule:

- recombinant innovation,
- improvisation, and
- bricolage.

Practice context for the rule.— Identifying hidden assets (resources) is a necessary first step in generating innovative solutions. However, existing resources can become even more

valuable if participants convert them into potential opportunities. In the literature on the resource-based view of the firm, this capability is generally called integration. (Gardner et al., 2012). In Strategic Doing, we refer to integrating resources as "linking and leveraging assets." As teams focus on Rule 4 of Strategic Doing, they begin to combine their assets to create new opportunities to address the Framing Question. In a Strategic Doing workshop held in Milwaukee in July 2008, Paul Jones, CEO of A.O. Smith Corporation, and Rich Meusen, CEO of Badger Meter, sat at the same table. A.O. Smith produces water heaters and has an extensive hot water testing lab. Badger Meter makes water meters and has a comprehensive cold water testing lab. By combining both labs' spare capacity, Jones and Meusen created Milwaukee's first incubator for freshwater technology companies (see Section 3.8.9, Milwaukee Water Council).

At this stage in the workshop, participants improvise and explore possibilities by building off each other's assets. They will take one asset as a focal point and explore how they can connect other assets to this major asset. As they connect these assets, a new idea, an opportunity to create shared value, forms in a process reminiscent of abduction. After a few minutes, they will select another asset as a focal point and repeat the process. In this way, they generate multiple diverse opportunities.

Scholarly research aligned with the rule.— Rule 4 finds support in research streams exploring the value of combining or recombining assets. This practice goes to the heart of entrepreneurship. As Galunic and Rodan (1998) explain, entrepreneurs recognize the underlying parts of a diverse system. They explore how to recombine components of this system in novel ways to create new value. Galunic and Rodan go on to quote Schumpeter (1934: 65), "To produce means to combine materials and forces within our reach...To produce other things by a different method means to combine these materials and forces differently." Sarasvathy refers to this entrepreneurial logic as effectuation (Sarasvathy, 2008, 2009; Sarasvathy & Ramesh, 2019).

Recombination also stands at the center of theories and practices surrounding economic growth (Galunic & Rodan, 1998; Weitzman, 1998), innovation (Hargadon & Sutton, 1993; Hargadon, 2003; König et al., 2011; Davis & Eisenhardt, 2011), and technology development (Kogut & Zander, 1992; Arthur, 2009; Kalthaus, 2020). In the context of business strategy, the practice of combining assets appears in a growing research stream exploring the co-creation of

"shared value" through interaction and dialogue. (Porter & Kramer, 2011). Payne and his coauthors point out (2008: 88), "The blurring of industry borders and convergence of different
types of industry represent opportunities to combine competencies, capabilities, and knowledge,
and initiate new ways of co-creating value." As Schumpeter suggests, recombination opens the
door to new solutions. This process often relies on networks, similar to the networks that emerge
through a Strategic Doing process. Grant (1996) explains that knowledge assets are frequently
tacit and difficult to value. As a result, networks are potentially an efficient way to combine,
recombine, and integrate knowledge to create new value, especially in uncertain environments

The practice of recombining assets finds support in two related concepts: bricolage and improvisation. Bricolage, a term first introduced by anthropologist Levi-Strauss, represents a process of meeting present challenges by making do with existing resources (Baker et al., 2003). Baker and Nelson (2005) tie this practice back to Penrose's resource-based view by exploring how entrepreneurs create something out of nothing in resource-constrained environments. Their entrepreneurial bricolage model explains how two firms with identical resources can generate different types of value only by how they configure these resources. Bricolage provided an early focus of exploration by strategy-as-practice researchers (Jarzabkowski, 2004). Eisenhardt and Bingham (2017) have found that bricolage explains how entrepreneurial firms reinforce an emerging opportunity logic. Research on how new cuisines form in France suggests that bricolage helps participants overcome constraints on their thinking by developing new knowledge (Rao et al., 2005). Other researchers also see bricolage as a process for generating new knowledge (Boxenbaum & Rouleau, 2011).

Bricolage is a form of improvisation. Improvisation lacks a rigorous definition, and scholars have defined the term in different ways. In its theatrical form, improvisation involves getting on stage without preparation or planning (Vera & Crossan, 2005). Weick (1998) suggests that improvisation is a mindset that falls along a spectrum. Organizational scholars have explored how improvisation stimulates innovation and creativity and can lead to broader organizational development (Crossan, 1998; Vera & Crossan, 2004, 2005). Strategy scholars find that improvisation provides a useful explanation for how entrepreneurial firms find new opportunities in complex and uncertain environments (Bingham, 2009; Eisenhardt & Bingham, 2017; Ott et

al., 2017).

4.4.5. Rule 5: Find a "Big Easy"

Statement of the Rule.— Rank all the opportunities to find a "Big Easy".

Key concepts implied by the rule.— The following scholarly concepts are implied by the rule:

- paradoxical thinking,
- strategic intuition,
- cognitive diversity, and
- organizational justice.

Practice context for the rule.— In this rule, participants make a decision on which of their opportunities they should focus. criteria are particularly helpful: impact and ease of implementation. With the first criteria, participants evaluate the impact of the opportunity on addressing the framing question. Typically, to assess this dimension, the Table Guide will focus the participants' attention on a time frame of two to three years in the future: if this opportunity is successful, how significant an impact will this opportunity likely have in generating a solution to the Framing Question? The second criterion is ease of implementation. In exploring this criterion, the Table Guide focuses the conversation on the next six months. Among all the opportunities, how easy will it be to generate some success over the next six months?

To balance these two criteria, the Table

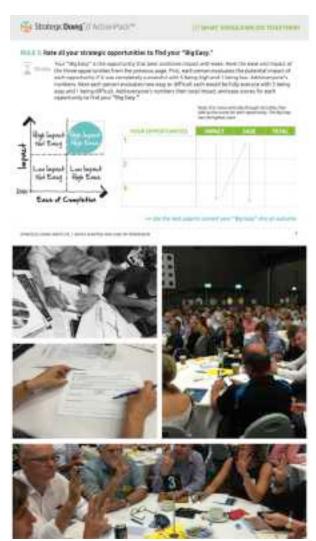


Figure 4.5.1: Finger voting in a Strategic Doing workshop. In practice, participants use finger voting to score each opportunity. The practice happens at each table and is recorded by a Knowledge Keeper. This Strategic Doing workshop took place at the University of the Sunshine Coast in 2015.

Guide introduces a 2 x 2 matrix. The participants evaluate at least three opportunities using this matrix. The participants list the opportunities in the first column. They record their scores on impact in the second column and their scores on ease of implementation in the third column. The participants score each opportunity on a scale of 1 to 5. Impact scores range from one (low) to five (high). Ease of implementation scores range from one (low) to five (high).

Typically, the Table Guide will ask each participant to complete the 2x2 matrix. The guide will then compile the scores for each cell in the matrix using finger voting. With this method, participants reveal their scores in each cell by holding up their fingers simultaneously. This approach assures transparency in the process. If the Table Guide sees that the scores diverge significantly in one cell, she will typically pause and suggest a more in-depth conversation to learn more about the divergence. For example, assume assessing Opportunity One's impact, Participant A votes 1, and participant D votes 5. The two participants are looking at the same opportunity differently. After a brief discussion, the Table Guide will ask the participants if they would like to change their votes. Once the participants complete the cells, the Table Guide compiles the scores for each opportunity. The opportunity with the largest score is the Big Easy and directs the participants where to focus. If the total scores are close, the Table Guide might open a brief conversation to explore the closely scored opportunities. The Table Guide looks for a consensus among participants on where to focus. In this situation, a consensus represents an agreement by the participants to move forward.

Scholarly research aligned with the rule.— This rule finds support in four divergent research streams: paradoxical thinking, cognitive diversity, strategic intuition, and organizational justice. At its core, Rule 5 addresses the challenge of paradoxical thinking. Contradictions frequently appear in the design and execution of a strategy (Smith & Tushman, 2005; Smith & Lewis, 2011). So, for example, an automobile company wants to achieve both high quality and low cost. Or, in the case of developing a strategy following the Strategic Doing protocols, a team wants to focus on an opportunity that is both likely to have a relatively large impact and relatively easy to do. A 2x2 matrix is a common strategy tool to explore these paradoxes (Lowey & Hood, 2011). Not everyone sees these paradoxes in the same light. This cognitive diversity represents a strength when teams are confronting complex challenges. (Page, 2008; Mello &

Rentsch, 2015). Table Guides explore cognitive diversity within the team when they identify significant differences in ranking each opportunity under Rule 5. As Strategic Doing practitioners grow in their sophistication, they can also rely on AEM-Cube, a practical, research-based tool to assemble cognitively diverse teams frequently used in conjunction with Strategic Doing (Reynolds & Lewis, 2017; Robertson & Schoonman, 2013).

Not all strategic thinking can be rational. As team members determine their scores for each opportunity, they combine both analytical and intuitive thinking (Khatri and Ng, 2000; Dane & Pratt, 2007; Duggan, 2007; Calabretta et al., 2017). As a process of decision-making, intuition is a subconscious, complex, quick synthesis of disparate experiences that fit best in unstable environments (Khatri and Ng, 2000). Intuition applies not just to individuals but also teams. However, the research on intuition in teams is both nascent and fragmented (Samba et al., 2019).

Finally, organizational justice represents a stream of research supporting this rule. Table Guides encourage participants to reveal their scores at the same time. The reasons are practical. Despite efforts to flatten power relationships through Rule 1, these power relationships can easily persist in the workshop. Finger voting provides a visual cue that every person's vote is equally weighted. Treating every vote the same promotes procedural justice, a component of organizational justice or fairness (Greenburg, 1990; Cropanzana et al., 2007). The transparency of the finger voting process and the simple logic of the process provides transparency in decision-making, which, in turn, likely promotes trust across the team (Abrams et al., 2003). Also, if team members feel that the decision-making process is fair, they are likely to be encouraged to share more knowledge (Akram et al., 2017).

4.4.6. Rule 6: Define a clear outcome

Statement of the Rule.— Convert the "Big Easy" into an outcome with measurable characteristics.

Key concept implied by the rule.— The following scholarly concepts are implied by the rule:

- · shared mental models, and
- prospection.

Practice context for the rule.— Once they have chosen a Big Easy opportunity, the participants in a Strategic Doing workshop focus on a more in-depth conversation about their outcome. This step involves taking the Big Easy and converting it to an outcome with measurable characteristics. To do that, participants begin visualizing the future and describing it in a way that they can communicate some quantifiable features. The Table Guide's role is to move the conversation to a level of detail so that participants share their visualizations in a meaningful way. As the conversation shifts from person to person, participants begin to integrate these visualizations. They focus on the most important characteristics of success. The Table Guide moves the conversation forward to establish at least three measurable characteristics. At the end of the step, everyone will have a clearer understanding of what success will look like, an essential step to achieving alignment, a vital strategic execution dimension (Srivastava & Sushil, 2017). This effort to draft success metrics also creates a shared mental model among the conversation participants. Scholars have found that strengthening shared mental models is an essential dimension to team effectiveness (Mathieu et al., 2000; Van den Bossche et al., 2011).

Scholarly research aligned with the rule.— By focusing on a shared outcome's characteristics, a Strategic Doing conversation following Rule 6 creates a shared mental model across the team. A seminal paper by two economists, Denzau and North (1994), points to the importance of this step in developing a strategy in open loosely connected networks. Under conditions of uncertainty, people make decisions on their actions based on their beliefs. These beliefs depart from the perfect rationality that most economists assume. Beliefs can form from myths, dogmas, ideologies, and even half baked theories, all embedded in our experiences. Within teams, however, mental models need not be so haphazard. Denzau and North suggest that shared mental models arise from peer-based conversations (Denzau & North, 1994). These mental models are knowledge structures that humans use to make sense of the world, make inferences based on available information, and make predictions. Our brains combine incoming information with stored information to build these internal models of the external world (Gilbert & Wilson, 2007).

One fundamental presumption of Strategic Doing is that practitioners can shape these mental models by designing and guiding strategic conversations. Practitioners can conduct these conversations both to share knowledge and to shape performance expectations. Behavioral research has shown that teams are more effective when shared mental models guide performance (Mathieu et al., 2000; Scheutz et al., 2017; Shugart et al., 2020, Roy & Denzau, 2020). Shared mental models are essential in turbulent environments. Unpredictable environments create uncertainty about the team's tasks and the nature of each individual's work. Shared mental models simplify communications among members of the team. When uncertainty arises, the team's shared mental models can quickly create expectations that keep a strategy on track (Converse et al., 1993, Mathieu et al., 2000, Gardner et al., 2012).

Shared mental models are also critically important when participants in a team are not from the same organization, a common situation in which we deploy Strategic Doing. In these situations, no hierarchies are in place to guide governance. Instead, strategies must emerge from loosely joined networks. Edmondson and Harvey (2017) capture this situation with their term, "extreme teaming." In extreme teaming, participants cross boundaries to innovate. These edges include different types: disciplinary, organizational, or industry. Edmondson and Harvey view the development of shared mental models as a critical step to a team's effectiveness with extreme teaming.

In addition to research on shared mental models, Rule 6 finds support in an emerging research stream on prospection. Unlike other species, humans can simulate the future, a process that scholars call prospection. Like how we use retrospection to recall past experiences, prospection refers to our ability to "pre-experience" the future by simulating it in an abbreviated form (Gilbert and Wilson, 2007). A growing body of research suggests that prospection drives our actions (Seligman et al., 2013; Seligman et al., 2016). Osman (2014) argues our ability to construct representations of the future and adapt to the future depends on our ability to learn, set goals, generate expectations, and draft action plans. Baumeister, Vohs, and Oettingen (2016) suggest a focus on "pragmatic prospection," which they define as thinking about the future in ways that will have practical utility and guide action. With some intriguing research, Sjåstad (2019) finds that collective prospection appears to trigger knowledge sharing or what he terms

"reputation-based generosity." In completing Rule 6, practitioners invite workshop participants to share their thinking about a shared future. This rule implies a conversation of collective prospection.

4.4.7. Rule 7: Design a Pathfinder Project

Statement of the Rule.— Define at least one Pathfinder Project with guideposts.

Key concepts implied by the rule.— The following scholarly concepts are implied by the rule:

- shared mental models,
- experimentation,
- learning by doing,
- inner work life,
- the progress principle, and
- transition management.

Practice context for the rule.— Having defined an outcome with measurable characteristics, participants in the workshop have developed a provisional answer to the first question of a strategy: where are we going? The Table Guide then directs workshop participants to focus on the strategy's second question: how will we get there? This process starts by defining a Pathfinder Project with three or four guideposts to measure progress. A good Pathfinder Project is an experiment that takes approximately 3 to 6 months to complete. It tests some critical hypotheses of the emerging strategy. Pathfinder Projects typically consist of prototypes, pilot projects, proofs of concepts, white papers, or forums designed to test ideas and broaden engagement. The guideposts help the team manage the risks of the project by keeping track of their progress.

Scholarly research aligned with the rule.— Four research streams provide a foundation for Rule 7: shared mental models; experimentation and learning by doing; inner work life and the progress principle; and transition management. First, Stout and her co-authors found that teams form more effective shared mental models with more detailed planning (Stout et al., 1999). Pathfinder Projects, combined with Rule 8 (relating to action plans) and Rule 9 (relating to 30/30 meetings), moves the strategy conversation into a phase of more detailed planning. By moving thinking about the future into shared actions that the participants can take together, the

conversation becomes more practical and less abstract. This step appears to strengthen shared mental models across the team.

Second, Pathfinder Projects designed under Rule 7 represent experiments to test hypotheses and stimulate a team's learning culture. Scholars have established that experimentation and learning by doing are critical to adaptation in complex environments (Sterman, 1994; Nicholls-Nixon, 2000; Edmondson, 2008, 2011; Liedtka, 2016; Eisenhardt & Bingham, 2017). Pathfinder Projects can take a variety of forms. Scholars have explored rigorously designed experiments (Thomke, 1998, 2003), "low fidelity prototyping" (Gerber, 2009), and "learning launches" (Liedtke & Hess, 2009), to name a few.

Third, by introducing the concept of inner work life and the "progress principle," Amabile and Kramer (2011a, 2011b) have demonstrated that making progress on a complex challenge creates a powerful positive motivation. Pathfinder Projects create teams' opportunity to generate small wins, defined as concrete, implemented outcomes of moderate importance (Weick, 1984: 43). When they achieve a little success, following Amabile and Kramer, Strategic Doing practitioners see momentum build. Small wins follow a central idea of transition management, discussed briefly below and in more detail under Section 4.4.10.

Finally, scholars have also demonstrated that smaller, experimental projects are critical to addressing complex challenges. This line of research has multiple roots. Years ago, Weick argued that achieving small wins represents a viable strategy for addressing complex challenges (Weick, 1984). Lindblom suggested that incremental changes can indeed make transformational change in complex environments (Lindblom, 1979). Vermaak (2013) indicated that small changes are pragmatically the only way to address transformational change. In the Netherlands, scholars have promoted transition management, which combines complexity theory with organizational leadership. This approach to wicked challenges focuses on transforming complex systems by accumulating small wins (Van den Bosch, 2010; Vermaak, 2013; Termeer et al., 2015; Termeer & Dewulf, 2019, Koch-Ørvad et al., 2019).

4.4.8. Rule 8: Draft an action plan

Statement of the Rule.— Draft a short term action plan with everyone taking a small step.

Key concepts implied by the rule.— The following scholarly concepts are implied by the rule:

- shared mental models,
- psychological empowerment,
- swift trust,
- commitment trust theory, and
- foot-in-the-door technique.

Practice context for the rule.— To move into action, the team drafts an action plan with each team member taking a small step forward over the next thirty days. Each team member makes an explicit, verbal commitment to complete at least one action with a tangible product or artifact delivered back to the team. This action plan is written down and shared.

Scholarly research aligned with the rule.— As outlined in the discussion on Rule 7, research on shared mental models supports this rule (Stout et al., 1999; see also discussion shared mental models in Section 4.4.6, relating to measurable outcomes). Research on psychological empowerment, a concept that emerged from psychology and management literature, also supports this rule (Conger & Kanungo, 1988). As the concept has evolved, scholars have defined psychological empowerment as intrinsic motivation characterized by people feeling more in control of their work. These feelings motivate them to take action and gain a sense of mastery over the issues that concern them. (Conger & Kanungo, 1988; Zimmerman, 1995; Spreitzer, 2008; Maynard et al., 2012). Psychological empowerment is a concept that applies to multiple levels: individuals, teams, and organizations (Maynard et al., 2012). More recently, scholars have extended this research in directions that appear to support Rule 8 further. Scholars have shown connections between psychological empowerment and shared leadership (Grille et al., 2015). In another promising direction, Malik and his co-authors (2020) draw on psychological empowerment literature to explain the connection between agile practices, psychological empowerment, and performance within teams. They found that some agile management practices promote psychological empowerment. Specifically, the team's ability to design how they function and how they communicate are the principal sources of psychological empowerment. They also found that psychological empowerment is the explanatory mechanism for the innovative behavior of agile teams.

Aside from impacts on individuals on a team, Rule 8 also implies impacts across the team. Under Rule 8, practitioners solicit specific, transparent commitments to act. These commitments



Figure 4.5.8: Cleaning North Carolina's coast. Using Strategic Doing, more than 40 stakeholders representing local and state governments, environmental groups and other non-profit organizations developed a strategic action plan to manage marine debris such as consumer trash, storm debris and lost, abandoned and derelict fishing gear and vessels littering the coast. Allen (2019).

may help build trust across an emerging team. Trust has a significant impact on the coordination and harmony (Rampersad et al., 2009). Scholars have explored concepts of trust extensively (Mayer et al., 1995). Relationship marketing scholars have developed commitment trust theory to explain how trust arises (Morgan & Hunt, 1994). A further concept, swift trust, has been deployed by scholars to explain how trust emerges from temporary teams. Scholars define swift trust as "the willingness to rely upon team members to perform their formal and informal roles in a hastily formed temporary team" (Zolin, 2006: 4). Sharing information throughout the Strategic Doing process, starting with Rule 3 (uncover hidden assets), may help form swift trust (Dubey et al., 2019). Both commitment trust theory and

swift trust may explain how Strategic Doing teams display behaviors that presuppose trust without a history of interaction and trust development (Zolin, 2006; Hyllengren et al., 2011; Dubey et al., 2019).

Interestingly, however, my work understanding the effectiveness of this rule began in an entirely different place: a paper written over fifty years ago, Compliance Without Pressure: The Foot-in-the-Door Technique (Feedman & Fraser, 1966). In two creative experiments, Freedman and Fraser demonstrated that if someone has agreed to a small request initially, she is more likely to comply with a larger request later. This finding aligns with our experience. In conducting

Strategic Doing workshops, we learned to ask initially for minimal commitments of time to start. These small commitments tend to lead to more extensive commitments of time and resources later. The foot-in-the-door technique may be the way to launch the communities of commitment that Kofman and Senge (1993) see at the core of a learning organization or network.

4.4.9. Rule 9: Set a 30/30

Statement of the Rule.— Set a 30/30 meeting to review progress and make adjustments.

Key concepts implied by the rule.— The following scholarly concepts are implied by the rule:

- double loop learning, and
- collective mind.

Practice context or the rule.— In designing a strategy process, practitioners set a "30/30 meeting" to assess learning and adjust the strategy. The meeting's name derives from my original work in Oklahoma City, where we set 30/30 meetings (see Section 3.8.1, page 87). The agenda for the meeting was simple: What did we learn in the last 30 days? What will we do in the next 30 days?

In teaching Strategic Doing, we provide practitioners with a template for their 30/30 meetings. The agenda includes the following questions:

- What have we learned over the last 30 days while performing our action items?
- Did anything that was to have been done not get done? If "yes", how will it get done?
- Does our proposed course forward still make sense? Do we need to make any course corrections to our Pathfinder Project?
- What will each of us do over the next 30 days? Who will do what by when and what is the deliverable?
- When, how and where will we get together next time?

Practitioners can design these meetings at any appropriate interval. So, Strategic Doing teams follow 7/7's; 14/14's, 90/90's or 120/120's.

Scholarly research aligned with the rule.—This rule promotes reflective practice and returns to the work of Argyris and Schön (Argyris, 1977; Argyris & Schön, 1974; Schön, 1983). In the context of Strategic Doing, reflective practice involves reflection-in-action (a method of practicing strategy) and reflection-on-action (a way of thinking and learning about strategy

practice). In Schön's terms, the practitioner engages in reflection-in-action to respond to "situations of uncertainty, instability, uniqueness and value conflict" (Schön, 1983: 50). To resolve this uncertainty, the practitioner experiments in real-time, formulates a hypothesis, evaluates the results, makes adjustments, and, if necessary, reframes the challenge.

Reflective practice is demanding. The practitioner plays different roles. An experienced practitioner becomes comfortable in these roles and develops the ability to shift quickly between them. On the one hand, the practitioner is a change agent, an active part of an ongoing change process. On the other hand, effective practitioners develop "a view from the balcony." This more distant perspective enables the practitioner to analyze the system and recognize emerging patterns of possibilities. McEwan (2016) suggests that this form of reflective learning is critical to strategy practitioners' development. New strategy practitioners develop their strategic management skills from real practice episodes, rather than formal education through business schools. I designed the 30/30 meeting to accelerate reflective learning and skill development.

This learning process takes place not only on the individual level but also, as Edmondson (2002) has pointed out, within teams. Psychological safety outlined in Rule 1 supports teambased learning (Carmeli & Gittell, 2009; Carmeli et al., 2009). Team learning takes place through interactions and continuous cycles of reflection and action. Embracing a pragmatist view, Edmondson sees reflection as critical to generating knowledge and understanding to guide action toward better, more satisfactory outcomes. These shared reflections can serve as an antidote for bias and errors within the team (Schippers et al., 2014). In subsequent research, Edmondson and her co-authors suggest that through discussion, teams can share their diverse experiences and develop an integrated learning perspective (Edmondson et al., 2007), or, from another perspective, a shared mental model of their learning.

By structuring the 30/30 meeting around questions, practitioners provoke reflection and discussion, key components to promote fast learning for innovating teams (Edmondson, 2012, 2016; Edmondson & Harvey, 2017). These questions guide the process of what Argyris (1977) calls "double loop learning." Single loop learning simply focuses on the actions taken and the outcomes generated to detect errors. Double-loop learning explores the activities themselves to see if they are appropriate to the situation. This reflection leads to a deeper questioning of the

hypotheses and assumptions underlying a current path of action. Through reframing provoked by this more in-depth reflection, participants learn to see in new ways. Single and double-loop learning leads to different types of questions.

Assume a team engages in a collaborative initiative, and the outcomes are less than what the team expected. A single loop learning review would explore these types of questions: "In view of the outcomes we see, did we follow the protocols to which we agreed? Did we do what we said we would do?" A double-loop learning review would explore more profound questions such as, "In view of the outcomes we see, do we need to redesign our initiative? Are the hypotheses and assumptions we have made correct? Based on what we've learned, what adjustments in our initiative should we make? Should we abandon what we are doing and try something else?" The questions outlined in the 30/30 review touch on both single-loop learning ("Did anything that was to have been done not get done?") and double-loop learning ("What have we learned over the last 30 days while performing our action items? Does our proposed course forward still make sense?").

4.4.10. Rule 10: Nudge, connect, promote

Statement of the Rule.— Nudge, connect, and promote relentlessly to build new habits of collaboration.

Key concepts implied by the rule.— The following scholarly concepts are implied by the rule:

- nudging,
- transition management, and
- propelling mechanism.

Practice context for the rule.— The workshop concludes with a commitment from each team member to nudge each other, connect to additional outside resources, and promote the team's strategy to recruit additional outside resources.

Scholarly research aligned with the rule.— On the individual level, this rule finds support in the growing literature on nudging. The practice of nudging, popularized in a book by Thaler and Sunstein (2009), is grounded in behavioral economics. The theory presents practitioners with simple, tangible tools (Ly et al., 2013). The theory suggests that interventions should "nudge"

individuals toward choices that they would have made if they were not subject to "bounded rationality" (Battaglio et al., 2019). Strategic Doing practitioners are promoting new habits of working together. At the close of a workshop, practitioners explain the purpose of nudging, a step that improves the effectiveness of the practice (Gold et al., 2020). The shared practice of nudging can stimulate these new habits. In addition, research summarized by Eppler and Kernbach (2021) shows that effective nudging leads to more productive meetings.

At the team level, Rule 10 finds support in emerging research on transition management. As introduced in Rule 7 (Pathfinder Projects), transition management emerged from research and practice primarily conducted in the Netherlands to address environmental policy (Rotmans et al., 2007). Transitions represent fundamental changes in multiple systems: economic, social, technological, cultural, political (Rotmans et al., 2001). The transition from steam power to electricity early in the industrial revolution provides an example of such a change. The challenge of moving from fossil to renewable fuels represents another transition, as does a shift from long term care hospitals to community-based wellness programs. Originally designed as a guide for public policy, transition management has applications across various complex systems, including complex processes of change in an organizational or business context (Rotmans, 2005). Traditional command-and-control management mindsets fail to handle shifting complexity (Weick, 1996). Strategic Doing provides one path to more network-based approaches to developing solutions to complex challenges (Nilsen et al., 2016).

Transition management helps explain how Strategic Doing develops these pathways. Wicked problems elude complete solutions, but we can steer the underlying systems that produce these challenges in a more desirable direction (Rotmans, 2005). In complex environments, small experiments help define pathways to new solutions (Sterman, 1994; Nicholls-Nixon, 2000; Edmondson, 2008, 2011; Liedtka, 2016; Eisenhardt & Bingham, 2017; Thomke 1998, 2003; Liedtke & Hess, 2009). These small experiments generate progress toward a larger outcome, and, as they do, they stimulate more engagement (Amabile & Kramer, 2011a, 2011b). Transition management provides a framework for managing these experiments so that they accumulate to larger-scale change (Termeer & Dewulf, 2019; Termeer & Metz, 2019). The transition management framework suggests that successful experiments can broaden and scale through

different non-linear propelling mechanisms (Termeer & Metz, 2019). Examples of propelling mechanisms include encouraging others to imitate the success of a small win (the "bandwagon effect"), promoting this success with positive narratives ("energizing"), and attracting new financial and human resources ("logic of attraction"). Connecting and promoting actions outlined in Rule 10 can trigger these propelling mechanisms (Van den Bosch, 2010; Termeer & Metz, 2019). In the context of the Purdue workforce initiative, we embedded the idea of a propelling mechanism inside the investment fund we designed (Section 3.8.6: U.S. Department of Labor: Workforce Innovation). We asked each applicant to the fund to present their argument on why their proposed initiative was replicable, scalable, and sustainable. These three criteria enabled us to identify proposals that were more likely to grow over time.

4.5 Summary

This chapter describes the journey from the swampy lowlands of professional practice to the high hard ground of academic scholarship. Over the years, as I traveled the academy's corridors, I found a broad array of insightful theories and empirical research. In addition to Argyris and Schön, three scholars stand out. Kathleen Eisenhardt has guided a valuable stream of research to translate the concept of "dynamic capabilities" into practical terms. By integrating her work with complexity theory, she has not only embraced the complexity I encountered as a practitioner. She validated the practices, the heuristics or simple rules, needed to manage this complexity. Amy Edmondson has led a similar, valuable research stream in team-based learning, what she calls teaming or extreme teaming (Edmondson, 2012; Edmondson & Harvey, 2017). Her understanding of how teams form and innovate again mirrors my experience developing innovating teams quickly in open, loosely connected networks. Teams are the smallest unit of meaningful transformation within networks, and Edmondson has illuminated the dynamics of how they form and operate.

Finally, Jeanne Liedtka pointed me to another insight. Strategy in networks is far more nuanced, subtle, and creative than most business schools teach and or most practitioners currently practice. An effective strategy practice in open networks follows more of a design process than most strategy scholars recognize (Liedtka & Rosenblum, 1998; Liedtka, 2000,

2001; Liedtka & Kaplan, 2019; Knight et al., 2020). But designing what? In her paper with Rosenblum (1996), she suggested that creating the conversation matters most. Webber (1993) would agree. Recall in his Harvard Business Review article; he argued, "the most important work in the new economy is creating conversations". Liedtke was early to point to the pivotal role conversations and a design orientation could play. The combination of three insights — conversation, experience, and design — positions strategy in open networks as a process of designing conversational experiences. Through conversations, knowledge is generated, distributed, and applied across the network (Webber, 1993; Von Krogh et al., 2000). Practitioners are only now picking up on the importance of conversation in their practice (Beer, 2020b; Durst, 2020).

Years ago, I worked briefly with Jim Gilmore, a seasoned practitioner who, with his colleague Joe Pine, introduced the experience economy concept (Pine & Gilmore, 2011). Gilmore and Pine's insights can also help explain why Strategic Doing appears to work in addressing wicked problems. The thrust of their argument: carefully designed experiences can create significant value for participants. This orientation ties back to Argyris, who put forth this proposition (Argyris, 1995: 20):

[H]uman beings are designing beings. They create, store, and retrieve designs that advise them how to act if they are to achieve their intentions and act consistently within their governing values. These designs, or theories of action, are the key to understanding human action.

Understanding Strategic Doing as a design process provides a valuable orientation on multiple levels. In the context of a three-hour Strategic Doing workshop, three streams of research led by Eisenhardt, Edmondson, and Liedtke converge to shape a learning experience. Participants see how they can quickly develop a sophisticated strategy to answer two simple but not easy questions (Eisenhardt). They follow a designed strategic conversation (Liedtka) defined by a set of simple, understandable rules (Eisenhardt), all within an environment of psychological safety, so that knowledge sharing and learning can take place (Edmondson). As team members repeat this cycle, bonds of trust begin to form in a reinforcing learning loop. Teams learn to guide themselves with simple protocols to design their conversations. They internalize a design

(Liedtka) as a theory of action (Argyris, Schön) to structure their encounters with wicked problems. This explanation conforms with what I have seen in situations where Strategic Doing has taken hold. It is, of course, simply conjecture at this point. Yet, it does align with my intuition on which I have come to rely. Firmer conclusions await additional research.

Argyris, Schön, Eisenhardt, Edmondson, and Liedtke are pivotal in explaining why Strategic Doing produces the results I have compiled over my career. Other streams of research are essential as well, and they are similarly disconnected. The literature review in Chapter 3 revealed a disconnect among strategy scholars between "dynamic capabilities" and "open strategy." Researchers could quickly bridge this gap by focusing on the structure and content of strategic conversations. Here, organizational development scholars leading the emergence of dialogic organizational development — Bushe, Marshak, Cooperrider, and others — have much to add. The lens of prospection, shaped by psychology scholars, is similarly essential. Gilbert, Seligman, Baumeister, and their colleagues suggest that the dynamic within our brain changes as we imagine the future.

Other disciplines have significant contributions to understanding why Strategic Doing produces its results. Behavioral economics suggests nudging as a critical intervention, and I have found that nudging plays a vital role in keeping an open network aligned. Alignment is a crucial dimension for executing a successful strategy (Srivastava & Sushil, 2017; Beer, 2020b). Scholars in transition management — Termeer, Dewulf, Van den Bosch and others — have brought forth the idea of "propelling mechanisms." This concept may help explain how:

- Nilsen and her team taught Strategic Doing to fifty university teams which in turn went on to form over five hundred collaborations in engineering education (Section 3.8.15);
- Purdue in a \$15 million workforce development initiative exceeded their targets by a factor of three (Section 3.8.6);
- the developing discipline of Strategic Doing altered the culture of the Oklahoma City economy to make it a national model (Section 3.8.1);
- a small regional university in Alabama created a vibrant entrepreneurial ecosystem (Section 3.8.19)
- Strategic Doing became "a way of being" for practitioners in Flint (presentation by Bob Brown, associate director, Center for Community and Economic Development, Michigan State University; see Section 3.8.12, and Appendix C-12).

Hopefully, Strategic Doing provides a framework to begin integrating these different research

streams. Years ago, Canadian environmental scientist Thomas Homer-Dixon (2000) wrote an insightful book, The Ingenuity Gap. In it, he asks, "How can we solve the problems of the future?" His main point: we are not generating enough ingenuity to address the growing complexity of the challenges we face. This thesis suggests that we can create more ingenuity through sophisticated collaboration emerging from strategic conversations. We can design and guide these collaborations with simple rules. Scholars can help propel these collaborations with more interdisciplinary research that connects and integrates across various research streams. Academics will also need to work more closely with practitioners. As Langley (2015) points out, this step will not be easy. Currently, a range of cultural and structural impediments obscure the path. This predicament is not new. Boyer (1990), Schön (1995), and the Kellogg Commission (1999) all sought to overcome these barriers. Yet, new understandings are emerging on how researchers and practitioners see the world differently (Simsek et al., 2018). If we can see diversity as a strength in dealing with complexity (Page, 2008), then multidisciplinary teams of researchers and practitioners will likely reduce our growing "ingenuity gap." Strategic Doing provides a pragmatic framework, a protocol of simple rules, to accelerate the process.

Chapter 6 explores how this integration might come about. It suggests that the convergence will occur within regional economies, a key component of our global economy (Purdue Center for Regional Development et al., 2009). Deep networks characterize these regional economies, a finding first articulated by AnnaLee Saxenian (1991, 1994, 1996). The different scholarly perspectives around regional economies — government (policy), business (strategy), and universities (engagement) — are beginning to converge on two concepts: platforms and ecosystems. The blurring lines among organizations also create new opportunities, as boundaries soften and become more porous (Bromley & Meyer, 2017). Remarkable new collaborations can emerge from linking and leveraging hidden assets across these boundaries. Recombinant innovation connects these assets in new ways, and it will lead to new opportunities. Increasingly, we can design and guide platforms to form self-organizing ecosystems. Within these ecosystems, transformations and better solutions will likely emerge from an accumulation of small experiments. I suspect that this path, which closely integrates scholarship with practice, will lead us to greater human ingenuity levels and the answer to Homer-Dixon's question. These

ecosystems will form faster if we rely on a shared operating system to simplify an otherwise bewilderingly complex strategy process. That is what Strategic Doing provides: a field-tested, open-source operating system that people can learn and apply.

Chapters 7 and 8 illustrate how universities can accelerate this convergence by redesigning their engagement mission. These chapters carry forward an argument made by Mary Walshok years ago in her book, Knowledge Without Boundaries (1995). Walshok demonstrated that universities have a broad role to play in tackling complex challenges and reshaping regional economies. The Kellogg Commission (1999) made similar conclusions four years later. A research project conducted by a team at the Massachusetts Institute of Technology reached a similar conclusion: universities can play a pivotal role in the regions they serve (Lester & Sotarauta, 2007). Universities can help us address the wicked challenges in front of us by moving beyond a "stable state" definition of relatively passive engagement and toward a more dynamic role of co-creation (Trencher et al., 2014). They can embrace a new epistemology grounded in pragmatism and rigorous inquiry (Schön, 1995). The balance of this thesis explores a path forward by applying the protocols and skills of Strategic Doing.

Chapter 5: Three Perspectives on Regional Economies

Introductory comment.— Business, government, education, and civil society all play a role in moving toward more sustainable development. This transformation will take a generation and involves guiding a wide range of complex systems in a more desirable direction (Rotmans, 2005). In today's global economy, regional economies have emerged as a crucial geographical scale to understand the opportunities to innovate (Saxenian, 1990, 1996; Storper, 1997; Cooke, 2005, 2008). A network paradigm began to emerge in the 1990s across several different research streams (Saxenian, 1990, 1991, 1996; Cooke & Morgan, 1993; Moore, 1993; Walshok, 1995; Nonaka & Takeuchi, 1995; Leydesdorff & Etzkowitz, 1996; Porter, 1998a). This perspective opened new horizons to understanding innovation and strategy (Gawer & Cusumano, 2002; Chesbrough, 2003; Adner, 2006; Cooke, 2007; Chesbrough & Appleyard, 2007; Whittington et al., 2011; Curley, 20016; Hautz et al., 2017; Malecki, 2018; Seidl et al., 2019).

In the 1990s, I was developing Strategic Doing coincident with this scholarly work. In 2005, as part of its new Center for Regional Development, Purdue University committed to developing Strategic Doing as an operating system to design and guide these networks. This article, which appeared in the Australasian Journal of Regional Studies in 2018 as "Three Perspectives on Regional Economies: A Convergence on Ecosystems and Platforms" (Morrison, 2018a), brings together these separate research streams to encourage closer coordination among scholars. In addressing complex challenges, Trencher and his colleagues (2014) suggest that universities may have a vital role in driving transformative changes through transformation management. The central concepts of platforms and ecosystems, the thrust of this chapter, create universities' opportunities to fulfill that role. Chapters 6 and 7 investigate the university role in more depth.

5.1 Abstract

Globalisation has given rise to a resurgence of regional economies. Scholars trying to understand this emergence have explored the phenomenon from different perspectives. It only makes sense that scholars write for different audiences. This preliminary systematic review examines the rise of the regional economy literature by examining different research streams.

These streams are directed toward three different audiences: business managers, regional policy makers and university leaders. The review suggests that these three streams are beginning to converge on two key concepts: ecosystems and platforms. By pursuing this convergence, scholars can benefit from the different perspectives and develop tighter integration across these research streams. This integration will likely yield more valuable insights.



Figure 5.1: Scholarly concepts from different research streams. This graphic provides an orientation to the argument that three research streams, each developing separately, are converging on the concepts of platforms and ecosystems.

5.2 Introduction

Globalisation has given rise to the resurgence of regional economies (Storper, 1997). This systematic review examines the emergence of regions from multiple perspectives. The purpose is to explore whether scholars from different disciplines, writing for different audiences, intersect around any central concepts. Indeed, this approach suggests that various streams of research are

beginning to converge on two connected concepts: ecosystems and platforms. This conclusion is preliminary and requires further development. However, the systematic review does indicate a promising path forward. If this emerging alignment is confirmed with further analysis, the implications could be significant along three dimensions: research agendas, theory development and policy.

Scholars write for different audiences. The review is organized around three key audiences: business managers, regional policymakers, and university administrators. The literatures within each of these streams is vast. Each perspective reveals three to four critical concepts scholars have developed to describe the growing importance of dynamic regional economies. Within each section, the review begins with leading authors and then traces the research flow. Figure 5.1 provides a map for the analysis that follows.

The analysis starts with the business perspective, led largely by management scholars. The scholarship in this section is primarily directed to business managers to guide them in building more competitive and innovative companies. Within the business perspective four key concepts have emerged. These key concepts are clusters, business ecosystems, open innovation, and platforms.

The review next moves to the regional policy perspective. Scholarship in this area is primarily led by regional economists and geographers. The primary audience is regional policymakers. This perspective includes three important concepts: regional networks; learning regions and regional innovation systems. The review then moves to scholarship that is primarily directed toward university leadership. These scholars are focused primarily on the developing role of the university within the emerging knowledge economy. Three key concepts dominate this research: the "engaged university"; entrepreneurial universities; and the Triple Helix and its derivatives. The review concludes by suggesting that all three streams are beginning to converge on the two central and related concepts of ecosystems and platforms.

5.3 Methodology

The literature exploring the impact of globalisation on the emergence of regional economies is vast. A SCOPUS review with the search term "regional AND economy AND

global*" returned over 7,083 articles. As Figure 5.2 demonstrates, the literature begins to gain momentum in the 1990's and has continued to accelerate. A systemic review should follow a replicable methodology (Smart *et al.*, 2003). This review followed these steps:

- Step 1: Define the corpus of literature using a broad SCOPUS search term: "globalization AND region";
- Step 2: Identify highly cited articles in the early period of literature development: 1990-2000 and designate "lead authors";
- Step 3: Evaluate the external audiences that the lead authors are seeking to influence to identify different research streams within the corpus;
- Step 4: Follow the citation stream of the lead authors to identify key concepts within each research stream;
- Step 5: Identify any emerging concepts that may be common across research streams.

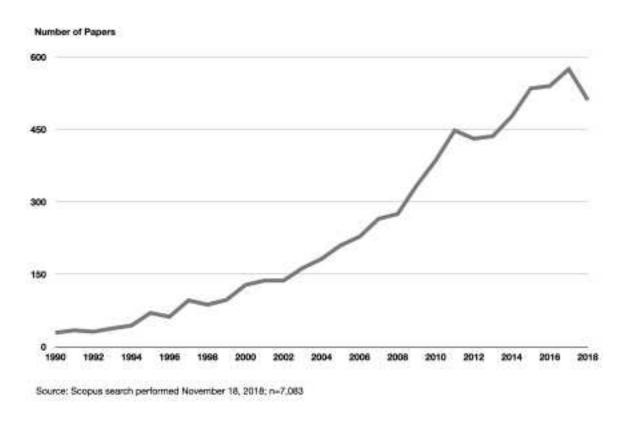


Figure 5.2: Growing scholarly interest in regional economies. This graphic shows the number of papers retrieved from SCOPUS with search term "Regional AND Economy AND Global". Source: SCOPUS search performed November 18, 2018; n=7083.

Based on this methodology, lead authors within three research streams were identified: (1) a business perspective directed toward management scholars and organizational managers; (2) a regional policy perspective directed toward regional policy makers; and (3) a university perspective directed toward university administrators. The citation stream for each lead author within these streams revealed the core concepts within each stream. In addition, some common concepts appear to be emerging across research streams. The balance of this paper proceeds as follows. Each research stream will be characterised in turn. The next section will explore two emerging concepts – ecosystems and platforms — that appear across research streams. The conclusion will draw implications of these preliminary findings and suggestions for future research.

5.3 The business perspective on regional economies

This section explores how business leaders increasingly see geographic proximity—the regional economy—as a resource for accelerating innovation. Four key concepts emerge from this perspective: clusters, business ecosystems, open innovation and platforms.

Clusters.— As the latest wave of globalization began to take hold after 1980, academics began pointing out the globalization paradox. On the one hand, telecommunications costs have declined so much that productive activities can be carried on anywhere in the world. On the other hand, local markets have become even more critical to competitive advantage. Resolving the paradox depends on an understanding of how information and knowledge networks have become integral to defining the competitive position of companies competing in the global market.

The roots of why information is important to competition lie in an article by Porter and Millar in 1985 (Porter and Millar, 1985). The authors explored how information technology can create competitive advantage. In particular, they point out that a firm's value chain is embedded in a broader "value system" that is defined by linkages with outside firms. These connections create interdependencies that can give rise to competitive advantages. Five years later, Porter introduced the concept of clusters to explain this dynamic (Porter, 1990). He demonstrated how information, integrated with physical production flows, can create a value system or value chain with competitive advantages.

Writing in 1998, Porter continued to develop his theory of clusters. Moving forward, he defined clusters as "geographic concentrations of interconnected companies and institutions in a particular field" (Porter, 1998a; 1998b). His primary research focus involved explaining how clusters improve productivity within an economy. He suggested three important ways: 1) increasing the productivity of a company; 2) driving the direction and pace of innovation; and 3) stimulating the formation of new businesses. In this way, Porter used his theory of clusters to explain the paradox emerging in the global economy: why regional economies are increasingly important in an interconnected world.

Business ecosystems.— The concept of business ecosystems entered the literature in 1993 (Moore, 1993). Moore started with a basic proposition: in a dynamic global economy, sustainable competitive advantage emerges from a company's ability to innovate. To explain the nature of this challenge, Moore used a biological metaphor of evolution and ecosystems. Each company has an ecosystem within which it evolves. This ecosystem extends beyond traditional industry boundaries. The ecosystem involves the continuous interaction and interdependencies that develop, as entities pursue their own goals in relationships with each other. Companies and organizations within the ecosystem co-evolve new capabilities, as they innovate to support new products and satisfy customer needs. In other words, ecosystems are dynamic.

Five years later, Moore amplified his argument (Moore, 1998). It is the combination of assets and the ability to link these assets together, that defines the competitive trajectory for firms. Networks and relationships become core attributes of competitiveness. The biggest challenge for company executives involves shifting their mindset from stand-alone hierarchical companies to seeing themselves as participants in continuously evolving complex systems. The development of business ecosystems is closely aligned to the concept of open innovation and platforms, to which the literature review now turns.

Open Innovation.— Open innovation is a process that describes the way in which companies innovate. In the past, companies relied on internal research and development resources to set their innovation agenda. With closed innovation, the company generates, develops and commercializes its own ideas. In 2003, Chesbrough introduced an alternative approach to innovation, the concept of open innovation (Chesbrough, 2003). Through this

process, companies rely on relationships with outside partners to accelerate innovation. Company boundaries become more porous. The company commercialises its own ideas with partners, as well as incorporating outside technologies into internal projects. More formally, Chesbrough and his co-authors have defined open innovation as "the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand markets for external use of innovation, respectively" (Chesbrough *et al.*, 2006). In another iteration of the concept, Curley proposes the idea of Open Innovation 2.0, in which open innovation takes place within an ecosystem (Curley, 2015; 2016).

Platforms.— The exploration of business ecosystems and open innovation has led scholars to explore the concept of platforms. The concept can be difficult to understand. The development of platforms as a separate concept for study emerged with research pioneered by Gawer and Cusumano (Gawer and Cusumano, 2002; Cusumano, 2010). Initially, the concept applied to product platforms. Companies develop a product platform on which different variations of a product can be built. The initial meaning of product platform applied only to a company's product development strategies. Gawer and Cusumano extended the idea of product platform to define industry platforms on which ecosystems can grow. In essence, the distinction is between platforms that are internal to the firm and platforms that are external to the firm. Ecosystems grow on external platforms (Cusumano, 2010; Gawer and Cusumano, 2014).

Hagel and Brown amplified this concept of platforms by demonstrating the fundamental dynamic of a "pull platform" to mobilize resources within a collaborative innovation project (Brown and Hagel, 2005; Hagel *et al.*, 2012). These platforms provide resources that participants on the platform can use to innovate through networks. Participants "pull" resources from the platform when the need arises. These pull models of innovation enable participants to manage growing uncertainty. They can access specialized and distributed resources without controlling them.

Increasingly, scholars are making the link between platforms and ecosystems (Gawer and Cusumano, 2014; Gawer, 2014; Isckia and Lescop, 2015; Altman and Tushman, 2017). Businesses can guide the formation of ecosystems by designing the platforms on which they emerge. The design of platforms includes issues of governance, participation, openness, and

protocols. The term ecosystem describes the community of interacting organisations that coevolve their capabilities and roles as participants on the platform. Network effects, or increasing
returns, emerge as participants continuously create value on the platform; the platform becomes
more valuable the more people use it (McIntyre and Srinivasan, 2017). The review reveals that
this metaphor of 'platforms'—and its connection to ecosystems—is being adopted by scholars
focused on other perspectives on the regional economy.

5.4 The regional policy perspective on regional economies

The literature review now moves from scholarship that is focused on a business perspective, or the viewpoint of the firm, to scholarship that is directed toward regional policymakers. In this section of the literature review, three key concepts emerge from the scholarship: regional networks; regional innovation systems; and innovation and entrepreneurial ecosystems.

Regional networks and learning regions.— The emergence of regional networks can be traced to the major work completed in the early 1990s by Saxenian (Saxenian, 1990; 1991; 1994; 1996). This line of research began with an investigation of how Silicon Valley recovered high technology employment in the semiconductor industry in the 1980s. In the 1970s, Silicon Valley had captured the attention of scholars and policymakers with its high technology growth in the semiconductor industry. By the mid-1980s, however, Japanese competition depressed semiconductor employment in the Valley. Then, a new wave of semiconductor investment expanded employment. Saxenian found that the flexible production networks and informal networks within the Valley enabled the regional economy to respond quickly to intensify Japanese competition (Saxenian, 1990). Saxenian pointed to these regional networks as critical to the regional economy's resilience.

Saxenian subsequently explored networks operating in the Valley beyond the semiconductor industry (Saxenian, 1991). She also compared the regional economies of Silicon Valley and Route 128 in Boston (Saxenian, 1994, 1996). She used the comparison to point to the weakness of cluster analysis. Cluster analysis, she maintained, creates an invisible boundary between an atomistic firm and an external economy. In other words, standing alone, cluster analysis does not

recognize that networks that are critical to understanding the dynamics of knowledge flows within a regional economy. She proposed a network approach to regions to explain the relationships among the internal organization of firms, their connections to each other, and to the social structures within the region (Saxenian, 1994).

Florida and Morgan amplified Saxenian by introducing and exploring the concept of "learning regions" (Florida, 1995; Morgan 1997). Florida maintained that learning regions will become increasingly important as the global economy moves into a more knowledge intensive period of development. Echoing Saxenian's work, Florida argued that within these regions, hierarchically organized firms will be replaced by firms that rely more heavily on networks and teams.

In exploring the concept of learning regions, Morgan looked more deeply at a convergence of innovation studies and economic geography. Focusing on regional policy within the European Union, Morgan drew the implications of learning regions for regional policymakers. He drew together the threads of a wide range of research in both innovation studies in economic geography to illustrate a potentially deep research agenda. More important, for the purposes of this review, he suggested that the emergence of a network paradigm helps policymakers overcome the rigidities of ideological thinking that create deep tensions between the state and the market. The growing importance of networks within regional economies is also reflected in a 1996 publication by the Organization for Economic Cooperation and Development, "The Knowledge-based Economy" (OECD, 1996). The publication underscored that networks are critical to understanding the diffusion of information, knowledge and technology.

Scholars have worked to distinguish different types of networks within regional economies. Bathelt, Malmberg and Maskell explored knowledge flows within a cluster (Bathelt *et al.*, 2004). The authors argued that clusters need both local networks, which they called "buzz" and global networks which they called "pipelines". Clusters need both types of networks to funnel different types of knowledge into the regional economy. Ostergaard took an even more granular look and explores how knowledge flows through social networks (Ostergaard, 2009). Those findings underscore the inadequacy of the concepts of "knowledge spill-overs", a concept on which many economists rely. He demonstrated how knowledge is diffused through informal contacts.

Huggins and his colleagues (Huggins et al., 2008; 2012; Huggins, 2016) moved to the level of the university to explore the role of universities in regional knowledge flows and networks. Huggins, Johnston and Steffson cautioned regional policymakers about expecting too much from policies designed to accelerate university knowledge transfer through networks (Huggins et al., 2008). Huggins, Johnston and Stride took a closer look at these networks within the UK higher education system (Huggins et al., 2012). Through more empirical work, the team presented a more nuanced look at how knowledge transfer takes place within regional economies. They find that more established universities are likely to have a wider range of organizations involved in knowledge transfer. Equally important, the authors point out that in lagging regions, universities can still play an important role. The nature of their networks is different. In lagging regions, networks are more locally focused than in leading regions. Huggins, writing in 2016, returned to themes first introduced by Saxenian. In exploring regional development in Silicon Valley, Taiwan, and Finland, Huggins concluded that regional policies should focus on the development of "open search networks" that are both local and global (Huggins, 2016). Designing these networks calls for experimentation, a region's existing clusters can renew themselves through more open and connected networks, a point first emphasized by Saxenian (Huggins, 2016).

Regional innovation systems.— Regional innovation systems represent a model initially designed to guide regional policy in the European Union. Scholarship by Cooke represents a direct path to the development of the concept (Cooke, 2008). Regional innovation systems are deeply grounded in network theory (Cooke and Morgan, 1993), and Cooke more formally explores the concept in a 1997 paper (Cooke, 1997). In that paper, he advocated that regional innovation systems make an appropriate and helpful connection between innovation systems and regional science.

In a review of the concept delivered in 2015, Asheim, Grillitsch and Trippl echoed and amplified Cooke's 2008 review (Asheim *et al.*, 2015). The concept of regional innovation systems integrates research on innovation systems with territorial innovation models developed by geographers and regional scientists. The following presents a brief summary.

Research on innovation systems was built on the premise that pathways to economic prosperity would be found by exploring the role innovation plays in a knowledge economy.

Researchers wanted to overcome the limited insights into innovation provided by economists. This work provides a new tool to policymakers who are in charge of science and technology policy (Lundvall, 2007). This work represented a rejection of the simple linear model of innovation which had dominated most of the thinking in post-World War II economies (Narayanamurti, 2016). The linear model portrays innovation as a straightforward process moving from basic research to applied research to commercialisation and the market. In place of this linear model, innovation systems research focuses on interactions and learning processes among multiple parties in a system. Innovation results from multiple parties interacting with a complex system that is characterized by co-evolution and self-organisation (Lundvall, 2007).

In regional innovation systems, the "soft infrastructure" of networks plays an important role in the performance of regional innovation systems (Cooke *et al.*, 1998). The regional innovation system literature is beginning to incorporate the platform metaphor, a concept that is more advanced in the strategy management literature. The concept enters the regional innovation system literature initially as a reference to "policy platforms" (Cooke, 2007; Cooke *et al.*, 2010; Asheim *et al.*, 2011). More recently Acs, Stam, Audretsch and O'Connor connect the regional innovation system literature to the strategy management literature of platforms (Acs *et al.*, 2017). Walshok, Shapiro and Owens, after investigating the regional innovation systems in San Diego, Philadelphia and St. Louis, conclude that intermediary organisations can serve as platforms to support regional innovation systems. The effectiveness of these intermediary organisations, however, are shaped by the distinctive characteristics of place (Walshok *et al.*, 2013).

5.5 The university perspective on regional economies

Universities are experiencing more demands based on the shifting character of the regional economy. This section explores how scholars have characterized these shifts with three key concepts: entrepreneurial universities, the Triple Helix model, and university engagement.

University Engagement.— The concept of "university engagement" emerged in the wake of the publication by Ernest Boyer of a 1990 report for the Carnegie Foundation for the Advancement of Teaching. The vocabulary of university outreach and engagement, which now has taken root among major universities in the United States, began with his initial report (Boyer,

1990). In it, Boyer introduced the "scholarship of application". In a subsequent paper, published posthumously, Boyer substituted the term "engagement" for the term "application" (Boyer, 1997). The Kellogg Commission on the Future of State and Land-grant Universities further developed Boyer's work (Kellogg Commission, 1999).

Boyer, president of the foundation, initially defined the "scholarship of application" as the application of knowledge to practical challenges or social problems. This type of knowledge arises when academic research asks, "How can knowledge be applied to consequential problems?" Further, "Can social problems themselves define an agenda for scholarly investigation?" (Boyer, 1990). Boyer's work led directly to the mobilisation of the Kellogg Commission. The Commission made the case for change by putting forth the proposition that the public view universities as out of touch and out of date (Kellogg Commission, 1999). The Commission called on universities to "renew the covenant" between universities and the American people by focusing on the institutional engagement. The concept of university engagement involves a new way of thinking about the relationship of the university to its community and regional economy. The Kellogg Commission outlined the meaning of the engagement by emphasizing that the concept goes well beyond conventional conceptions of outreach and public service. It is "embedded" in a "commitment to sharing and reciprocity". "By engagement, the Commission envisioned partnerships, two-way streets defined by mutual respect among the partners for what each brings to the table":

Such partnerships are likely to be characterised by problems defined together, goals and agendas that are shared, and definitions of success that are meaningful to both university and community and developed together, and some pooling or leveraging of University in public and private funds. The collaboration arising out of this process is likely to be mutually beneficial and to build the capacity and competence of all parties. (Kellogg Commission, 1999).

Following the work of the Commission, McLean, Thompson and Jonker proposed that engaged institutions have two key characteristics (McLean *et al.*, 2006):

- A significant portion of the University's activities are oriented toward the needs of the communities it serves, and
- The university's faculty staff and students are involved in a broad range of collaborations with the community that the university serves.

To these two characteristics, Fitzgerald and his co-authors add a third: An engaged university recognizes that "not all knowledge and expertise resides in the academy... expertise and great learning opportunities in teaching and scholarship also reside in non-academic settings" (Fitzgerald *et al.*, 2016). In other words, the university is involved in an ecosystem. The university actively participates in the design of this ecosystem by participating in collaborative initiatives.

Walshok's work, which pre-dates the Kellogg Commission, nevertheless explored the practical implications of an engaged university. Exploring the evolving role of the research university in the United States, Walshok argued that to meet the needs of society, research universities must reframe their traditional approaches to teaching and learning. At the same time, they must develop new institutional mechanisms for connecting new knowledge that they develop "to the increasingly large and diverse publics who can use and contribute to that knowledge" (Walshok, 1995). In other words, moving toward an engaged university involves designing collaborations across the traditional boundaries both inside and outside the university. A core activity involves spanning traditional boundaries (Weerts and Sandmann, 2010). This argument is similar to Clark's proposal for the entrepreneurial university discussed below (Clark, 1998).

Walshok, Furtek, Lee and Windham explain in practical terms how the University of California, San Diego worked to transform itself into an engaged university and built regional innovation capacity (Walshok *et al.*, 2002). The authors highlighted three important "hooks" to the engaged university. Within each step, the authors demonstrated some practical steps.

- Build a research base with world-class scientists and engineers—this step involves
 developing research clusters of "geographically concentrated groups of non-profit
 research institutions or groups within research institutions that have an expertise in
 specific fields of science and technology". These research clusters must be connected to
 the regional economy through continuous interaction with local business leaders.
- Develop social networks to support new and growing companies—this step involves both creating quality places, "amenities of place", as well as continuously forming teams of researchers, innovators and entrepreneurs. This step reinforces a culture open to entrepreneurs.
- Develop responsive education and training initiatives—this step involves developing both "breadth and depth of the advanced skills and knowledge" of the residents in the region.

Subsequent research into San Diego's health and life sciences ecosystem have reinforced these findings (Majava et al., 2016). Other research into San Diego's innovation economy is also supportive of these three thrusts (Walshok and Shragge, 2013).

Scholars have continued to advance the concept of university engagement. McNall and his co-authors propose that the concept of systemic engagement to suggest that universities can be effective partners in systemic approaches to complex community change (McNall *et al.*, 2015). The authors argued that the most challenging problems facing humanity in the 21st century involve complex dynamic systems. A new, more sophisticated form of engagement, systemic engagement, is needed to meet the call of Boyer and the Kellogg Commission. The approach follows six key principles:

- Systems thinking—designing inquiries that embrace a systems perspective.
- Collaborative inquiry—using participatory approaches to research and evaluation that solicit multiple perspectives on problems.
- Support for ongoing learning—incorporating flexible, continuous evaluation that supports ongoing cycles of inquiry and action.
- Emergent design—embracing the uncertainty of any solution with the recognition that more effective solutions will emerge based on what is being learned.
- Multiple strands of inquiry in action—organizing multiple teams to pursue different dimensions of a complex challenge.
- Transdisciplinary—integrating the perspectives of multiple academic disciplines.

Systemic engagement sets forth potentially important design principles for how universities address increasingly complex social and economic challenges. This notion of systemic engagement tries to capture how universities can effectively engage within dynamic ecosystems. The framework embraces the complexity science used by economists to interpret the emerging knowledge economy (Arthur, 1996; 1999; Beinhocker, 2006). As such, the proposed framework begins to align the concept of university engagement with the underlying complexity of social and economic systems embraced in the concept of ecosystems.

Entrepreneurial Universities.— The concept of entrepreneurial universities initially emerged from the work of Burton Clark, a professor of higher education and sociology at the University of California, Los Angeles. Clark is interested in exploring how universities are transforming themselves in the wake of the dramatic emerging trends of the knowledge economy (Clark, 1998). His research, which began in 1994, explored the transformation that took place in

five exemplary European universities from 1980 to 1995. The universities included the University of Warwick (England), the University of Twente (The Netherlands), the University of Strathclyde (Scotland), Chalmers University (Sweden), and the University of Joensuu (Finland). From these case studies, Clark identified five pathways of transformation to a new model of what he called the entrepreneurial university (Clark, 1998). These pathways can be also viewed as characteristics of Clarke's definition of how an entrepreneurial university can contribute effectively to a dynamic regional economy:

- A strengthened steering core—entrepreneurial universities have a systematic capability to steer themselves. There is an alignment between the managerial centre and what Clark termed the "academic heartland".
- An enhanced development periphery—entrepreneurial universities design units that make the boundaries of the university more porous.
- A diversified funding base—entrepreneurial universities nurture and grow new sources of revenue.
- A stimulated academic heartland—in an entrepreneurial university academic units within the university become more entrepreneurial by reaching out beyond the boundaries of the university and promoting new sources of income from engagement.
- An integrated entrepreneurial culture—entrepreneurial universities develop a culture that embraces change. Strong practices that embrace change cultivate a new identity and a distinctive reputation.

In subsequent research, Clark identified three additional characteristics of entrepreneurial universities capable of sustaining transformation (Clark, 2004).

- Reinforcing interactions—there must be continuous interactions that create sufficient mutual value to sustain these interactions.
- Perpetual momentum—there must be a continuous commitment to building perpetual momentum by taking small steps: "momentum is acquired from the cumulative thrust of small steps".
- Ambitious collegial volition—there must be continuous expressions of the collective will to transform. Within entrepreneurial universities, Clark finds a volition to take risks, to move ideas into action: "entrepreneurial universities accumulate small connected volitions—acts of will—that adapt their character".

According to Shattock, Clark's research generated a significant impact among universities in Europe (Shattock, 2010). Clark's work also triggered an interest among scholars to conduct case studies in order to gather a more holistic view of the complex changes taking place in universities operating within dynamic regional economies (Rhoades and Stensaker, 2017). For

example, Bramwell and Wolfe explore the impact of the University of Waterloo on the regional economy by identifying the "virtuous cycle of deep and interactive links with the local industrial community" (Bramwell and Wolfe, 2008). The authors conclude that by nurturing and "entrepreneurial attitude of mind" among faculty and students, the University of Waterloo stands out as a particularly exemplary example of an entrepreneurial university. In particular, they point to the following activities:

- Generating, attracting and retaining talent;
- Providing critical research support to industry;
- Global linkages; and
- Building "civic capital.

Wolfe and Bramwell provide a useful model for how the framework of entrepreneurial universities, as originally envisioned by Clark, can be applied to define a university's role in a regional economy.

The Triple Helix Model.— The Triple Helix model of university transformation is rooted in technology commercialisation. The work originated in a series of academic conferences held in the 1990s. In the call for the first conference, the sponsors indicated that they wished to explore the "university's position in the newly emerging knowledge infrastructure" (Etzkowitz and Leysdorff, 1995).

The Triple Helix model represents one of the first efforts to define an alternative approach to the linear model of commercialisation that emerged after World War II with the publication of Vannevar Bush's "Science: The Endless Frontier" (Bush, 1945). Scholars have concluded that this model is inadequate to describe technology commercialisation. The process is more subtle, sophisticated and complex (Narayanamurti, 2016; Shneiderman, 2016). With the Triple Helix, scholars use an organic metaphor based in molecular biology, in contrast with the ecosystem metaphor that is grounded in ecosystem science. As Figure 4 demonstrates, the model continues to attract scholarly interest.

The Triple Helix model encourages scholars to explore the interactions among business, government and universities in order to capture the reciprocal linkages taking place. This line of inquiry, according to the Triple Helix thesis, illustrates the enhanced role in innovation played by universities (Etzkowitz and Leydesdorff, 2000). Scholars engaged in the development of the

concept continue to articulate the model (Etzkowitz and Ranga, 2013; Leydesdorff and Meyer, 2003). The boundaries of the model are not tightly drawn. Scholars have added helices to the model with quadruple and quintuple helix models being proposed (McAdam *et al.*, 2016; Baccarne *et al.*, 2016; Miller *et al.*, 2016).

Cooke, a proponent of regional innovation systems, critiques the Triple Helix model as an inadequate approach is to providing policy guidance, especially in less advantaged regions without strong research universities: "Triple Helix thinking draws attention only to possible but weakly generalisable broad outlines of important contemporary innovation interactions" (Cooke, 2005). In response, scholars who focus on the development of the Triple Helix model argue that the Triple Helix model provides more flexibility and granularity to enable scholars to understand the complex flows within the knowledge economy (Ranga and Etzkowitz, 2013).

The value of the Triple Helix model for practitioners may not be rooted in its analytic power. Rather, the Triple Helix model may provide a helpful narrative structure to guide the complex interactions among multiple parties within a region. This insight comes from applying the Triple Helix model to the evolution of the Research Triangle in North Carolina (Morgan, 2016). Morgan found that the Triple Helix model provided a useful metaphor to explain the collaborative innovation that emerged in the region. Participants in the region describe these interactions as highly organic with no formal agreements or contracts. In a similar way, Rodrigues and Melo researched the application of the model in a lagging region of Portugal. They found that a primary benefit comes in inspiring people to think differently about collaboration. The model may give rise to new perceptions of value and improve the capacity to act (Rodrigues and Melo, 2013).

5.6 Convergence on ecosystems and platforms?

More recently, the concepts of innovation ecosystems, entrepreneurial ecosystems, and platforms are appearing across all three research streams.

Innovation Ecosystems and Entrepreneurial Ecosystems.— The concepts "innovation ecosystem" and "entrepreneurial ecosystem" have attracted growing interest among scholars focused on business management, regional policy and universities. Both concepts have a

relatively new lineage. Figure 5.3 illustrates the growth in scholarship for the "innovation ecosystem" literature. Figure 5.4 illustrates the growth in scholarship for the "entrepreneurial ecosystem" literature. Whereas the innovation ecosystem research stream began accelerating after 2009, the entrepreneurial ecosystem stream began its rapid growth in 2014.

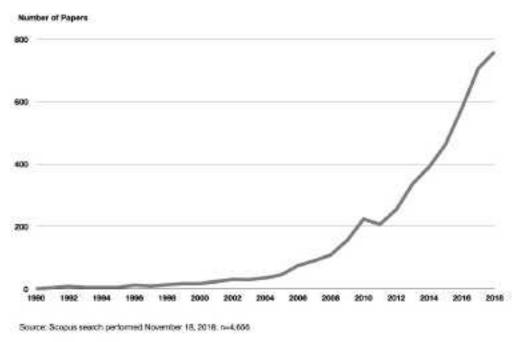


Figure 5.3: Growing interest in innovation ecosystems. This graphic shows the number of papers retrieved from SCOPUS with search term: "innovation ecosystem". Source: SCOPUS search performed November 18, 2018; n = 4,656.

The literature on innovation ecosystems is grounded in both the business perspective stream and the regional policy stream. It appears to be an outgrowth from scholars developing the concept of "regional innovation systems". Strategic management scholars are focused primarily on how firms can develop their own innovation ecosystem (Adner, 2006). In contrast, scholars exploring regional innovation systems are primarily focused on the challenges facing regional policymakers in shaping technology and innovation policy in an era of increasingly open innovation. The innovation ecosystem literature introduces the potentially useful concept of orchestration (Dhanaraj and Parkhe, 2006). Within ecosystems, the creation of value involves collaboration across firms and organisations. The concept of orchestration suggests that leading firms within an innovation ecosystem can play a central role in aligning interests to achieve

desired business objectives. Dhanaraj and Parkhe define orchestration as a set of deliberate actions to create an extract value from an innovation ecosystem. Gastaldi and Corso go on to suggest that in innovation ecosystems, academics can play an important role as orchestrators in ecosystems of continuous innovation (Gastaldi and Corso, 2016).

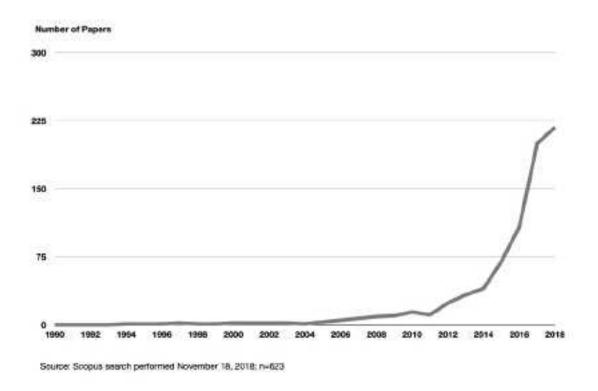


Figure 5.4: Growing interest in entrepreneurial and startup ecosystems. This graphic shows the number of papers retrieved from SCOPUS with search t5.erm: "(entrepreneurial OR startup) AND ecosystem". Source: SCOPUS search performed November 18, 2018; n = 623.

The entrepreneurial ecosystem literature, which is rooted more directly in the U.S. context, is largely focused on policies directed to the formation of entrepreneurial ecosystems. Theory development in entrepreneurial ecosystems is in its infancy (Roundy *et al.*, 2016). However, there is growing interest in entrepreneurial ecosystems, since there is growing evidence that entrepreneurship plays an important role in economic growth and development (Baumol and Strom, 2007). Scholars recognise that the research literature on entrepreneurial ecosystems is underdeveloped (Spigel, 2017; Roundy *et al.*, 2018).

Platforms.— The concept of platforms, often tied to the concept of ecosystem, is also appearing across all three streams of literature. Figure 5.5 demonstrates that the connection of

platforms with both innovation and entrepreneurial ecosystems is growing in momentum. This graph indicates that a growing number of papers are connecting the concepts of ecosystems and platforms together.

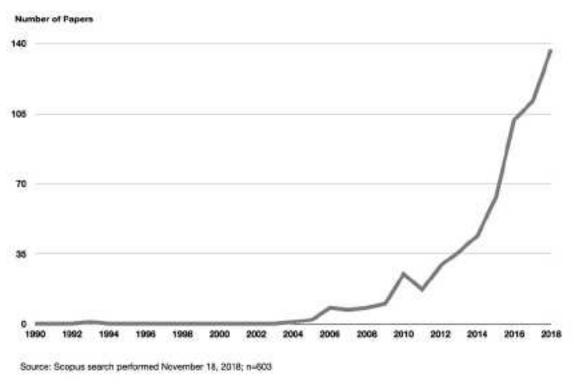


Figure 5.5: Growing interest in platforms and ecosystems. Number of Papers Retrieved from SCOPUS with Search Term: "(((entrepreneurial OR startup OR innovation) ecosystem) AND platform)". Source: SCOPUS search performed November 18, 2018; n = 603.

As explored above, the relationship between the concepts of platforms and ecosystems is most thoroughly developed among management scholars considering the business perspective. We see the growing adoption of this perspective among scholars focused on both a regional perspective and a university perspective. Within the regional perspective, Asheim and his coauthors provide a highly cited article focused on the concept of "platform policies" to develop regional advantage (Asheim *et al.*, 2011). Since its publication, this paper has been gaining momentum among scholars. Within the university perspective, Whitmer and his co-authors find the concept of platform useful for explaining the emerging university role in engagement (Whitmer *et al.*, 2010). Other scholars see the university as a platform or hub for the

development of ecosystems (Walshok *et al.*, 2002; Walshok and Shragge, 2013; Majava, *et al.*, 2016; Gastaldi and Corso, 2016; Malecki, 2018; McNall *et al.*, 2015).

Despite its early stage of development, the entrepreneurial ecosystem literature introduces another set of potentially useful concepts that echo the concept of platform. These concepts are "place" and "narrative". The concept of place and its connection to entrepreneurial ecosystems emerges from several papers. Ecosystems involve continuous knowledge flows that take place within a geographic location (Spigel, 2017; Malecki, 2018). The concept of place is, however, more than a geographic location; it is deeply connected to identity. Gill and Larson, incorporating Gieryn, explain the concept in these terms:

"[A] place is a specific spot in the world, embodied in built and natural things and infused with meaning. Places are distinct from space in that place is space filled by people, practices, objects and representations" (Gill and Larson, 2014; Gieryn, 2000).

The notion that the university can provide a place (or platform) for entrepreneurial ecosystems to develop is presented by Miller and Acs in their exploration of the University of Chicago (Miller and Acs, 2017).

In his exploration of entrepreneurial ecosystems, Roundy introduces "narratives", another potentially valuable concept to explain the concept of platforms (Roundy, 2016). He emphasizes that entrepreneurial ecosystems do not just have physical characteristics. They are also social constructions. In particular, the narratives that develop during the creation of these ecosystems, may be critical to their continued development and sustainability.

Roundy structures his argument by initially pointing to the importance of narrative at the individual level of entrepreneurship. Narratives play an important role in developing the entrepreneur's individual understanding of events, experiences and opportunities. The narratives that entrepreneurs construct about their venture can accelerate the flow of resources to the new firm. Roundy proposes that narrative can play an equally important role in the development of entrepreneurial ecosystems. In particular, narratives can serve important functions such as transmitting the ecosystem's culture, making sense of the ecosystem, and constructing the ecosystem's identity. In other words, narratives can explain the special value of a platform or place.

5.7 Conclusion

The three research perspectives on the emerging regional economy that are considered in this systematic survey of literature are business strategy, regional policy and university administration. These research streams, which serve different audiences, appear to be converging around concepts of platforms and ecosystems. If this preliminary conclusion is sustained through further analysis, the convergence holds important implications for research agendas, theory development, policy and practice. As scholars design their research strategies, the development of more multi-disciplinary teams appear promising. The phenomena under review involve multiple complexities—relationships, connections, and patterns of interactions—that are difficult to visualise. Quantitative data and analysis will likely be inadequate to capture and explain constantly changing systems. A multi-disciplinary team, focused on developing a visual language centred on platforms and ecosystems appears to be a promising approach. The research challenge is not too dissimilar to the challenge of developing a visual language to explain phenomena in systems biology (Novere et al., 2009). From a policy perspective, the convergence on the concepts of ecosystems and platforms suggests that policy making to develop regional prosperity should focus on more adaptive and experimental approaches (Swanson and Bhadwal, 2009). Ecosystems and platforms are inherently dynamic. Fixed approaches to policy, animated by simple "if/then" logic are not likely to be successful. Instead, multiple policy experiments are likely to yield better results. Finally, practitioners should be aware of the complexity of ecosystems and platforms. While ecosystems, as complex adaptive systems, are inherently unpredictable, the platforms on which they form can be designed and guided. Here, research in strategic management appears to provide the most promising path forward. What would it look like if business managers, regional policy makers and university administrators all aligned their actions to strengthen a regional economy? How could they develop a more inclusive and dynamic process for sharing assets and making collaborative investments? If the convergence around ecosystems and platforms is, in fact, really taking place, the development opens an exciting new frontier for research, policy and practice.

Chapter 6: Network-based Engagement for Universities

Introductory comment.— As climate change becomes more dire, regions are struggling to transform their economies and put them on a more sustainable path. For example, Bennett (2020) suggests Australia consider following the prescriptions of a "doughnut economy" that can be sustained within environmental limits (Raworth, 2017). The transition to more sustainable development involves complex reconfigurations of interlocking complex systems (Rotmans, 2005). Neither hierarchical, top-down policy prescriptions by government nor free market approaches are likely to be successful. Instead, we need new network-based approaches to find these paths forward (Loorbach, 2010). This chapter outlines the development of a new university role based on our work at Purdue. It appears as "Network-Based Engagement for Universities: Leveraging the Power of Open Networks" (Morrison, 2015), a chapter in Carlot, C., Filloque, J., Osborne, M., & Welsch, P., (eds.), The Role of Higher Education in Regional and Community Development in the Time of Economic Crisis, (National Institute of Adult Continuing Education, 2015), a publication of PASCAL International Observatory.

6.1 What's Going On? The Nature of Our Economic Transformation

PCRD's approach to regional transformation and university engagement is grounded in a key set of assumptions about how our economies are transforming. As knowledge becomes a larger component of the value embedded in products and services, business enterprises must move toward more networked operations to remain competitive (Logan and Stokes, 2004). The pace of change in these markets is accelerating, and network-based business models help firms keep up with these changes, while minimizing their risk (Chesbrough, 2006; Nambisan and Sawney, 2008). As business firms adopt the strategies, they define new market opportunities. These opportunities can include a new range of collaborations with university partners.

These network-based business models represent a fundamental departure from how traditional business has organized its operations. From the early years of industrialization, businesses increased the scale of their operations by developing hierarchical organizations that vertically integrated different stages of production (Chandler, 1993). Government, university and

non-profit institutions followed suit and organized themselves in much the same way.

Hierarchical organizations have several significant advantages. Reporting relationships and levels of responsibility are clear. As job descriptions become more narrow and focused, employees develop the skills to become more specialized. Defined organizational boundaries deliver rationality, clarity and stability.

At the same time, hierarchical organizational structures generate significant disadvantages. Organizational boundaries can inhibit communication within the organization. These communication breakdowns can create the sense of fragmentation and tension which undercut coordination and productivity. Excessive specialization can build up formal procedures that slow internal operations. The organization becomes less responsive to changes taking place in its environment. As the organization becomes more specialized, it also becomes less flexible and more costly to operate, as personnel and overhead costs increase.

Both globalization — the logistical and legal integration of national markets — and dramatic advances in information technology laid the groundwork for businesses to move toward more networked forms. In the 1980's, firms began forming global production networks to take advantage of lower costs. By the 1990's, firms moved from focusing solely on supplier networks to building customer networks. The explosion of the Internet that followed the introduction of the first commercial web browser in the mid-1990's pushed businesses even faster toward network-based business models (Chesbrough, 2006; Logan & Stokes, 2004).

Universities in the U.S. face difficulties keeping up with these shifts. It is not difficult to explain. Universities have traditionally been organized around independent departments and hierarchies. These traditions, based on academic freedom, tenure and promotion, are difficult to change. More important, perhaps, university administrators lacked a strategic framework to interpret and respond to the shifts taking place in global markets. Beginning in the 1990's, small steps were underway to fill this void, to answer the question, "What is the universities role in an economy in which networks create wealth?"

Michael Porter of the Harvard Business School suggested that productivity gains in advanced economies emerge from network or "clusters" of related businesses and support organizations. In his formulation of clusters, universities play an important supporting role (Porter, 1998a, 1998b).

Yet, the strategy framework proposed by Porter to interpret clusters takes the viewpoint of the business firm, not the university. Porter suggests that clusters emerge from the interaction of five competitive forces shaping markets: the bargaining power of suppliers; the bargaining power of buyers; the threat of substitute products or services; the threat of new entrants and the rivalry among existing competitors. This strategy framework provides no guidance to universities about how to shape their role in clusters or make strategic decisions about how to allocate scare university resources. Further, although Porter advances strong evidence in support of clusters, he provides virtually no guidance on how to design a strategy process to develop clusters. The work at the Purdue Center for Regional Development (PCRD) fills this void.

6.2 Purdue and the development of network-based models of engagement

Formed in 2005, PCRD anticipated a new challenge for research universities to become more engaged in promoting regional prosperity. Our Center's work is guided by an emerging theory of change defining the role of research universities and other higher education institutions to improve the competitiveness of regional economies. A theory of change represents a model that guides interventions in a complex system to improve its performance. It includes a set of assumptions, a set of target outcomes, and a process for designing pathways to achieve these outcomes.

Two core assumptions underlie PCRD's theory. First, in an increasing number of markets, wealth and prosperity will be generated by organizational forms that are collaborative and connected through networks of purposeful relationships (Beinhocker, 2006). Second, as organizations move from hierarchical to network-based structures, there will be a growing number of opportunities to generate increasing returns (Arthur, 1996).

The Market Economy and the Civic Economy.— We start by defining a regional economy in terms of the interaction that takes place between a market economy and a civic economy. The market economy consists of activities and investments that are publicly valuable and privately profitable. The term "privately profitable" means that an organization can capture sufficient value from its activities to generate risk adjusted returns that attract additional investment for growth. The term "publicly valuable" is closely aligned to the economists' view of public goods.

A public good arises from an activity or investment that generates value which is more widely shared.

The civic economy, by contrast, consists of activities and investments that are publicly valuable but not privately profitable. In the United Kingdom, Nesta also uses the term "civic economy", but in a different sense (Nesta, 2011). Nesta uses the term to describe an organizational form. PCRD defines the civic economy by looking at activities and investments and how value is created and captured or shared. In order for an economy to generate productivity improvements and new levels of prosperity, activities and investments in the civic economy should support activities and investments in the market economy. At the same time, the market economy generates wealth which, through taxes and charitable investments, should support continuous investment and renewal of the civic economy. While private firms dominate the market economy, the civic economy includes government, educational institutions, philanthropy and a wide range of non-profit organizations.

Importantly, our definition of the market economy and the civic economy is not defined by organizational form. In other words, a university or non-profit corporation can engage in market activities. For example, the Bayh-Dole Act defined how universities can generate licensing revenues from its intellectual property. Similarly, a private company can engage in activities and make investments in the civic economy. So, for example, a private sector firm engages in developing the civic economy when it forms a collaboration with a community college to define more effective career pathways.¹

In the USA, we see a wide range of examples that illustrate the symbiosis between the market and civic economies. The establishment of public land-grant universities, federal government support for the construction of railroads, the G.I. Bill, investments in basic and applied research and the interstate highway system are all clear examples of how the civic economy has operated to support continued investment and expansion of the market economy.

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¹ Often, in the past, we have called these activities "public-private partnerships". We are finding that this term is too narrow to describe the wide range of collaborations emerging in the civic economy.

The Transformation in How Wealth is Created.-- PCRD depicts the transformation taking place in both our market economy and our civic economy in terms of two interlocking S curves. This perspective illustrates that the business models that define markets pass through life cycles. The first curve represents the organizational forms that emerged from the Industrial Revolution.

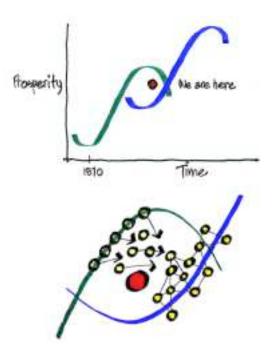


Figure 6.1: Transformation from hierarchies to networks. To move from hierarchies to networks, leaders must migrate the assets embedded in existing organizations to new organizational forms that are more reliant on networks. This S-Curve graphic helps explain that transformation.

Private sector companies, as Chandler explains, organized themselves into hierarchies in order to generate and capture wealth (Chandler, 1993). Within regional economies, civic organizations similarly organized themselves in hierarchies in order to conduct their activities. Beginning about 30 years ago, networks began to emerge as an efficient and effective way to generate and capture wealth (Arthur, 1996).

By depicting the transformation in this way, the challenge facing our regional economies becomes clearer. To be competitive, regions need to migrate standalone assets from the first curve to establish networked assets on the second curve.² We have ample evidence to illustrate what happens to a region that fails to make this transformation. Across the United States, especially in the industrial Midwest, we confront the challenge of shrinking cities, in which both the market and civic economies are in decline. At the same time, evidence is accumulating that regions able to move assets into new networks quickly can make the transformation and continue generating new waves of wealth (Saxenaian, 1994). Recent research has shown that building innovating networks offers a promising strategy not just for entrepreneurial hotspots like Silicon Valley, but also for slower growth second-tier manufacturing regions (Dempwolf, 2012). The prescription is clear: regions that learn how to design and guide complex networks will be more competitive. They will learn faster, spot new market opportunities faster, and align their assets toward these opportunities faster.

Civic Economy Portfolio.-- The PCRD theory of change posits that regions should focus their efforts on building new networks of collaborative investment in five areas: brainpower; innovation and entrepreneurship networks; quality, connected places; new narratives; and collaborative skills. A portfolio of collaborative investments accelerates regional transformation. The university's engagement strategy should be focused on assisting regions develop networks in these areas. The logic underlying this framework runs as follows.

To be competitive in today's global economy, any region must continuously develop networks that produce brainpower with 21st century skills. To generate wealth from this brainpower, the region needs networks of support for innovating companies and entrepreneurs. To be globally competitive, the region must also focus on physical development — creating quality, connected places — because both smart people and innovating companies are mobile. They will only located in quality places that are connected within the region and globally. A competitive region also needs clear narratives — a set of stories — that point to the possibilities ahead: what could and should be. These stories align people to these new possibilities. They

² In presentations to the public we refer to the first curve as our Grandparents' Economy. We refer to the second curve as our Grandchildren's Economy. By simplifying in this way, the core idea — that our economies are undergoing fundamental transformations — becomes more accessible.

create coherence in complex environments and improve both individual and group productivity. Finally, the region needs to develop collaborative skills among its engaged citizens in order to design and guide these networks.

Network Analysis.-- As regions move into this new world of networks, leaders in both the market and civic economies need new tools to visualize and analyze these networks. These tools enable leaders to generate hypotheses about their competitive strengths and how these strengths



Figure 6.2: Two questions of strategy and Strategic Doing. Strategic conversations can speed the formation of networks capable of innovating. Strategic Doing answers the two core questions of strategy by structuring a strategic conversation based on four questions.

might be recombined into new innovating networks or clusters. PCRD has focused on building interactive tools for both industry and occupational cluster analysis (PCRD, 2009). Other researchers are developing new network-based tools for regional innovation analysis, including exploring the application of social network analysis to cluster development (Dempwolf, 2012; Casper, 2007). PCRD's business cluster definitions provide a valuable framework for analyzing the competitive position of regional economy. They uncover value chain

connections within related markets. Occupational cluster analysis provides insights into the talent pool within a regional economy. Exploring occupational clusters provides insights into how the skills within this talent pool match up to the needs of employers in the market economy. PCRD is combining these tools and others into a new interactive platform called Regional Decisionmaker.

Network activation: Strategic Doing.-- Network analysis provides powerful insights into the potential for forming new networks to stimulate innovation, but the activation of these networks — their design and management — requires a new strategy discipline. Strategy is an ongoing process by which members of an organization or network answer two questions: Where we going? And how will we get there? Strategic planning, the traditional approach to designing a strategy, emerged in the 1960s to solve the particular problems of guiding hierarchical

organizations. As business organizations more open organizational forms, the discipline of strategic planning has become less useful (Mintzberg, 1994(a); Morrison, 2012). PCRD has been incubating a new strategy discipline specifically oriented to guiding open, loosely joined networks. This discipline, strategic doing, provides an agile framework for members of the network to develop a strategic action plan quickly, to move toward measurable outcomes, and make adjustments along the way.

Strategic Doing breaks to fundamental questions of strategy into four questions. The first question – What could we do? – invites members of a network to learn about the assets

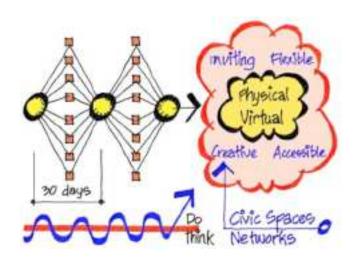


Figure 6.3: Strategic Doing: a recursive process in a safe space. Universities create the civic spaces within which strategic conversations can take place. These spaces are both physical and virtual.

within the network and explore how these assets can be linked and leveraged in new ways. As members of the network connect their assets, they begin finding new opportunities. The second question of Strategic Doing — What should we do? — pushes the strategic conversation within the network to a deeper level. The question prompts members of the network to define an outcome from among the opportunities they have identified. Converting an opportunity into an outcome involves

defining clear characteristics of the outcome that are measurable. As members of the network define the metrics that characterize a successful outcome, they generate a clearer sense of joint purpose and alignment.

The next question of Strategic Doing — What will we do? — begins to chart a pathway to this outcome. Converting ideas into action within a network represents a distributed responsibility. As members make commitments and move into action, they build bonds of trust that improve the effectiveness of the network. Finally, the final question completes the initial version of the network strategy. Members decide when they will come back together to assess their progress.

The last question of Strategic Doing – What's our 30/30? – pushes members of the network toward an assessment of what they did the last 30 days and what they plan to do the next 30 days. The 30 day interval is arbitrary. In some cases, networks get together every 60, 90, or 180 days. The point of the last question is to make clear the commitment of members of the network to continue the strategic conversation and establish a clear discipline of learning by doing. When they come back together, the members of the network can again travel through the four questions and compile the next version of their strategy. Although Strategic Doing is an easy process to understand, it is a difficult discipline to master. Strategic Doing is a collective discipline. Its effectiveness grows as members of the network become more familiar to the discipline imposed by the process.

6.3 Examples of university engagement with network-based models

Purdue and Workforce Innovation.-- Purdue launched one of the first large-scale applications of network-based approaches to regional engagement in a 14 county region anchored by its main campus. Like many regions in the Midwest, this region has suffered significant relative decline with contraction of manufacturing (Longworth, 2008). Equipped with a \$15 million-dollar grant from the US Department of Labor to promote innovations in workforce development, Purdue organized collaborations in four focus areas: entrepreneurship support; 21st century skill development; innovation support; and leadership development. These focus areas tracked three of the five areas of regional transformation: developing brainpower, improving innovation support networks and strengthening collaboration through a disciplined process of strategic doing. Grant restrictions prevented PCRD from investing any funds in developing new narratives or in making improvements to physical infrastructure.

After four years, Purdue launched over 60 collaborative initiatives. Over 80% of these initiatives continued past the initial funding. Results included training over 1,500 entrepreneurs; training over 15,000 workers; supporting over 7,600 high school students in new STEM (Science Technology Engineering and Math) disciplines; and providing training in supply chain management over 500 companies. Because PCRD took time to develop and follow a strategy discipline, PCRD was able to keep the administrative costs of these initiatives very low. PCRD

hired an additional 1.5 full-time equivalent professional staff to manage the \$15 million investment. PCRD's experiment of using these models demonstrated that network-based models could generate dramatic improvements in the productivity of federal investments in workforce development (Hutcheson and Morrison, 2012).

University of Wisconsin and the water cluster.-- In 2007, the University of Wisconsin – Milwaukee sponsored a meeting in Milwaukee to explore the development of a cluster in freshwater technology. Sixty people attended the event to explore the assets within the region. These discussions led to a white paper and plans for a second summit (White, 2008). The second summit, held July 14, 2008, included an introduction to strategic doing with a workshop provided by PCRD to the 100 or so attendees.

In the Fall of 2008, the leadership of the cluster developed their basic strategy during a 36 hour "lockdown" session. The strategy set clear outcomes in talent development (brainpower); global communications (narratives); governance (collaboration); and corporate/university linkages (innovation and brainpower). The strategy also called for the establishment of a School of Freshwater Sciences and Research Park (brainpower, innovation, and quality place). The strategic doing framework, including the portfolio for civic economy investments, guided the initial development of the cluster. The strategy is being continuously revised to identify additional opportunities to "link and leverage" the region's assets.

Arizona State and the solar cluster.-- Arizona State University (ASU) has worked with PCRD to develop a strategy process leading to the formation of a solar cluster. Network-based strategy models encourage university professionals to design engagement experiences that help develop and focus the networks needed for cluster development. ASU has used these models to design engaging experiences and identify working teams within specific focus areas.

In the first summit, held August 2-3, 2011, participants received a briefing book prior to the event. ASU requested each participant to complete a homework assignment in which they identified and evaluated potential collaborations to expand collaborative investment in the cluster. Participants ranked their collaborative ideas along two dimensions: the size of the potential impact and the difficulty of implementation. During the summit working session, the participants were asked to propose their collaborations for consideration by the group. Once a

preliminary list of collaborations emerged, the participants then turned their attention to ranking the collaboration using the same criteria: size of impact and easy of implementation. Text voting enabled quick assessments of each collaborative option. The first summit led to the formation of working groups with activities falling into the framework of the civic economy portfolio. The initial four groups included: Workforce and Supply Chain (brainpower); Policy and Finance (innovation); and Applied Research Collaborations and Pilot Projects (innovation); Building and Strengthening the Narrative (narrative).

ASU held a second summit six months later on March 26-27, 2012. In addition to a program that explored the regulatory barriers to solar development in Arizona, the summit participants received updates from the working groups on their progress and their next six month agenda. ASU held its third solar summit from October 9-10, 2012. During the first day of the summit, participants took field trips to learn in more depth how solar technology and business development are taking place in Arizona. The working groups continued to advance their work by presenting proposals for collaborative investments, as well as budgets and action plans for moving forward.

Michigan State and regenerating inner city neighborhoods.-- In one of the most ambitious applications of these network-based models, professionals at Michigan State University are guiding the development of new networks to regenerate the community some neighborhoods in Flint, Michigan. Over the past 40 years, Flint has absorbed massive economic blows. Employment in the auto industry has declined from its peak of 80,000 workers to only 8,000 in 2010. The city has lost most of its tax base. With a vacancy rate of about 21%, Flint's neighborhoods are blighted with abandoned buildings and high rates of crime.

In 2010, a new neighborhood partnership formed to pursue a federal grant that encouraged applicants to take a more systems level view of their neighborhoods. The grant application was turned down, but the partners in Flint reconvened in January 2012 to explore some next steps. A core team of seven people emerged to outline principles for moving forward. These principles focused on designing practical collaborations to improve the lives of neighborhood children and youth based on available resources and assets.

From these initial steps, the core team quickly launched a new Strategic Doing network. In December 2014, over 30 neighborhood activists in Flint came together for a three day training session for designing and executing strategy in open, loosely connected networks. Subsequently, 17 practitioners indicated that they wanted to continue their training with field experiences required to get certified by Purdue. With certification, they will incorporate agile strategy disciplines into their existing work and introduce the approach to others. So, for example, professionals from the community foundation are looking to use Strategic Doing in a five-year effort to create a sustainable and equitable local food system. They are also looking to use it with a major literacy initiative and their neighborhood summit work. We are now scheduling Strategic Doing training in Flint twice a year, in order to introduce the discipline to others who are confronting the challenges of regenerating their urban neighborhoods.

Northern Illinois University and Purdue and collaborations in Rockford.— Northern Illinois University and Purdue are partnering to support a project to redesign how the City of Rockford makes community development investments among over twenty community and economic development organizations. Across the country, local governments are facing major financial challenges. Rockford is no different. The city's mayor challenged organizations funded by the city to design a collaborative strategy for the city's community and economic development investments. In response, the groups formed the Economic, Development, Education and Entrepreneurship Network also known as EDEEN.

The City Council has agreed to support this initiative, as members of the network learn to collaborate using the discipline of strategic doing. The traditional process of funding each group separately created no incentives for collaboration. By pushing the groups to develop a collaborative strategy, the Mayor and the Council encourage crossing traditional boundaries. EDEEN began meeting regularly in 2012.

Stanford, VentureWell and redesigning undergraduate engineering education.— In an initiative funded by the National Science Foundation and managed by Stanford university and VentureWell, 37 universities are now transforming their undergraduate engineering programmes using the agile strategy disciplines of strategic doing. The initiative, Pathways to Innovation, focuses on introducing entrepreneurship and innovation educational experiences to

undergraduate engineering. The first cohort of 12 universities began the programme in January 2014. The second cohort of 25 schools began their transformation journey in January 2015. In addition to building collaborations with in engineering schools, the Pathways initiative accelerates the collaboration of enterprising engineer in faculty and students across universities.

6. 4 Summary

The network-based approach to university engagement is in its infancy. Purdue has incubated some promising tools and disciplines that universities can use to design and guide the networks needed to transform regional economies. We have launched a number of promising pilot projects, and we are learning some important lessons. First, not all networks of the same. A community of interest — all the fans of the Boston Red Sox, for example — represents a very loose network. The learning community, in which members of a network help each other accelerate their learning, represents a more formal network. Regional economic transformation, however, relies on a third type of network, an innovating network. Members of an innovating network share the objective of creating something new together by linking and leveraging assets within their network. Innovating networks require high levels of trust among the members. Building these innovating networks takes time and discipline.

We are learning that the collective discipline of Strategic Doing takes time to spread throughout the network. Like any new discipline, it takes practice to master. Universities can play an important role in supporting this learning. We are have found that metrics play a different role in networks than in hierarchical organizations. In a hierarchical organization, the top-tier management develops a strategy, and the rest of the organization is charged with execution. In this context, metrics allow top management to make sure that their directives are being carried out. In a network, metrics play a different role. They enable members of the network to learn what works. As networks evolve and become more sophisticated, members tend to embrace metrics to help them learn. Finally, developing a new discipline of strategy for open networks needs continuous evaluation. We are working to define the protocols that will enable us to gather data across networks. Only then can we develop reliable measures of effectiveness and set the stage for continuous improvement. Based on the promising and dramatic results generated by

Strategic Doing, Purdue has launched a new certification in the discipline. A new non-profit institute, the Strategic Doing Institute, has been formed to support a growing network of colleges and universities engaged in the discipline. Based on the promising results generated by Strategic Doing, Purdue has launched a new certification in the discipline. To support this new discipline nationally, Purdue formed network of colleges and universities to teach this discipline.

Chapter 7: Shoals Shift Project

Introductory comment.— In addressing the complex transformations we face, universities can play a central role in these transitions. To do so, universities will need to fashion a more aggressive role in the regional economies they serve (Trencher, 2014). From 2005 to 2019, our Purdue team developed tools and frameworks for universities to guide complex regional economic systems. Our approach is deeply grounded in the emerging field of complexity economies and the notion that our economy consists of networks embedded in other networks (Arthur et al., 2020). In 2014, I began working with the University of North Alabama to deploy Strategic Doing to transform their regional economy into a more sustainable, entrepreneurial economy. As of late 2020, over sixty faculty and staff at the university have taken the two and a half-day master class in Strategic Doing. This chapter tells Shoals Shift's story, a regional initiative pioneered by the university and anchored by Strategic Doing. The Journal of Entrepreneurship and Public Policy published this chapter as "Shoals Shift Project: An Ecosystem Success Story" (Morrison et al., 2019). I co-authored this paper with Douglas Barrett and Janyce Fadden of the College of Business at the University of North Alabama. My contribution focuses on the theory of developing ecosystems using Strategic Doing. My coauthors provided a detailed description of the Shoals Shift story and how they applied these models. Shoals Shift won national and international recognition: the 2016 University Economic Development Association Innovation + Talent award and the 2019 Deshpande Foundation Rising Star award.

7.1 Abstract

Purpose.— This paper is a case study applying a reflective theory of development for entrepreneurial ecosystems in the Muscle Shoals region of northern Alabama. The theory provides guidance for practitioners and policymakers interested in developing entrepreneurial ecosystems.

Design.— The theory offers five propositions, which are illustrated and applied in the case study. The propositions include the need for civic leaders recognizing local talent; support

networks for entrepreneurs; a quality, connected place; activities designed to increase interactivity of entrepreneurs within the ecosystem; five distinct phases producing replicable, scalable, and sustainable projects; and universities providing platforms upon which the ecosystems can develop.

Findings.— Application of the proposed theory is transforming the entrepreneurial ecosystem in the Muscle Shoals region. In just four years, the project has produced over thirty initiatives and events, precipitously increased student participation in entrepreneurial ventures, and raised over \$1 million.

Value.— The theory and its application developed from a collaboration between the Agile Strategy Lab at Purdue University and the Institute for Innovation and Economic Development at the University of North Alabama. This collaboration is replicable, scalable, and sustainable, and is a model for university-led entrepreneurial ecosystem development and transformation.

7.2 Introduction

The transformations underway in our global economy have created new opportunities for universities to play an increasingly important role in their regional economies (Walshok, 1995). And yet, the complexity of this transformation provides no clear pathway forward for universities. Globalization has increased the importance of knowledge generation, the prominence of regional economies, the significance of entrepreneurial and innovation activities, and the importance that networks provide to regions. Deep veins of research have documented these intersecting trends, particularly the focus on regions to understand the practical impacts of globalization (Storper, 1997), the significance of networks within regions to illustrate how regions adjust to technology shifts (Saxenian 1996), and the importance of innovation systems to explain regional prosperity (Cooke, 2001).

As these trends have been identified and documented, scholars have explored different dimensions of the university role in rapidly evolving regional economies. They developed the concept of the "entrepreneurial university" to describe universities that are more open and flexible to new market opportunities (Clark, 2001). Another thread of research has focused on the relationships that universities developed within dynamic regions. These relationships can be

characterized as a Triple Helix, a Quadruple Helix, or even a Quintuple Helix depending on the scope of these relationships (Leydesdorff & Etzkowitz, 1996; Etzkowitz & Leydesdorff, 2000; Leydesdorff & Meyer, 2003; Carayannis et al., 2010). From the practitioner viewpoint, these concepts of an "entrepreneurial university" or a "helix" of complex relationships provides very little guidance. It is relatively difficult to translate broad, even compelling concepts into practical initiatives (Rodrigues & Melo, 2012; 2013).

More recently, another potential line of research offers promise to universities in helping them to define their emerging role in regional economies. Drawing on business ecosystems research, the concept of entrepreneurial ecosystems has emerged as a popular frame for research. This paper explores entrepreneurial ecosystems from the perspective of the "reflective practitioner" (Schon, 1983). The purpose is to explore how this concept can be made more practical, replicable, sustainable, scalable, and applied.

The propositions presented in this paper were developed by the Agile Strategy Lab at Purdue University and are the basis for a novel way to translate complex issues into practical initiatives. The Shoals Shift Project case study which began in 2014 used this theory as presented and is the research basis for this paper. The University of North Alabama's Center for Innovation and Economic Development compiles the data for the project. Annually the team evaluates the data, determines successes and failures, makes recommended changes and implements the next year's initiatives. In 2016, the Shoals Entrepreneurial Center received an Appalachian Regional Commission 3-year grant that allowed the collaboration including University of North Alabama and the Shoals Chamber of Commerce to expand initiatives and thus gain additional access to data and participants. Two of the authors are active in the Shoals Shift Project and are able to gain access to data, interview participants and document the program.

The paper proceeds as follows. The next section explores the emerging literature around ecosystems and platforms. This literature provides a foundation for the theoretical section that follows. Derived from practice, the exploration of theory identifies some emerging concepts in the application of entrepreneurial ecosystems to regional economies. Based on the work of the Agile Strategy Lab at Purdue University, this section sets forth a series of propositions about how the university can develop effective policies and practices to build entrepreneurial ecosystems. It

is demonstrated how this emerging theory has been applied in the Muscle Shoals region of northern Alabama. The paper concludes with reflections on the implications of this work for policy and further research.

7. 3 Literature Review

Universities long have played a role in regional economic development and growth. (See, e.g., Breznitz 2014, or Kenney and Mowrey, 2014.) Traditionally, economic development is divided into three "legs": business retention and expansion, recruitment, and startups. (See, e.g., Blair and Carroll 2009.) According to the University Economic Development Association Higher Education Engagement in Economic Development: Foundations for Strategy and Practice, (Klein and Woodell, 2015) the following definition is applicable.

"In higher education, economic development means proactive institutional engagement, with partners and stakeholders, in sustainable growth of the competitive capacities that contribute to the advancement of society through the realization of individual, firm, community, and regional-to-global economic and social potential."

To this end, Klein and Woodell (2015) reframe the traditional three "legs" with talent, innovation, and place. Economic development will not occur without 21st century talent and brainpower, research and innovation, and stewardship of place. Regardless of which model one views as more appropriate, a university achieving efficacy in economic development pursuits will serve as a facilitator of efforts to improve the talent and innovation pipelines.

Recent scholarship points to the early development of the entrepreneurial ecosystem construct. As Roundy, Bradshaw and Brockman (2018) conclude, "what is missing from prior work on entrepreneurial ecosystems is a guiding theoretical framework....We know surprisingly little about how ecosystems emerge, adapt and produce outcomes impacting society". To help fill this gap, the authors go on to propose viewing entrepreneurial ecosystems from the perspective of complex adaptive systems. An entrepreneurial ecosystem is a self-organized, adaptive, geographically-bounded community of individuals and organizations. They self-organize into a coherent structure within which new ventures form dissolve over time (Roundy et al., 2018). This stance carries with it several important implications:

- Describing an entrepreneurial ecosystem must move beyond simply producing a list of components. The interactions among individuals and organizations within the ecosystem how these agents connect and the patterns that emerge are central to the development and strength of the ecosystem. We know relatively little about these interactions; this dimension needs further investigation.
- An entrepreneurial ecosystem self-organizes over time in a series of phases, but we also know relatively little about how entrepreneurial ecosystems develop. There are a few longitudinal studies available to provide these insights.
- An entrepreneurial ecosystem operates with feedback loops that enable the system
 to learn and adapt. The system operates with distinct but open boundaries, so it
 responds and adapts to its environment. In other words, the civic context within
 which entrepreneurial ecosystems develop can either speed or retard the process
 of development.
- The coherence of the ecosystem emerges through patterns of common behavior among individuals operating with the system. Strengthening these patterns in how individuals frame conversations, behave, and work together will likely speed the development of the system.

In an extensive review of the literature on entrepreneurial ecosystems, Cavallo, Ghezzi and Balocco (2018) suggest some directions for future research. These recommendations can provide the path forward to advancing the theoretical insight that entrepreneurial systems operate as complex adaptive systems. Specifically, Cavallo et al. (2018) call on scholars to advance the current understanding of how to create an entrepreneurial ecosystem, what makes it grow, and ultimately what leads to sustainability.

Here, the insights of scholars from management provide some valuable guidance. These scholars have connected the concept of platforms to ecosystems. Moore (1993) introduced the concept of the business ecosystem nearly 25 years ago. Gawer and Cusumano (2002) explored how companies like Intel, Microsoft and Cisco designed platforms on which their business ecosystems could grow. Hagel, Brown & Davidson (2012) introduced the concept of "pull platforms" from which participants pull resources to accelerate innovation. From this perspective, businesses focus on orchestrating platforms that provide an inviting environment on which networks create shared value (Dhanaraj & Parkhe, 2006). This "platform management perspective" provides insights into how ecosystems develop (Tsujimoto et al., 2017). Platforms represent a portfolio of products, services or technology that create a foundation on which an ecosystem grows (Gawer and Cusumano, 2014).

Thus far, literature on entrepreneurial ecosystems, still early in development, largely lacks a practitioner perspective. Reflective practice can provide important insights into the development of theory (Schon, 1983). Practitioners engaged in reflective thinking routinely generate expert knowledge for use in practice. Dewey characterized the process of reflective thinking as first encountering a state of doubt, hesitation, perplexity, followed by an act of searching, hunting, inquiring to find insights that will resolve the doubt (Dewey, 1933, 1941). The process involves an iterative cycle of thinking in the midst of practice. Through experience, the practitioner reframes the challenges of practice and makes adjustments. Reflective theory (or theories-in-use) emerge from this iterative cycle. According to Schon (1988), theories-in-use synthesize both explicit theories and informal knowledge to guide practitioners. Seen in another way, reflective theory fills the gaps left by formal, academic knowledge.

7.4 Theory

This paper sets forth reflective theory on entrepreneurial ecosystems generated by the Purdue Agile Strategy Lab at Purdue University (Purdue). Since 2005, practitioners at the lab have been developing new approaches to collaboration and strategy in complex, open systems, like regional innovation systems, clusters, and entrepreneurial ecosystems. Based on this work, several propositions have been generated to guide this reflective theory.

- Proposition 1: It is possible to develop strategy in the open, loosely connected networks that characterize entrepreneurial ecosystems by following a discipline of simple rules.
- Proposition 2: Universities can design platforms to guide and accelerate the development collaborations from which entrepreneurial ecosystems emerge.
- Proposition 3: An entrepreneurial ecosystem develops through a series of phases or "horizons".
- Proposition 4: A dynamic entrepreneurial ecosystem emerges from a portfolio of complex, interconnected collaborations in the following strategic focus areas: 1) talent development; 2) entrepreneurial support networks; 3) quality connected places; and 4) new narratives; and 5) planned activities to increase intentional interactions and collaborative skills.

The following addresses each of these propositions.

Proposition 1: Strategy in open, loosely connected networks: It is possible to develop

strategy in the open, loosely connected networks that characterize entrepreneurial ecosystems by following a discipline of simple rules.

Ecosystems are formed by the accumulation of collaborations, the interactions among individuals within the ecosystem. As these interactions become more dense, ecosystem becomes more vibrant and, potentially, resilient. The question arises whether a strategy discipline applied to open, loosely connected networks can increase the volume, velocity and productivity of collaborations within the ecosystem.

Since 2005, practitioners at Purdue have been experimenting with a new strategy discipline designed specifically for open, loosely connected networks. Stripped to its most basic level, a strategy describes where an organization is going and how it will get there (Chandler, 1962). Traditionally, hierarchically based organizations have relied on protocols and procedures defined as strategic planning. Initially developed for large, multidisciplinary corporations, strategic planning methodologies made their way into the universities in the 1980s (Dooris, et al., 2004). As markets have become more dynamic, dissatisfaction with traditional strategic planning has grown (Mintzberg, 1993).

Strategy in open, loosely connected networks is a different discipline from strategic planning, which was designed to guide hierarchical organizations. In open loosely connected networks there is no command and control structure in place. Participants in the collaboration cannot tell each other what to do. In a wide range of field experiences, Purdue practitioners have found that a new discipline they have defined, called Strategic Doing, can be effective for universities in building collaborations quickly complex situations. (Morrison, 2013; 2015). These situations include accelerating community development (Morrison, 2012); creating new collaborations in workforce development (Hutcheson & Morrison, 2012); and improving the undergraduate experience in engineering education (Sullivan et al., 2016; Nilsen et al, 2016; Nilsen et al, 2017).

As a neutral convener, universities are excellent facilitators of collaboration. Finding appropriate partners is a key component for collaborative success. Cotsones (2013) defines four necessary factors for effective collaboration: shared vision, leadership, functional networks, and resources. The specific partners may differ from region to region, but these factors should drive

the decision to select appropriate organizations with whom to work.

Hutcheson (2013) offers further clarification with respect to economic and community development foundations and action. A group convening to enact ecosystem transformation must be ready for change. Conditioned on this readiness, the following conditions are associated with a higher likelihood for effectiveness: 1) they come together in loosely joined networks; 2) they link and leverage network assets; 3) they build trust through an iterative process in which planning and doing are integrated; 4) they share responsibility for action across multiple organizations; and 5) they generate near-term early successes in meeting their goals.

Strategic Doing provides a protocol of simple rules for groups of individuals to come together and address complex problems for which there is no obvious or predetermined solution. These challenges are inherently complex and dynamic, what have been called "wicked problems" that universities address (Dentoni & Bitzer, 2015; Rittel & Weber, 1973). The discipline is based on the notion that effective collaborations follow a structured set of conversations. The underlying structure of these conversations can be invoked through a series of simple, but not easy questions. As such, Strategic Doing follows the guidance of Eisenhardt and Sull (2001), who found that strategy in dynamic environments involves a discipline of following simple rules. Teaching these simple rules to participants across an ecosystem will speed the development of the ecosystem.

Proposition 2: Universities as platforms for ecosystem development: Universities can design platforms to guide and accelerate the development collaborations from which entrepreneurial ecosystems emerge.

While the connection between platforms and ecosystems developed in the business management literature, the connection can help universities to find their role in the development of ecosystems. A platform for entrepreneurial ecosystem is space for convening, learning and the formation of collaborations. Individuals with different backgrounds come together to address common challenges or opportunities. Through these interactions, they form collaborations which, taken together, develop an ecosystem. The university can intentionally design these platforms through a range of activities designed to stimulate collaboration. More than a single physical or digital space, the platform represents a metaphor for providing a space within which interactions

can occur that are essential to the formation and development of the ecosystem.

By stimulating activity on the platform, the university encourages individuals to move from their traditional hierarchical mindsets to more horizontal, collaborative mindsets and behaviors. These interactive activities promote the formation of complex collaborations that make up the ecosystem. Scholars are only beginning to investigate the role of the university as a platform for the design and development of ecosystems (Grobbelaar, 2018; Nyman, 2015). The proposed theory emphasizes that an effective university platform for ecosystem development includes both physical locations where face-to-face interactions can take place and a steady stream of activities designed to create shared value among the participants. A supportive digital platform is helpful, but not essential. In addition to providing a venue for the formation of collaborations, the platform provides opportunities for faculty at the university to develop curricula, teaching materials, and case study research.

Proposition 3: Phases of ecosystem development: An entrepreneurial ecosystem develops through a series of phases or "horizons".

Generally, the literature on entrepreneurial ecosystems treats these systems as static (Borissenko and Boschma, 2017). This gap leads to a poor understanding of how entrepreneurial ecosystems establish themselves and evolve over time. Like Roundy, Bradshaw and Brockman, we theorize that ecosystems develop in phases (Roundy, et al., 2018). The phases proposed are as follows and are summarized in Figure 7.1:

- **Phase 1:** The conversation shifts toward mutual benefits. Value creating interactions depend on connections and conversations that focus on the creation of mutual benefits. Taken together, these interactions form the civic culture of a region. When the civic culture is inclusive, when interactions focus on mutual benefits, collaborations form more easily. On the other hand, when the civic culture is characterized more by individual extraction how individuals can benefit narrowly, collaborations are far more difficult to form. As a consequence, ecosystems will form more quickly when the pattern of conversation focuses on mutual benefits (Putnam, 1994).
- **Phase 2:** A core team forms to design and guide the formation of an ecosystem. Transforming an ecosystem represents a complex process within a regional economy. The proposed theory is that this complex transformation takes place more quickly when a core team of individuals comes together to develop an agenda for collective action.

- **Phase 3:** A strategic agenda emerges. The core team guides conversations that lead to a strategic agenda for ecosystem development. This agenda includes a range of activities and investments that will stimulate the formation of collaborations and new value creation.
- **Phase 4:** Initial pilot projects launched. In the next phase, the strategic agenda comes to life as initial pilot projects are launched. These pilot projects serve to test hypotheses about what could work, as well as expanding existing networks of individuals involved in the ecosystem development.
- **Phase 5:** Collaborations continue to invest. As new patterns of interaction emerge, network effects take hold. Both the number and scale of collaborations increases. An expanding pattern of self-directed teams moves on new opportunities for value creating interactions. Through this expansion, the ecosystem achieves sustainability.

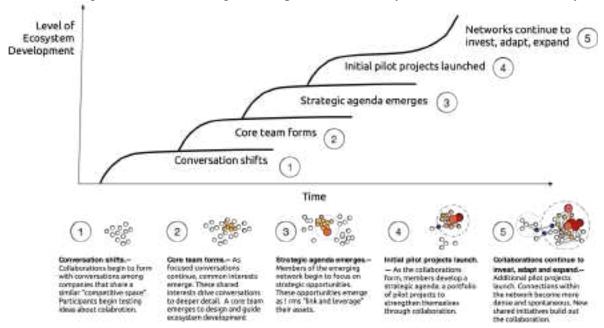


Figure 7.1: Phases of ecosystem development. As ecosystems develop, they move through identifiable horizons.

Proposition 4: Portfolio of collaborations for ecosystem development: A vibrant ecosystem emerges from a portfolio of collaborations which, in turn, embeds a theory of change.

Further, the proposed theory proposes that collaborations to support a vibrant ecosystem will fall into identifiable focus areas of activity. These focus areas, summarized in Chart 2, reflect what is required for the ecosystem to prosper and become sustainable. They include:

- Collaborations to build brainpower The long-term health of the ecosystem depends on brainpower (Barro, 2013; Hanushek et. al., 2008). The mixture of brainpower within the ecosystem is unique. It reflects education, skills, research, ideas, and knowledge that can be converted into value. Without collaborations to renew brainpower continuously, the ecosystem has no long-term sustainability.
- Collaborations to support entrepreneurs Entrepreneurs convert brainpower in to value. They represent central actors to the entrepreneurial ecosystem (**Roundy** et al., 2018). Yet, they cannot act alone. To be successful entrepreneurs need teams and networks (Klotz, et al., 2014; Nikiforou et al., 2018; cf. Greenberg & Mollick, 2018; Hallam et al., 2018). These teams and networks form to channel required resources to the growing firm.
- Collaborations to develop quality places Entrepreneurs are attracted to quality places where they can quickly assemble the resources they need to grow their business. At the same time, entrepreneurs also transform their communities (Feldman, 2014). The place creates the local context within which entrepreneurial ecosystems develop. This context is critical to understanding how these ecosystems develop (Audresch & Belitski, 2017; Autio, et al, 2014).
- Collaborations to develop new narratives Ecosystems emerge from conversations. The pattern of conversation reflects a prevailing narrative within a region. As ecosystems emerge and develop, new stories propel them forward. These stories enable participants to make sense of entrepreneurial opportunities within the evolving ecosystem (Roundy, 2016, 2019).
- Collaborations to increase intentional interactions and develop collaborative skills Finally, new and developing ecosystems need activities and shared skills to stimulate collaborations. These activities extend beyond networking events to include both 1) forums that serve to uncover hidden assets within social networks and 2) project-based conversations that can identify new opportunities to collaborate (Thompson et al. 2018). These face to face contacts accelerate the development of trust within the ecosystem (Storper & Venables, 2004).

The logic of these focus areas fits together as follows: for an ecosystem to prosper, civic leaders should cultivate talent capable of mastering technology; they should provide opportunities for talented people to convert their ideas and skills into wealth through support networks for startup companies; they should provide quality, connected places for these support networks to form and grow; they should design clear narratives to inspire people to engage in the ecosystem; and, finally, they should create a continuous flow of intentional interactions to develop collaborative skills.

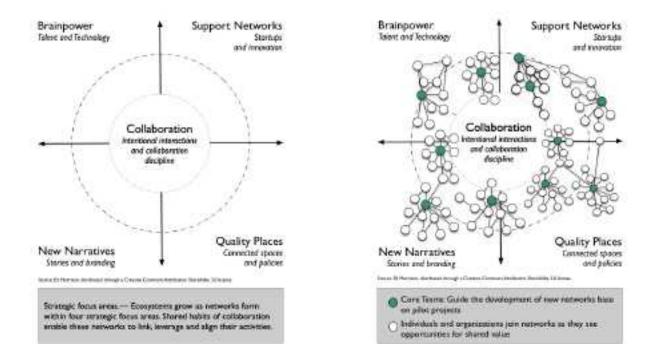


Figure 7.2: Portfolio of collaborations for ecosystem development. Ecosystems develop with a portfolio of collaborations. The theory of change is embedded in four different types of collaborations required. Each type has a different strategic focus.

Theory Summary

Based these propositions, a new theory of entrepreneurial ecosystem development follows:

- 1. Ecosystem development depends on widely shared collaborative skills. Collaboration itself is a complex process that engages multiple skills and takes practice to master. Strategic Doing, an agile management discipline, has emerged as a replicable, scalable and sustainable approach to teaching these skills, a shared operating system for ecosystem development. The more people within a region who have mastered these skills, the faster ecosystems will develop.
- 2. Ecosystems require platforms that can be designed and guided. Ecosystems are complex, dynamic systems. They cannot be designed. Yet, the platforms on which these ecosystems can form can be designed and guided. With platforms guided using an agile strategy discipline (Proposition 1) collaboration can form quickly on these platforms. In regions, as Proposition 4 explains, universities are in an ideal position to design and guide the platforms on which ecosystems can grow.

- 3. Ecosystems develop in stages over a number of years. They emerge through continuous experimentation guided by an agile strategy discipline (Proposition 1). As they emerge, ecosystems develop through five identifiable phases. This development path takes time and persistence. A core team provides persistence and continuity to focus on diverse collaborative activities on the platform (Propositions 2 and 4) and at the same time teach the skills of shared collaboration (Proposition 1) to speed the process.
- 4. Ecosystems emerge from a dynamic portfolio of collaborations in five focus areas. Every region faces global competition. Ecosystems can help regions prosper, if they 1) develop brainpower; 2) convert this brainpower into value through entrepreneurship support networks; 3) create quality, connected places to attract and keep entrepreneurs and their support networks; 4) create new narratives to point toward new entrepreneurial opportunities; and 5) strengthen collaborative skills and connections across the emerging ecosystem. Unlike other institutions or organizations within a region, universities can actively participate in all five focus areas. They are in an ideal position to design and guide platforms (Proposition 2) to form them.

7.5 Theory Application: Shoals Shift Project

In 2014, as the aftermath of the Great Recession dragged on, the local economy lost 1,900 manufacturing jobs to factory closures. The regional leaders began searching how to rebuild jobs in the face of a new economy. At the same time, University of North Alabama (UNA) students were asking university leaders why the region did not have appropriate jobs for their skills upon graduation, forcing them to seek opportunities elsewhere. At the Shoals Chamber of Commerce, young business leaders, including several UNA alumni, challenged the organization to justify why they should keep their newly established ventures in the Shoals. Responding to these dual demands required a focused economic development effort to drive the region's growth.

UNA heard the voices of its students and young business leaders as an urgent call-to-action. The University recognized that typical academic approaches like offering new majors and minors and convening community leaders might be a part of its response, but that it would need to fundamentally expand its traditional role to fully address the complex challenge of regional economic development and the depletion of the region's manufacturing sector.

As a result, the University partnered with the Shoals Chamber of Commerce and the Shoals Business Incubator to build a new collaboration that would change the region's economic trajectory. This would be no small feat; the Shoals is a rural community that has long relied on manufacturing jobs for its economic sustenance. Defined by the boundaries of Alabama's Colbert and Lauderdale Counties, the Shoals is home to many residents who face trenchant, generational poverty. Residents on average earn only 73% of the nation's per capita income. Only 20% of adult residents have a Bachelor's degree or higher educational attainment compared to the US average of 30%, and family household poverty is 20% higher than the national average. Named Shoals Shift, this unique collaborative effort was launched to leverage existing assets within the region and develop creative ways to grow a digital economy. Long-term success equates to retaining UNA graduates in the area by promoting the development of new ventures and generating new 21st Century jobs in existing industries and in growing local startups. Maybe even attracting a growing company to the region.

The collaborative team is deeply committed to this work and has consciously embraced an action-biased approach of "doing not waiting." Like entrepreneurs, the team has been willing to experiment and try new ideas, even in the face of great uncertainty. For example, the first business plan competition it hosted in 2014 was announced and planned even though program funding was not yet secured. Through their networks, the team was able to raise the necessary \$15,000 and host a successful competition.

The partnership has arranged an array of open competitive events to create highly visible venues through which it can simultaneously spur student learning and community enthusiasm. Having students compete with community participants advances a real-world experience that is difficult to reproduce in the classroom. It also exposes community leaders to entrepreneurial students sooner than similar academic program models, resulting in deeper relationships earlier.

The team embraced Strategic Doing to create a transformative movement with the goal of expanding the digital technology cluster. The team's work in Strategic Doing has allowed it to reach and train broad audiences in collaborative problem-solving while building community enthusiasm and growing its network of supporters. Through a collaboration with the Purdue Agile Strategy Lab, the team began conducting regular training in Strategic Doing. In effect, the

strategy discipline became a widely shared "operating system" for building the complex collaborations required for developing an ecosystem.

Over four years, progress has been extremely swift as the community has rallied around the collaboration. To begin building a new narrative around these activities, the team labeled their collective initiatives and their growing networks "Shoals Shift". The core team guides Shoals Shift and hosts a suite of events with more than 250 competitors that are now part of the region's business calendar and culture. The core team raises over \$150,000 annually, and in 2016, its efforts were rewarded with a \$997,150 Appalachian Regional Commission Partnerships for Opportunity and Workforce and Economic Revitalization (POWER). The Project has educated more than 200 UNA students in entrepreneurial approaches and assisted 17 UNA student startups that are raising capital and creating jobs – all to create a brighter future in a region that had grown accustomed to decline.

Innovation via transformation

Since its beginning, Shoals Shift has compelled the partners including UNA, Shoals Chamber of Commerce, and the Shoals Business Incubator to consider carefully how to present Shoals Shift to the community. In many cases, these organizations have had to shift their narrative away from the traditional economic development strategy of recruiting manufacturing companies. This collaboration is built on the key tenants of Strategic Doing. These tenets involve uncovering hidden assets within the region; linking and leveraging these assets to define new opportunities; quickly defining collaborative projects to investigate these opportunities; and intentionally cultivating a collaborative culture of mutual trust and respect. The participants found that with each succeeding project their capability increased to predict success and take on larger challenges.

The graphic chart 3 below reflects the wide array of initiatives Shoals Shift has launched since 2014 and highlights the associated long-term economic development objectives of those efforts. At the base of the pyramid are innovative curricular programs at UNA – what universities know and do best. On that foundation, UNA has created a layer of new co-curricular programs to spur student entrepreneurial action outside of credit-bearing coursework. All of the programs

at UNA include involving business leaders with the students. Having the students meet and be welcomed in the community is another way to show students that they will have the support they need if they stay in the region to build their startup business. By crossing the dotted yellow line in middle of the pyramid to include community participation, the partners have taken on a responsibility to act as a collaboration – moving beyond typical organization pursuits to foster deep-rooted regional change. The projects evolved opportunistically. Moving forward with an initiative depended on whether an enthusiastic team was ready to pursue the initiative from idea to reality.

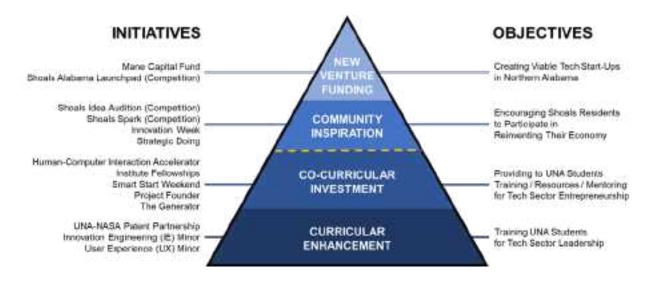


Figure 7.3: Shoals Shift initiatives. This graphic helps explain the structure of the Shoals Shift initiatives to the community.

Following are foundation-to-capstone summaries of the Shoals Shift's innovative initiatives.

Curricular enhancement

Technology-Focused Minors: UNA's College of Business has added two minor courses of study: Innovation and Entrepreneurship (IE) and Human Computer Interaction/User Experience (UX), to train students to lead and work in technology businesses in the area. IE is a groundbreaking minor that provides a systematic approach to student-driven innovation. It introduces tools and methods for creating, communicating, and commercializing meaningful, unique ideas. Students are taught in a flipped classroom style that allows them to work in teams.

Learned skills apply to both individual entrepreneurship and leading innovation in existing companies.

For students, Innovation and Entrepreneurship complements any major or field of study, including the sciences, arts, humanities, business, engineering, and education and enables them to learn how to employ the tools and methods of innovation in their field of interest. IE helps them to acquire skills that are essential to participation in the global economy and facilitates them to gain knowledge to lead the commercialization of new products, services and technologies. For employers, Innovation and Entrepreneurship accelerates a continuous flow of innovations - big and small - to address department, division, and company problems and opportunities and can be used on major innovation projects that have a dramatic impact on sales and profits or minor projects that help transform the culture. Focusing on a four-stage process of Define, Discover, Develop and Deliver allows the program to integrate painlessly with classic project management systems such as Compression Planning, Stage-Gate, Design for 6 Sigma, or Hoshin Planning. Introduced in 2014, 86 students have taken courses in the minor; ten have earned the minor thus far, and eighteen are on track to graduate with it. User Experience (UX) students learn to understand the expectations and needs of end-users in order to develop more efficient software and technology products. This interdisciplinary minor includes students from Art, English and Professional Writing, Psychology, Geography, Computer Science and Computer Information Systems. UNA has recently invested in 2 labs (described below) to allow the students access to real-world problem solving by teaming with local and regional industrial companies. One lab is for studying Human Computer Interaction and the other lab is for Cybersecurity. Thus far, 89 students have taken UX coursework, yielding thirteen graduates and fourteen more on track to earn the minor. The graduating students find themselves being sought after by employers.

UNA-NASA Patent Partnership: Launched in February 2017, the NASA partnership was ratified and announced during the inaugural NASA Day at UNA event. The collaboration engages undergraduate students majoring in science and business through a Business Plan Writing class. "The program is an innovative approach to engage students early on as undergraduates and employ nontraditional classroom methods to allow top students to engage in

experiential learning," according to Dr. Santanu Borah, UNA Professor of Management. Students gain entrepreneurial experience conducting market analysis and commercialization methods using NASA patents. NASA makes selected patents available for student exploration; student teams prepare a classroom presentation and a written report focused on each patent's viability as a business. NASA benefits from the identification of new markets and commercial partners. From memory foam to invisible braces and the Global Positioning System, NASA research has a long history of yielding high-value commercial products.

Co-curricular investment

Smart Start Weekend: To generate student interest in business startups and entrepreneurial know-how, in 2015, UNA created an annual, intensive three-day training program that is open to UNA and local high school students and occurs in spring. Over the course of the three days students form teams each of which functions as a startup firm. The weekend culminates in an angel like pitch. The effort overall has attracted 125 total participants and 70 community mentors forming 25 companies. About half of participating students have been female, and nineteen students later competed in Shoals Idea Audition. Two students went on to compete in the Shoals Alabama Launchpad described below. The weekend culminates with a panel of local investors providing encouragement to the students. Several mentors have become initial investors in these student startups.

The Generator: A few months after the first student Startup Weekend the participating students gave an update to a UNA Executive Business Council, comprised of business and community leaders. Several leaders stayed after the meeting and hatched a plan to support a student incubator. Opened in 2015, this incubator and co-working space for UNA students has blossomed into a hotbed of student-led energy and creativity. The Generator hosts a club of more than 30 students and serves as a place to gather and work on business ideas. To guide student efforts, the University has established connections with more than 150 business mentors in various sectors; these mentors have helped students launch their ideas into companies. In 2017, the University invested in maker space equipment for the Generator, adding a commercial-grade 3D printer and a CNC machine. In 2017-18, 17 businesses were launched by students,

including four female and two underrepresented minority founders. These start-ups raised about \$290,000 in seed capital.

Project Founder: As the number of students increased in the program there arose a need to provide some structure and motivation to continue to progress from a concept idea to a running business. The Director of Innovation and Entrepreneurship approached the Dean of the College of Business to establish such a pathway. UNA's Project Founder was launched in Fall 2017 to provide financial incentives for early-stage student-led startups. Using a tiered funding strategy in four cycles, students can apply and receive awards starting at \$500 and up to \$2,500, based on demonstrated entrepreneurial milestones. Five students are currently progressing through the program toward business launch. Program awards are provided by UNA's College of Business.

Integration with Industry: To link student entrepreneurial energy with regional companies, UNA created an Institute Fellowship program in 2016. The Fellowships are an opportunity for employers to engage UNA students for research and expansion initiatives to advance the company and provide a real-world project for students to practice and showcase entrepreneurial skills. These opportunities are paid, faculty-mentored experiences – driving toward an actionable, student-led project-end report. To launch the program, UNA attracted \$125,000 over three years from the Daniel Foundation of Alabama and utilized funding from its 2016 Appalachian Regional Commission grant. Thus far, 50 students have served as Fellows. Their work has helped to retain or create twenty-five jobs. Several students have also found employment with the companies they assisted. These Fellowships are named after UNA's Institute for Innovation and Economic Development; the creation of the Institute is described further below in Institutional Changes.

The Human-Computer Interaction (HCI) Accelerator was created in January 2017 with University funds and \$81,300 from the State of Alabama Innovation Fund. The Accelerator analyzes hands-on software projects for regional businesses. The Fund serves the dual-purpose of growing companies and offering real-world training for UNA students. So far, 23 UNA seniors have worked in teams to complete five user-experience and software design projects, including a scheduling application for the Shoals Golf Tournament and a mobile event application to serve the roughly 250,000 attendees of the W. C. Handy Music Festival.

Community inspiration

Strategic Doing: To reach beyond campus boundaries and inspire energy, networking and know-how for regional-level change, three faculty and staff became certified as Strategic Doing instructors. Strategic Doing is a flexible approach that allows previously unconnected people to collaborate to accomplish complex tasks often in a workshop setting. UNA now offers two-and-a-half-day practitioner training twice each year attended by 89 faculty, staff members, and community leaders have completed this training. One of the twelve initiatives that arose during and after the training focuses on reinvigorating an older neighborhood. UNA student JimBo Adkins, a senior Geography major, leads this initiative. According to Adkins, "Strategic Doing provided an opportunity for the Seven Points community to collaborate and connect based off their assets. This created a high level of excitement in the room." The concept that large-scale collaborative change is not only possible, but achievable, is central to the Strategic Doing mindset.

Innovation Week: Responding to a student suggestion, the Shoals Shift team launched Innovation Week in 2017. Each spring, public events focused on innovation and entrepreneurship are collaboratively planned throughout the region. The week typically includes Shoals Alabama Launchpad competition, Innovation Awards and Smart Start Weekend. One year included the very popular video games demonstration at the Florence Lauderdale Public Library showcasing the competitive nature of gaming and its benefit to the region.

Shoals Spark: Created in 2015 to engage the region's middle school and high school, this annual social innovation challenge seeks ideas that would make the Shoals a better place. Since inception, the event has attracted more than 140 participants and 50 winners. Community members and students annually advance upwards of 30 ideas. The contests thus far have yielded at least two active projects: solar-powered charging stations and a local producers' market. The competition relies on video submissions and attracts students from many regional schools. A local credit union funds cash prizes from \$125 to \$500. The students enter the competition by preparing a short video. This approach lowers the entry barriers and increases the submissions. The project ideas excite the students and enable them to see the region in a new way. In this way, the initiative develops new entrepreneurial narratives for the region.

Shoals Idea Audition: Started in 2014, this annual three-minute pitch contest is a public forum to introduce new ideas to a panel of business leaders and experts for \$8,000 in prizes. The event has attracted more than 140 participants, produced 15 winners, and awarded \$35,000. The Shoals Shift team provides training, so participants can concisely describe their business ideas and pursue next steps. Shoals Shift raises \$15,000 annually from private sponsors to support this work. Several of the Audition winners have advanced to the local and statewide Alabama Launchpad.

New venture funding

The work described above is spurring deep-rooted entrepreneurial change in an economically underperforming region. The fruits of these efforts arise in the form of new viable technology-based business ventures. There are significant financial obstacles for the formation of startup businesses. All ventures typically require up-front financial support. One major gap in the regional economic development landscape in 2014 was a lack of seed and angel funding. UNA and the Shoals Shift partners have since initiated two durable community resources to serve as incentive for business development and financial fuel for worthy startups.

Shoals Alabama Launchpad (ALP): The Shoals ALP is a regional spinoff of the statewide Alabama Launchpad competition and the first regional competition hosted by the Economic Development Partnership of Alabama (EDPA). This pre-seed \$100,000 competition is for startups that need additional capital to launch or scale their businesses. The organizing partnership is led by UNA's Institute for Innovation and Economic Development and includes EDPA, Shoals Chamber of Commerce, and Shoals Business Incubator. Individual awards are based on milestones submitted through the project budget required during the application phase. The judge's panel reviews applications and required attachments to determine which teams will be admitted. Teams accepted into the competition advance to the Pitch Phase. During the Pitch Phase, teams submit a full business plan and make an eight-minute pitch presentation before the panel at a live, public pitch event. Teams that advance following the pitch presentation submit a revised business plan for a market assessment by a third party. Each team receives a copy of their assessment valued at \$2,000. Finalists incorporate the assessment into their final business

plan and pitch presentation. The Finale Phase culminates in a live pitch presentation, after which winners are selected and announced. Shoals ALP executed its first competition in 2017 with nine applicants leading to five finalists and awards totaling \$95,000. In the second competition in 2018, there were five applicants and two finalists with awards totaling \$100,000. UNA students competed and were awarded funds in each cycle. Prize money was raised 50% locally and matched by EDPA.

Mane Capital Fund: Established in 2016, private investors launched a \$1,000,000 angel fund for local startups. Three investments have been made to date. The UNA College of Business and Shoals Business Incubator (SBI formerly known as Shoals Entrepreneurial Center) played instrumental roles in generating interest in the development of the Fund, and the Shoals Shift partnership was the driving force underlying its creation. Grants provided by the Alabama Department of Economic and Community Affairs and Appalachian Regional Commission in 2015 supported a consultant to help establish the Fund. Twenty local accredited investors are now associated with the Fund. These investors have a strong desire to invest in regional sustainable companies, enhancing the region's economy. The Fund has teamed with an established angel fund, which provides valuable expertise and national collaborations that will be critical to achieving the Fund's long-term goals.

Institutional changes

The community needs that inspired the launch of Shoals Shift also spurred recognition within UNA that it needed a focal point on campus for economic development activity. As a result, UNA launched the Institute for Innovation and Economic Development in 2016. It invested in three faculty and staff members to drive its programs and outreach. The Institute focuses in four areas: economic development, corporate consulting, strategy facilitation, and business innovation initiatives. The Institute's public-facing presence has served to reinforce UNA's commitment to work with industry partners and local, state and national economic development agencies. Since forming, the Institute has bid on 35 projects and secured sixteen grants and contracts for \$557,050, including the UNA Economic Impact Report, three Daniel Foundation student fellowship grants, an Alabama Innovation Fund grant, and an Appalachian Regional Commission

Partnerships for Opportunity and Workforce and Economic Revitalization (POWER).

The changes within UNA, as well as the initiatives with UNA as a collaborative partner, illustrate Proposition 2: a university serving as a platform for ecosystem development. The portfolio of the Shoals Shift initiatives supports Proposition 4. Chart 2 further illustrates the support of Proposition 4 by categorizing each collaborative initiative in Brainpower, Support Networks, New Narratives, and Quality Places.

Results

Shoals Shift Project generated the following outcomes:

- 1. 17 student-led startups founded / 10 registered LLCs launched by students
- 2. 50 Institute Fellows
- 3. \$290,000 student seed capital raised
- 4. 140 Shoals Idea Audition participants, 15 winners, and 70 judges
- 5. 125 Smart Start Weekend participants, 50 mentors, and 15 investor judges
- 6. 14 Shoals Alabama Launchpad participants, 7 funded orgs, 10 judges, 10 jobs created
- 7. 80+ students benefitted from the Generator Club
- 8. 89 faculty, staff and community leaders trained in Strategic Doing
- 9. \$500,000+ raised from local businesses/agencies / \$1,000,000 raised in Angel funding
- 10. Won 2016 University Economic Development Association Talent & Innovation Award and named a finalist in the 2018 Honor Society of Phi Kappa Phi's biennial Excellence in Innovation Award
- 11. Major grants awarded from the Appalachian Regional Commission and the State of Alabama
- 12. Sixteen presentations at national and international conferences
 - Strategic Doing Practitioner Conference (May 2016, 2017, 2018)
 - University Economic Development Association (UEDA) (Oct 2016, Oct 2018)
 - International Business Innovation Association (InBIA) (Mar 2017)
 - Association to Advance Collegiate Schools of Business (AACSB) (Apr 2017)
 - Development District Association of Appalachia (DDAA) (Apr 2017, Mar 2019)
 - Society of Business, Industry, and Economics (SOBIE) (Apr 2017)
 - Network of International Business Schools (NIBS) in Leeds, UK (May 2017)
 - Association of Chamber of Commerce Executives (ACCE) (Jul 2017)
 - Council for Community and Economic Research (C2ER) (Jun 2018)
 - Southern Business Administration Association's Summer Conference (Jul 2018)
 - University of Texas San Antonio Institute for Economic Development (Jul

2018)

• International Economic Development Council (IEDC) (Oct 2018)

Sustainability

In 2016, Appalachian Regional Commission recognized Shoals Shift's role in diversifying the regional economy by awarding the project a \$997,150 POWER grant. Other sources of external funds have included: State of Alabama Innovation Fund (\$81,300); Daniel Foundation of Alabama (\$75,000); and annual local sponsorships (\$350,000 total). UNA's commitment includes faculty and staff, rent at the Generator incubator, equipment purchases, and sponsorships exceeding \$700,000 annually. Most important to sustainability is the endurance of the team that guides the events and develops new ways to expand the Shoals Shift movement. The team has been meeting every 6-8 weeks since 2014. These touchpoint feedback and planning meetings bring the various team members together in a feedback look that is another critical step in successfully implementing Strategic Doing.

Pages, Markley, Katona, and Johnson (2018) published a report for the Appalachian Regional Commission named "Entrepreneurial Ecosystems in Appalachia". The project was led by EntreWorks Consulting, in partnership with the Center for Regional Economic Competitiveness and the Center for Rural Entrepreneurship. The report highlighted 8 case studies which included the Shoals Shift project. We quote at length from the report's conclusions regarding Shoals Shift:

"The Shoals Shift effort formed at the right place and the right time. Local leaders were open to new economic development approaches, and strong local advocates made a convincing case to embrace entrepreneurship as a regional strategy. Shoals Shift leaders also believe that their success can be attributed to the process as well. They built a strong alliance, which was further bolstered by the Strategic Doing methodology. Strategic Doing kept them focused and ensured that they remained accountable and supportive of one another. They are now a strong and dedicated group of volunteers, each of whom is devoted and committed to their shared cause. Yet, what else can be learned from the Shoals Shift example?

• "Dedication to Entrepreneurship. Shoals Shift first builds upon the fact that a group of individuals, each dedicated to entrepreneurship and committed to working together, can create a movement. The players around the Shoals Shift table were truly committed to collaboration. They represented different

organizations with different missions, but they were able to unite around the shared mission of Shoals Shift. Hence, attitudes of ownership or prioritizing individual organizational missions are absent from discussion. While one entity may have been responsible for sponsoring or housing a specific event or program, the success of that event/program was attributed to the bigger Shoals Shift umbrella.

- "Just Do Something. Participants of Shoals Shift consciously embraced a method of doing not waiting. Like entrepreneurs, they were willing to experiment and try new ideas, even in the face of great uncertainty. For example, the first Launchpad event was announced and planned even though program funding was not in place. Yet, the group had self-confidence and trusted that they could find a way to succeed. Via their network, they were soon able to raise the \$50,000 needed for the program. Limited resources were a constraint, but not a barrier to success.
- "Elevate the Visibility of Entrepreneurship. Like much of the Southern US, the Shoals region has long pursued business recruitment as a core economic development strategy. Changing these practices takes time and commitment, and this was part of the core mission for Shoals Shift, i.e., to shift the regional conversations about business development. It took the effort of a few to implement a handful of successful programs to bring entrepreneurship to the attention of the community as a viable economic development alternative. The result is that entrepreneurship has been quickly embraced and engrained in the local/regional culture.
- "Create Space for Entrepreneurship/Innovation. The creation of entrepreneur-friendly spaces, such as the Generator and SEC, has value on many levels. First, these places provide physical meeting points for entrepreneurs to share their stories and network. They are also tangible and visible to the public. Second, programs like Co-Starters and the Smart Start Weekend create space for the flow of ideas and sharing of concepts within a structured setting. Incubators also provide a needed leg up—via subsidized rent and equipment access—for new businesses. Third, events like Launchpad and the Shoals Idea Audition create yet another type of space, a space that is public in nature and announces to a wider audience that entrepreneurship and innovation are encouraged and rewarded.
- "Be Creative. Shoals Shift built on local assets, such as the formidable infrastructure of the SEC and UNA, and creatively leveraged those assets into something bigger. Yet Shoals Shift also creatively took what existed elsewhere and replicated it in the region. Launchpad was originally a state level program that was first adapted to the local level by the Shoals Shift

team. Similarly, looking elsewhere towards impactful programs, Shoals Shift identified Co-Starters, a program that had seen great success in Chattanooga, as a resource to bring into the region. Rather than finding the funds to develop a similar program, Shoals Shift used their limited resources, reached out to the founders of Co-Starters and was able to replicate the program in Shoals."

Efforts of Shoals Shift to support entrepreneurship focused on three key strategies, lifting the perception and visibility of entrepreneurship as an effective economic development activity, providing space for entrepreneurs to congregate and innovate, and ensuring that entrepreneurs have access to business support organizations. Armed with few resources, the group managed to establish the Institute for Innovation and Economic Development, create the Generator, and offer a myriad of programs geared towards championing entrepreneurship. One off events like the Shoals Idea Audition, Innovation Week and Launchpad were all successful in bringing attention to entrepreneurship as a legitimate business development strategy. Ongoing programs, such as the Smart Start Weekend, Co-Starters and Bizz Buzz, are encouraging residents to explore entrepreneurship. Other communities can learn from these efforts that one need not start with substantial financial support; similar to most good entrepreneurial efforts, one needs to start off with a good idea, dedication and much self-reflection. Shoals Shift exemplifies this. While still in infancy, given how strongly the community has embraced and indoctrinated the idea of entrepreneurship, the ecosystem will most likely successfully mature as the businesses needing that ecosystem matures." (Pages et al 2018.)

7.6 Discussion and Findings

Over the last four years, Shoals Shift has undertaken an ambitious effort to change the civic culture in a rural region by reorienting people and organizations toward entrepreneurial opportunities. Shoals Shift emerged from a deep commitment on the part of the UNA leadership. To develop an entrepreneurial ecosystem, they relied on concepts, frameworks and practices developed by the Purdue Agile Strategy Lab.

UNA and its Shoals Shift partners began by developing a deep understanding of how strategy practice has changed. To develop and guide strategy in open, loosely connected networks, the

core team began by introducing Strategic Doing to the community and then by conducting regular training in the discipline (Proposition 1). UNA then stepped forward with aggressive investment in in time, resources, and funding to support Shoals Shift. The university's commitment to working outside their traditional boundaries accelerated and added to the previous work of the Shoals Chamber of Commerce and the Shoals Business Incubator. In effect, UNA and its partners provided the initial platform on which the Shoals Shift collaborations formed (Proposition 2).

From the beginning, the Shoals Shift team recognized that a healthy entrepreneurial ecosystem does not emerge from one institution or a narrow range of big initiatives. Rather, the Shoals Shift team committed to the idea that a healthy startup ecosystem in North Alabama will

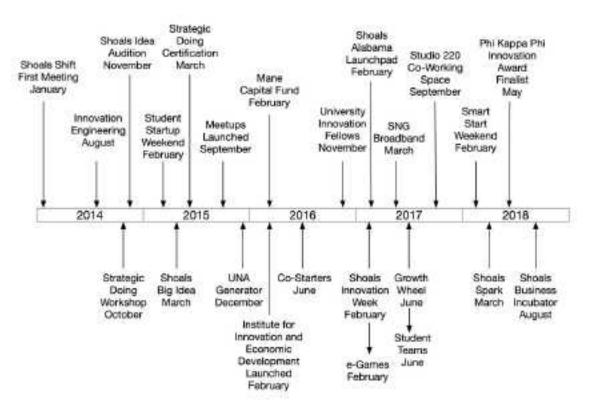


Figure 7.4: Timeline for Shoals Shift initiatives. An ecosystem emerges from a portfolio of initiatives that are linked, leveraged and aligned to each other.

emerge in phases (Proposition 3) from a balanced portfolio of collaborative initiatives (Proposition 4). If we track the progress of Shoals Shift since its founding four years ago, that is, indeed, what happened. Figure 7.4 highlights the timeline of when programs were introduced.

Each of these initiatives can be mapped to the focus areas set forth in Proposition 4. Shoals Shift focused on developing technology-savvy talent; converting talent into startup companies through support networks; creating quality, connected places for networks to form; developing a new narrative to point toward a more promising future; and continuously building the skills of collaboration.

In Figure 7.5, the five ecosystem development phases from proposition 3 are shown with respective Shoals Shift steps. Beginning with the shift in conversation (phase 1) in September 2013, what became the Shoals Shift core team started meeting (phase 2) to discuss collaboration.

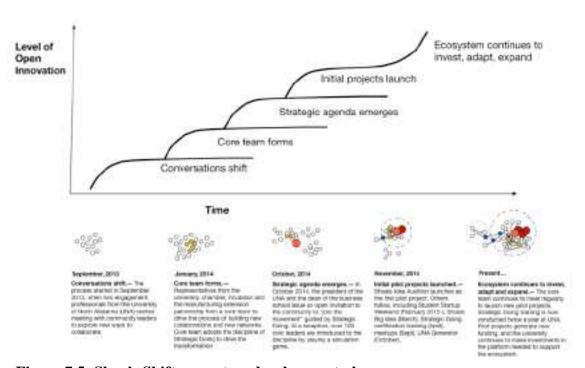


Figure 7.5: Shoals Shift ecosystem development phases.

After the team determined that building a digital technology cluster was the desired outcome, they hosted workshops (phase 3) to establish projects to begin the path to this end. Beginning with Shoals Idea Audition (phase 4), other projects emerged within the next year. Other previously-discussed projects have followed, while the original programs have been modified as needed (phase 5).

Overall the reflective theory of development for entrepreneurial ecosystems as presented in this paper has been demonstrated by the achievements of the Shoals Shift Project which is one example of many that are using the Strategic Doing rules to guide their ecosystems to a more robust inclusive equitable economy. Shoals Shift provides a roadmap for other universities engaging in local economic development, specifically those schools desiring to help transform the regional entrepreneurial ecosystem. The process starts with the formation of a core team drawn from different organizations. Members of the core team then design and guide the process by following the underlying disciplines and frameworks set forth in this paper. No two ecosystems will be the same. However, the principles of design and strategy for building and managing the platforms on which these ecosystems grow is starting to emerge in a way that is easily replicable.

The policy implications are that universities provide valuable platforms on which rural economies can be revitalized. However, many of these universities are strapped for funding. The Shoals Shift case study implies, however, that relatively small investments, carefully designed, can generate significant returns for the regional economy. Rather than making significant upfront investments, phased investment programs encourage experimentation and collaboration with other investors. These programs are designed to manage risk and encourage co-investment. Finally, these conclusions are both promising and tentative. Shoals Shift also points a bright light down promising avenues of future research.

Chapter 8: Strategic Doing — The Book

Introductory comment.— Argyris and Schön assert that learning a theory of action and the skills of deploying a theory of action are not separate activities. "Skill is a hybrid term that refers to both a property of concrete behaviors and to a property of theories of action." Further, "thetheory of action has not been learned in the most important sense unless it can be put into

practice. Learning to put a theory of action into practice and learning a skill are similar processes" (Argyris & Schön, 1974: 12). Strategic Doing is a theory of action to develop and implement a strategy in open, loosely connected networks. These strategies rely on practitioners designing and guiding complex collaborations through conversation (Hardy et al., 2005). Scholars have long known that conversations are critical to creating and sharing knowledge (Webber, 1993; Von Krogh et al., 2000; Mengis & Eppler, 2005) and promoting learning (Baker et al., 2005; Liedtka, 2008; Edmondson, 2008). Scholars also long ago established that collaboration requires a portfolio of skills, structures, and processes (Hardy et al., 2005).



Figure 8.1: Soundview award. Soundview an executive book service, ranked Strategic Doing a 2019 Best Business Book.

Strategic Doing addresses this challenge with a protocol of ten rules that takes ten skills to implement. Learning these skills can take place in several ways. Formal education and training include courses and instructor-led programs. Informal learning occurs without an instructor or trainer. The learner initiates the learning, which involves action and doing (Noe & Kodwani, 2018). In explaining how partitioners acquire skills, Schön refers to Dewey. Practitioners develop skills through learning by doing. "Everything is a practicum" (Schön, 1987:). To stimulate the acquisition of these skills by practitioners, I led a team to write a book, Strategic Doing: Ten Skills for Agile Leadership (Morrison et al., 2019). The following sections reprint chapter 8 from the book. These sections illustrate we are translating Strategic Doing as a theory of action into a set of skills that practitioners can practice in their informal learning. The complete book appears as Appendix A.

8.1 Start Slowly to Go Fast—But Start (Skill 7)

Imagine, for a moment, that you are standing on a beach gazing out at the distant island. Your kayak sits next to you. You are planning a day trip to the island and back, and you're getting a bit of a late start; you have to make sure you'll be back by sundown.

You face a choice. You could sit on the beach and try to plan your trip in detail to make sure it will be successful. To do that, you'd have to take measurements of the strength of the wind and its direction. You would calculate the size and direction of the waves. You would have to check the weather to see if the winds are likely to pick up or calm down. You need to estimate the timing of the tides and the strength of the pull of the moon. You would also have to remind yourself to estimate the impact of currents on your course. With all this information, you would then need to make some calculations to plot your course.

Alternatively, you could check the weather forecast, quickly assess the conditions ahead of you, get in the water, and start paddling.

The smart choice is to pick up that paddle. The only way to understand the true impact of the wind and the waves on our kayak is to experience it. We can then make calculations on the fly and adjust. Using the same approach, we can see how the other invisible factors influence the direction of our kayak. We don't really need to know whether it's the tides or the current that are causing our boat to drift. We simply see that our boat is drifting, and we make a subtle change in our direction. On a calm day, we don't need to make these adjustments very frequently. But if the wind were to pick up so that the wave action on our boat were to become more violent, we would be smart to make these adjustments more frequently. Instead of adjusting our course every ten minutes or so, we might make adjustments after only two or three paddle strokes.

We like this kayaking analogy because it captures a lot of the uncertainty that we all face as we live our lives. We may all have an outcome to achieving our mind Dash a better job, a more agile organization, a more prosperous community – and we want to get there as quickly as we can. The reality is that we really can't learn how to make progress toward that outcome until we start doing something. That does not mean that we don't sit for a moment, gather some information (like a weather report), and think. It does, however, mean that we don't try to come up with the perfect plan we don't become paralyzed with analysis. We don't lock down our

capacity to act by engaging our fears. Instead, we face the future with confidence and our ability to experience what we can't fully understand, to learn, and to make decisions that blend both facts and our intuition. We have enough experience to recognize that we can trust our intuition, yes we are smart enough to realize that we might be wrong. We might need to make adjustments. When the invisible forces affecting our course are strong and quickly changing, we will need to be prepared to make some quick decisions.

The actual leader understands the limits of our capacity to understand and analyze complex, invisible systems. Agile leaders are biased toward action for a simple reason: we only learn about these complex systems by doing. If we wanna make big changes fast, we have to go slow... but above all, we have to go.

8.2 Launching your learning

When you have an outcome in your mind, it does not have to be perfect to start. Equally important, you don't need to plot a perfect path to your outcome before you do anything. In order to learn how to get from here (where you stand) to there (the outcome you want), you need to start. You start with something quite limited in scope – the first few paddle strokes, so to speak — and see what happens.

Here's why: without starting, you can easily become overwhelmed. Karl Weick, a psychologist at Cornell University, published an important paper in 1984 that captured this idea. Weick was exploring why large-scale social problems can close down innovation. These social problems, such as increasing poverty, rising crime rates, environmental pollution, heart disease, or traffic congestion can loom so large in our minds that we become paralyzed. Sensationalizing these problems, all in the hope of mobilizing action, can do just the opposite. We easily become more frustrated, and we are more prone to feeling helpless. Weick astutely observes, "Ironically, people often can't solve problems, unless they think they aren't problems." He proposes the idea of addressing the challenges of large problems with an approach emphasizing the value of "small wins".

We've all been in those situations, in which we've defined a problem at such a large scale and general terms that we have no idea where to start. "Boiling the ocean" is a bit of somewhat-

annoying business jargon that captures the idea. We can never boil the ocean simply because there is too much water. In the same vein, we can never make much progress, if we set ourselves up with an impossible task from the start. We are taking on more than we can handle. Because our resources are limited, we end up spreading ourselves too thin. We end up, as Weick observes, feeling frustrated and helpless. By contrast, when we break big challenges into smaller, more manageable tasks, we not only reduce our risks, we also increase the chance of feeling good about getting something accomplished.

Weick's ideas have taken hold, especially in the worlds of design and innovation. Elizabeth Gerber, a professor of design at Northwestern University, highlights the importance of *low fidelity prototyping*, a closely related idea (2009). Gerber defines a low fidelity prototype as a minimally detailed expression of an idea. In the case of designing a new web site, a low fidelity prototype might simply be a drawing. For a new product, it might be a cardboard mock-up. According to Gerber, low fidelity prototyping speeds up the development process. She cites a number of reasons: it reframes the possibility of failure into an opportunity for learning; it improves communication among team members; it provides the team with a sense of progress; and it increases a team's confidence in their own creativity.

There's another reason that getting projects off the ground quickly is important. They act as experiments to test some key assumptions. In the management world, good experiments help companies deal with complex, dynamic situations. Perfect knowledge is not possible, so the best option involves testing ideas. Jeanne Liedtka, professor at the Darden School of Business at the University of Virginia, calls these experiments *learning launches*. This concept captures the entrepreneurial mindset and the bias toward action. Analysis can be time-consuming, misleading and paralyzing (think of the poor soul trying to analyze every detail of a kayak trip.) In contrast, designing experiments generates knowledge about what works (or doesn't). This practical knowledge is far more immediate and relevant than a grand plan.

8.3 Qualities of a Good Starting Project

We've concluded that there are a number of important characteristics of a good starting project:

They are short (enough): they follow the "Goldilocks Rule" - not so simple that they can be completed in a week, but not so complex that they take a year to complete. If the project is too short, you won't have enough time to reap the other benefits that we'll describe in a moment. If the project takes too long, your team can easily get bogged down and discouraged. 90-120 days is a good length to avoid both of these risks.

They engage everyone on the team: they build trust among team members, but this can't happen if only part of the team is involved. This usually happens for two reasons: First, the idea may be too simple. If it is too easy the group will lose interest early and could disband before the more difficult work is addressed. What's too easy? As long as the idea will take at least a small contribution from everyone, it's big enough. Remember the planters the citizen's downtown improvement group wanted to build? Although it's straightforward, there was plenty to do: pick locations, get permissions, buy materials, assemble the planters, and make a plan for ongoing maintenance. There is another bad habit we are trying to overcome with this idea. Many of us are in the habit of coming up with good ideas for someone else to do. This tendency works against the formation of a cohesive team. You can't outsource this process.

They create a "buzz," garnering attention for the work: they present a wonderful opportunity to create a new story, a new narrative, about what is possible through collaboration. Every organization and community has a narrative. Too often these narratives look backward. They are often cynical. A good starting project provides a new narrative to explain what is possible if we align our efforts and adopt new ways of thinking and behaving. The team provides a model to follow.

They test some key assumptions: at the early stages of a collaboration, we are making some key assumptions. An early project enables us to test some of these assumptions and accumulate new insights. For example, a low fidelity prototype often tests customer acceptance: will customers be willing to pay for the product, and how much? A Chamber of Commerce hosts an after-work event downtown. Will this idea draw enough people to launch something like a "First

Fridays" series? A company wants to retain its young talent. Will more professional development opportunities help?

They don't require permission: it's important to work on a project that can start immediately. That is, the team designing the project does not need permission to launch it. It is important to move a potential collaboration out of the talking stage quickly. Otherwise, the probability of success declines dramatically. Team members lose focus and enthusiasm when permission becomes an obstacle - you suddenly find yourself back in "If Only Land." Avoid this by designing a starting project that does not require permission. You are better off scaling back a project than designing one that can be easily delayed or derailed.

8.4 Keeping the Team on Track

A starting project does not need a detailed project plan with milestones. However, it does need a logical route to follow, and it's useful to mark the path with *guideposts* – just a few key points along the way that will warn you if you're getting off course. In this way, guideposts help a team manage risks. Much like walking a trail, the team knows that if it misses a guidepost, it should stop and figure out why. Should they reset their course? Is the project too ambitious? Has a key assumption failed? Deciding on what the guideposts are should be also confirms that you'll be able to complete the project in a reasonable time. Remember, you are using your project as a learning process to figure out what works.

Here's an example from our work. Suppose a corporate team comes together to design a new approach to managing customer relationships. The company has multiple divisions, each selling a different product line Dash primarily business office equipment and furniture. Some, but not all, of these business units have customers in common. Originally the divisions were separate companies, and over the years, various mergers and acquisition's have resulted in a single company. However, each division has its own sales operation, and each of those uses its own "customer relations management" (CRM) software platform. A CRM includes all the relevant data about each customer – contact information, sales history, deals being negotiated. These CRM's do not communicate with one another, so if a customer from one division decides to buy a product from a sales person representing a different division, that sales person has to enter all

the same information over again in the new CRM, process a new credit application, and so on. This is a huge waste of time for both the company employees and customers. The company's upper management team defines an outcome of deploying a new single CRM across the company over the next two years. This system would include the capacity to analyze data to identify new cross division sales opportunities as well as to flag problematic customers who take an inordinate amount of support or who do not pay on time. It would be a big shift for the company with a great deal of training required, but won the team is convinced will pay off handsomely in higher productivity.

The team defines their starting project is combining just a sample from two divisions CRM's as a pilot. The reason that by installing this system on a small scale first, they can spot problems that might crop up before they launch a larger scale deployment. The team decides that the project will be up and running in 180 days. If all goes well, they will then integrate the two divisions data into one CRM that could be to other divisions. To set the guide posts for the project, the team then decides what Hass to be done in 45 days, 90, and 150 days, if they are to stay on track. So, for example, within 45 days, the team agrees it must decide on an outside vendor to help design the pilot and complete the specifications for a deployment that could scale across the entire company. In 90 days, all the test data needs to be uploaded. In 150 days, the training process for the sales team should be developed and approved.

8.5 What Next?

Those first tentative paddle strokes will give you important information, but it wouldn't make for a very satisfying day on the ocean if you stopped there. It's best to think of our initial project as both standing alone and at the same time part of a series – when one is complete (or nearing completion), you'll see what the next one should be. You'll know what adjustments to make based on what you've learned, and possibly have identified some challenges you still need to learn more about. And while the kayak may be strictly a one-person craft, there is plenty of room for others to join you in pursing the goal you've set for yourself. That "buzz" you created means that you now have a bigger team and your next project can be bigger in scope.

Here's another example of this skill in action: a team of HR leaders has come together to think about its management training program. The company's current program targets "up and coming" young talent. Participants attend a series of weekend courses over the course of two years; at the end they have earned about half the credits needed for an MBA degree through a local university; many then choose to complete that degree on their own. The number and quality of applicants has decreased over the past few years, primarily because supervisors have to "nominate" participants and agree to pay about half the tuition cost – and the "word on the street" is that the program isn't worth it (and more generally, the MBA degree isn't in as much demand as when the program started more than twenty years ago). The team would like to create a set of courses based on simulations and other more modern learning approaches. They know that eventually the company's "top brass" will have to approve the new program, but several of those individuals came through the current traditional program and view it very favorably.

The team decides that these kinds of major changes in the curriculum will never happen without strong support throughout the company – beyond just the HR department. The team decides to test the assumption that this support can be galvanized. They design an initial project of creating a pop-up class that uses a "pop-up" format. Pop-ups are informal, non-credit classes that "pop up" informally for just a few sessions, and they are a great way to test student interest in a topic quickly. They hope a dozen or so participants will come to a one-session workshop on creating budgets – a modest goal, since it's scheduled for a weekday night, and they're not offering any food or drink. To their delight, more than forty employees show up. Not only have they demonstrated that there is plenty of interest, a few of the participants attending ask if they can be part of the re-design effort. Their next project, with an expanded team that can handle a bigger challenge: a series of pop-ups.

8.6 Putting the Skill to Work: the Agile Leader as Experimenter

Applying this skill means reminding yourself of where you want to go, and then finding a way in which you can start in a low-risk, small-scale way. Examples of good initial projects include projects like a pilot, a low fidelity prototype, a forum series, a web site, site visits or field trips, customer discovery interviews, or a business plan (or a business model canvas). Remember

that you are experimenting: you may find that your first project doesn't go the way you're hoping. That doesn't mean it's not the right project.

Agile leaders understand that especially in a complex environment with an adaptive challenge, moving toward a big goal requires experimentation and small steps. To go fast, one has to start by going slowly. Getting to a clearly defined initial project is an exciting moment for a group: chances are no one has traveled the exact path that the team has outlined. By quickly and confidently outlining a project with a handful of guideposts, the team is inviting others to contribute. The anticipation created by a good initial project is infectious. As an agile leader moves the project into action, the excitement will only grow.

8.7 Case Study: Overcoming the Academic Bureaucracy with Small Wins

A National Science Foundation grant to establish a National Center for Engineering Pathways to Innovation (Epicenter) was awarded in 2011 to Stanford University and VentureWell, a non-profit organization that furthers innovation and entrepreneurship in higher education. The mission of Epicenter was "to empower US undergraduate engineering students to bring their ideas to life". One key premise of the initiative was working with faculty to redesign the undergraduate engineering experience. The leaders of the initiative wanted to involve 50 higher education institutions, with the idea that 50 was a large enough number of institutions to achieve a "tipping point" in re-imagining engineering education.

Before she joined the Purdue team, Liz was hired by VentureWell after the grant had been awarded to help lead the project. She quickly learned that while there was not yet a specific plan for how to effectively engage engineering faculty from 50 institutions, it was clear they needed to move swiftly to get results in the time remaining on the grant. She asked Ed and Scott to help her guide the faculty in using the principles of Strategic Doing.

Curricular change was a particular focus for the NSF, but the traditional concept of redesigning curriculum usually means new courses - which tend to get caught in the "bureaucratic buzzsaw" at many institutions. The arduous process of gaining approval often saps the energy of a group, even if the course is ultimately approved. To address this risk, the Epicenter team expanded the idea of change to encompass learning experiences more generally –

whether or not those experiences happened in the context of a new course. Working in teams of three to eight people, the schools each identified one small starting project that might lead to bigger opportunities. The ideas were modest; for example, a new learning module for a course one of the members was teaching, a small "maker space" with a few 3-D printers, or a competition in which students could propose innovative products or services they wanted to launch. But more importantly, each was an idea that could be completed relatively quickly and did not need to go through an approval process. Liz followed up with the teams to help them stay on track and as they got the first project underway, encourage them to pick a next small project.

Over a little less than three years, more than 500 such projects were launched, with as many as 31 by a single University. Many of these projects were fairly modest taken on their own. However, some more much bigger: the experience of success in taking on a small starting project help the team gain confidence in their ability to work together, and signal to university leadership that theirs was a group that could "get things done." These completed projects off and open the way to new resources and institutional support and made possible major achievements and many of the schools, such as a new certificate program in entrepreneurship or even a new university center.

Chapter 9: Summary and Conclusions

9.1 Problem Restatement and Approach

For the past twenty-five years or so, strategy practitioners and researchers have been confronting two perplexing trends. The first trend appears in the increasing volatility and complexity in the environment. This mixture of complexity and volatility generates a steady stream of adaptive or wicked challenges. The second trend involves the break-down of hierarchical organizations and the emergence of network-based forms of governance. These two developments have converged to underscore the importance of managing continuous adaptation through knowledge and learning. Strategy practice and research have not kept up, and there is a persistent gap between scholars and practitioners.

This research reports on a twenty-six year journey to confront these trends in the "swampy lowlands" of real world problems.

9.2 Main Findings

The main findings of this research are as follows:

- Strategies to confront wicked problems in networks emerge from strategic conversations with an underlying structure and trajectory.
- Effective strategic conversations take place in situations of psychological safety.
- Effective strategic conversations are framed with an appreciative question.
- These conversations can be managed by following four questions and ten rules. They represent heuristics that have emerged to manage strategy in complex environment.
- The rules imply teachable skills. Practitioners can put these rules into practice by learning these skills.
- This approach to strategy appears to be supported by multiple theories of practice across different disciplines.

9.3 Contribution to Knowledge

The main contributions to theory include:

- The development of a theory of action for a strategy process in open networks.
- The development of a disciplined, replicable practice for open strategy.
- The introduction of strategic conversations as a dynamic capability

The main contributions to practice include:

- A tested approach to address wicked problems within an open, loosely joined network of participants.
- A clear protocol for designing and guiding "strategic conversations" and the skills required to design and guide these conversations.
- The articulation of the skills required for practitioners to design and guide these conversations.
- Curricula for teaching these skills.

9.4 Research Limitations

This thesis appears at the end of a career, not the beginning. The research from 1993 to 2015 was conducted outside the bounds of a thesis. The combination of practitioner activism and inquiry within this research can create bias. Some of the projects from which the Strategic Doing model emerged lacked the key qualities normally associated with quality action research. A growing network of researchers and practitioners engaged in the development and deployment of Strategic Doing helps to minimize this bias and bring more rigor to the work (Reid, 2016; Sullivan et al., 2017; Nilsen et al., 2016; Nilsen et al., 2017).

The research presented in this thesis also gives rise to generalization issues. To address this issue, Yin (2017) recommended replication of multiple case studies. The underlying structure of Strategic Doing, discussed in Chapter 4, provides a replication design to the research. Nevertheless, the issue of generalization can never be completely extinguished.

9.5 Future Research

Future research could focus in four areas.

Further research into Strategic Doing as a theory of action.— Working with the Agile Strategy Lab at the University of North Alabama and researchers at Purdue University, the University of Oregon's Institute of Policy Research and Engagement has begun the process establishing research protocols and a database to enable researchers to access data collected by practitioners of Strategic Doing. Researchers could join this network of scholars engaged in evaluating Strategic Doing.

Application of practice theories to Strategic Doing.— Chapter 4 (relating to the theory and practice of Strategic Doing), outlined a series of theories of practice that appear to support Strategic Doing as a theory of action. Researchers could explore the suggestions presented in this

chapter.

Application of the strategic conversation construct to dynamic capabilities and open strategy research streams.— The rigorous definition of strategic conversations presented in this thesis could stimulate research on the integration of dynamic capabilities and open strategy. In reality, as complexities in organizational environments grow, strategy practitioners will increasingly rely on networks to access resources outside the organization in order to develop solutions. As chapter 5 suggests, organizations will operate more as platforms and within ecosystems (Moore, 1993; Ciborra, 1996; Whitmer et al., 2010). From a practitioner's viewpoint, the current separation in research streams between dynamic capabilities and open strategy is artificial. The increased development of dynamic capabilities will entail engaging people in collaboration within open, loosely connected networks. The development of open strategy capabilities to manage these collaborations and networks is unavoidable.

Expansion of the findings to dialogic organizational development.— Dialogic organizational development explores the role of conversations in organizational development (Bushe & Marshak, 2014, 2015). A variety of different approaches fall under this umbrella. Strategic Doing could add to the portfolio of tools used by practitioners and evaluated by researchers.

Application of the findings to transition management.— Transition management has emerged as a model for guiding complex systems toward more sustainable paths (Rotmans et al., 2001; Kemp et al., 2007; de Haan & Rotmans, 2011). Within this model propelling mechanisms align and accumulate small wins into transformative change (Termeer & Dewulf, 2019). Strategic Doing could be evaluated as a propelling mechanism.

9.6 Conclusion

This thesis marks an important guidepost in a journey that started in 1993. Using Schön's vivid metaphor, in the early 1990s, I was lost in the swampy lowlands of real problems. Guided by the disciplines of reflective practice, I found my way through to some exciting discoveries, a theory of action, and the skills needed to support it. Strategic Doing is now spreading globally. We teach it in both Spanish and Dutch. As wicked challenges accelerate, people across the world are searching for more productive

approaches to design new, more sustainable, collaborative, and resilient systems. They are finding Strategic Doing.



Figure 9.1: Strategic Doing is taught in Dutch and Spanish.

I end with a story of Yo-Yo Ma, the world-famous cellist, who discovered Strategic Doing on a concert tour. In 2018, Yo-Yo's staff invited me to join him in Youngstown, Ohio, USA. Yo-Yo was in the midst of his Bach Project (https://bach.yo-yoma.com/). At every stop along the way, his staff scheduled field trips, so Yo-Yo could engage with the community. Yo-Yo is deeply concerned about the fractures taking place in our societies, and he is interested in exploring how the arts and cultural organization could play a role in healing these fractures.

In Youngstown, the staff, who learned of my work through their networks, invited me to conduct a Strategic Doing workshop. After the workshop, I texted Yo-Yo to thank him. I also asked him if he would like to read my book, which was coming out in a few months. (I hoped for a a short quote I could use.) He texted back, telling me he was too busy, but he asked me to send the book anyway. Then, three months later, out of the blue on New Year's Eve, Yo-Yo texted me. "I've sent you an e-mail with a blurb". I quickly opened his e-mail. I nearly dropped. Yo-Yo's "blurb" was a bit more than I expected. It became the Foreword to our book:

I've been waiting for this book all my life. Strategic Doing answers so many questions I have on how cultural organizations can band together to be part of the solution in addressing society's most complex issues.



Figure 9.2: Yo-Yo Ma and the author August, 2018. Photo taken after a Strategic Doing workshop in Youngstown, Ohio, USA.

I was a witness to and participant in this approach when I met Ed Morrison in Youngstown, Ohio, working with a group of socially committed citizens, each determined to work to reinvigorate a once thriving community. In one short hour he had us each identify and unlock our assets, come up with a plausible group plan, and determine a course of action moving forward, agreeing to meet again 30 days from that moment.

Now we have the book that details 50 years of work (between its 5 co-authors), showing how Strategic Doing has been catalytic in revitalizing communities, cities, industries, and sectors all across the country.

Strategic Doing is precisely what we need at this moment. In a fast-changing world, filled with disruption, with institutions not equipped to absorb or deal with the pace

of change, here is a way of thinking and acting, here is an agile strategy that makes collaboration take place at the necessary speed for social good.

Yo-Yo Ma December 31, 2018 Arlington, Massachusetts

My journey continues.

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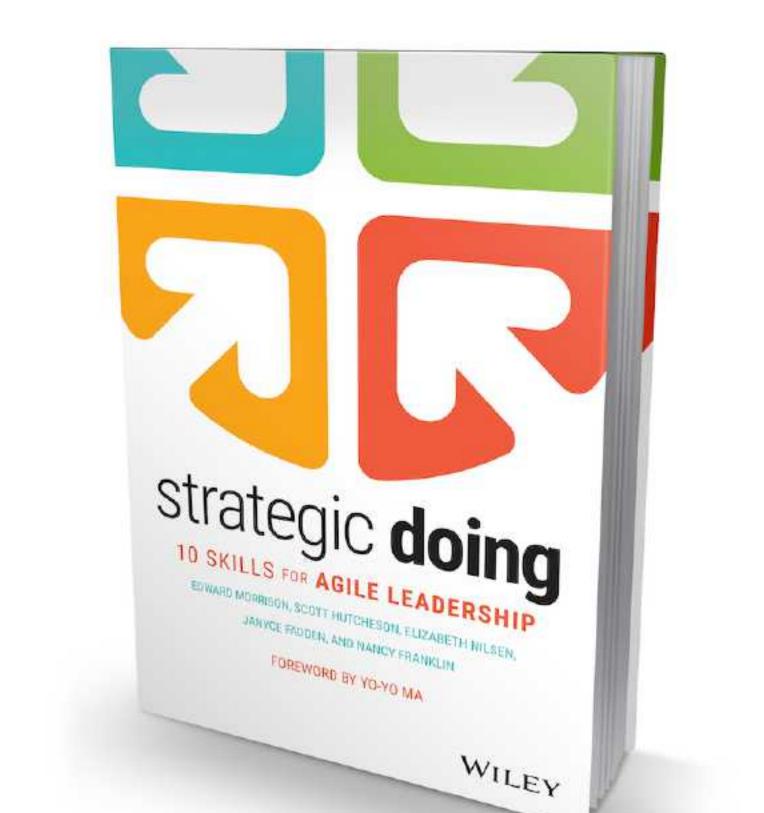
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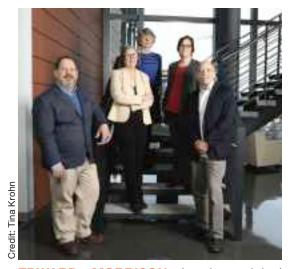
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Appendix A: Strategic Doing: Ten Skills for Agile Leadership

Appendix B: Sample Teaching Materials for Strategic Doing

Appendix C: Data from Action Research Projects





EDWARD MORRISON is the original developer of Strategic Doing and founder of the Purdue Agile Strategy Lab. The Lab emphasizes the strategic value of collaboration, open innovation, and network-based models in today's global economy.

SCOTT HUTCHESON is Associate Director of the Purdue Agile Strategy Lab. Scott has been engaged by nearly 400 industry, public sector, higher education, and nonprofit clients in thirty U.S. states and internationally.

ELIZABETH NILSEN is Senior Program Director of the Purdue Agile Strategy Lab. With a background in nonprofit management and higher education, she guides the expansion of the Lab's programming and partnerships.

JANYCE FADDEN is Director of Strategic Engagement for the College of Business at the University of North Alabama. She has held leadership positions at Honeywell, General Signal, and Danaher Corporation.

NANCY FRANKLIN is Principal of Franklin Solutions, working with leaders to facilitate strategic initiatives. Nancy has led partnerships at Penn State, Virginia Tech, Indiana State, and IBM/ROLM.

Praise for Strategic doing

"Shared leadership—not the all-powerful individual—will be the key to thriving in these new times. This book. . . explains what it really looks like on the ground. . . . A valuable resource for anyone looking to get to the 'next level,' as well as those trying to help them."

-Marshall Goldsmith, Thinkers 50 #1 Executive Coach; only two-time #1 Leadership Thinker

"Today's competitive marketplace demands more than just executing a plan. We need to form active partnerships incorporating people with diverse expertise to solve complex problems. The authors present a practical guide to doing just that."

-Greg Satell, author of Mapping Innovation: A Playbook for Navigating a

"I've been investigating how organizations' working environments influence a group's ability to achieve their goals for two decades. . . . This book provides insight into the practices and behaviors that help build high-performing groups. Readable and practical guidance for every organization and team."

-Amy C. Edmondson, Harvard Business School, author of The Fearless Organization

"Provides a roadmap, along with specific examples, for every community to thrive in the new economy."

-Victor Hwang, Ewing Marion Kauffman Foundation, author of *The Rainforest:* The Secret to Building the Next Silicon Valley

"Most of us like the idea of collaborating with others, but we don't do it. . . . So, are there rules for collaborating? The answer is yes, and this valuable book sets them out clearly and succinctly. An important contribution."

-Robert Reich, University of California at Berkeley, former US Secretary of Labor

"The missing element in most strategic initiatives is a successful collaborative approach. Strategic Doing adds to the agile strategy toolset available to managers who drive for results."

-Mark DeLuzio, President and CEO, Lean Horizons Consulting, Shingo Prize Academy inductee, author of Turn Waste into Wealth

"It's no longer about individual talent development, it's about our ability as leaders to coach a team to be agile, recognize opportunities, and adjust the course appropriately. . . . If you're talking about collaboration, this book provides a foundation."

-Ben Amaba, Chief Innovation Officer, IBM/Industrial Sector, Watson and Cloud Platform

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TEN SKILLS FOR AGILE LEADERSHIP

EDWARD MORRISON, SCOTT HUTCHESON, ELIZABETH NILSEN, JANYCE FADDEN, AND NANCY FRANKLIN

FOREWORD BY YO-YO MA

WILEY

nomplex challenges are all around us—they impact our companies, our communities, and our planet. This complexity and the emergence of networks is changing the practice of strategic management. Today's leaders need to understand how to design and guide effective collaborations to accelerate innovation and change-collaborations that cross boundaries both inside and outside organizations.

Strategic Doing offers an important guide to navigating this new world. Designed to be practical, the book introduces ten skills that anyone can learn. The skills have been successfully adopted by executives, managers, university administrators, government officials, students, community leaders, and others from a variety of disciplines.

The book's authors are both practitioners and teachers of Strategic Doing, helping others to master the skills. Solidly based in research, Strategic Doing explains each of the skills in detail and clearly illustrates how individual skills are used as part of an effective collaboration.

Filled with compelling case studies, the book provides guidance about how to get started using the ten skills and illustrates how a particular skill was critical in a targeted situation. The authors also reveal how the skills can be combined to amplify their effectiveness, and more generally, how to use the skills in a wide range of situations.

Strategic Doing outlines a new discipline of leadership strategy specifically designed for open, loosely-connected networks.

mankind has known."

"Over my 50-year career as a transformational change facilitator, I've witnessed the acceleration of the speed and complexity of organizational adaptation. This book is the best consolidation and codification of best practices for [a different approach to strategic planning and implementation] that I've seen. [The authors] make the Strategic Doing methodology clear and provide a manageable roadmap that makes the methodology easy to

Bob Sadler, CEO of Sadler Consulting, executive coach and authority on change leadership and executive presence

apply ... just in time to address the largest speed and complexity challenges

"Don't even bother reading all those other books on leadership and strategy. I know because I've written a number of them. *Strategic Doing* is THE source to understand how leadership and strategy are changing in this age of speed and complexity. What makes this book more important are the ten practical skills that you and your colleagues can learn to become masterful at leading in a disruptive age."

Jay Conger, chaired professor of Leadership Studies at Claremont McKenna College and author of The High Potentials Advantage

"Over the past 30 years, I have been traveling the world for 60 Minutes. One trend is clear. The challenges we face are growing in complexity. The best way to address these challenges is through human ingenuity unleashed through collaboration. This book illuminates that path. Recommended."

Bob Anderson, producer, 60 Minutes (CBS)

"After 12 years in public office, working on the complex, systemic, and interwoven challenges of poverty, crime, health disparity, and economic development, I can say that our nation desperately needs the guidance provided by *Strategic Doing*. At a time of global change and national strife, the lessons in this book not only provide a path for multiorganizational success, they represent a practical, nonpartisan formula to preserve our American democracy."

Lawrence Morrissey, mayor, Rockford, Illinois 2005–2017

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"Ed Morrison has mastered the art of making progress happen in a complex, change-resistant world. Now he and his colleagues have assembled decades of hard-won lessons into an easy-to-assimilate book – which is great news for every enemy of chaos, confusion, and inertia."

John D. Donahue, faculty chair of Harvard's Masters in Public Policy program and author of Collaborative Governance

"If you want to *do something* to make your community better but worry, 'I'll need a grant' or 'I'll need a powerful board of advisors,' stop worrying and start doing! Strategic Doing requires *no money, no powerful CEOs*, and *no one's permission*. It's a simple-to-understand process that any group can use to take the resources they have and launch innovative and impactful projects. I use it with my clients and am consistently blown away by what people like you and me can do with Strategic Doing."

Rebecca Ryan, noted futurist and economist, author of Regeneration: A Manifesto for America's Next Leaders

"When our foundation was looking for a tool to offer to the rural communities we serve, Strategic Doing emerged as the right vehicle. The agility of the process enables a group of 5 or a group of 50 to bring forth an idea, divide the workload, determine the feasibility, and when appropriate, foster the implementation. Our communities have been encouraged by increased participation in civic activity from a broad spectrum of ages."

Betsy Wearing, coordinator of Communications, Programs, and New Initiatives, Dane G. Hansen Foundation

"An important evolution is taking place among U.S. land-grant universities.... The learning, discovery, and engagement taking place on our campuses today is now pointing us to new approaches to the economic challenges facing society. This valuable book builds on that tradition through the new discipline of Strategic Doing to achieve higher and more productive levels of collaboration.... Anyone interested in solving such problems more effectively, faster, and more collaboratively will find this book a welcome treasure."

Martin Jischke, former president, Purdue University

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"This is a book about Strategic Doing. It not only consolidates years of real experience but is also written in a style that is fully consistent with the title: action focused. ... Because of the integration of the broad base of experience with the science of ecology, cybernetics, and complexity, this book shows a depth beyond expectation, considering how hands-on and practical this proven approach is."

Peter Robertson, executive lecturer and research fellow, Nyenrode Business University (The Netherlands)

"Applying deep underpinnings in social science research, Lean/Agile experimentation, and refinement through rigorous practice, the Strategic Doing founders have created a framework to define and execute strategy for our time. ... This book is for anyone or any organization that wants to tackle a 'big hairy audacious problem' with effective, complex collaboration. "

Patricia Sheehan, Agile Transformation lead and coach, AstraZeneca Agile Centre of Excellence

"Strategic Doing is the most impressive and effective way to get things done in our community. It allows everyone an opportunity for input and provides clarity of vision, mission, purpose, and tasks upon which we have all agreed. If we continue to work together, there is no limit to our achievements."

Macke Mauldin, president, Bank Independent

"As someone who leads a complex organization, I am always looking for new approaches to how I work. Learning to be proactive and truly collaborative is what the Strategic Doing method has taught me. Strategic Doing is not just for the workplace but can easily be applied to all areas of life that involve people coming together for a common goal. These are simple and well-supported skills that anyone can employ in their work and life to make a tangible difference."

Stephen Jennings, senior vice president, Rady Children's Hospital; executive director, Rady Children's Hospital Foundation

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"The challenges we face today – in our communities, in the economy, and in society as a whole – are far too complex to be ameliorated by the same simple approaches to planning and implementation that we've used in the past. This book provides a road map to the future of strategy, and to a better world."

Jim Woodell, former vice president for Economic Development and Community Engagement, Association of Public and Land-Grant Universities; convener, Collaborative for Insight and Impact

The convergence of the physical and digital worlds, especially in manufacturing, presents unprecedented opportunity for the creation of transformational value. With all the chess pieces on the table, there are a seemingly unlimited number of opportunities. ... [L]eaders need the skills and insights presented in this book. *Strategic Doing* should be required reading for every leader charting a pathway forward.

Don Cooper, VP, PTC/Global Rockwell Alliance

"Strategic Doing is a straightforward vehicle to get to a decision and action, very quickly, with busy people. In an era where diversity and collaboration are critical to success, it can be done quickly and efficiently. ... It is time tested, and I personally endorse and recommend this book with enthusiasm!"

Charles Van Rysselberge, president (retired), Oklahoma City Chamber of Commerce, Charleston (South Carolina) Chamber of Commerce

"Speed and agility are hallmarks of successful companies. In the world of software engineering, agile methodology and design thinking have become ubiquitous tactical systems for getting to better results in less time when faced with complex challenges. Yet, a gap remains between this agile methodology at the tactical level and the way leaders often think in setting direction for their organizations. This book addresses that gap and should be required reading for every organizational leader."

Kenneth Johnson, CEO, Blue Sentry Group

"For those involved in strategic planning and management across corporate, government, universities, and community organizations, Strategic Doing provides three key advantages. It addresses the fundamental flaws



that have emerged in the application of traditional strategy and planning within a whole new environment. Secondly, it provides a simple, logical, low cost, and low risk way of getting the right things to happen quickly and – thirdly – it works!"

Emeritus Professor Michael Hefferan, University of the Sunshine Coast (Queensland, Australia)

"After 30-plus years as a leader in the hospitality industry, I've realized collaboration is a much-needed skill that is often challenging to implement in a fast-paced service environment. As the founder of a company with completely remote-based employees, clients all over the world, and multiple projects happening on a daily basis, learning the art of collaboration is something that is crucial to our success – yet something not taught in most work places or universities. [T]his book is a must read for anyone who wants to succeed in business, or, for that matter, in life today!"

Caryl Helsel, founder and CEO, Dragonfly Strategists

"Today's communities, geopolitical regions, economies, and societies face many highly complex challenges. Effective solutions to these challenges require that the leaders of organizations charged with addressing them – be they educational, governmental, nongovernmental, or private – must work across traditional organizational, cultural, and geopolitical boundaries. Strategic Doing, with its ten skills to developing effective networks, is a much-needed 'perspective changer' on strategy and leadership."

Vic Lechtenberg, former provost, Purdue University

It doesn't matter the context in which you are operating, whether you find yourself in a corporate, government, or nonprofit space – if you're bringing twentieth Century solutions to twenty-first Century problems, you will not have the agility to effect meaningful change. Strategic Doing is a twenty-first century solution. This book provides the reader with a set of practices for tapping into the resources of loosely connected networks and helping your organization move forward quickly. ... Change is the new constant. This book will help you successfully embrace that change.

Will Samson, Organizational Change Management, General Dynamics Information Technology \bigoplus

"Everyone agrees that complex problems require complex solutions. ... How ironic is it that the answer to this collaboration-complexity nexus is something very *simple*: the ten skills of Strategic Doing (SD). SD takes an asset-based approach. However, the identification of assets is a hollow victory if those assets are not mobilized. SD provides the skills to catalyze this mobilization, leading to two important outcomes: problems are solved and the human capital of the participants is simultaneously enhanced. Can there be a better win-win scenario?"

Sam Cordes, professor emeritus and cofounder, Purdue Center for Regional Development

"As many warn that our technology might serve to isolate us, the authors offer real, all-hands-on-deck hope: a daring and wonderful proposition for us to work and think *together* – and accomplish things others might once have deemed formidable in the extreme. ... I like to tell kids they can build a better future, and paint a portrait of what that could look like, but they are actually charting the course, a way to get there. For all of us, I hope the world listens and *does* likewise."

Noah Knox Marshall, author, Dax Zander: Sea Patrol

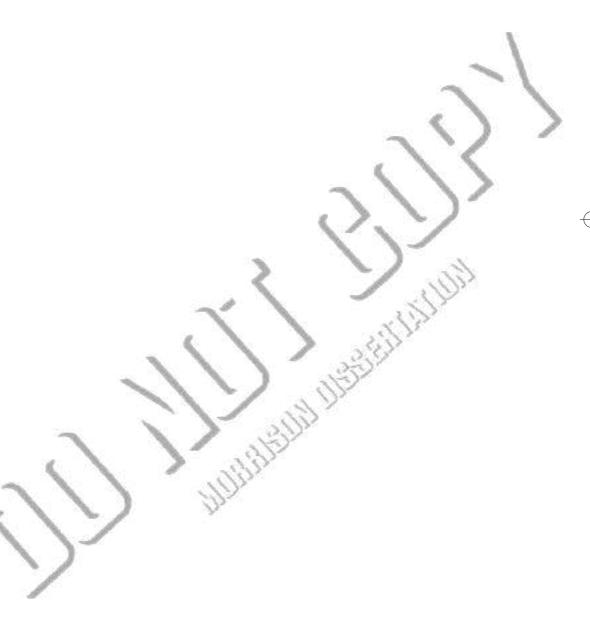
"Dealing with intractable challenges in your family, organization, or community? Look no further. This book, replete with clear guidance and real-life examples, shows you how to work with others to implement practical solutions that transform big wishes into reality."

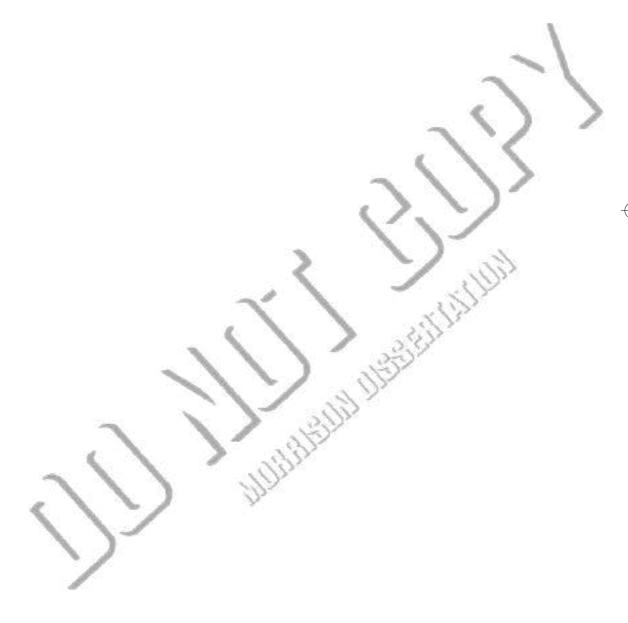
> Eleanor Bloxham, founder and CEO, The Value Alliance and Corporate Governance Alliance

"[Our] manufacturing ecosystem is much stronger and much more collaborative as a result of the skills taught in Strategic Doing. Montana's successful entrepreneurs depend on agile strategies where all manufacturers collaborate for mutual benefit. It is great that these skills are being brought together in this important book."

Paddy Fleming, director, Montana Manufacturing Extension Center, part of the National Institute of Standards and Technology's Manufacturing Extension Partnership (NIST MEP)

Strategic Doing





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Strategic Doing

Ten Skills for Agile Leadership

EDWARD MORRISON
SCOTT HUTCHESON
ELIZABETH A. NILSEN
JANYCE FADDEN
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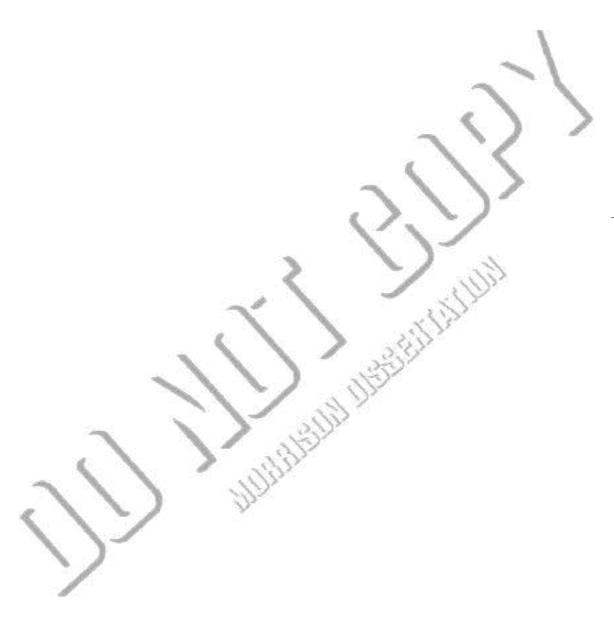
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This book is dedicated to the remarkable Strategic Doing community that now stretches across the globe. You inspire us.







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I've been waiting for this book all my life. Strategic Doing answers so many questions I have on how cultural organizations can band together to be part of the solution in addressing society's most complex issues.

I was a witness to and participant in this approach when I met Ed Morrison in Youngstown, Ohio, working with a group of socially committed citizens, each determined to work to reinvigorate a once-thriving community. In one short hour he had each of us identify and unlock our assets, come up with a plausible group plan, and determine a course of action moving forward, agreeing to meet again 30 days from that moment.

Now we have the book that details 50 years (between its five coauthors) of work, showing how Strategic Doing has been catalytic in revitalizing communities, cities, industries, and sectors all across the country.

Strategic Doing is precisely what we need at this moment. In a fast-changing world, filled with disruption, with institutions not equipped to absorb or deal with the pace of change, here is a way of thinking and acting – an agile strategy that makes collaboration take place at the necessary speed for social good.

Yo-Yo Ma December 31, 2018 Arlington, Massachusetts

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Appendix B: Teaching Materials

Strategic Doing: The Game







Appendix B: Teaching Materials

Strategic Doing Training Exercise: Point the Finger





Appendix B: Teachin
Strategic Doing Field Guide (excerpt):
2.5 day training



Appendix B: Teac

Your Name:		
Your Practitioners' Resou	rce Library user name:	
Your Instructors:		
Name	Email	

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For(e)ward

FROM THE AUTHORS

This revision is occasioned by an exciting development - the release by Wiley of our book *Strategic Doing: Ten Skills for Agile Leadership.* This guide is intended as a companion to the book for the participants in the 2.5 day training for new Strategic Doing practitioners. It includes materials for class exercises as well as additional content outside the scope of the book to help you develop and implement your own Strategic Doing workshops.

This second edition is a revision of the Strategic Doing practitioner's "field guide." "1.0" was itself a major revision of the the very first guide, a large binder of materials which marked an effort to codify the Strategic Doing discipline in order to help others learn the skills to lead complex collaborations in open networks. Since that beginning, we've learned a great deal from participants in the trainings about what activities and exercises are most effective as well as how to communicate the content in a classroom format.

As we said in the last edition, we expect further revisions. We continue to learn from practitioners around the globe who are using Strategic Doing in a wide variety of situations, addressing challenges in communities, regions, companies, universities, government, and nonprofit organizations.

Experimentation is not just a principle within Strategic Doing; it's the way in which we ourselves use the discipline.

Four of us have worked on this revision, supported by dozens of practitioners in the Strategic Doing community of practice. We are indebted to them. Thanks also to David Allen Moss of MossMedia for his design guidance, as well as Kim Mitchell, whose graphic talents (as evidenced by the illustrations in this guide) continue to enrich the Strategic Doing community.

We wish you great success as you learn over the next few days how to "do more together".

Ed Morrison Liz Nilsen	

WHAT'S AHEAD

As we start our time together, we think you should know what you can expect from this experience. In broad terms, when you finish this training, you'll be what we call a Strategic Doing "practitioner" – that is, you'll have the skills to guide a group (using the Strategic Doing principles) to identify opportunities and move them into implementation. The group might be one within your own organization, it might be a collaboration across organizations, or perhaps a group with which you're working as a consultant.

The book *Strategic Doing: Ten Skills for Agile Leadership* is designed to help individuals develop leadership skills. In this training, you'll learn how these skills can be put together in a disciplined fashion to manage a collaborative group.

Larger, systemic change is certainly possible with Strategic Doing - and there are several examples of this kind of change in the book. This sort of transformation is not easy, even for experienced leaders - and it is beyond the scope of this training. Thus, we encourage you to start with a relatively modest challenge involving one or two small groups of people. We encourage you to talk with your instructors for guidance if you are contemplating large transformations. Know too that over time, your abilities with Strategic Doing will grow, and with them your capacity to take on bigger challenges.

As instructors, we're making a commitment – a promise, if you will – to help you "do more together."

- We promise to introduce you to new ways to think about networks and how to do complex collaboration in open loosely-connected networks.
- > We promise to teach you about the importance of civility and why civil behavior enables complex thinking to happen.
- We promise to introduce you to new ways of doing complex work with simple rules.

These commitments we are making as "instructors" to you as "students" are promises that all of us in the Strategic Doing network make to one another. We welcome you into that learning community – the hundreds of practitioners exploring this discipline. We look forward to working with you not just over the next few days, but in the weeks, months, and years ahead, as together we discover new ways to live out what we call the "Strategic Doing Credo":

- > We believe we have a responsibility to build a prosperous sustainable future for ourselves and future generations.
- No individual, organization or place can build that future alone.
- Open, honest, focused and caring collaboration among diverse participants is the path to accomplishing clear, valuable, shared outcomes.
- > We believe in doing, not just talking and in behavior in alignment with our beliefs.

(Adopted by the Strategic Doing Design Team at Turkey Run State Park (Indiana), October 2011)

Welcome to a community that stretches across the globe, that believes in the power of simple rules to tackle our most complex challenges.







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elcome to a unique learning experience! Over the next few days you'll be developing a new set of skills and habits that will equip you to address complex challenges in your organization, community, or region.

This "Field Guide" is designed to be part textbook, part workbook, part reference guide for when you return home.

At the outset, we want to clarify the relationship between this Field Guide and the book *Strategic Doing: Ten Skills for Agile Leadership* (particularly if you've come to the training having already read the book. The book is written for a general audience and in particular is written for the individual - the person that wants to become a more effective leader within their company, organization, or community. In the book, we present ten skills that any individual can use to that end.

At the end of the book, we touch on the idea of how the skills could be combined in a specific fashion to create a larger group process.

That process is what you'll be learning about in our 2.5

days together. The ten skills are still relevant - in fact, you'll recognize them as what we'll be referring to as ten "rules" for an effective group experience. There will be more emphasis on how you can use each skill within the group literally, while the group is seated together around a table. We call this kind of setting a Strategic Doing "workshop" - a session in which a group goes from an appreciative question to an action plan.

We'll cover the key concepts in the book during the training, but you'll benefit most by reading all the way through the book - whether you did so before the training or after you get home. The book is arranged in the same way we'll be covering the content - first an overview of some underlying ideas, then the ten rules, then guidance on how to start using Strategic Doing in a workshop.

A FEW NOTES TO HELP YOU GET THE MOST OUT OF THE FIELD GUIDE:

- > Learning Objectives for each chapter will tell you what you can expect from each section;
- The Big Ideas summarize the material in the relevant chapter of the book and/or that will be presented;

Appendix B: Teaching Materials

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- > Copies of *key slides* and workspace for *class exercises* will help you consolidate your new knowledge.
- > Tips for *Table Guides* and *Knowledge Keepers* provide a guide for these key roles (you'll learn more about these roles in the training). Most chapters include a fast reference of best practices.
- > Pages of the standard *Strategic Doing "pack"* the tool each workshop participant uses - are included in each chapter so you can see how the 10 Rules are used in the workshop.

An important accompaniment to this book is the online Practitioner Resource Library. You'll be receiving a login and password by email either just before or during the course of the training. The library includes printable versions of some of the materials in this book, links to additional resources and readings, and "success" stories related to many of the components of Strategic Doing you'll be learning about. It's also where you can get more information about certification and ordering (optional) materials for your workshops.

Your instructors are available to you throughout the workshop – and beyond – to help you get the most out of the training. Each faculty member has used Strategic Doing in a wide variety of settings over at least several years, and has been certified by the Strategic Doing Institute based on their demonstration of skills in teaching the discipline. Take full advantage of their experience to get the most out of the time.

By taking part in this training, you're becoming part of the larger Strategic Doing community – beginning with the others in the training. Get to know them, find areas of common interest, and begin to build your own "community of practice" that you can draw on in the weeks and months ahead.

An Overview of Strategic Doing

(This section of the Field Guide accompanies pages 3-25 of Strategic Doing: Ten Skills for Agile Leadership)

LEARNING OBJECTIVES

At the end of this module you will:

- Be familiar with the concepts of the S-Curve, complex systems, strategy, and collaboration;
- Understand the historical transition from hierarchies to networks and its implications;
- Be able to describe key features of networks and their behavior:
- Understand how the need to think, behave, and do differently are prerequisites to Strategic Doing.

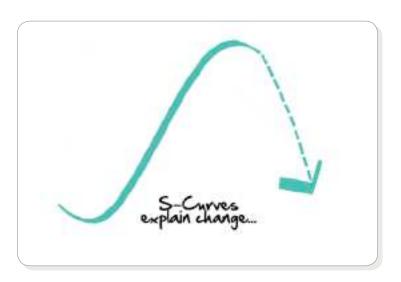
THE BIG IDEAS

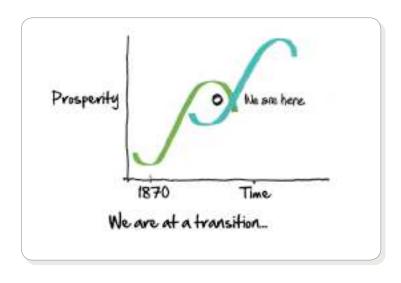
Increasingly, we face complex challenges in our organizations, our communities, and our world. These

challenges are usually embedded in **complex adaptive systems** – that is, there are multiple actors and/or forces that created the challenge, and continue to shape it. It feels as if the challenge is a moving target – just when you think you have a good idea for addressing it, it seems to change shape, upending your previous assumptions.

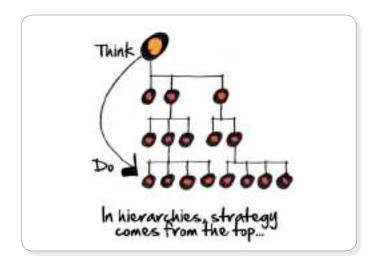
A useful model for thinking about the evolution of our common life is the **S-Curve**. S-Curves explain how ideas, products, biological systems arise, grow, mature, and (eventually) decline. Many of our challenges have to do with finding ourselves on or nearing the decline phase and needing to jump to a new S-Curve.

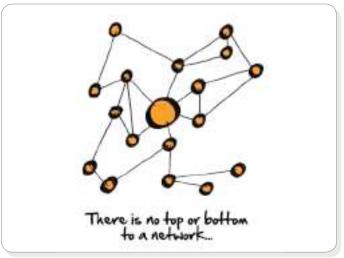
This kind of challenge does not respond well to the tools many of us learned when we began our careers. One reason for this is that over the last 50 (or so) years, we have undergone a transition in the paradigm of work we do together. Until fairly recently, most work was done in the context of a hierarchy, in which one or a few people at the top transmitted instructions to those below. That model has shifted to a network paradigm, in which individuals or organizations come together to address a particular need; that joint effort may be temporary – once the need is addressed, the work together ceases.





llied Chemical and Dye	3M Company
American Can	American Express
American Smelting & Refining	Apple
American Telephone and Telegraph	Boeing
American Tobacco	Caterpillar
Bethlehem Steel	Chevron
Chrysler	Cisco Systems
Corn Products Refining	Coca-Cola
DuPont	Dow
Eastman Kodak	Exxon Mobil
General Electric	Goldman Sachs
General Foods	Home Depot
General Motors	Intel
Goodyear Tire and Rubber	IBM
International Harvester	Johnson & Johnson
International Nickel	JP Morgan Chase
Johns-Manville	McDonald's
Loew's Theatres	Merck
National Distillers Products	Microsoft
National Steel	Nike
Procter & Gamble	Pfizer
Sears Roebuck	Procter & Gamble
Standard Oil Co. of California	Travelers
Standard Oil Co. of New Jersey	UnitedHealth
Texas Company	United Technologies
Union Carbide	Verizon
United Aircraft	Visa
United States Steel	Walgreens Boots
Westinghouse Electric	Wal-Mart
F. W. Woolworth	Walt Disney Company





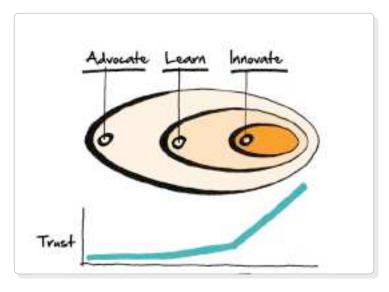
	HIERARCHIES	NETWORKS
Shape	Vertical	Horizontal (no top or bottom)
Members	Single institution	Single or multiple institutions
Advantage	Efficient in stable environments	Nimble in changing conditions
Key Challenge	Communication of instructions	Alignment toward shared outcomes

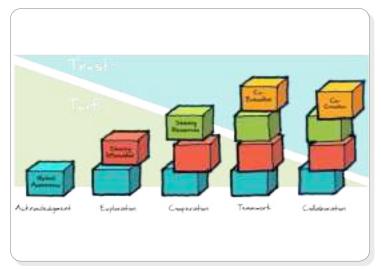
A summary of some of the key differences between hierarchies and networks is shown in the table above. Some organizations make the jump successfully, and others do not. Here's one example: the companies in the Dow Jones Industrial Average (DJIA). The DJIA shows the business community's consensus about a set of companies which best illustrate the general health of the economy – when we hear that the "market" is up or down, it's usually this DJIA that's being referred to. Only one of the firms in the list in 1939 is still there today (Procter & Gamble), and many of the 1939 firms have disappeared completely!

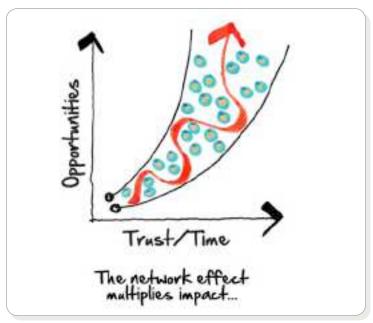
In order to successfully navigate these challenges, we need to think differently, behave differently, and do differently.

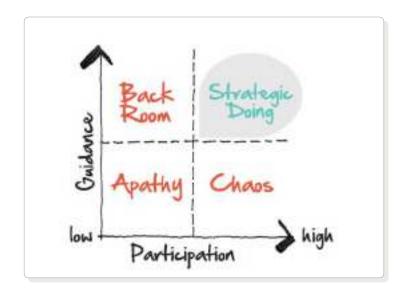
Thinking differently involves understanding how it is that networks are structured and function. The networks that lead to effective collaborations have several distinguishing features: they do not have a top or bottom; they are

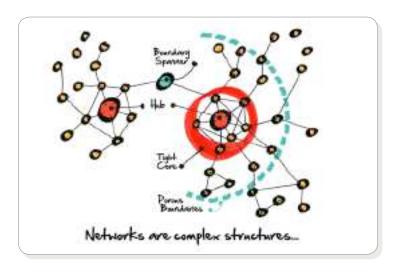
Appendix B: Teaching Materia STRATEGIC DOING | PRACTITIONER'S FIELD GUIDE







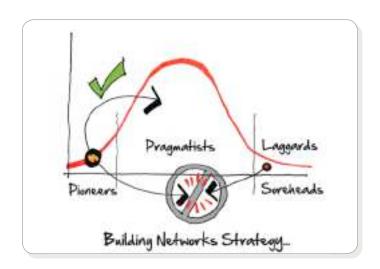




Working the Balance

Strategic Doing represents a balance of leadership and participation. Take a few moments to reflect on experiences you've had in which leadership and participation were not optimally balanced.

Backroom Deals	
Apathy	Chaos



gathered around a hub of resources; they tend to have a few people very central to the work and others more distant, with these positions shifting over time; and they are connected to other networks through boundary spanners: people who belong to both networks. Another way in which we need to think differently involves our definition of "collaboration," because much of what passes for collaboration in fact is not. Networking, coordinating, cooperating and teamwork are all ways of working together, but they may not be true collaboration. Collaboration involves developing resources and creating new value together; these tasks require high levels of trust.

Behaving differently recognizes that we need some rules for how we relate to each other when facing complex challenges. People respond to challenges as 1) pioneers, 2) pragmatists, or 3) soreheads. We are accustomed to accommodating soreheads and their negativity, but we need to set aside that practice for effective collaboration. One way to do that is to establish and enforce "rules of civility." Those rules allow us to have difficult conversations with one another, and open the way to work in which many people participate, but that is still guided so that it is not unproductive chaos.

Doing differently means that we recognize that the old ways of working together – including traditional strategic planning – don't work very well in this new environment. Instead, we can borrow from agile open source software development to create patterns of collaboration that emphasize learning, iterative improvements, and recognizing contributions from many sources. The ten rules that follow this overview will introduce you to this new way approach. While they are straightforward, they are not easy to master and require practice and experience.

HOW NETWORKS DEVELOP

Innovating networks take time to emerge. In our work, we have identified four distinct phases in the development of these networks.

- > In the first phase, the conversation begins to shift among members of a community. They think less in hierarchical or "vertical" terms and more in networked or "horizontal" terms. Instead of looking up and down, they begin to look around.
- > As they do, they emerge into the second phase: becoming aware of the networks around them and how easily they can be accessed through tapping the boundary spanners. They are actively looking for such connections that can expand their capacity to do complex work.
- > During the third phase, members of the network learn how to guide their network strategically by working in an agile 'plan/do/plan/do" manner. They apply the lessons of Strategic Doing, finding ways to link assets in different parts of the new network to create value.

Appendix B: Teaching Material STRATEGIC DOING | PRACTITIONER'S FIELD GUIDE

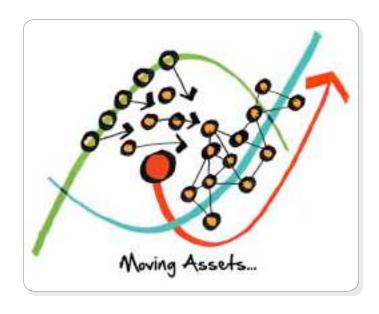
In the fourth phase, members of the network launch pilot projects to see how they can create new value. These projects start out as experiments. They expand the successful ones and reform or abandon the unsuccessful experiments.

Sometimes all four phases happen in a single, day-long Strategic Doing workshop. More often, the transition is slower; it may have its own iterative nature, or there may be a "two steps forward, one step back" kind of evolution. However it happens, this sequence of changes taken together leads to an **inflection point**. An inflection point means that there is a turning or bending away from one course or direction to a new course. Sometimes the phrase **tipping point** is used in the same way. There is a change from a hierarchical way of thinking and acting to a network that can innovate and get business done more quickly and productively.



Going back to our characterization of the transition as a movement between two S-Curves, we can now see our challenge more clearly. We need to connect the resources (which we'll call **assets**) from the old ways of doing business (often in a hierarchical fashion) into new networks that take advantage of the emerging opportunities.

As we build these networks and reach the inflection or tipping point, we become more aware of the **network**



effect. Innovating networks generate increasing returns as the network size increases (remember the porous boundaries) and more and more assets are aligned in service of the desired strategic outcome(s).

Even though the network has tremendous power as a structure to power innovation and change, this does not mean that all hierarchies need to be eliminated. Strategy guru John Kotter talks about the need for both hierarchy and networks. Hierarchy is needed for the structural functions of fiscal management, human resources and IT management. Many day-to-day transactions also depend on hierarchies-imagine going to a fast-food restaurant and ordering a standard item, only to have the counterperson tell you that the store's network, including the partnering suppliers, will have to convene to talk about how to best meet your needs. Networks are needed for almost everything else. Networks are where innovation occurs and better ways to reach shared goals are explored and agreed upon. Hierarchy helps support network functioning

Your Network
Use this space to sketch a network that you are a part of (use the graphic on p. 7 for a guide). Who is part of the core, and who is on the periphery? Are there neighboring networks? Who are the boundary spanners?

Appendix B: Teaching Materials STRATEGIC DOING | PRACTITIONER'S FIELD GUIDE

in organizations by focusing on more routine tasks that need to be done.

THE QUESTIONS OF STRATEGIC DOING

To move people in a network, we need to engage them emotionally. Recall, these are pragmatics. Rather than the flowery language of a vision statement, pragmatics need specifics and clarity. They need to be able to see both the destination (or outcome) and the pathway. Since it is an open network, we need to convince them that we can, indeed, get from here to there. A few examples of outcomes and destinations in various fields are shown below. strategy, then, answers the questions "Where are we going?" and "How will we get there?" To answer those two questions, Strategic Doing divides them into four questions. The first two questions focus on where we are going (the outcome). The second two questions draw the pathway.

OUTCOMES AND PATHWAYS

Military

The four questions are:

- What could we do? Given the strategic challenge we are facing, what are the activities and resources we could use in meeting our challenge?
- What should we do? Out of all the opportunities we have to respond to our challenges, which one(s) make the most sense for us to pursue right now?
- What will we do? What concrete, short-term steps can those of us gathered together here take to move toward the outcome?
- What's our 30/30? When will we come back together to report what we've learned, adjust as necessary, and set our course for the next period of time (usually, 30 days)?

These four questions are the bedrock of Strategic Doing. We ask them over and over, iteratively – refining our strategy as we learn. As the graphic shows, we come together to ask these questions, separate to follow up on tasks we have each agreed to, and then come back together again.

Series of battles

PATHWAY

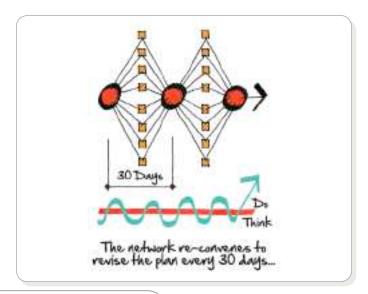
Education Knowledgeable citizens Primary and secondary curricula Economics High standard of living Business-friendly laws and policies, job training programs Commerce Leading market position Investments in open innovation networks			
job training programs Commerce Leading market position Investments in open innovation	Education	Knowledgeable citizens	Primary and secondary curricula
	Economics	High standard of living	
	Commerce	Leading market position	

OUTCOME

Takeover of government

SIMPLE VS. EASY

The four questions of Strategic Doing are simple ones. However, it is not easy to stay on this course. It requires tremendous discipline by both leaders and participants. To make this discipline easier to adopt, the "10 Rules of Strategic Doing" break the cycle of questions down even further and help us deliberately move through the process.







Do More Together

Guiding the Conversation

The role of the Table Guide is critical to the success of the Strategic Doing session.

To be effective, Table Guides should be trained prior to the session (via video or inperson). The workshop leader should confirm that they are comfortable with the process and the expectations. Each Table Guide should have another person at the table acting as the "Knowledge Keeper" to act as scribe. Both Table Guides and Knowledge Keepers will need to listen carefully for what people are willing to share and how we might build connections among these assets to create new opportunities.

What is your role in guiding the process?

- *Keep track* of time and push people to focus on the questions
- » Cut off people who stray too far afield
- » *Encourage* participation with short, focused comments
- » Check to make sure the Knowledge Keeper is tracking the conversation in the pack
- Briefly *review* the ground rules, or be prepared to reference them if necessary
- » Lead by asking questions, using the "power" question model

What are the common pitfalls?

Stage of conversation

What Could We Do Together?

Seeing opportunities by connecting assets.

What Should We Do Together?

Converting opportunities into outcomes with specific characteristics.

What Will We Do Together?

Defining a Pathfinder Project and action plan.

What's our 30/30?

Getting the right level of engagement

NOT REPRO Potential Pitfall

People talk about what they do, not the assets they can contribute People focus on assets and not the connections among assets.

HINT: Ask each person for one asset; start with one and connect from that.

People are too weak in their language.

HINT: Start by having everyone close their eyes for a moment and imagining success; then have each person describe what they "see.

People are vague or incomplete in their commitments.

HINT: Follow up and ask about each column in the pack page.

People do not make definite plans to reconnect.

HINT: Sometimes doing this earlier in the session ensures that follow-up will

One person dominates, and / or others do not join in the conversation.

HINT: Use body language (away from the "talkers;" use direct questions if needed: "It's important we hear from everyone. Miriam, what do you think?"

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Do More Together

Overview

What is Strategic Doing?

Strategic Doing is a process that enables leaders to form collaborations quickly, identify outcomes with measurable characteristics, and make adustments along the way.

> The process focuses on four FORSAMPLE key questions:

What to Expect

During a Strategic Doing workshop, participants are led through a structured set of conversations to define five things:

- 1. Opportunities
- 2. At least one outcome with characteristics ar
- At least one starting ("Pathfinder") project
- 4. A complete action plan
- 5. A plan to meet again.

What could we do together?

- Look first at assets within the group at the table.
 - Next, look to see how combining the known assets might offer new opportunities.
 - Evaluate who is not at the table but miht have an interest and resources helpful to the solution.

NOT REPRODU

What should we do together?

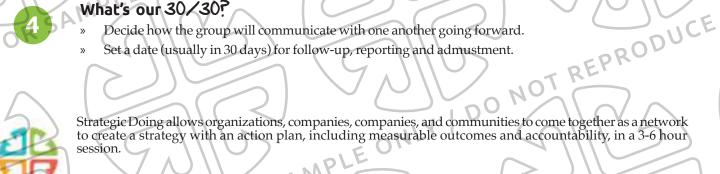
- Identify an opportunity to begin pursuing that is both do-able and will have an impact
- Define the desired outcome more specifically with measurable characteristics.

What will we do together?

- Choose a starting (or "Pathfinder" project to begin testing the idea and generating momentum.
- Draft an action plan in which everyone will take part.

What's our 30/30?

- Decide how the group will communicate with one another going forward.
- Set a date (usually in 30 days) for follow-up, reporting and admustment.



Contact us at info@strategicdoing.net to learn more about Strategic Doing and how you can use it to be more effective. Follow us at strategicdoing, net or on social media to learn about activities and opportunities.

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Appendix B: Teaching Materials

QUICK REFERENCE



Note: Duplicate this sheet for additional projects, strategic outcomes, and/or multiple groups. Complete each after ODUCE 30/30 or other check-in.

	Date:	ONTA DO 11
FO	Group Name:	
	Strategic Outcome: Metric 1	(any results so far)
9	Metric 2	(any results so far)
	Metric 3	(any results so far)

Pathfinder project 3	REPR
Name: DO NO	
Complete?	Y/N
Notes:	

(Pathfinder project 1
$\left \cdot \right $	Name:
)\	Complete? Y/N
	Notes:
	NPLE ONL
_	OR SAM
-	Pathfinder project 2

Pathfinder project 4	000
Name:	9/11/2
Complete?	Y/N
Notes:	

Pathfinder p	project 2
Name:	
Complete?	Y/N
Notes:	JU SAN
	ORS

Pathfinder project 5	REPRODU
Name:	NOT
Complete?	Y/N
Notes:	

Appendix B: Teaching Materials

Syllabus: Purdue One Unit Online Course

December 13, 2018

TECH 39000: The Science & Practice of Complex Collaboration

Distance Learning Summer 2019 Syllabus v.1

Course Credits:

1 credit

Time & Location:

Distance Learning

Instructor:

Dr. Scott Hutcheson
School of Engineering Technology
Officer (ADOY 158)

Office: KNOY 158

Phone: (765) 479-7704 (mobile)

hutcheson@purdue.edu

Office hours are by appointment or virtually (phone and email) on Monday evenings 7-9pm

Course Description:

- What is collaboration and how is it different than teamwork?
- Why is collaboration especially important in addressing complex technical and social challenges?
- What are the 10 Rules of Collaboration and how do put them into practice?
- What is the science behind the 10 rules?

These are some of the questions that are explored in this online 1-credit undergraduate course designed by the Purdue Agile Strategy Lab and offered to all Purdue undergraduate students through the Purdue Polytechnic's School of Engineering Technology.

This is an innovative online course delivered, in part, on a social learning platform called *FutureLearn*. The course is taught by a lead instructor and a network of learning mentors with a wide variety of backgrounds. The course is designed to be fast paced, interactive, and fun! Students will walk away with a set of practical skills to help them design and lead complex collaborations, giving them a competitive edge as they enter the workforce. Students can take the course from anywhere and be one credit closer to graduation! Students also get a valuable set of digital tools including a *Strategic Doing Field Guide*, the *Strategic Doing Trail Map* App (for iPhone or Android), and access to a digital *Student Resource Library* with worksheets, templates, and other tools to help improve the productivity of collaborative teams.

The tools and approaches taught in this course have been incubated and developed by the Purdue Agile Strategy Lab and its partners. These same tools and approaches are being used in a rapidly growing number of companies, nonprofits, and government agencies.

Syllabus: Purdue One Unit Online Course December 13, 2018

Course Learning Objectives and Competencies:

The course will be taught focusing on three learning objectives and several competencies.

Learning Objectives

- 1. Students will be able to articulate what is collaboration and how it is different than teamwork
- 2. Students will demonstrate an understanding of why collaboration is especially important in addressing complex technical and social challenges.
- 3. Students will learn the 10 Rules of Collaboration and how do put them into practice.

Competencies

- 1. Students will recognize the elements of safe places and spaces for deep focused conversations.
- 2. Students will learn to design appreciative questions.
- 3. Students will gain an understanding of recombinant innovation.
- 4. Students will recognize and help others identify assets using tools like an Asset Map.
- 5. Students will sharpen their ability to see and shape new opportunities by linking, leveraging, and aligning assets.
- 6. Students will understand how to harness the collective intuition needed to prioritize strategic opportunities.
- 7. Students will learn to convert strategic opportunities into strategic outcomes with measurable objectives so that others can visualize success.
- 8. Students will appreciate the importance of experimentation and "learning by doing."
- 9. Students will understand the role pathfinder projects play in complex work.
- 10. Students will be able to describe the characteristics of an effective pathfinder project and how to design one.
- 11. Students will understand how shared leadership can be productive.
- 12. Students will be able to construct effective action items and action plans.
- 13. Students will understand the importance of feedback loops.
- 14. Students will recognize the characteristic of effective "nudges."

Course Materials

Course materials for this course include a set of digital and hardcopy resources. The estimated total cost for these resources is \$125. This included the textbook *Strategic Doing: Ten Skills for Agile Leadership*. Your instructor will provide more information about these resources.

Virtual Class Periods:

The course will be delivered asynchronously over a five-week period. That means that the work required for this course (both the content to be viewed and read as well as the assignments completed) can be done anytime during the week. There will, however, be deliverables due each week. Often by midnight on Sundays. Some assignments and activities may need to be completed at different times. Your instructor will provide a schedule of due dates.

Course Presence & Participation:

Course presence will be monitored. Students are expected to be present in the course at least once per week. Instructors can monitor presence by seeing who is logged on each week. Any student not being active in a given week will receive a 10% deduction in their overall course grade for each week of inactivity. Students are also required to be an active learner through course participation. This participation will be demonstrated mainly by students being active in course discussions. Participation will account for a significant percentage of the course grade.

Syllabus: Purdue One Unit Online Course

December 13, 2018

Tests & Quizzes:

There will be a final exam and periodic quizzes to assess student's understanding of the material presented.

Course Topics:

- What is collaboration and how is it different than teamwork?
- Why is collaboration especially important in addressing complex technical and social challenges?
- What are the 10 Rules of Collaboration and how do put them into practice?
- What is the science behind the 10 rules?

Class Communication:

Your instructor will communicate with you through a course email distribution list and via course announcements. Therefore, you are expected to check your @purdue.edu email account and the online course platform regularly.

Grade Assessment:

Total	100%
Final	25%
Quizzes	20%
Discussions	35%
Living Lab Reflection Assignments	20%

Grading Scale:

Α	90-100
В	80-89
С	70-79
D	60-69
F	0-59

Conduct:

Professional conduct will be expected of all class members. The highest caliber of mutual respect among all class members, students and instructors alike, is demanded. Harassment of any form will not be tolerated. Should you feel that you are the victim of harassment of any form, immediately take the issue to the course instructor, a counselor, or the department head. Appropriate corrective action will be taken, and your privacy will be safe guarded. Safety infractions or behavior problems will lead to failure in the course and referral to the Dean of Students.

Academic Dishonesty:

You must do your own work. Presenting someone else's work as though it was your own is dishonest. Signing in for someone or asking someone to sign in for you is also dishonest. Purdue takes great pride in the integrity of its faculty/staff/and students. Any acts that are deemed by your instructor to be dishonest will be reported to the Dean of Students and may result a zero on the grade associated with the assignment or grading component or in failure of the course.

Purdue's Honor Pledge:

Students are expected to uphold the following - As a boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together - we are Purdue.

Syllabus: Purdue One Unit Online Course

CAPS Information:

Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at (765)494-6995 and http://www.purdue.edu/caps/ during and after hours, on weekends and holidays, or through its counselors physically located in the Purdue University Student Health Center (PUSH) during business hours.

Special Learning and/or Special Exam Conditions:

If you require special learning conditions, inform the instructors within the first week of classes so that accommodations can be made.

Campus Emergencies:

Although this is an online course, students and faculty may be on the Purdue campus when enrolled in or instructing this course. With that in mind the campus emergency policies should be followed. In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Please contact me by email or phone to get information about any changes.

Emergency Notification Procedures

EMERGENCY NOTIFICATION PROCEDURES are based on a simple concept – if you hear a fire alarm inside, proceed outside. If you hear a siren outside, proceed inside.

Indoor Fire Alarms mean we will stop class or research and immediately evacuate the building. We will proceed to our Emergency Assembly Area away from building doors. We will remain outside until police, fire, or other emergency response personnel provide additional guidance or tells us it is safe to leave.

All Hazards Outdoor Emergency Warning Sirens mean to immediately seek shelter (Shelter in Place) in a safe location within the closest building. "Shelter in place" means seeking immediate shelter inside a building or University residence. This course of action may need to be taken during a tornado, a civil disturbance including a shooting or release of hazardous materials in the outside air. Once safely inside, find out more details about the emergency. Remain in place until police, fire, or other emergency response personnel provide additional guidance or tell you it is safe to leave. Please see the Emergency Preparedness Syllabus Attachment for more information.

This syllabus is subject to change and updates. Revisions will be distributed by the instructor.



Appendix B: Teaching Materials UESTIONS AND 10 RULES OF STRATEGIC DOING



BEFORE YOU BEGIN

- Create and maintain a safe space for deep, focused conversation
- 2. Frame a conversation around an appreciative question

WHAT COULD WE DO?

- 3. Uncover hidden assets that people are willing to share
- 4. Link and leverage your assets to create new opportunities





WHAT SHOULD WE DO?

- 5. Rank all your opportunities to find your "Big Easy"
- 6. Convert your Big Easy to an outcome with measurable characteristics

WHAT WILL WE DO?

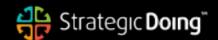
- 7. Define at least one Pathfinder Project with guideposts
- 8. Draft short-term action plan with everyone taking a small step





WHAT'S OUR 30/30?

- 9. Set your next meeting so you can review your progress and make adjustments
- 10. Nudge, connect, and promote relentless your new habits of collaboration







Appendix C Field Research and Practice

- C-1: Oklahoma City: Forward Oklahoma City
- C-2: Kentucky Community Assessment Program
- C-3: Ascension Parish, Louisiana
- C-4: Charleston Digital Corridor
- C-5: Purdue Center for Regional Development
- C-6: U.S. Department of Labor
- **C-7: Economic Development Institute**
- C-8: Edward Lowe Foundation
- C-9: The Water Council
- C-10: Space Coast: Brevard County, Florida
- C-11: Medora, Indiana
- C-12: Flint, Michigan
- C-13: Fraunhofer IAO
- C-14: New Jersey Innovation Institute
- C-15: Stanford VentureWell Pathways
- C-16: Revolutionizing Engineering Departments
- C-17: National Aeronautics and Space Administration
- C-18: National Institute of Standards and Technology
- C-19: Shoals Shift
- C-20: Kauffman Foundation

Serious Economic Development Tools
Previous program impacts

Return On Investment

Forward Oklahoma City
The New Agenda
1996-1999

Economic Strategy

Relevant, Realistic, Results

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Executive Summary

In 1993, Chamber Chairman Ken W. Townsend appointed a management committee to devise a strategy that would position Oklahoma City as one of the nation's premier locales for quality growth. The resulting plan – Forward Oklahoma City-The New Agenda – was adopted by the Chamber's Board of Directors at its annual planning conference in November 1994. National Community Development Services (NCDS), Inc. of Atlanta, Georgia was retained to assist in attaining the funding for the plan.

In place since 1996, Forward Oklahoma City is nearing the end of its run, and an assessment of the relative success of the program is needed in preparation for refunding efforts. To aid in this assessment, the Economic Strategy Center (ESC), Inc. of Atlanta, a research affiliate of NCDS, was retained.

The ESC performs this type of analysis from a funder's point of view and relies heavily on methodologies borrowed from the finance and investment professions. This posture gives the ESC the ability to quantify program results beyond traditional economic development constraints, in ways that investors understand and appreciate. Having completed this type of analysis nationally in over 110 locations, comparisons can be made regarding organizational effectiveness that other methodologies do not allow.

This report contains four distinct sections: Economic Overview, which provides general information on the status of the area economy; Economic Portfolio Analysis, which analyzes the benefits of an economic development program beyond the traditional measures of jobs, earnings, and capital investment; Return On Investment Benchmarking Analysis, which incorporates a bottom-up approach on a company-by-company basis; and Investment Performance, which presents the current value of the future benefits of economic development.

Return On Investment (ROI) Benchmarking Analysis

Introduction

Return On Investment (ROI) Benchmarking focuses on measuring the relative economic impact of local and regional economic development organizations. Its purpose is to provide investors in local and regional economic development programs objective and unbiased information on the performance of their investment. It does this by establishing organizational averages, or benchmarks, that allow the comparison of monies invested (inputs) to broad economic impacts (outputs). Because the methodology is standardized, measures of effectiveness and efficiency at the organizational level can be made.

ROI Benchmarking is not intended to be a definitive study of economic impact. It also does not use macro economic measures to describe an area's economic health. It is a bottom-up approach, focusing on what investors in economic development programs demand: measurability, accountability, and return on their investment.

This type of analysis has been performed in over 110 communities and regions in recent years. Performance ranges have been established that allow the results of the Greater Oklahoma City Chamber of Commerce (OKC Chamber) to be compared to other organizations in the ESC's database.

Methodology

Each company assisted in a relocation/expansion decision by OKC Chamber from January 1996 through July 1999 was a potential candidate for inclusion in the analysis. The complete list of assistances provided by OKC Chamber (see Appendix C) for that time period totaled 101 representing seventy-nine (79) different companies. Primary industries are utilized for this analysis and are defined as those that are in value-added, dollar-importing, and large secondary effect industries. Five instances of assistance/companies were eliminated from consideration based upon industry type (SIC Codes). Three other companies, representing five instances of assistance, were eliminated because they no longer have a presence in the area. Ninety-one (91) instances of assistance – seventy-one (71) companies – were examined.

Employment – both what was announced/anticipated and what has actually accrued as of August 1, 1999 –, average wages/salaries, and capital investment was collected for the ninety-one (91) instances of assistance. OKC Chamber supplied employment and earnings multipliers (RIMS II) for the area. The calculated impacts were then compared to the monies invested in the program to determine an actual impact return on investment. The analysis focuses on what has actually occurred; i.e., the jobs that have been filled. Announced jobs information is provided as a reference point.

In addition to a standard return on investment analysis, evaluation was also conducted based upon the level of assistance (see Appendix D) – extensive, moderate, or basic – provided to each company. The importance placed upon technology-based and high-technology companies is also reflected in the analysis.

This method of specifically identifying each company assisted by the economic development organization is the most accurate method of determining a true return that can be attributed to a program or organization. Economic success that would naturally occur in a region does not find its way into this type of analysis.

Limitations

The results of the ROI Benchmark Analysis must be interpreted within the limitations of the study itself. These limitations include:

- Self reported data All of the companies used in the study were supplied by
 OKC Chamber. Companies are included based on the condition that OKC
 Chamber had significant, but not necessarily exclusive, influence on their
 decision to locate or expand in the Oklahoma City area. The employment and
 earnings multipliers used were supplied by OKC Chamber as relevant to the
 area.
- All benefits accrue to the local economy The economic development
 practitioner realizes that the benefits of job creation rarely accrue solely to the
 immediate area. The methodology used in this study cannot precisely state
 the geographic parameters to which these benefits accrue.
- 3. No costs except organizational expenditures The only "cost" component used in the study was OKC Chamber's economic development budget, and it must be realized that many more costs actually exist in the recruitment/expansion/ retention process. Other costs, such as tax abatements and incentives, are rarely at the discretion of OKC Chamber, and are therefore not included in this analysis.

Results: Aggregate

For the seventy-one (71) companies assisted – ninety-one (91) instances of assistance – the cost effectiveness of OKC Chamber in terms of job creation, earnings injected and capital investment is very good.

- Approximately 65% of announced jobs have been filled
- Total injected earnings: \$465,936,280 annually
- Upon reaching full employment (projected), annual payroll impact will exceed \$1 billion
- Total capital investment impact (assuming all is new construction): \$740,054,948

Table 8: Aggregate ROI Comparison

Announced	Actual	National Average
\$242	\$373	\$1,200 - \$2,000
\$136	5187	\$500 - \$960
\$90	\$72	\$40 - \$52
\$164	\$130	\$87 - \$145
\$14,422	\$22,228	592,000 - \$130,000
\$21,817	\$26,680	\$25,576 (1997 MSA)
	\$242 \$136 \$90 \$164 \$14,422	\$242 \$373 \$136 \$187 \$90 \$72 \$164 \$130 \$14,422 \$22,228

The results can be interpreted in the following manner.

- Each reported job used in the analysis had a cost of \$373. When specific industry
 multipliers are used, and their impacts on employment are imputed, this cost falls to
 \$187. Both cost figures are well below national averages
- For every dollar spent by OKC Chamber, \$72 of direct earnings was injected into the
 economy. When specific industry multipliers are used, and their impacts on earnings are
 imputed, the amount of earnings injected rises to \$130 per dollar spent. Both earnings
 figures are at or above national averages
- Each job created or retained used in the analysis carried with it an average of \$22,228 in capital investment, which is lower than national averages. It should also be noted that the data is skewed upward by reporting of large, one-time events such as semiconductor plant locations which require a great deal of capital investment
- The weighted average salary of the jobs filled is 104% of the area average salary

Results: Extensive and Moderate Assistance

Companies provided either extensive or moderate assistance are generally those considered a focus for a program. The OKC Chamber provided either extensive or moderate assistance to 90.1% of total (64 of 71) companies evaluated representing 98.2% of announced jobs, 97.1% of actual jobs, and 98.5% of capital investment. A commensurate budget amount of 90% was used in the analysis of the assistance provided.

Those companies on which most of the time and effort was expended produced results similar to the aggregated results: a very cost effective performance.

Table 9: ROI for Companies Provided Extensive or Moderate Assistance

Table 7. No. 101 Companies 1	Announced	Actual	National Average
Cost per Job Cost per Impact Job	5222	\$345	\$1,200 - \$2,000 \$500 - \$960
	\$125 \$99	\$173 \$78	\$40 - \$52 \$87 - \$145 \$92,000 - \$130,000 \$25,576 (1997 MSA)
Annual earnings injected per dollar spent Total impact earnings per dollar spent	\$179	\$141	
Capital investment per Job	\$14,460	\$22,528	
Weighted average salary	\$21,846	\$26,873	

The results can be interpreted in the following manner:

- Each reported job used in the analysis had a cost of \$345. When specific industry
 multipliers are used, and their impacts on employment are imputed, this cost falls to \$173
- For every dollar spent by OKC Chamber, \$78 of direct earnings was injected into the
 economy. When specific industry multipliers are used, and their impacts on earnings are
 imputed, the amount of earnings injected rises to \$141 per dollar spent
- Each job created or retained used in the analysis carried with it an average of \$22,528 in capital investment
- The weighted average salary of the jobs filled so far is 105% of the area average salary

Results: Technology-oriented Companies

Technology-oriented companies represent 43.7% of total companies (31 of 71) and 46.2% of instances of assistance (42 of 91). OKC Chamber provided either extensive or moderate assistance to 90.3% of the technology-oriented companies evaluated representing 99.3% of announced jobs and 98.9% of actual jobs for these types of companies.

Technology-oriented companies produced even more impressive salaries but very low capital investment.

Table 10: Comparison of Total Companies and Technology-oriented Companies Receiving Extensive or Moderate Assistance

C-0.01 to 0.0000000000000000000000000000000000	<u>Total</u> Companies	Technology- oriented
Cost per Job	\$345	\$386
	\$173	\$155
Cost per Impact Job Annual earnings injected per dollar spent	578	\$81
Total impact earnings per dollar spent	5141	\$154
[2.1] [전경 회사 [전 5] #인경시시시 [전시 시기 [전 5] #인경시 [전 5] #인경시 [전 5] #인경시 [전 5] #인경시시 [전 5] #인경시	\$22,528	\$4,006
Capital investment per Job Weighted average salary	\$26,873	\$31,050

The results can be interpreted in the following manner:

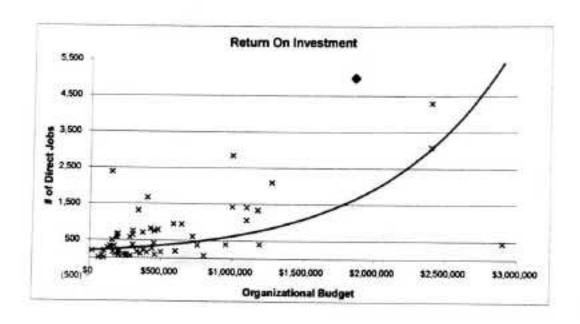
- Each reported job at technology-oriented companies used in the analysis had a cost of \$386. When specific industry multipliers are used, and their impacts on employment are imputed, this cost falls to \$155.
- For every dollar spent by OKC Chamber, \$81 of direct earnings was injected into the
 economy. When specific industry multipliers are used, and their impacts on earnings are
 imputed, the amount of earnings injected rises to \$154 per dollar spent
- Capital investment specific to the technology-oriented companies is substantially lower than that of overall companies, averaging \$4,006
- The weighted average salary of the jobs filled is 121% of the area average salary. The
 exceptional salary structure of these jobs partially offsets the lack of major capital
 investment

Organizational Comparison

The OKC Chamber has produced some of the most positive results to date.

- The budget/job creation relationship is more clearly demonstrated graphically. Figure 14
 includes all of the organizations currently in the ESC database, with the upward-sloping
 line representing the best fit, or average, line through all of the included points
- All points are on an average annual basis
- The concentration of points in the lower left corner, reflecting similar budgets (inputs) and job creation (outputs), signifies a consistency of organizational performance that allows relative comparisons to be made
- A solid black diamond represents the OKC Chamber. It's position, well above the average performance line, is indicative of the excellent return on investment achieved by the activities of the OKC Chamber

Figure 14



Investment Performance

Net Present Value (NPV)

One of the most important, and most theoretically correct, measures of investment performance is that of Net Present Value (NPV). It incorporates risk, the time value of money, investment outlays, and the size and timing of cash flows. It can be defined as the present value of future cash inflows (earnings), minus the present value of the cost of the investment. A decision is considered good for the economy if the NPV is positive. A discount rate of 12% was used in this analysis.

The NPV for OKC, projected ten years from the date Forward Oklahoma City began, is \$1,352,137,052. (see Appendix F)

- January 1996 through June 1999, OKC Chamber, including recruitment and retention, has invested \$6,509,479 for economic development efforts
- Returns earnings associated with the jobs recruited/retained for companies provided with extensive assistance were \$139,962,500 at the end of 1996; \$65,214,280, end of 1997; \$97,503,520, end of 1998; \$10,150,000, through June 1999
- The investment ratio for this NPV = \$208 meaning that every dollar invested so far will yield \$208 if no other jobs, and therefore earnings, are added through end of 2005

Internal Rate of Return (IRR)

The IRR is the discount rate at which the present values of future cash inflows equal the present value of cash outflows (costs). In other words, it is the discount rate at which NPV would equal zero.

OKC Chamber's IRR for activities January 1996 through June 1999 and projected to the end of 2005 = 6350%

Summary

The task of assessing the performance of a regional economy is more of an art than a science. There are literally hundreds of pieces of information that can be put together to form an economic picture. The challenge is picking the right pieces, or, in effect, asking the right questions. This report answers these questions from four perspectives: general informational comparison, top-down, bottom-up, and projection.

In a general economic evaluation, OKC fares well. Population growth has exceeded the state in the most recent five-year and ten-year periods. Wage and salary employment growth is very good; outpacing the state and the nation. Much of the growth, though, is in the service and retail sectors, typically lower paying industries, which skews total employment representation and also affects per capita personal income. In the most recent five-year period, OKC has added manufacturing jobs – the traditional indicator of stability, high capital investment, and secondary job creation – at a rate (15.7%) exceeding the state (11.5%) and eclipsing the nation (3.8%). However, manufacturing's share of overall employment continues to fall. The construction industry has been very active both in terms of job growth, a 29.7% increase in five years, and building activity, a 200% increase in housing permits since 1988. In addition to the abundant growth of jobs in the retail sector, retail sales have seen a steady increase reflecting earnings growth and the positive population momentum. While OKC is increasing the number of jobs – up 23.7% since 1987 – and the amount of earnings – per capita personal income has risen 50.8% in the same time – it lags the nation in rate of growth.

The Economic Portfolio Analysis reiterates the need for OKC to focus on the type of jobs being generated. The employment share has shifted away from manufacturing toward services and retail pulling earnings quality down. While OKC has experienced growth, the benefits of that growth, as evidenced by per capita personal income, are slower than other comparable locales.

Appendix C-1: Oklahoma City

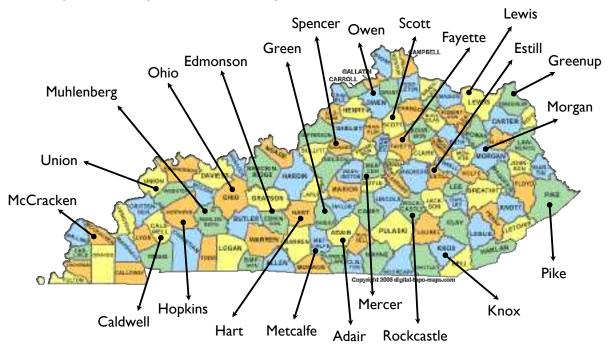
The ROI Benchmarking Analysis reveals that the OKC Chamber is an effective tool for economic development. On a cost per job basis of \$373, the cost of creating jobs through the efforts of OKC Chamber is significantly lower than other organizations, and the earnings injected per dollar spent of \$72 is significantly higher. Both of these measures signify a very effective and efficient economic development program. Capital investment, averaging \$22,228 per job, while lower than the benchmark, is significant because of the high number of jobs created. Also, the benchmark is skewed by several reports of large, one-time events in the data such as the location of a semiconductor plant, which would entail a great deal of capital investment.

When broken out by level of assistance, the companies provided extensive or moderate service by the OKC Chamber are even more cost effective. Companies receiving extensive or moderate assistance cost the OKC Chamber less than all companies Combined – \$345 per job compared to \$373 per job for all companies assisted – and earnings injected per dollar was slightly better – \$78 for extensive and moderate compared to \$73 overall.

Nearly 44 percent of the companies evaluated, and over 46 percent of the instances of assistance (some companies received more than one instance of assistance), were technology-oriented. This shows a concerted focus on this type of industry; consistent with the goals of the program. While the costs of targeting technology jobs is a bit higher – \$422 per job compared to \$345 per job overall – yield is very comparable – \$73 in earnings injected for technology; \$78, overall – and weighted average salary is significantly better – \$30,995 for technology, \$26,873 overall.

Improving economies at the local level cannot be done overnight, no matter how much money is thrown at the situation. They are also not immune to economic conditions outside of their influence. What can be accomplished, though, is the operation of a mechanism that addresses the real economic problems in a proactive, cost efficient, results-oriented manner. The Forward Oklahoma City program is accomplishing all three. Attention must continue to be given, though, to those industries that provide primary jobs, the effects of which will ultimately provide a better quality of life for all of those in Oklahoma City.

Kentucky Community Assessment Program



The Community Assessment program was a joint initiative of the Kentucky Industrial Development Council (KIDC, now called the Kentucky Association for Economic Development) and the Kentucky Cabinet for Economic Development. Here is how it worked.

Counties first applied for a community assessment through either the Cabinet or KIDC. Based on criteria developed by the Cabinet and KIDC, four or five counties were selected to participate in the program each year. Once a county was selected, KIDC assembled a team of economic development professionals from around the state (the "Assessment Team"). In addition, KIDC invited representatives from the Workforce Development Cabinet, the Tourism Development Cabinet and the Kentucky Housing Corporation to participate, where appropriate. KIDC also invited participation from utilities, local economic development organizations, education organizations, and engineering and construction firms. I led the Assessment Teams. Prior to the visit, our team asked the community leadership to complete a survey. The results of this survey helped us identify critical issues. The Assessment Team then travelled to the community for a two day visit. On the evening before the first day, the Team assembled to review the results of the pre-visit survey and to discuss the overall strategy for the assessment.

During the first day, the team listened to the community leadership to understand the challenges the county faced. The team then fanned out through the county for tours. In the afternoon of the first day, the team conducted interviews with community leaders to probe more deeply into specific issues. Finally, at the end of the first day, the team reassembled to discuss its findings and develop recommendations.

In the evening, I would distill the findings of the Assessment Team into a report. On the morning of the second day, I presented the findings of our report. Finally, within a week, I compiled a written report and submitted it to the community. Within a year after the initial Assessment Team visit, our team would come back to assess the county's progress. During this follow-up visit, the Assessment Team offered additional thoughts and guidance. Over the five years the program was active, the team found that 20 of the 22 counties made measurable progress. The following is a report for Owen County, conducted in 2003.

December 26, 2003

Owen County: Assessment Report

Community Assessment Program

Kentucky Industrial Development Council and the Kentucky Cabinet for Economic Development

The Community Assessment Team visited Owen County in October, 2003. This report reflects the Strategic Action Plan that the Community Assessment Team developed during its visit.

On October 2003, a Community Assessment Team visited Owen County to provide some guidance to the county's economic development efforts. The Community Assessment program is a joint initiative of the Kentucky Industrial Development Council and the Kentucky Cabinet for Economic Development. Here is how it works.

Counties first apply for a community assessment through either the Cabinet or KIDC. Based on criteria developed by the Cabinet and KIDC, four or five counties are selected to participate in the program each year. Once a county is selected, KIDC assembles a team of economic development professionals from around the state. In addition, KIDC invites representatives from the Workforce Cabinet, the Tourism Cabinet and the Kentucky Housing Corporation to participate, where appropriate.

Prior to the visit, we ask the community leadership to complete a survey. The results of this survey helps the team identify critical issues. The Assessment Team then comes to the community for a two day visit. On the evening before the first day, the Team assembles to review the results of the pre-visit survey and to discuss the overall strategy for the Assessment.

During the first day, the team listens to the community leadership to understand, from their perspective, the challenges the county faces. The team then fans out through the county for tours. In the afternoon, the team conducts interviews with community leaders to probe more deeply into specific issues. Finally, at the end of the first day, the team reassembles to discuss its findings and develop recommendations.

Building competitive communities.

At this point, Ed Morrison, a consultant to KIDC, distills the findings of the Assessment team into a report. On the morning of the second day, Ed presents the report. Finally, the Assessment Team compiles a written report and submits it to the community.

Within a year after the initial visit, the team comes back to assess the county s progress. During this follow-up visit, the Assessment Team offers additional thoughts and guidance.

This program has been remarkably successful in encouraging rural counties in Kentucky to develop new approaches to economic development. Since its inception, we have completed about twenty assessments. All but two counties have shown significant progress.

The counties participating in the program gain access to experienced economic development professionals at virtually no cost to the community. More important, the community leadership gains access to important networks for learning and resources.

For Owen County, we assembled the largest Assessment team that we have ever deployed. members of the Assessment Team included:

- Rick Starks, TVA
- Darrell Ishmael, East Kentucky Power Cooperative
- Jim Moening, KY Workforce Development Cabinet
- Kim Hammons, KY Tourism Development Cabinet.
- Kevin Sheilley, Team Taylor County
- Ron Zavitz, Pro-Tek Environmental Management
- Steve Carter, KY Cabinet for Economic Development
- Janet Williamson, KY Cabinet for Economic Development
- Ann Morris, KY Cabinet for Economic Development
- Rich McCarty, KIDC
- Smith Mitchell, KY Cabinet for Economic Development
- Lisa Wilson, H.C. Nutting Company
- Ed Morrison, consultant to KIDC

Building competitive communities.

Globalization poses new challenges before our national economy, and rural counties are confronting perhaps the most difficult set of challenges. To understand how the challenges have evolved, we need to understand in more detail the forces underlying the global integration of world markets. For the last forty years, costs of communicating, shipping goods, and traveling have all declined dramatically. As a result, it is now possible for a company to design products in Oregon, ship the designs to Malaysia, and

^{1.} The community pays out-of-pocket costs for the Assessment Team during their visit.

The current situation

receive new products all within the space of 90 to 120 days. The global integration of markets means that the competitive advantage that rural counties in the South once had -- relatively low cost land, labor and utilities -- is now rapidly disappearing. As a result, factories based on this old formula of competition are closing. All across the south, textile, apparel, and shoe plants have moved to lower cost locations.

So, as we confront the challenge of building competitive economies in our rural areas, we must recognize that the old formulas of competing are no longer as affective as they once were. To define a prosperous path for Owen County, we must recognize these new competitive realities.

This report is structured as follows: The next section reviews the current competitive situation of Owen County. In complying this review, the Assessment Team relied on the framework of a Strength Weaknesses Opportunities Threat (SWOT) analysis. This framework enables us to quickly categorize different factors that can influence the future prosperity of Owen County. The next section of the report proposes a vision that we believe makes sense based on our visit to Owen County. In the following section we propose a clear set of principles on which to build a competitive strategy. The final section of the report discusses strategic priorities that the county s leadership can pursue.

The current situation

THE STRENGTHS OF THE COUNTY

Although there are a number of important strengths within Owen County the following stand out. First, the county has successfully completed some very sophisticated infrastructure projects. These include developing a water system, developing a gas line, constructing new schools, conducting a program of road improvements, and upgrading the health care system. None of these projects is easy to accomplish. The fact that the county has moved forward on these infrastructure improvements demonstrates that the county can work together to accomplish common goals.

In addition to the specific infrastructure projects, the county has a very strong collaboration between the city of Owenton and the County government. In fact, the close collaboration between the City and the County is the strongest that the Assessment Team has seen in six years. In addition to the strong leadership collaboration, the county enjoys a broad network of civic organizations that are engaged in the county. The backbone of this network are the churches. In addition, however, the Chamber of Commerce, the Lions Club, and Rotary all play important parts in the community life of the county.

Agriculture provides an important strength for the county. Although traditional forms of agriculture have been declining for some time, the base of agriculture within the county creates a platform to develop new sources of wealth. We will discuss how to develop these options later in the report.

The artistic and craft community also provides an important base on which to build. The farmers market, held last summer, demonstrates how the arts, crafts, and agriculture communities can come together to create a new and important economic activity within the county.

The current situation

Finally the renovations in New Liberty demonstrate the types of projects that will continue to restore and revitalize the county as economic winds shift. The same type of commitment that brought new and restored housing to New Liberty can strengthen other communities within the county, as well as revitalize the economy of Owenton.

WEAKNESSES

The primary weakness that concerns the Assessment Team is in leadership. Clearly, there are leadership voids within the county. One void involves age. The county does not have a strong group of upcoming leaders that range in age from 35 to 55. This leadership gap will weaken the county if it is not addressed.

At the same time, a second leadership void raises concern among the Assessment Team. The leadership in the county reflects the interest of Owenton, but we are unclear as to how well other areas of the county are represented.

Brain power is also a significant weakness within the county. The county has a school system with relatively high dropout rates and relatively little emphasis on technical skills training.

Another weakness involves the physical appearance of the county. One member of the Assessment Team put it this way: The county is in disrepair. In fairness, not all of the members of the Assessment Team agreed with such a harsh assessment. At the same time, there is an element of truth in the comment. The county has no mandatory trash pickup, no zoning subdivision or building codes, no revenue base to support growth, and a relatively weak telecommunication infrastructure. All of these issues need to be addressed in order to develop a prosperous county for the future.

Finally, there is no strategy yet clearly defined for the spec industrial building. In addition retail businesses are in decline around Owenton. The economic base of Owenton is weakening.

OPPORTUNITIES

Tourism development represents the most immediate path to build the economic base within the county. Agricultural tourism, arts and crafts, corporate retreats, sporting retreats, and main street revitalization in Owenton all represent important opportunities for the county.

At the same time the county has significant opportunities for business development. Its location near the dynamic northern Kentucky economy creates significant opportunities for new growth. Selective recruitment of high quality, low impact businesses can add to the economic base within the county. In addition, the Assessment Team sees opportunities in food processing, innovative telecommunications development, and building creative businesses. In sum, the county has a number of different paths that it could follow to develop its economy.

THREATS

The Assessment Team evaluated the threats facing the county in terms of three scenarios. Under the first scenario, the county is overcome by unmanaged growth. Without adequate tools to manage the growth that is coming to the county, the county could turn into a low quality destination. That means rural roads could be overtaken by billboards and signs, subdivisions could leap frog across the county with substandard roads, and the beauty of the county could be marred by increasing trash and litter.

Vision and purpose

In the second scenario, the Assessment Team saw a different threat. If the Owen County leadership does not adequately develop a strong base of new leaders, the current generation of leaders could eventually collapse. Volunteers get tired, new politicians get elected, and the current climate of close collaboration among leaders in the counties could end.

The third threat scenario involves a financial collapse of the county. Without adequate planning, the county and city of Owenton could face growing financial difficulties as growth creates more demands for public services. Without adequate revenues to support these services, the county, the city, and the school district could face serious financial difficulties in the future.

The leadership of Owen County can take advantage of his strengths and opportunities and minimize its weaknesses and threats by working together to focus on a number of important strategic priorities for the county. The rest of this report outlines exactly what steps need to be taken.

Vision and purpose

VISION

We will leave to future generations a prosperous Owen County that is rich in rural beauty. Our leadership is committed to promoting continuous improvements in education, sustainable business development, and the preservation of our rural character.

OUR PURPOSE

Our purpose in following this path in implementing new strategies to define a process and a framework for making decisions about the future of Owen County.

Guiding Principles

In developing a strategy for Owen County we will follow these principles:

INCLUSION AND CONSENSUS

We encourage participation and action based on an open and honest exchange of views. We understand that a healthy community requires both public participation and leadership direction.

SUSTAINABILITY AND RESTORATION

Our resources are finite and our environment is fragile. We need to promote physical development patterns in our county that are efficient, low cost, and make the most of the infrastructure already in place, rather than constantly expanding into new areas.

Strategic priorities

We have outlined the following strategic priorities to translate this vision into action.

These priorities fall into the following groups:

- 1. Leadership initiatives
- 2. Tourism initiatives
- 3. Entrepreneurship initiatives
- 4. Financial initiatives
- 5. Growth management initiatives
- 6. Infrastructure initiatives
- 7. Business recruitment initiatives
- 8. Brainpower indicatives

LEADERSHIP INITIATIVES

The county leadership should pursue the following initiatives:

- Hire a community development person.
- Make leadership Owen County more inclusive.
- Make leadership Owen County (and its alumni) more project driven.
- Develop a program to enlist retirees moving into the county.
- Participate in Leadership Kentucky.
- Hire an economic development professional.

By hiring a community development person, the county can increase the volume of outside funds that are invested in the county. Pendleton County has pursued this approach with a great deal of success. Once an additional set of resources are generated by economic development, the county can consider hiring a full-time economic development professional.

In developing Leadership Owen County, the leadership should recruit participants who represent all geographic areas within the county. In addition, it makes sense to focus Leadership Owen County on the implementation of specific projects that come out of this strategic plan.

One of the major assets that the county may be developing is a pool of retirees moving into the county. These retired persons may have useful expertise in other resources that they would be interested in devoting to improving the quality of life in the county. Finally, emerging leaders in Owen County should take every effort to participate in the programs of Leadership Kentucky.

TOURISM INITIATIVES

Developing tourism represents a clear opportunity for the county. The tourism development program should consist of the following steps:

- Establish a tourism committee of the chamber.
- Organize a regular clean up, fix up, paint up.
- Paint the water tower and make a signature statement.

- Distribute existing brochures at locations in northern Kentucky and at events within the county.
- Inventory all attractions in the county.
- Develop new marketing packages.
- Develop web site.
- Get plugged into Kentucky Tourism networks.
- Pursue Renaissance and Main Street programs.
- Establish a small group to explore the corporate training and retreat markets.

Currently there is no central focus for tourism development within the county. We recommend that the chamber of commerce establish a tourism committee. One of the first steps that the committee can take is to organize a regular clean up days in the county. You might consider establishing a house painting program in which volunteers will paint houses for those residents who cannot afford it.

The water tower in Owenton provides an opportunity to make a significant graphic statement about arts and creativity in the county. The leadership should paint the tower creatively and make this statement. In addition, to promote existing attractions within the county the leadership should organize a distribution plan to distribute existing brochures at locations throughout northern Kentucky.

The Assessment Team believes that there are a variety of attractions in the county that can be effectively marketing if they are combined in innovative tourist packages. For example it may be possible to combine arts and crafts attractions, hunting and golf. Or, it may be possible to construct a Northern Kentucky golf trail that includes golf courses within the county.

Marketing the tourism opportunities should include improving the Owen County tourism web site. A leading rural county that has developed an elegant web site for tourism is Allegheny County, Maryland (http://www.mdmountainside.com). Explore this web site to see how the Owen County web site can be improved to market tourism attractions.

Kentucky is fortunate to have an active state wide tourism development program. Owen County can benefit from these networks, if the tourism committee of the chamber gets actively involved. In addition to building these networks, the chamber should supervise the hiring a Community Development professional to focus on tourism development. This professional should pursue immediately the Resonance program designation and the Main Street program.

Finally the chamber should establish a small group to explore the corporate training and retreat market. Owen County sits on the edge of a large metropolitan economy. Providing a corporate retreat within the county could add an additional tourism attraction.

ENTREPRENEURSHIP INITIATIVES

One of the keys for building prosperity in Owen County will be improving the climate for small business startup and expansions. A number of rural areas are developing new approaches to building stronger entrepreneurship supports within their communities. A working group established by the chamber could review these initiatives and define appropriate steps for the chamber to take to improve entrepreneurship. This area may be of interest to some of the retirees within the county.

- Establish a chamber working group on entrepreneurship
- Learn about agribusiness opportunities with high value agriculture
- Establish entrepreneurship training in high schools

The county should consider establishing a food processing incubator and distribution center. A similar incubator facility near Athens, Ohio has stimulated the development of food processing and distribution. A group from Owen County should take a field trip to Athens to visit with The Appalachian Center for Economic Networks. A processing incubator would include a kitchen, a food processing line, a distribution facility, and other support in food science for potential entrepreneurs.

In addition the chamber working group could evaluate entrepreneurship training in the high schools. Entrepreneurship training curricula have been developed by a number of groups including the Kauffman Foundation. A retiree mentoring program may also provide promising results for the county.

FINANCIAL INITIATIVE

 Establish a financial working group to evaluate long term financial conditions in the county.

The county leadership should focus on developing a working group to review the revenue structure for the county. This working group could include, for example, retirees with business experience. The purpose of the working group is to develop recommendations on improving the tax structure of the county, including the city, the county, and the school board. In addition, this working group might be valuable in recommending a plan for the proceeds to the City of Owenton from the water sale.

GROWTH MANAGEMENT INITIATIVES

It simply makes sense for the county to pass subdivision regulations and building codes. These two ordinances will establish minimum quality standards for development within the county. Without these standards in place, the county is inviting inadequate construction of roads and houses.

Growth management is controversial issue within the county, but it will not go away. For the foreseeable future, Owen County will be adding population. The core issue is not whether the county will grow, but how it will grow.

- Establish a working group to learn about growth management issues.
- Take field trips to model counties to learn about how rural counties in Kentucky are coping with growth.
- Organize public information and listening meetings to discuss approaches to growth management.

Other counties are confronting the same sets of challenges. Some counties have opted to improve their ability to manage growth by adopting ordinances to assist in guiding growth. Unfortunately, zoning ordinances are often caught in widespread public misperceptions. An appropriate zoning ordinance for a county provides both a blueprint for managing growth and a set of tools to manage long run tax burdens. In sum, a good growth management plan both protects property values and reduces taxes over the long-term.

By encouraging more compact development patterns, a zoning ordinance can reduce the amount of investment within the county in roads, water lines, sewer lines, school bus routes, and water and fire and safety expenses. In managing these expenses over the long haul, the county reduces the level of taxes it needs from citizens.

Because growth management is controversial in Owen County, the Assessment Team recommends a gradual, but focused effort to explore options for a county. As a first step, the leadership within the county should organize a working group of interested citizens committed to understanding how growth management policies and zoning can fit into the long run prosperity of the county. The place to start is by encouraging this working group to understand in detail the concerns and fears of citizens about growth. Specifically, the working group should focus on what residents in the county want the county to look like in five to ten years. The working group can then explore different options for achieving this goal.

INFRASTRUCTURE INITIATIVES

The county should continue its investment infrastructure including:

- Continue investments in water, gas lines.
- Identify additional investments to improve connections to the interstate.
- Institute mandatory trash pickup.
- Establish a working group to define a more modern telecommunications network.

The county should continue its current and major opportunity in the future for Owen County is the development of smaller knowledge-based businesses. However this growth path requires an adequate telecommunications system within the county. The county currently does not have a sophisticated broadband system outside Owenton. Other rural counties have aggressively invested in wireless infrastructure to promote economic development. The county should establish a small working group to investigate different options for improving the telecommunications infrastructure in the county.

BUSINESS RECRUITMENT INITIATIVES

The county s recruitment program should focus on these steps:

- Establish a clear set of principles to define the types of businesses that will be targets for recruitment.
- Define policies regarding local incentives, if any.
- Complete a community inventory questionnaire.
- Develop a marketing plan in consultation with other economic development organizations in Northern Kentucky.

Within the county, there are lingering concerns over the type of business that the Industrial Authority might recruit. To lay these fears to rest, the Industrial Authority should adopt a clear statement of the types of businesses it will target in its recruitment effort. These businesses should confirm to the overall goals of this strategic action plan. Specifically these businesses should be light assembly, office, or low impact environmental businesses.

Next steps

The Industrial Authority, once these principles have been developed, can then build a stronger consensus on the types of businesses that should be recruited to the Spec building.

In addition the Industrial Authority should explore the type of local incentive package that it is willing to develop to recruit an outside business. In addition, the county leadership should complete a community inventory questionnaire. This questionnaire will assist the county in marketing the building. Finally, the Industrial Authority can improve its marketing prospects by discussing the building with other regional economic development organizations. It may be that these organizations come across prospects that they would be willing to pass on to Owen County.

BRAIN POWER INITIATIVES

Among the other opportunities for Owen County developing brain power stands as a priority. Three steps are important to take:

- Launch an education campaign about the importance of education.
- Launch a dropout reduction initiative.
- Expand connections to technical education.

Two few adults understand the importance of education to economic development. With the globalization of our economy, this importance has grown. A high school dropout has earnings which are dwindling because of increased competition from low skilled workers abroad. At the same time, the real earnings of high school graduates have not increased significantly in recent years.

Meanwhile, the earnings of people with some level of post secondary education have improved. The bottom line is this: high school education is no longer a ticket to the middle class. Every child should extend their education to some level of post secondary education. At the same time, dropping out of high school represents a life time disability. High school dropouts can no longer earn a middle class wage. At a maximum a high school dropout will earn in the neighborhood \$7.50 per hour or \$15,000 per year.

To encourage children to stay in school, it is important to push the development of career pathways in high school. These career pathways show young people how to move from high school through post secondary education into a career. Owen County schools should be expanding their commitment to technical education for young people who are not oriented toward going to four years of a liberal arts college.

Next steps

We have included in the appendix through this report a strategic action plan which reviews the various steps outlined. This strategic action plan provides a framework for you to adjust and make decisions about how you will translate this report into specific initiatives and action.

The Assessment Team stands ready to assist you in any way, but the responsibility for taking this next step rests on your shoulders. Within a year, the Assessment Team will

Owen County Project Web Site

return to Owen County to complete a follow-up visit. During this day long follow-up, we will review your progress and outline new steps to move the community forward. In the meantime, we will be ready to answer your questions and provide you additional assistance, if you request it.

Owen County Project Web Site

We have built a web site for your follow-up. On this site you can download a copy of this report, background materials, and a spreadsheet that you can use to translate your report into action steps. You can access the site at http://www.edmorrison.com/kidcowen

In addition, this web site includes helpful links to resources you can use in implementation.

Resources

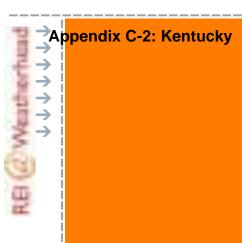
Web site	Address
Project web site	http://www.edmorrison.com/kidc-owen
Smart Growth America	http://www.smartgrowthamerica.com/
Quality Places	http://www.qualityplaces.marc.org/3_principles.htm
Planners Web	http://www.plannersweb.com/
The Appalacian Center for Economic Networks	http://www.acenetworks.org/
USDA Agritourism Website	http://www.nrcs.usda.gov/technical/RESS/altenterprise/
North American Farmers Direct Marketing Association	http://www.nafdma.com
Center for Rural Entrepreneurship	http://www.nafdma.com
North Carolina Rural Entrepreneurship Institute	http://www.ncruralcenter.org/entrepreneurship/index.asp
National Center for Dropout Reduction	http://www.dropoutprevention.org/

Workplan Fra Owen County				
KIDC Assessment Team				
Strategy Initaitives	Activity	Lead responsibility	Estimated Start	Estimated completion
Leadership initiatives				
	Hire a community development professional	County	1Q2004	4Q2004
	Make Leadership Owen County more inclusive	Chamber	1Q2004	On-going
	Make Leadership Owen County more project driven	Chamber	1Q2004	On-going
	Develop a program to enlist retirees	Chamber	2Q2004	On-going
	Participate in Leadership Kentucky	Chamber	1Q2004	On-going
	Hire an economic development professional	County	3Q2005	On-going
Tourism initiatives				
madaves	Establish a tourism committee at the chamber	Chamber	1Q2004	3Q2004
	Organize a regular clean- up, fix up	Chamber, Rotary, Lions	1Q2004	3Q2004
	Paint the water tower with a distinctive logo	Chamber, Rotary, Lions	2Q2004	3Q2004

	Distribute brochures to NKY locations	Tourism working group	1Q2004	On-going
	Develop a web site	Tourism working group	2Q2004	1Q2005
	Get plugged into KY tourism networks	Tourism working group	1Q2004	2Q2004
	Pursue Renaissance and Main Street programs	City, Tourism working group	2Q2004	On-going
	Establish small group to explore corporate training market	Chamber	3Q2004	1Q2005
Entropropourchin				
Entrepreneurship initiatives				
	Establish a chamber working group on entrepreneurs hip	Chamber	1Q2004	2Q2004
	Learn about agribusiness opportunities for high value agriculture	Entrepreneurshi p working group	2Q2004	3Q2004
	Establish entrepreneurs hip training in high school	Entrepreneurshi p working group	3Q2004	1Q2005
Financial initiative				
midative	Establish working group to evaluate long term financial outlook for the County	Chamber	1Q2004	On-going
Growth management initiatives				

	Establish workling group to learn about growth management	County	2Q2004	3Q2004
	Take field trips	Growth working group	2Q2004	3Q2004
	Organize public information and listening sessions	Growth working group	3Q2004	1Q2005
Inifrastructure initiatives				
	Continue gas and water investments	County	On-going	On-going
	Define projects to develop better interstate access	County, Chamber	3Q2004	2Q2005
	Institute mandatory trash pick-up	County	1Q2005	3Q2005
	Establish working group to build a more modern telecommunica tions network	County, Chamber, City	1Q2004	On-going
Business recruitme	ent initiatives			
	Establish clear set of principles for recruitment	Industrial Authority	2Q2004	3Q2004
	Establish pronciples for local incentives	Industrial Authority	2Q2004	3Q2004
	Complete community inventory questionnaire	Industrial Authority	2Q2004	3Q2004
	Develop marketing plan	Industrial Authority	3Q2004	1Q2005
Brainpower initiatives				

Launch an education campaign about the importance of education	Superintendent, Rotary, Lions, Churches	3Q2004	On-going
Launch a dropout reduction initiative	Superintendent, Rotary, Lions, Churches	3Q2004	On-going
Expand connections to technical training	Supertintendent	3Q2004	On-going

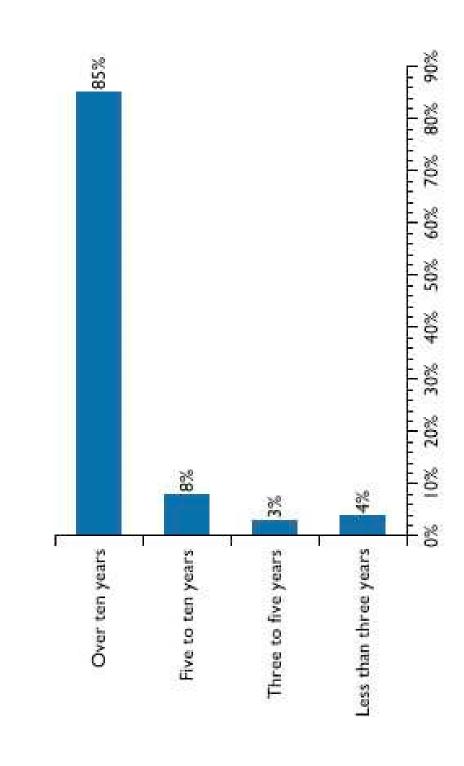


Owen County Survey

KIDC Assessment Team

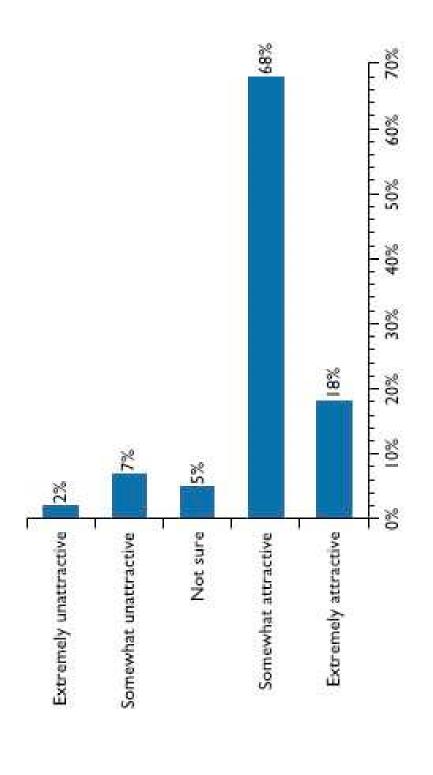
October, 2003

First of all, how long have you lived in Owen County?



Physical appearance ranks high...Over 86% say the county is attractive

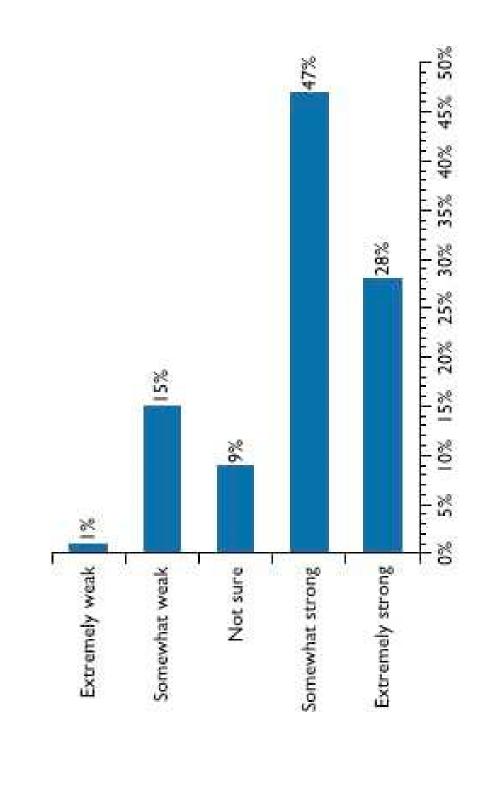
How would you characterize the physical appearance of Owen County?

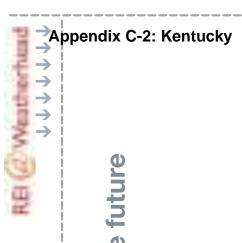




Respondents see community spirit as strong...75% see it as strong

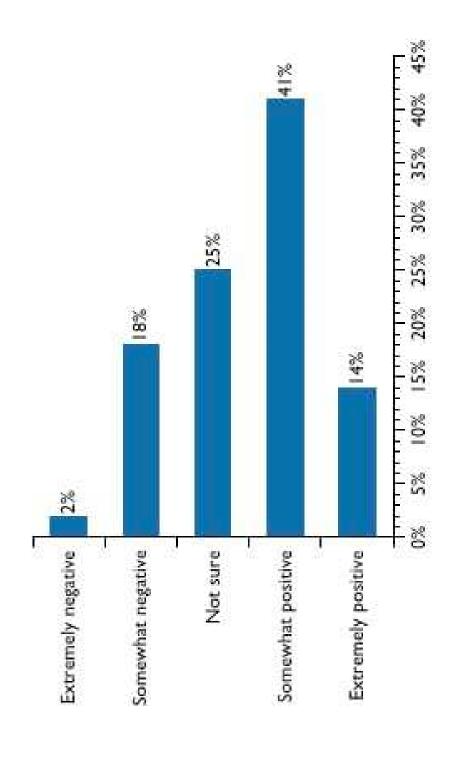
How would you characterize the "community spirit" in Owen County?

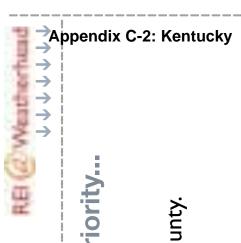




Relatively high level of people are uncertain about the future

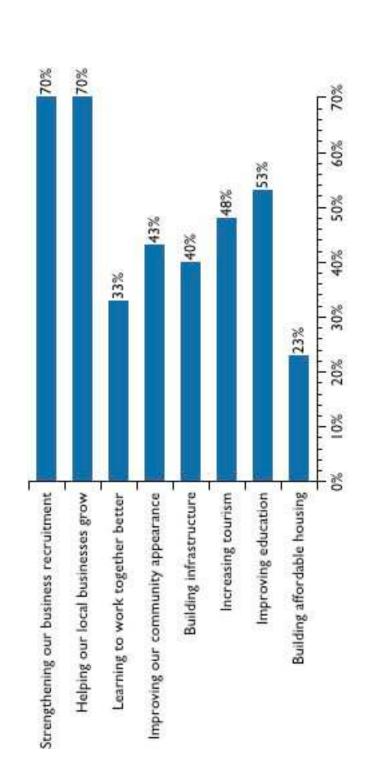
what are your feelings about the future of Owen County? As you look out over the next three to five years,





Respondents see education improvements as high priority... balance between recruitment and expansion

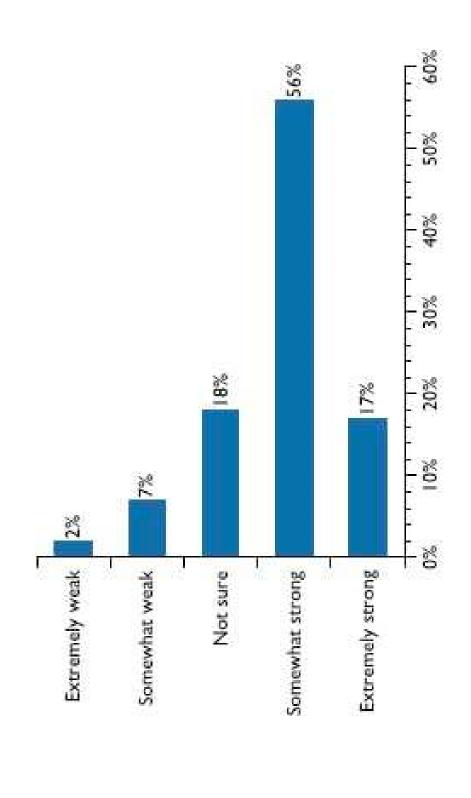
What do you see as the major challenges that are facing Pendleton County. Check all that apply.

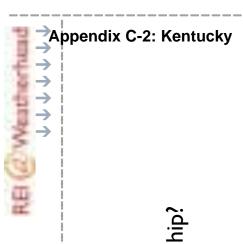




Overall leadership is rated relatively high for an assessment county

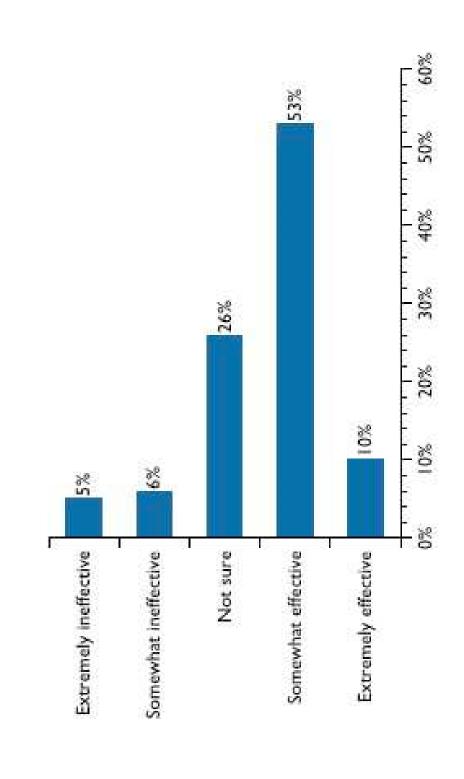
erall leadership is rated relatively high for an assessment county county how would you rate the overall leadership in the county among elected officials, nonprofit an assessment county among elected officials, nonprofit shaped by the county among elected by the county among electe

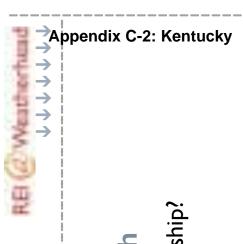




Political leadership is rated relatively high

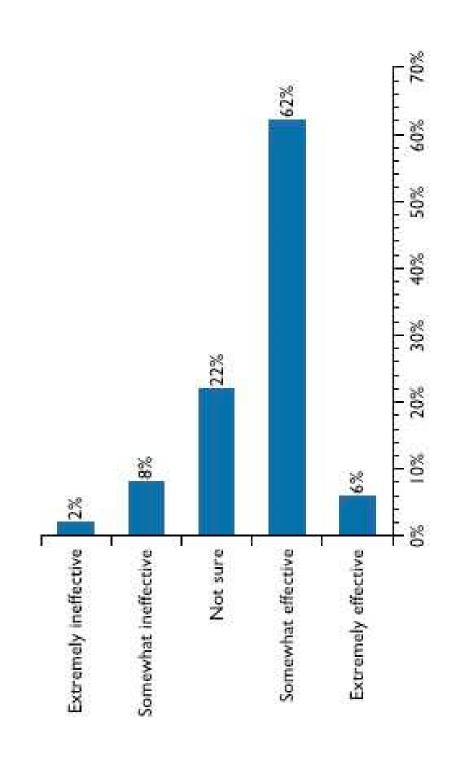
How would you characterize the effectiveness of your political leadership?

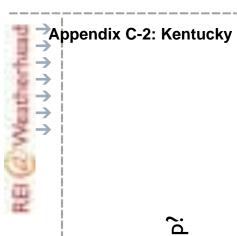




Business leadership is also rated relatively high

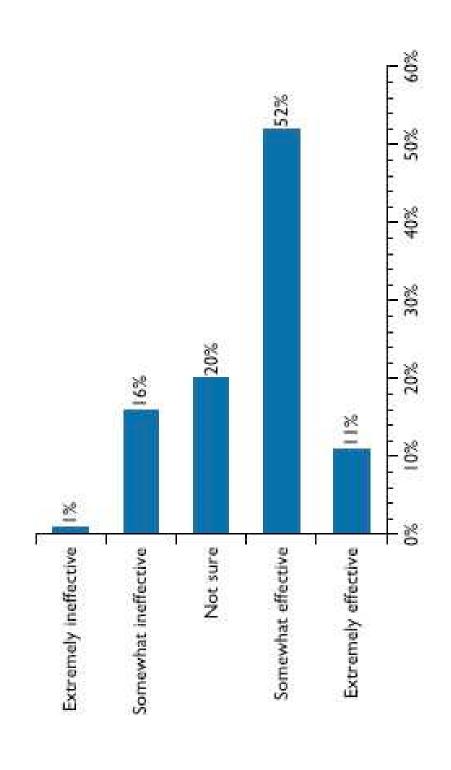
How would you characterize the effectiveness of your business leadership?





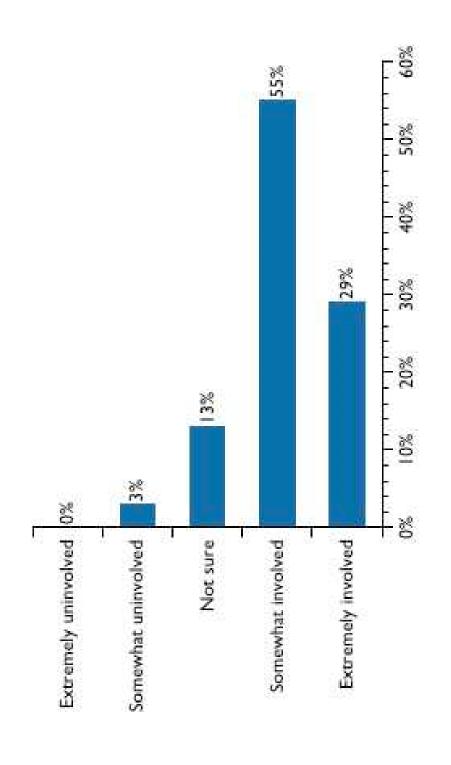
School leadership is rated relatively high

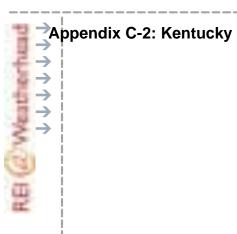
How would you characterize the effectiveness of your school leadership?



Relatively strong involvement of churches and civic groups

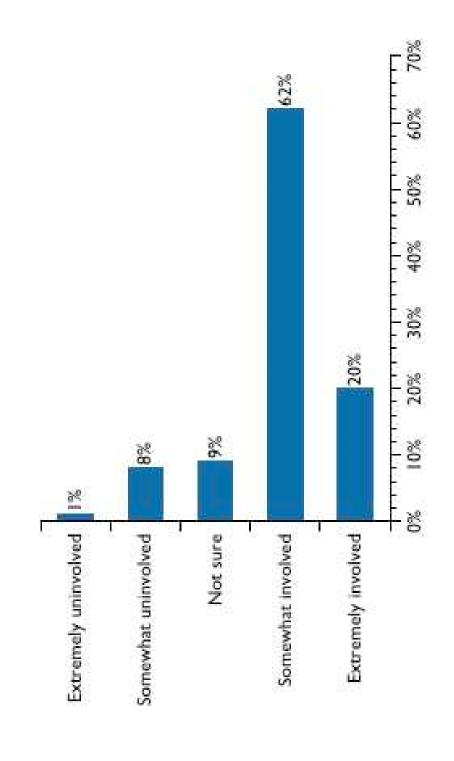
How involved are the churches and civic groups in improving life in the county?





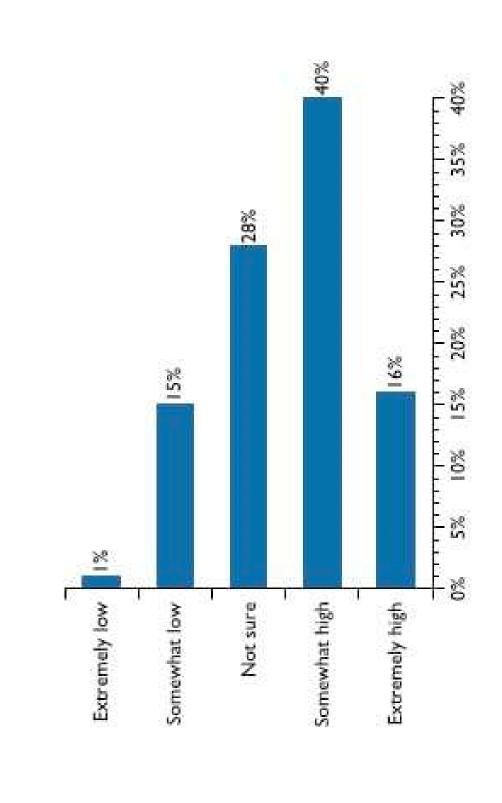
Relatively strong involvement of youth

How involved are young people in improving life in the county?



Trust levels seem relatively high

How would you characterize the level of trust among the citizens of Owen County?





Appendix C-3: Ascension Parish, Louisiana



ASCENSION PARISH LAND USE MASTER PLAN



ASCENSION PARISH DEVELOPMENT ORDINANCE

He it ordained that the Ascension Parish Governing Authority bereby enacts the following ordinance: Chapter 17, Planning and Development, of the Code of Ordinances of Ascension Parish Louisians is amended as follows. After Section 17.11 add the following new articles:

Article 1: GENERAL PROVISIONS OF DEVELOPMENT AND ZONING

Section 17-101. Short title and organization.

The regulations contained in Articles 1 through 5 of this Chapter shall be known as and may be cited as the Ascension Parish Development Ordinance of 2003. This ordinance is organized

Article I: General Provisions of Development and Zoning

Article II: Zoning Districts and Overlay Zones

Article III: District Development Standards

Division 1: Development Framework

Division 2: Use Requirements by District

Division 3: Structure Requirements by District

Division 4: Site Requirements by District

Division 5: Business Park Development Standards

Division 6: Flood Hazard Overlay Zone Requirements Division 7: Development Standards for Airport Overlay Zones

Division 8: Development Standards for Other Overlay Zones

Division 9: Contract Agreements

Article IV: Other Development Requirements

Division 1: Offstreet parking Requirements

Division 2: Landscaping for Offstreet Parking

Division 3: Commercial Property Landscaping Standards

Division 4: Bufferyard Requirements

Division 5: Street Access Standards

Division 6: Commercial and Industrial Storage Standards

Division 7: Manufactured Housing and Mobile Horse Standards

Division 8: On Premises Sign Standards

Division 9: Off Premises Sign Standards

Division 10: Lighting Standards

Division 11: Waste Discharge Standards

Division 12: Group Home Standards

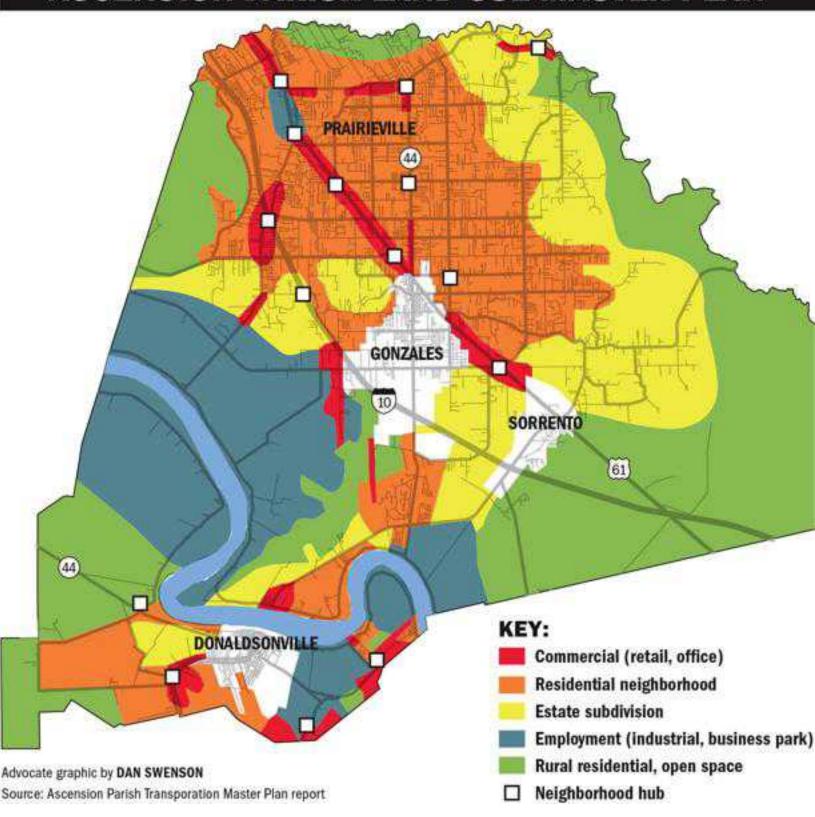
Division 13: Home Occupation Standards

Division 14: Adult Business Standards

Division 15: Alcohol Beverage Business Standards



ASCENSION PARISH LAND USE MASTER PLAN



Ascension Parish Development Code 2003

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Division 7: Manufactured Housing and Mobile Home Standards

Division 8: On Premises Sign Standards

Division 9: Off Premises Sign Standards

Division 10: Lighting Standards

Division 11: Waste Discharge Standards

Division 12: Group Home Standards

Division 13: Home Occupation Standards

Division 14: Adult Business Standards

Division 15: Alcohol Beverage Business Standards

Division 16: Telecommunication Tower Standards

Article V: Administration and Enforcement

Section 17-102. Legislative intent.

- (a) The citizens of Ascension Parish, after completing a detailed planning process, have determined:
 - (1) Ascension Parish is experiencing unprecedented growth in new residential and commercial development in the future. This growth far exceeds historical trends.
 - (2) As a rural parish, Ascension Parish does not have an extensive infrastructure public investment to support development. If development is not carefully planned, the costs of roads, water systems, and sewer systems can quickly accelerate the pressure to raise taxes.
 - (3) As the location for a large number of industrial plants, Ascension Parish must carefully manage residential and commercial development close to these plants, in order to protect the public safety.
 - (4) Ascension Parish occupies an extensive flood plain which can create serious construction and public safety problems with concentrated development.
 - (5) If growth is not carefully managed, development may destroy the rural character of the parish. This character represents a valuable property right to the residents of the parish.
- (b) To protect property rights and manage public investments, the Parish Council has enacted this ordinance to establish a clear plan for growth in the parish.
- (c) The purpose of this ordinance is to protect public health and safety, increase property values, promote orderly development consistent with the character of the parish, and provide for the careful management of public investment and taxes.
- (d) This Ordinance reflects the experience that the Parish has had in implementing land use regulations since the passage of the initial Development Ordinance in 1998.

Section 17-103. Enactment.

Be it ordained by the Ascension Parish Council, pursuant to the authority of the Home Rule Charter powers granted by Louisiana Constitution Article 6, Section 5, wishes to exercise all its power allowed under the police powers of the United States Constitution, the Louisiana Constitution, and Louisiana Revised Statute 33:1236, as amended.

Section 17-104. Jurisdiction.

(a) The provisions of this ordinance shall apply to the unincorporated areas in Ascension Parish, Louisiana.

- (b) This ordinance shall be administered by the Ascension Parish Planning and Zoning Commission, established under Section 17-1: Ascension Parish Planning and Zoning Commission -- Created.
- (c) This ordinance sets forth the requirements for a person to obtain a development permit for the construction or major alteration of a building or structure in the unincorporated areas of Ascension Parish. The requirements for development permits are set forth in Section 17-352: Development permits required. The ordinance also sets forth additional requirements for obtaining a building permit for single family structures. The requirements for building permits are set forth in the Ascension Parish Buildings and Building Regulations, Chapter 6 of the Code of Ordinances of Ascension Parish.
- (d) This ordinance implements the Ascension Parish Master Plan and the Ascension Parish Land Use Plan adopted by the Parish Council.

Section 17-105. Commentary.

Throughout this ordinance, subsections prefaced "Commentary" are included. Each commentary represents an official statement of legislative finding and purpose. Whenever a section or subsection of this ordinance is deemed to require clarification, explanation of its intent, or further elaboration, that section is followed by a commentary. The commentaries have been legislatively adopted together with the more formal text of the ordinance. They are intended as a guide to the administration and interpretation of the ordinance and shall be treated in the same manner as other aspects of legislative history.

Section 17-106. Interpretation.

An administrator, the Planning and Zoning Commission, or the courts shall interpret this ordinance to promote the purposes set forth by the Ascension Parish Council. Those called upon to interpret this ordinance shall proceed as follows:

(a) Determine the public purpose of the standard for which an interpretation is required.

Commentary: Before any zoning interpretation is made, there must be an explicit identification of the purpose for which the initial regulation was imposed. Each zoning regulation is intended to protect the interests of both present and future neighbors and the general public. Each standard is developed as a regulatory response to an identifiable negative impact or potential. A sound interpretation of any standard in this ordinance cannot be ensured without a careful analysis of the end to which the regulation is directed.

(b) Determine the impact of the proposed interpretation.

Commentary: It is not always possible to define precisely the impacts of a proposed interpretation. Those charged with interpreting this ordinance should determine impacts after evaluating the viewpoints of adjacent land owners and, where appropriate, expert opinion from parish employees or independent parties.

(c) Determine that the proposed interpretation will ensure a just balance between the rights of the landowner and all others who will be affected by that person's land use proposal.

Commentary: This ordinance provides the Zoning Official and the Planning Director with the responsibility for administering its provisions. Their decisions can be appealed to the Planning and Zoning Commission and the Zoning Board of Adjustments. Decisions of the Board are subject to judicial appeal.

Section 17-107. Findings of fact.

The Ascension Parish Council finds that:

- (a) Industrial operations in the parish involve the manufacture and transportation of chemicals. These operations pose a risk to public health and safety and should be adequately separated from high density residential development.
- (b) Large portions of the parish exist within a flood hazard area. Construction within this area must meet special building standards in order to minimize the risk of loss from flooding.
- (c) The Parish is undergoing rapid growth and suburbanization. The Parish has a limited infrastructure to support this growth. Building new infrastructure should be geographically concentrated in order both to reduce the cost of this infrastructure and to encourage development outside the flood hazard area.
- (d) The Parish has a limited amount of land available for industrial and business development. The Parish needs land use regulations to balance residential, commercial and industrial growth in order to protect the long term tax base of the parish.

Section 17-108. Guiding principles and policies.

To achieve the purposes of this ordinance as set forth in Section 17-102 Legislative intent, the Planning and Zoning Commission shall adopt the following set of integrated guiding principles and policies to manage land development in Ascension Parish. These principles and policies are set forth in the Ascension Parish Master Plan and the Ascension Parish Land Use Plan, adopted by the Parish Council.

(a) Principle 1: Protect public safety and property. Protect the public safety and property values by providing adequate separation of industrial, commercial, and residential uses.

Commentary: The central challenge in Ascension Parish is to protect public health and safety from five major challenges: 1) periodic flooding; 2) the encroachment of residential uses near chemical plants; 3) the separation of truck traffic on parish roads; 4) the growth of traffic on a narrow, rural road system; and 5) the increase waste water pollution from increased residential construction.

(b) Principle 2: Manage growth. Encourage growth only in areas of the parish which can support it with adequate soils, drainage, and physical infrastructure.

Commentary: The parish has limited development sites available that are outside the 100 year flood plain. A large portion of the available land for future development is near historic or industrial properties.

(c) Principle 3: Preserve the rural character of the parish. Preserve rural, conservation, and recreation areas from high intensity residential and commercial development.

Commentary: The rural character of the parish comes from open space, trees, and historic sites. Residential growth, while not incompatible with preserving rural character, can erode this character.

(d) Principle 4: Encourage compact commercial centers. Encourage the development of compact commercial centers throughout the parish and discourage "strip" commercial development along highways.

Commentary: Establishing neighborhood commercial centers at crossroads will reduce traffic congestion on narrow rural roads. This approach will also reduce "strip development" that tends to undercut the rural character of the parish.

(e) Principle 5: Keep the process simple and open. Streamline the process of land use management and encourage continuous public comment on development practices.

Commentary: Maintaining an open, fair process is critical to the success of this ordinance. Without public confidence in a fair, impartial process, enforcement of these regulations will not be effective.

(f) Principle 6: Use flexible performance zones that focus on controlling the intensity of development.

Commentary. Instead of having a proliferation of single use zones, the parish should expand the allowable uses of the existing zones and add a few more flexible use zones. The Commission should focus on managing the intensity and impact of development and not so much on the use. This approach meets the needs of a rural parish and reduces the cost of administration.

(g) Principle 7: Discourage subdivision development within the 100 year flood plain.

Commentary. Subdivision development is occurring in large areas of the parish that cannot support the intensity of this development. The allowable subdivision development should be largely restricted to the northern part of the parish outside the 100 year flood plain.

(h) Principle 8: Support subdivision development where water and sewer lines are likely to run.

Commentary. Clustering subdivision development near water and sewer lines will reduce the overall cost of water and sewer to the taxpayers of the parish.

(i) Principle 9: Within a zone allowing subdivision development, use a flood plain overlay zone to restrict development within the 100 year flood plain.

Commentary. This overlay zone will reduce drainage problems from development by restricting the amount of fill that can be added within the flood plain.

(j) Principle 10: Reduce the amount of commercial development to discourage strip commercial development along rural roads.

Commentary. The 1998 parish zoning map encouraged commercial zones all along the highways. With the exception of Airline Highway, most roads in the parish cannot support major new commercial development. The Commission should encourage commercial development around intersections, where traffic flow can be more easily managed.

(k) Principle 11: Establish a truck route between the industrial plants and Interstate-10.

Commentary. Currently trucks are mixing with residential traffic on parish roads. This problem will only worsen as the parish grows. A truck route, with limited commercial and residential development, will separate industrial from residential traffic. This step will protect the public safety and provide an efficient corridor from the industrial plants to the Interstate.

(1) Principle 12: Create high quality business development zones in the parish.

Commentary. The 1998 Zoning Map did not provide a site for locating high end office, research and technology development. This district should be located near the current industrial zones and should be compatible with surrounding residential development. The district should encourage high quality business development with minimal environmental impacts. The Parish needs additional business development to diversify the economy. In addition, expanding business development will strengthen the tax base to handle the continued growth of residential development.

ARTICLE II: ZONING DISTRICTS AND OVERLAY ZONES

Section 17-109. Establishment of zoning districts and overlay zones.

Ascension Parish is hereby divided into districts and overlay zones. These districts and zones are necessary to promote compatible uses within districts, to implement the official Ascension Parish Land Use Plan, to serve the other purposes of this ordinance as detailed in Section 17-102 Legislative intent, and to implement the principles and policies outlined in Section 17-108 Guiding principles and policies.

Section 17-110. Establishment of zoning districts.

For the purpose of this ordinance, all land and water in the unincorporated areas of Ascension Parish are divided into zoning districts as follows: The following sections specify the intent of the zoning districts and overlay zones established by this ordinance. These districts are as follows:

- (a) High intensity districts:
 - (1) Mixed use corridors (MU)
 - (2) Industry (IND)
- (b) Medium intensity districts:
 - (1) Crossroad commercial (CC)

- (2) Medium Intensity residential (RM)
- (3) Transition (T)
- (4) Business park (BP)
- (5) Airport District (A)
- (c) Low intensity districts:
 - (1) Rural (R)
 - (2) Conservation (C)

Commentary: This ordinance creates districts which encourage mixed uses within districts. The primary policy objectives in developing these zones are 1) to separate hazardous industrial uses from high concentrations of residential development; 2) to concentrate traffic from commercial and high intensity residential development around roads in the parish which can more easily handle higher traffic volumes; 3) to protect the public safety by encouraging development which is adequately served by roads, fire stations, and police stations, and 4) to preserve property values based on the rural character of the parish by discouraging residential subdivisions in remote areas of the parish and the commercial strip development which follows these developments.

Section 17-111. Establishment of overlay zones.

- (a) This Ordinance establishes the following Overlay Zones: flood hazard overlay zone waste site overlay zone; historic site overlay zone, *chemical emergency overlay zone*.
- (b) The overlay districts shall be superimposed on the other districts established by this Ordinance. All regulations in this Ordinance applicable to underlying districts shall remain in effect, except that where the overlay districts imposes additional regulations, the more stringent regulations shall prevail.
- (c) The delineation of the overlay zones are set forth on the official zoning map.

Commentary. Overlay zones lie on top of zoning districts. They impose an additional level of land use control to handle specific development problems within the parish.

Section 17-112. Map of zoning districts and overlay zones.

- (a) The boundaries of the various districts and overlay zones are shown on the Official Zoning Map of Ascension Parish, Louisiana. This map appears as Exhibit A of this ordinance, with an accompanying legend that explains the map's symbols. The zoning maps, including all notations, are part of this Ordinance.
- (b) The chairman of the Planning and Zoning Commission, the chairman of the Parish Council and the Parish President shall sign and date the zoning map.
- (c) Unless otherwise shown on the zoning map, the boundary lines of zoning districts and overlay zones are lot lines, property lines, the center lines of streets or alleys or

such lines extended, railroad right-of-way lines, the center lines of creeks and streams or corporate limit lines as they existed at the time of the enactment of this ordinance, or otherwise section lines, as they exist within the various townships and ranges. Boundary lines which do not coincide with these landmarks shall be determined by using the scale of the zoning map. If a boundary line traverses a parcel or tract of land and if a minimum of 51% of the property is located within a particular district, then the entire parcel or tract would be considered as being zoned that particular district.

Section 17-113. Statement of purpose and intent: Mixed use corridors (MU).

This district is characterized by the most intensive residential and commercial development. These districts are located in areas where the road system is most capable of supporting growth with a minimum risk to the public safety. High density residential development should include apartment buildings and townhouses. Commercial development should be concentrated or "clustered" at strategic sites in relation to population centers, other commercial sites, and adequate roads.

Commentary: This district is designed to concentrate the most intensive residential and commercial development along the major arteries of the parish. By encouraging concentrated, cluster development, the Commission will minimize the infrastructure costs and manage public safety risks most appropriately. In addition, commercial development should use shared access to parking lots and shared parking lots in order to minimize traffic congestion and sprawl along the parish roadways. While this district allows many varied uses, the district should develop with adequate buffering, careful traffic planning, and appropriate lighting plans to minimize any nuisance between uses.

Section 17-114. Statement of purpose and intent: Industrial district (IND).

This district is designed to accommodate industrial and warehouse development which is compatible with the economic development and environmental protection of the parish.

Commentary: Industrial development will be concentrated in areas which are already providing a site for industry. This district is adequately served by infrastructure. Concentrating industrial development in this district also minimizes the public safety risks from production and transportation. In addition, concentrating truck traffic will reduce the maintenance costs on parish roads. This zone incorporates all property set forth as industrial property in Section 17-10, Industrial Areas.

Section 17-115. Statement of purpose and intent: Crossroad commercial district (CC).

This district serves the commercial needs of the outlying residents in the parish. The purpose of this district is to disperse commercial development opportunities throughout the parish, while mnimizing the adverse impact on traffic flows.

Commentary. Most of the commercial development in the parish should be focused on mixed use corridors, where the roads can handle traffic volumes. At the same time, residents in the outlying areas of the parish need convenience retail of stand alone stores or smaller

Appendix C-3: Ascension Parish, Louisiana

neighborhood convenience centers. To reduce congestion on rural roads and improve road access, these commercial buildings should be located at intersections.

Section 17-116. Statement of purpose and intent: Medium intensity residential district (RM).

This district is designated for residential development, including multi family dwellings and subdivisions. This district exists largely outside the 100 year flood plain and in the northern part of the parish where planned water and sewer systems can support more intensive development. Commercial development in this district should be limited and located at highway intersections.

Commentary: This district is designed to be adjacent to high intensity mixed use corridors, but commercial development should not be allowed to disrupt the residential character of this district. In addition to single family houses, town houses, garden homes and apartment buildings are intended for this district.

Section 17-117. Statement of purpose and intent: Transition district (T)

This district is designated for limited residential and commercial development. The district lies within the chemical emergency warning zone established by the chemical plants in the Parish.

Commentary: This district provides a public safety buffer between large-scale residential and commercial development and industrial plants. These plants pose a serious public health risk which must be carefully managed. Beginning in 1985, the chemical industry operating in Ascension Parish established the Community Awareness Emergency Response, or CAER, Committee. The Ascension Parish Chemical Industry's CAER Committee has installed a 26-siren community alerting system, designed to be heard within an approximate radius of 2.5 miles of each plant, in the area in which the plants are located. The system will provide effective early warning for the community. The Transition District falls within this community alerting system and is designed to discourage high density residential development within this warning zone.

Section 17-118. Statement of purpose and intent: Business park district (BP).

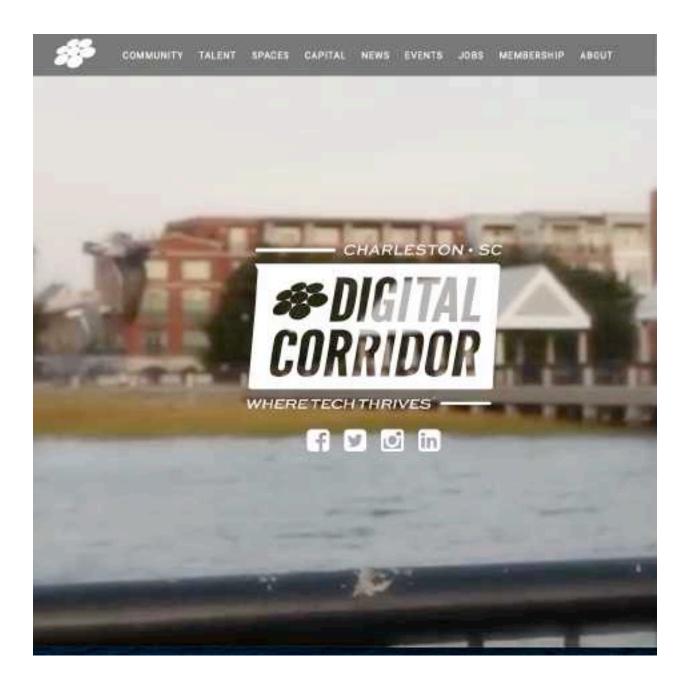
This district is intended to provide for the future economic expansion of the parish with high quality office, light manufacturing, and research and distribution development.

Commentary: This district enables the parish to expand its economic base without encroaching on residential development. By establishing high development standards for this district, the parish reduces the impact of business development on surrounding residential development, while at the same time encouraging investment in high income employment.

[Section 17-119. Reserved.]

Section 17-120. Statement of Purpose and Intent: Airport district (A).

The purpose of this zone is to comply with regulations of the Federal Aviation Administration.





COMMUNITY

TALENT

SPACES CAPITAL

Fridays @ the Corridor - Customer Success and the Experience Economy

Feb 15, 2019, 8:30am - 9:30am @ Flagship-Bridge (385 Meeting Street)



Customer Success is no longer an outcome but a way of life for the most successful companies today and it doesn't stop there. At the February Fridays @ the Corridor session, we'll hear from Ryan Eckenrode, Principal Relationship Marketing Specialist atBlackbaud, about what makes a successful customer experience and how your company can achieve it. Learn more and register HERE.



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NEWS

EVENTS

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Home / Events / Fridays @ the Corridor

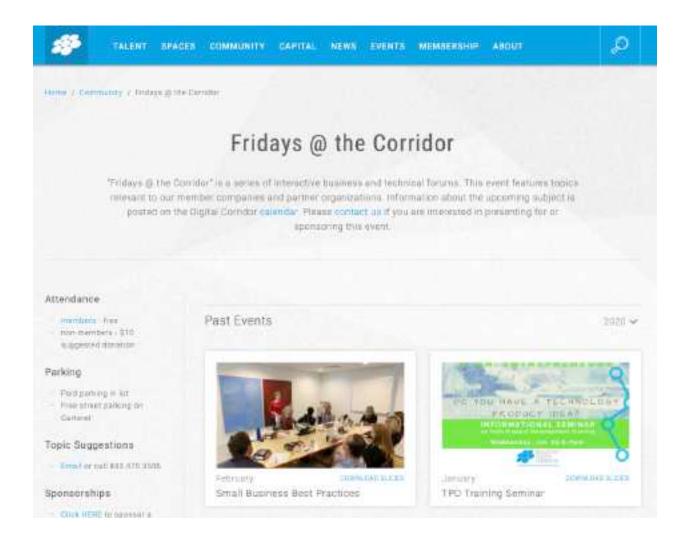
Fridays @ the Corridor

Jun 23, 2017, 8:30am - 9:30am @ Flagship, 475-A East Bay Street



The key to effective digital marketing is understanding your target market and using what you learn to drive your marketing campaigns. At our June Fridays @ the Corridor, HookLead's Zack Hanebrink will discuss how to leverage this information for Facebook Advertising, Google AdWords, Content Marketing, Social Media and Conversion Opportunities, Learn more and register HERE.

Appendix C-4: Charleston Digital Corridor



School of Engineering Agile Strategy Lab **Technology**

Strategic

Focus Areas

Strategic Diversity in Teams Complex Communication Innovation Ecosystems Strategic Doing

Purdue Students **Taking Strategic Feaming**

Assessments

insights to students about how they Using AEM-Cube an assessment Insight, we are providing new tool from Lab partner Human can best contribute to team

Presentation, Workshop or Training on Strategy People Attending a

Strategic Doing **Frainings**

Canadian provinces, and the 2.5 day trainings to develop practitioners in 12 states, 2 Strategic Doing workshop

Purdue Strategy

nnovation Ecosystem: 5 Deans Student Success: Provost Engagements

Data Science: Provost, VPR Polytechnic High School

Global Security & Defense Innovation

Whistler Center Carbohydrate Research Birck Nanotechnology

Ag: Scale Up Conference Health Care Advisors Mandela Fellows

I-GSDI

New Courses in Agile

Collaborative Leadership Strategy and

Online Wiley: Masters in Engineering Online FutureLearn

Online Collaboration Course **Technology**

Montana State University Jniversity of Oregon Universities Engaged

New Mexico State University

New Jersey Institute of Technology Jniversity of North Alabama University of North Carolina The Ohio State University Colorado State University Selkirk College (Canada) Vorth Carolina State

University of Massachusetts-Lowell Merick Business School (Belgium) Memorial University (Canada) Kansas State University

Queensland University of Technology Michigan State University University of Puerto Rico

East Stroudsburg University

Strategic Doing One Day Workshops Engineering Change Lab, NE

South Dakota Center for Disabilities AEM Cube, West Lafayette Workforce: Fremont, NE Workforce, Tallahassee ComPlexity, WL

Health Care Operations, NJ Norkforce, Colorado

New Mexico State: Food Innovation Louisiana Bureau Family Health East Stroudsburg University Youngstown Civic Culture Aviation Innovation, NJ Kauffman Foundation Duquesne University US Air Force, NJ

JAV Cluster, Cape May, NJ

NORDP, Rhode Island

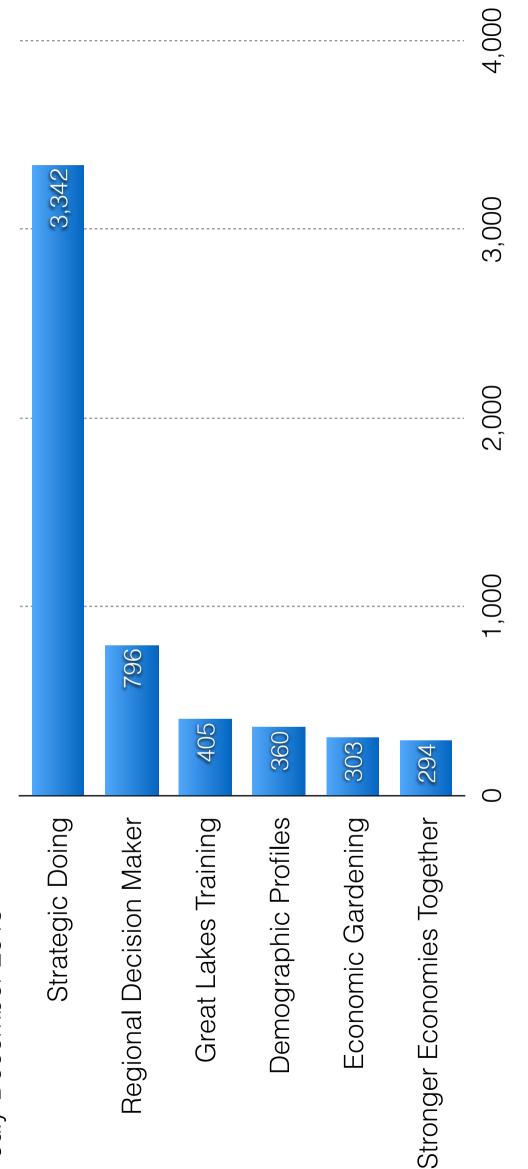
Countries Represented by Learners Online

647

inkedin Post Engagements

active on-line presence with an average of over 600 page hits per month on the PCRD web site. The PCRD Strategy Team has developed a very





Source: Tyler Wright

education and training activities that engaged In 2015, the PCRD strategy team conducted 3,800 people.

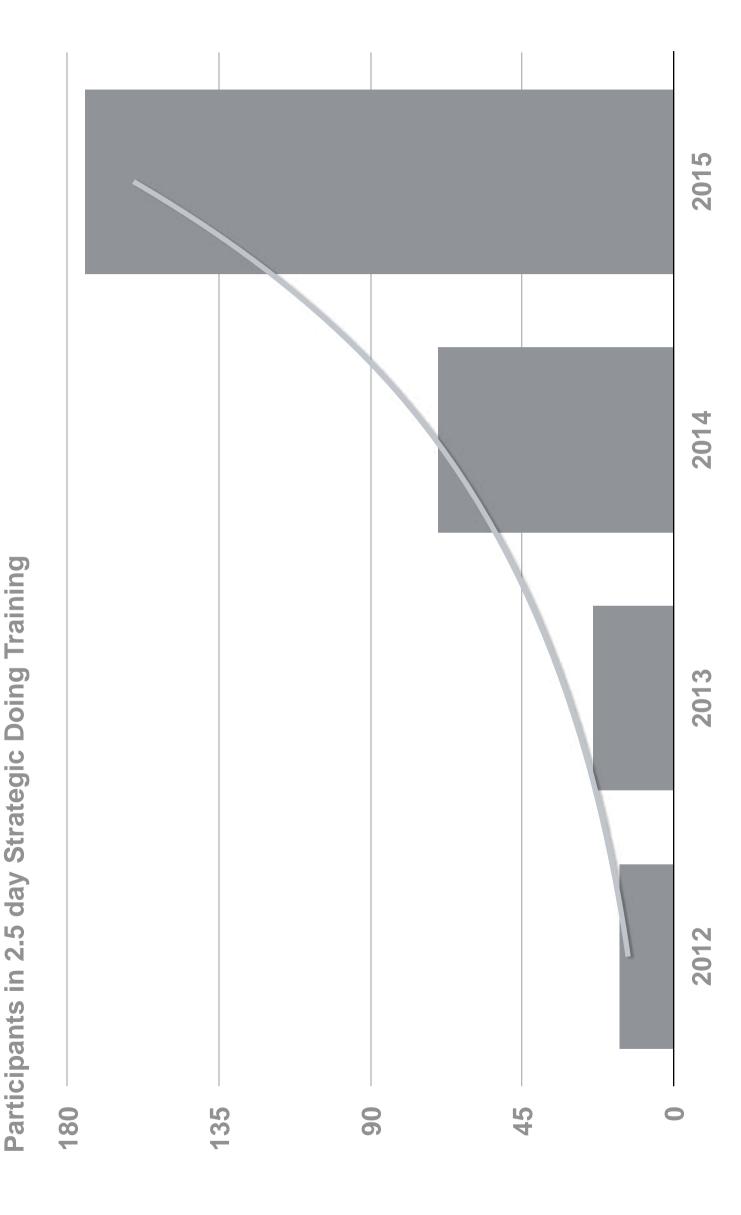
Number Trained

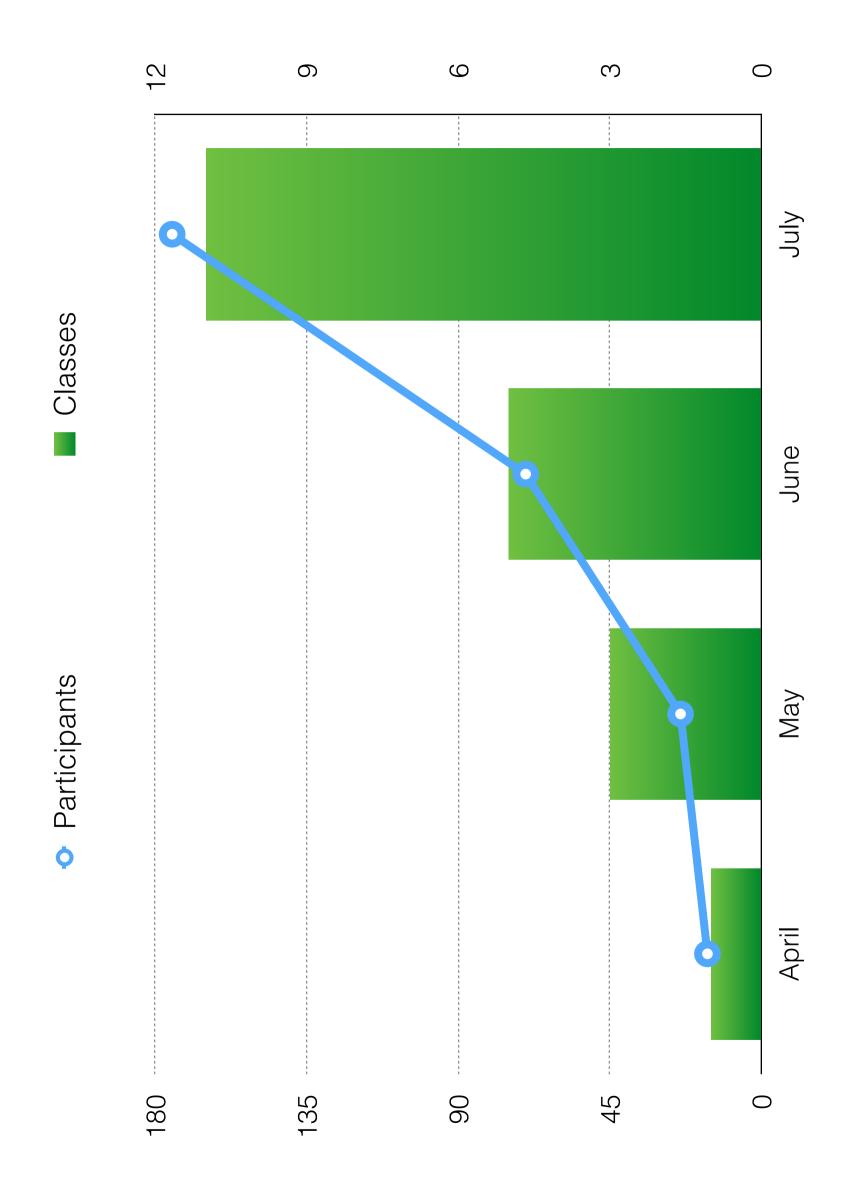
Purdue Students	360
Indiana Residents and Professionals	654
US Residents and Professionals	2,219
International Residents and Professionals	268
Total	3,801

education and training activities that engaged In 2015, the PCRD strategy team conducted 3,800 people.

-				
	Indiana	SN	International	Total
2.5 Day Training Sessions in Strategic Doing	28	119	28	175
Table Guide Trainings	20	16	25	61
Students receiving initial training in SD	360		200	560
SD trained in Engineering Education efforts	50	419	20	519
SD Simulation introduction/Workshop	556	1,208	210	1,974
Introduction to SD/ presentations		457	55	512
Total	1,014	2,219	568	3,801

In 2015, demand for 2.5 day professional training in Strategic Doing reached a tipping point and began to accelerate.

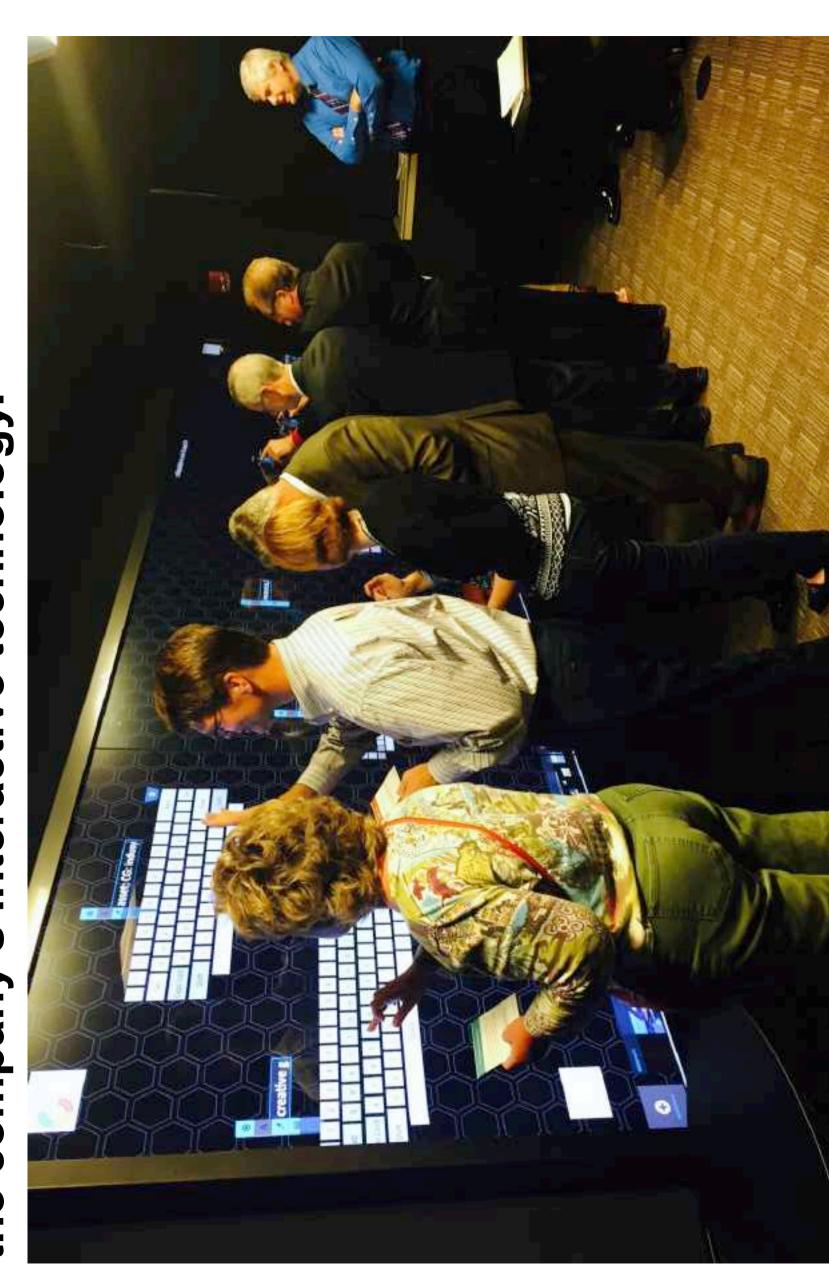




With the University of the Sunshine Strategic Doing workshop to date Coast we conducted the largest



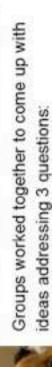
Purdue partnered with Lilly & Co's IT department to introduce Strategic Doing: The Game and leverage the company's interactive technology.



Agile strategy is an effective way for Strategic Doing Dinner in Chicago. Purdue faculty to engage industry Below, the LyoHub describes its



A LyoHUB Strategic Doing Dinner was held on April 13, 2016 at the Big Ten Headquarters in Chicago





What would it look like if there were new, technologically disruptive lyophilization equipment? What would it look like if there was a national center for education and workforce training in lyophilization?

Six projects, led by industry, are being developed as a result of these efforts





Ed Morris

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Purdue Agile Strategy

NETWORKS, CLUSTERS AN

TAKING REGIONS TO THE NEXT LEV WITH OPEN INNOVAT

Agile Strategy Lab School of Engineering



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Appendix C-5: Purdue Center for Regional Development | Agile Strategy Lab

FORWARD

challenges to building a economies of shared, sustainable prosperity. This Networks, clusters and ecosystems are rapidly becoming central report explains why.

Our global economy has been rapidly moving toward knowledge as a central source of value. The Internet, our first interactive mass medium, accelerates the trend and opens new doors of opportunity. We now can build dynamic, entrepreneurial economies almost anywhere.

But these opportunities are only open to those who can shift their thinking. companies, communities and regions that recognize the fundamental shift That is the aim of this report: to introduce you to new perspectives, based on extensive practitioner experience. Prosperity will emerge only in those underway.

"Jumping the curve" represents a helpful metaphor for embracing new ways of thinking, new ways of behaving and new ways of doing complex work together. Traditional linear, hierarchical, command-and-control mindsets are becoming increasingly outdated. Yet, they still dominate many viewpoints in too many places.

By contrast, organizations, communities and regions that embrace the complexities of open networks will learn the amazing power of collaboration. Places that master the deep skills of collaboration will be more prosperous. They will spot opportunities faster, they will align their assets faster, and they will act faster.

This report summarizes12 years of work at Purdue exploring and developing these new approaches. We invite you on the journey, as we continue to design "what's next" for our organizations, communities and regions.

Ed Morrison Director Purdue Agile Strategy Lab



A Word on Terminology

other fields are grappling with a fundamental shift underway in out economy: practitioner's viewpoint. Scholars in economics, strategic management, and This report explores an emerging area of theory and practice from a the emergence of networks. Settling on terms is a tricky business. Not only do we have multiple disciplines central question remains: How do we build a shared, sustainable prosperity in involved, the whole phenomenon we are trying to grasp is relatively new. The an increasingly interconnected world?

To grapple with this question, we have a wider range of terms at our disposal: quadruple helix, clusters, regional innovation systems, entrepreneurial innovation networks, open innovation, open innovation 2.0, triple and ecosystems and innovation ecosystems. We are trying to describe what Eric Beinhocker, in his master work, The Origin of Wealth explains as a new form of economics. "Economies are not just like open systems; they are literally and physically are a member of the universal class of open systems". A new field of complexity economics is emerging to explore this shift in our thinking.

companies. All of these are complex systems of networks, embedded in other In this report we will focus on how regional economies can use networks to become more entrepreneurial and innovative. We will refer to clusters, ecosystems for start-up companies and ecosystems for growth networks. We are not struggling to define these terms precisely

25 years of struggling with the shift underway. This report distills experiences from large metropolitan areas, clusters, regions, rural counties and inner city Rather from the practitioner view, we are distilling lessons accumulated over neighborhoods. The important point is this: We have learned enough to say possibilities. We can transform these economies with new skills, disciplines and tools. This report provides a starting point to what we have learned. that we can design and guide networks that open economies to new

Background on the Field Work

strategy models, specifically designed for open, loosely connected networks. The field work underlying this report started in 1993 when Ed Morrison, now director of the Purdue Agile Strategy Lab, began experimenting with new

Doing —shifted to Purdue. The emerging lessons embedded in this report are The first experiment, the transformation of Oklahoma City, was successful, as 1990's, these ideas also evolved with 23 rural counties in Kentucky, counties Bowling Green. In 2005, these experiments in strategy — called Strategic was the second, the launch of th eCharleston Digital Corridor. During the that had been left out of the growth corridors of Louisville, Lexington and earned from the following cases:

- · Oklahoma City (regional transformation over 7 years)
- Kentucky (23 cases of rural counties over 7 years)
- Charleston, South Carolina (launch of a software cluster)
- Space Coast, Florida (NASA Shuttle shutdown, launch of a clean energy cluster)
- Milwaukee, Wisconsin (launch of a water cluster)
- North Central Indiana (regional workforce innovation over 4 years)
- Rockford, Illinois (launch of an aerospace cluster)
- Muscle Shoals, Alabama (launch of a startup ecosystem)
 - Cape May, New Jersey (launch of a UAV cluster)
 Flint, Michigan (neighborhood regeneration over 5 years)
- Shreveport, Louisiana (neighborhood regeneration over 10 years)
- Sunshine Coast, Australia (launch of regional innovation ecosystem)
- New Jersey (technology and innovation management; 5 cases over years)

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The Starting Point: Money Flows



To start down the path of building a shared prosperity, we first need to get some basics under our belt.

Here is a convenient and simple way to think about how a regional economy prospers. The performance of a regional economy can be characterized with three flows of money.

"Good Money" flows into the economy from businesses that have markets outside the geographic economy. These firms are often called "traded businesses".

"Neutral Money" circulates within the economy when businesses buy and sell from each other.

"Bad Money" flows out of the economy when people make purchases from businesses outside the economy.

This leads us to a simple explanation of how to build prosperity within a regional economy:

- 1. Expand the volume of Good Money;
- 2. Increase the velocity of Neutral Money; and
- Reduce the flow of Bad Money.

If you think this notion is too simple to start, please don't. We learned this approach to explaining from David Morgenthaler, founder of Morgenthaler Ventures, and an iconic Silicon Vally venture capitalist. He believed that too few people had this grounding.

Traditional Approaches to Expanding Money Flows

with Mississippi, developed incentive programs targeting As a professional practice, economic development traces its roots back to the 1930s. States in the South, starting manufacturing companies in the Northern states. By southern states improved their Good Money flows. relocating these manufacturing companies, these

This approach to economic development was remarkably successful. In the years after World War II, with the advent of air-conditioning and a new interstate highway system, southern states became remarkably more competitive.

By the 1990s, economists were raising serious concerns about this "economic across the South. By the 1970s, northern states began copying the strategy aggressively from locations in the Northeast to new, greenfield plants all So, for example, in the 1950's the textile and shoe industries moved war among the states".

pay off, and the economic development practice of relocating companies does Institute. The evidence, however, is increasingly clear: these incentives rarely little to build a long-term prosperity within a region. In terms of our long term incentives, according to recent research by Timothy Bartik of the Upjohn Today, state and local governments invest over \$45 billion in relocation prosperity, much of this investment is wasted.



Globalization, Knowledge and Networks

dramatically since the 1930s. We can capture the shifts in There are a number reasons why relocation incentives are three words: globalization, knowledge and networks. conditions of economic competition have shifted generally a bad investment. Most important, the

1950s and 1960s.— Globalization has its roots in the 1950s with the invention of containers to carry freight. By the 1960s, dramatic improvements in elecommunications and commercial air service opened new markets.

coupled with the resurgence of the postwar economies in Germany and Japan Across Asia, rapidly developing economies in Hong Kong, Korea, Singapore ntensified pressures for domestic industries like steel and automobiles. 1970s.— Dramatic reductions in trade barriers beginning in the 1970s, and Taiwan led to even more competition.

globalizing their manufacturing networks. At the same time, China started to open its economy. The Chinese government enacted joint venture laws to nanufacturing capabilities, which triggered even more outside investment. 1980s.— Beginning in the 1980s, U.S multinational manufacturers began encourage foreign direct investment. The integration of Hong Kong and Taiwan investment into a Greater China economy accelerated China's

1990s.— In the 1990s, the commercial Internet began shifting the terms of competition even more dramatically. In an increasing number of markets, knowledge and networks began to emerge as the key to competitiveness.

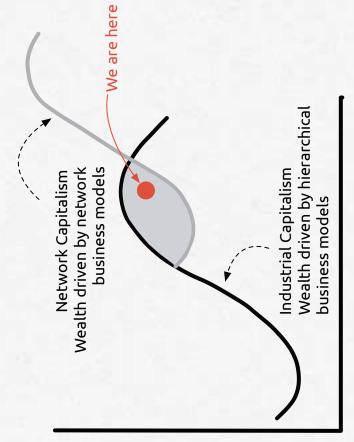


Our Challenge: Jumping to a New S Curve

All economies change. S Curves explain how technologies, business firms, and regional economies go through phases of early adoption, rapid growth, maturity and decline.

In the broadest form, we are moving from organizations that create wealth through hierarchical command and control methods to organizations in which wealth is created through collaboration, knowledge and networks.

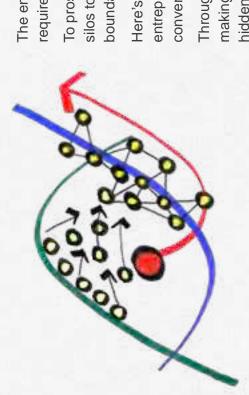
The connection between Three Flows of Money and S Curves is straightforward. As companies within the economy move through their S curves, the business and technology foundations of an economy shift. With these changes, the pattern of money flows also shifts. So, for example, when the steel industry in Ohio collapsed, economies, like Youngstown, contracted. Civic leaders had become complacent and did not invest in new technologies that could give rise to new S-curves.



Prosperity

Time

Networks to Jump the S Curve



To survive and thrive, every organization, community and region must now "jump the curve" to a new way of thinking, behaving and doing work together.

The environment is shifting for everyone. The transformation taking place requires each of us to gain a new understanding of the power of networks.

To prosper in the emerging world of network capitalism, we must break down silos to improve the flow of information across organizational and political boundaries.

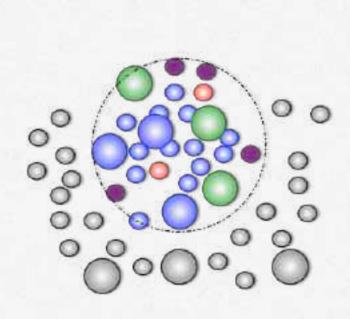
Here's the good news: We now have the opportunity to ignite a new era of entrepreneurship and innovation, simply changing our focus and starting new conversations.

Through new collaborations, we can overcome the inertia of sluggish decisionmaking. We can uncover new opportunities from assets that are largely hidden within our personal networks. We can jump from a hierarchical, linear mindset to a environments that are far more entrepreneural and innovative.

The organizations, communities and regions that find ways to "jump the curve" will find pathways to a more prosperous future. They will spot opportunities faster. They will align resources faster. And they will innovate faster.

The biggest mind shift involves spending less time trying to fix our current problems and spending more time designing what's next. As management scholar Peter Drucker advised years ago, to confront an increasingly volatile future, "starve your problems, and feed your opportunities."

Networks, Clusters, Open Innovation and Ecosystems



In Europe, the concept of Open Innovation 2.0 captures the concept of ecosystems. Left standing is the question of how to design and guide these ecosystems.

profession began focusing on the phenomenon of clusters. Since that time, we have learned the "Why" of clusters Beginning in the 1990s, the economic development (why they matter), but we have struggled with the "How" (how to design and guide them). in the early 1990's, Michael Porter, a business professor at Harvard, proposed that clusters are critical for understanding and improving the performance of organizations that benefit from being connected and located close to one egional economies. The regional economy is composed of a portfolio of clusters. A cluster, in turn, represents a group of businesses and related

development strategies now typically start by understanding the unique clusters For over 20 years, economic developers and policymakers have experimented development engages members of a cluster in a dialogue about how they can collaborate to compete. But figuring out how to do that has proven to be tricky. of a region and building from these strengths. In addition to analysis, cluster with a wide range of initiatives designed to build clusters. Regional

regional development. Its application to regional economies is connected to the companies rely on outside partners to accelerate their innovation productivity. The notion of ecosystems in regional development can also be traced to the More recently, concept of ecosystems has emerged as a way to promote Advantage, she pointed out that competitive regions are more networked These networks enable assets to flow more quickly across organizational development of the concept of "open innovation". Introduced in 2003 by ousiness professor Henry Chesbrough, open innovation describes how pioneering work of AnnaLee Saxenian. In her landmark book, Regional boundaries

Networks, Clusters, Open Innovation and Ecosystems

More recently, concept of ecosystems has emerged as a way to promote regional development.

Ecosystem is a metaphor borrowed from ecology. It is an effort to describe an economy from the perspective of open, loosely connected networks

concept of "open innovation". Introduced in 2003 by business professor Henry Its application to regional economies is connected to the development of the Chesbrough, open innovation describes how companies rely on outside partners to accelerate their innovation productivity.

The notion of ecosystems in regional development can also be traced to the These networks enable assets to flow more quickly across organizational Advantage, she pointed out that competitive regions are more networked pioneering work of AnnaLee Saxenian. In her landmark book, Regional boundaries. Scholars are now focusing on ecosystems, but their work is only beginning. In contrast, Purdue's practitioners have been working in this field for over 20 years. In a word, practitioners "learn by doing".

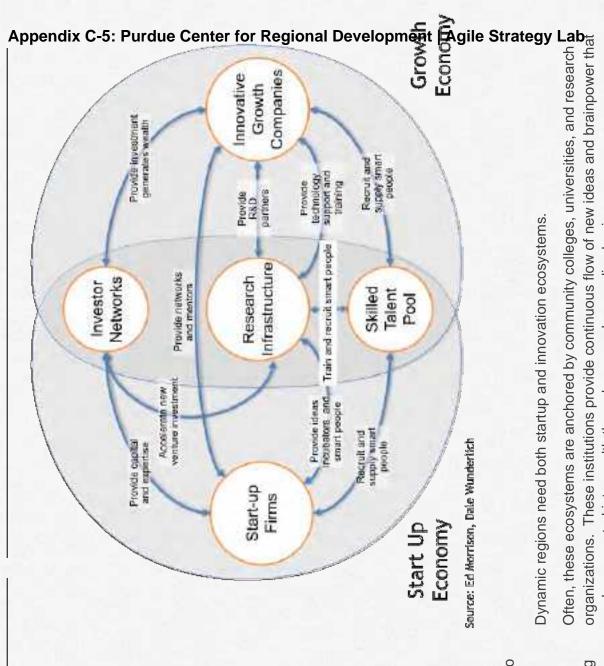
This report focuses on the lessons from Purdue's practice, based in the Agile challenges, like building ecosystems. The balance of this report shares these Strategy Lab. The experimental and inductive methods that characterize "reflective practice" are particularly well-suited to addressing complex insights.

working definition, this report will distinguish between ecosystems designed to accelerate start-up companies and ecosystems that support growth by existing We start by proposing a clarification. Scholars refer to both "entrepreneurial ecosystems" and "innovation ecosystems". The terms remain cloudy. As a firms. Both, we contend, are designed to support entrepreneurs. 5

Ecosystems Startup and Innovation

boundaries to both startup networks that speed the deployment of resources Ecosystems represent across organizational and existing firms. A startup ecosystem encourages the formation of new firms. It typically angel capital networks, mentoring involves incubators, accelerators, initiatives.

speeding resources to existing firms to nnovation initiatives, and transforming An innovation ecosystem focuses on promote more productive innovation. These ecosystems are focused on a different type of investor, open internal innovation practices.



can be converted into wealth through new and expanding businesses.

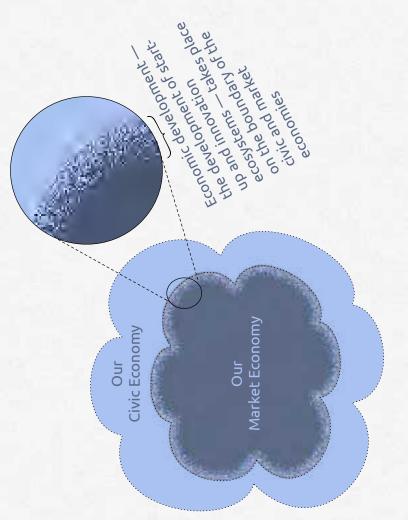
Introducing Our Civic Economy

To understand how to develop
ecosystems, it's helpful to see our
economy from a new perspective.

We are used to thinking about our economy in terms of a public sector and private sector. In addition, we include a third sector of voluntary, non-profit organizations. In ecosystem development, it's easier to characterize our economy in terms of a market economy and a civic economy.

A market economy includes all the organizations, investments and activities that are publicly valuable and privately profitable. The civic economy includes organizations, investments and activities that are publicly valuable, but not privately profitable. So, our civic economy includes government, education, most healthcare, philanthropy, and nonprofit organizations.

Ecosystem development is most critical at the boundary between our market and civic economies. On the boundary, we are using networks to speed the flow of resources among organizations to encourage the expansion of a sustainable, equitable market and civic economies, faken together.





New Patterns of Thinking, Behaving and Doing



Most of us have been training to think and act in hierarchical organizations. Networks are different. They require us to adopt some new mental models, trustworthy behaviors, and new approaches to getting things done. This fact is especially true in the civic economy, where no one can tell anyone else what to do.

To speed the development of healthy ecosystems, we need to build new, shared habits. We are moving our orientation from hierarchies to networks.

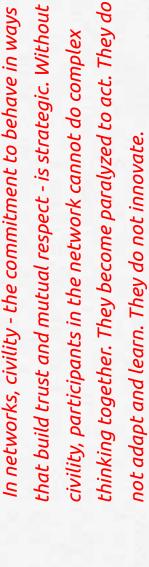
Shared habits take time to develop. Many of us are deeply oriented toward hierarchical organizations that function on the basis of boundaries with command-and-control systems. Hierarchical organizations foster a pattern of thinking and behavior that often runs against collaboration.

To build a culture of collaboration within the organization, community or region, we need new habits of thinking, behaving and doing work together.

- **Thinking differently** involves exploring across organizational and political boundaries.
- **Behaving differently** suggests that we can advance our own interests by behaving in a way that builds trust and mutual respect.
- **Doing differently** involves a willingness to take shared risks and experiment together.

New patterns of collaboration cannot emerge without a willingness among participants to think differently, behave differently to work together differently.

The Strategic Role Civility Plays

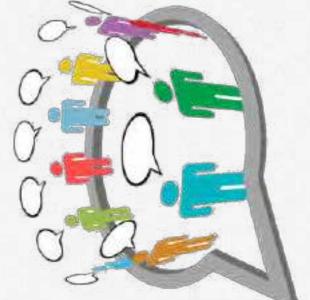


psychological safety". Participants in a network share a belief that they can Within our organizations and teams, a commitment to civility provides eveal their thinking without fear of negative consequences.

completed a two-year study on high-performance teams, the results revealed that the most effective teams that one characteristic: psychological safety. Civility provides the cornerstone for the formation of trust. When Google

curve" and breaking down silos will require people to form new collaborations civility: how members of the team behave toward each other. "Jumping the In practical terms, psychological safety translates into establishing rules of and to work together in new and different ways.

With agreed-upon rules of civility, members of the team can form collaborations more quickly. Their energy is more focused toward shared outcomes. In other words, civility accelerates innovation.



The Questions that Guide Collaboration



Leadership in networks involves asking insightful questions, listening, seeing patterns, and asking still more questions.

Collaboration begins with conversation. Collaborative leaders learn that they can design and guide these conversations by asking simple questions. As participants in a collaboration learn to ask and answer these questions, complex collaboration begins to emerge and grow.

either case, the individual bird or bee follows a handful of simple rules out of The process is not too dissimilar from a flock of birds or a swarm of bees. In collaborations. By following simple rules, participants can design and guide which complex patterns emerge. The same thing happens with productive their own complex collaborations.

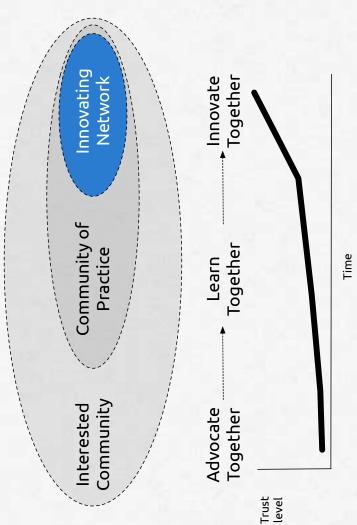
At the Purdue Agile Strategy Lab, we have discovered the simple rules that lead to complex collaboration. These rules are embodied in a conversation around four questions:

- With the assets and resources each of us have, what could we do if we combine these assets in ways?
- Among all of the things we could do, what should we do?
- Once we decide what we should do, what will we do to get started?
- earned and what we're going to do next? (We call this our 30/30. In other When are we coming back together again to evaluate what we have words what did we do the last 30 days and what will we do the next 30 days?)

By asking and answering these four questions — and moving from talking to doing — a complex collaboration can emerge.



Types of Networks



Not all networks are the same. To jump the curve, organizations, communities and regions need to form innovating networks. These are networks in which participants share assets to create something that no individual participant can create alone.

Network-based thinking is more subtle and deep than most people realize. Donating networks evolve over time as participants develop the trust needed to share and combine assets to innovate. An interested community, such as all the fans of an athletic team or all of the alumni of a university, share an interest, but they hardly know each other.

A community of practice is a tighter network in which members of the community know each other by name, but they are each pursuing their own individual definition of success. They help each other learn.

Innovating networks are the most sophisticated and productive. While they are also learning networks, into something more: participants work toward a shared outcome. Trust levels have to be higher, because participants are both committing their own resources and incurring some risk of failure. Yet, forming these innovating networks is critical. They enable us to "jump the curve."

The Structure of an Effective Innovation Network

common. They have tight cores and porous boundaries.

Innovating networks share several characteristics in

Boundary spanners within the network continuously

search for new opportunities to link to other networks. Tight cores enable an innovating network to stay focused and organized.

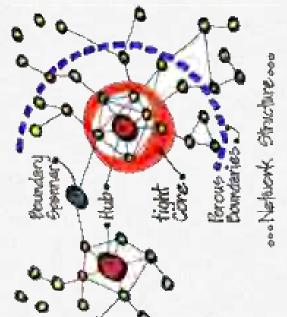
and out from the network. In practical terms, the network is open to new ideas Porous boundaries to the network ensure that information flows both into and learning.

Typically, this means that the network is managed by a core team. The core

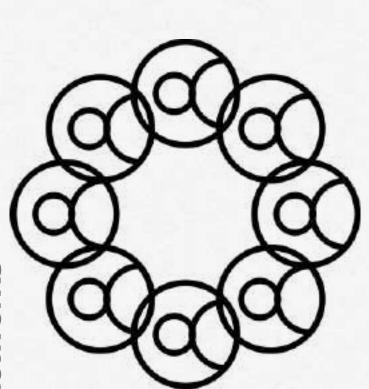
team relies on frequent communication to translate ideas into action.

Boundary spanners look for opportunities to increase the scale of the innovating network by linking to people embedded in other networks.

networks do not have tops or bottoms. (These appear in hierarchies, but not The concepts of "top-down" or "bottom-up" do not apply to networks, since networks.) Instead, effective innovating networks balance both leadership guidance from the core team and open participation through porous boundaries and boundary spanning.



Core Teams and Networks



Effective core teams are cognitively diverse. They have also learned to behave in ways that build trust and mutual respect. A good core team models the behaviors for others to follow.

As we move toward networks, clusters and ecosystems, we start to see the importance of a core team.

Effective networks, clusters and ecosystems sure to common characteristics. They have a tight leadership core that designs and guides the network at the same time, they have porous boundaries that enables the network, cluster or ecosystem to grow and adapt.

The importance of core teams shifts our thinking about leadership. In hierarchical organizations leadership is positional. The higher you are in the hierarchy, the more important your leadership position. In addition, we think of leadership as being embodied in a single theater.

Networks, clusters and ecosystems are different.
Leadership is collaborative. Leadership is embodied in roles, not positions. These roles reflect individual strengths.

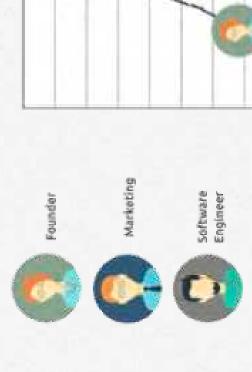
As the network, cluster or ecosystem grows and adapts, leadership rotates based on the circumstance. High levels of trust within the core team enable these leadership transitions take place quickly.

Strategic Diversity Within a Team

We all see the world differently.
Complex challenges involve complex solutions. No single individual has a perfect perspective.

That's why it's important to promote different viewpoints within a team. The challenges of leadership within core team shift as circumstances change. With a diverse set of viewpoints and skills within a core team, it functions more productively.

At the Purdue Agile Strategy Lab, we use a simple assessment tool to measure the "strategic diversity" within a team. We locate members of the team on an "S-curve". Some members of the team are more comfortable with the open, creative process that typically characterizes activities at the early stage of innovation. Other members are more comfortable focusing on issues related to growth, scaling execution and efficiency. A high performance, innovating team is strategically





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Innovating Networks: The Dynamics of

Skeptics can provide some useful insights into what might not work. Soreheads, on conversation and can be a distraction. Sore heads the other hand, add little to the innovations die when the core team does no skeptics Passive challenges of achieving scale. Many Crossing the chasm embodies the focus on these challenges early. Willing volunteers "The Pragmatists" The "Chasm" network Civic entrepreneurs Their close Core team Percent of regional citizens

increasing numbers of people become engaged. It's when a core team moves beyond its initial networks that the innovation hits a tipping point and begins to scale.

Scaling takes place when the core team

moves beyond its own networks and

engages "willing pragmatists"

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Collaboration in the Midst of Complexity

organization, community or

transformation of an

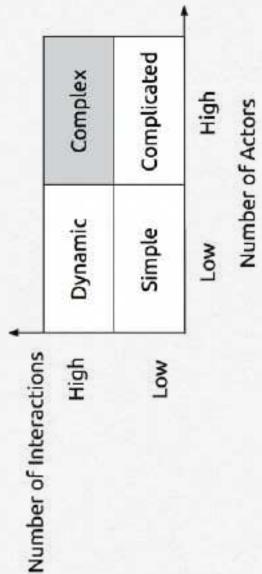
In any large-scale

region, a large number of

number of interactions

creates complexity.

individuals with a high



Most of us know how to build trust oneon-one. We are comfortable and faceto-face meetings with a limited number of people. But large-scale transformation involves a large number of people in many interactions.

How we build trust in these complex environments? In other words, how we build trust at scale?

To answer this question, the Purdue Agile Strategy Lab began to test a new shared discipline to build trusted relationships, collaboration, and innovating networks.

Source: Modified from Sheffield, J., Sankaran, S., & Haslett, T. (2012). Systems thinking: taming complexity in project management. On the Horizon, 20(2), 126-136.

Collaboration

together before. Is it possible, in a few hours, for teams of Cracking the Code on Imagine a room full of people who have never worked people to develop their own roadmaps to innovate? The answer: Yes. However, the process they follow must be easily understood and quickly practiced. Through "learning by doing", participants must develop new habits of working together.

Through dozens of field trials, the Purdue Agile Strategy Lab has integrated a process called Strategic Doing. This protocol of collaboration moves participants toward shared, measurable outcomes. It teaches them to focus on moving ideas into action quickly and to experiment hypotheses and assumptions about the innovation they are designing. Rather than being deflected by excuses, they commit immediately to "doing the with Pathfinder Projects. These projects help team members test their

Each member of the team commits to making a small step to help execute the Pathfinder Project. In this way, by aligning commitments to actions, members of the team quickly begin building trust.

Most important, team members learn that they can design and guide strategy As members of the team learn by doing, they commit to making adjustments. quickly. The traditional hierarchical process of strategic planning is quickly discarded. New, shared habits form to guide strategy



4 Questions, 10 Rules Strategic Doing: and 10 Skills

Strategy in open, loosely connected networks needs to

start with a fundamental question: within a network,

what is strategy? The discipline of Strategic Doing

answers this question rigorously.

Strategic Doing Cycle



questions: Where are we going? and How will we get there? to answer these questions within a network, we need to design a "strategic conversation"; that In Strategic Doing, strategy means providing clear practical answers to two is, a conversation that answers these two core questions of strategy.

To do that, we need to design conversations around four questions:

- What could we do?
- What should we do?
- What will we do?
- What's our 30/30?

By answering these questions, a team can generate all of the components they need for a strategic action plan.

Underlying these four questions, 10 rules guide participants in developing their strategy. These ten rules embody ten specific skills to complex collaboration. Strategic Doing is a clear, shared discipline that takes practice to master. These four questions are simple to remember but not easy to answer.







A Strategy Framework for Ecosystems

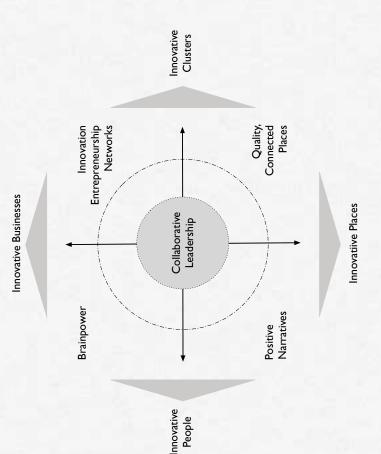
a framework designed to guide the development of

clusters and ecosystems. The framework explains

how regions must compete in an increasingly

connected economy.

At the Purdue Agile Strategy Lab we have devised



First things first. No region can prosper in a knowledge economy without **brainpower**. Brainpower generates the knowledge needed to power the economy. This brainpower takes many forms, but it is embodied in individuals. We can measure brainpower in in a variety of different ways, such as educational attainment or, more narrowly, research funding or patents.

Next, for a region to prosper, it must convert brainpower into wealth through **innovation and entrepreneurship**. Most often, we think of innovation and entrepreneurship in terms of incubators, angel capital networks, and entrepreneurship programs. All of these initiatives, working together, determine the capacity of a region to turn ideas into wealth.

The third major component of a successful cluster or ecosystem involves **quality, connected places**. Both people and firms are mobile. They will not stay in a region that does not offer a quality connected place for them to live and work.

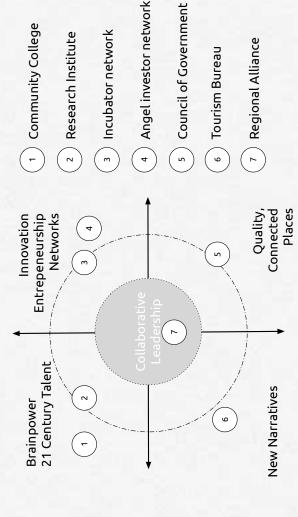
The fourth component of a vibrant ecosystem involves **new narratives**. These new narratives are critical because they point to the future. They provide guidance and inspiring stories of how will thrive. Lastly, an ecosystem needs continuous collaboration in order to build the networks needed to power prosperity.

Mapping Assets at Different Scales

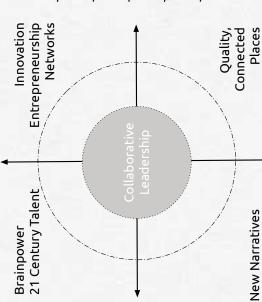
Use this framework to start mapping assets within an ecosystem. The same framework can be used at different geographic scales.

This flexibility reduces the complexity of mapping assets. At the end of the day, its not the mapping of assets that matters. It is forging the connection among assets — within new innovating networks — that opens the door to new opportunities.

In three different counties, for example, each county can begin mapping assets and then exploring connections both within the county and across county boundaries.



Appendix C-5: Purdue Center for Regional Development

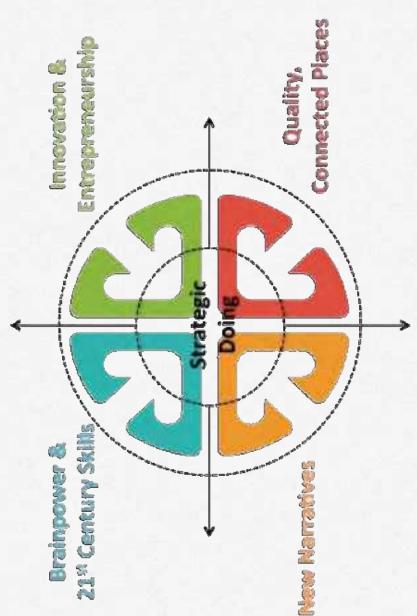


Region Region Cluster aliaby
Commutation
Organization

Using Strategic Doing to Build Ecosystems

By integrating Strategic Doing into an ecosystem strategy, regions can begin developing their ecosystem.

The process involves conducting a series of workshops to form collaborations that strengthen the flow of resources to both startup and growth companies.

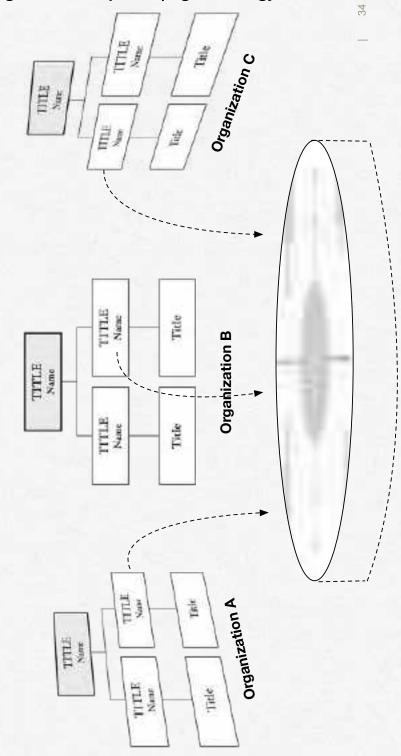


Creating Platforms for Ecosystems

Ecosystems form on top of platforms. Ecosystem design starts with platform design.

By designing the platform and guiding interactions on the platform, ecosystem builders can encourage the formation of productive networks that link and everage assets across the ecosystem. Collaborations organize on the platform.

platform model provides a valuable approach to convening willing participants in a new network or ecosystem. Platform metaphor enables the ecosystem to form without provoking an "immune response" from existing organizations. Platform thinking is becoming essential in ecosystem development. The



A Strategic Discipline for the Platform

Strategic Doing Networks Strategic Planning Hierarchies 00

Strategies for clusters and ecosystems is different. Without a strategy discipline, convening people can degenerate to chaos.

Strategic Doing is a simple process for building collaborations quickly and moving them toward measurable outcomes.

Participants make adjustments as they learn by doing. The discipline enables diverse participants to develop a strategic action plan quickly.

Companies, communities and regions are using and sharing the discipline to develop their own networks and ecosystems. As participants master these shared skills, they learn to design and manage their own teams.

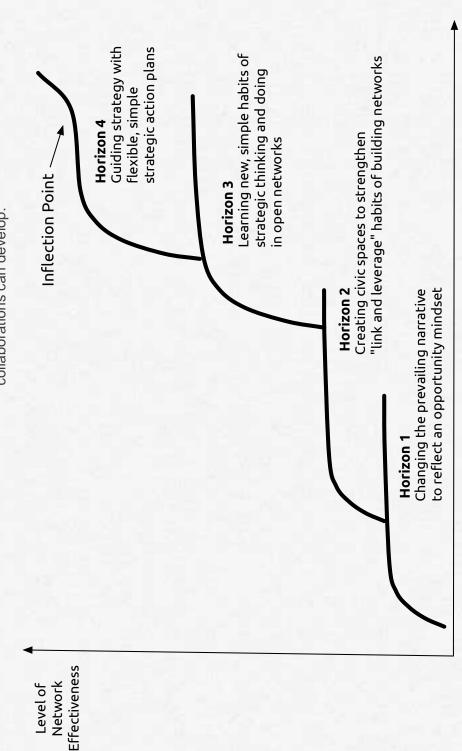
This approach is fundamentally different than strategic planning, which places a heavy emphasis on analysis and "getting things right" before actually implementing anything,

How Networks **Jevelop**

Network Level of

Networks take time to develop.

Designing a series of strategy workshops is the best process to guide the development of the networks needed for clusters and ecosystems. As participants "learn by doing", they become models for how effective collaborations can develop.

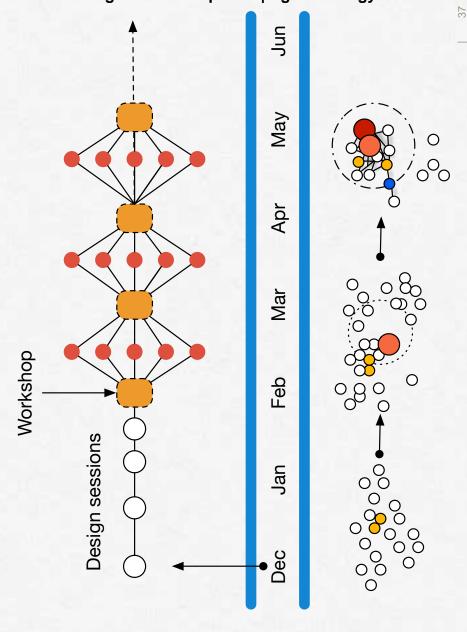


Time

Designing a Strategy Process for the Platform

Using the principles of Strategic Doing, groups can customize their strategy process to see their needs.

The process typically involves an on-going series of workshops. Between the workshops, team members complete individual assignments. When the team reconvenes, they update their strategy.



Designing a Strategy Ecosystems Process for

As team members become accustomed to using metrics as process of continuous check-in meetings (30/30 meetings). Managing a network of initiatives involves designing a learning tools, the process of shared learning becomes embedded in the network.

to using metrics as suring becomes

By following the principles of strategic Doing, organizations, communities and regions can design their own strategy process.

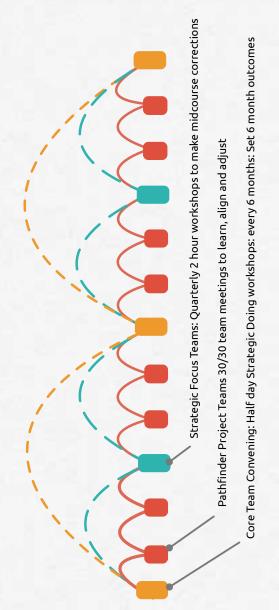
Strategic Doing is a data driven strategy process. By focusing

on transparency and shared learning, the discipline accelerates adaptation.

Strategic Focus Area Teams

Core Team

Pathfinder Project Teams







Commercializing Technology is Challenging

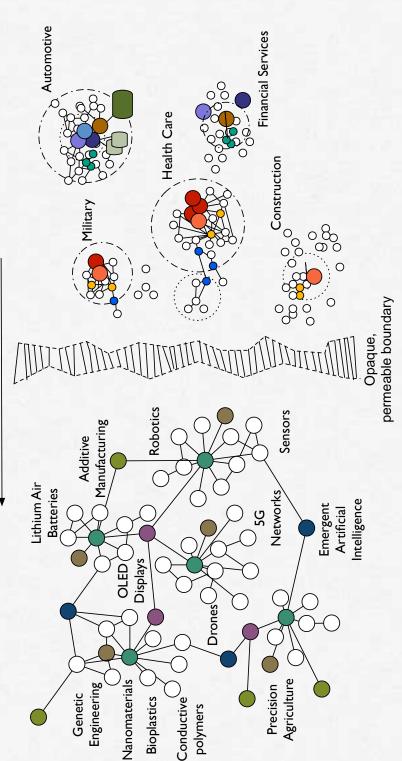
Technology Development

networks, clusters and ecosystems to bridge the boundary. Technology and innovation management must overcome the opaque boundary. Platforms can help develop the

Technology in search of a market fit

Markets in search of technology solutions

Market Opportunities



Commercialization is Challenging

Technology in search Development Technology

of a market fit

of technology solutions

Markets in search

Market

Opportunities

Adding powerful tools developed by Fraunhofer IAO to a collaboration

The Purdue-Fraunhofer IAO team continues to pilot these tools and frameworks in New Jersey with the New Jersey Innovation Institute.

Fraunhofer Purdue Callaboration - Timeline

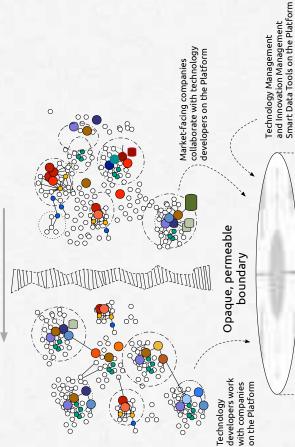
platform can speed the development of technology and innovation.

overcome the opaque boundary. Platforms can help

Technology and innovation management must

develop the networks, clusters and ecosystems to

bridge the boundary.



Technology

S pilot projects in TIM in those bornewarks Conditions BAD Teathord for TW & Straingle Craing Non Jersey smovation 2016 Novara - Stuttgari First meeting to Statigact, Germany 2015 Exchange workshops Pardue, West meets Stiefegla Dolng" Lafayorte USA 2013





Case Studies



Strategic Doing"

Strategic Doing is an open source discipline that is taught through an affiliated network nonprofit organization, the Strategic Doing intellectual property of Strategic Doing, developed by Ed Morrison, is held by a of colleges and universities. The core

development of Strategic Doing since 2005. Purdue University, through its engagement mission, has generously supported the

initial application took place in Oklahoma City beginning in 1993. The work now continues through the Purdue Agile clusters and ecosystems developed over 25 years. The This approach to developing strategies of networks, Strategy Lab.

We can provide background information on the following regions where these approaches have been applied:

- Oklahoma City
- Milwaukee (The Water Council)
- Rockford, IL (Rockford Area Aerospace Network)
- Flint, MI (neighborhood regeneration)
- North Central Indiana (workforce development innovation)
- North Alabama (regional innovation)
- North Carolina (manufacturing cluster)
- Space Coast, FL (clean energy cluster)
- Sunshine Coast, Queensland (regional strategy)
- Charleston, SC (Charleston Digital Corridor)

Bozeman, MT (manufacturing cluster)

- Newark, NJ (defense suppliers)
- Cape May, NJ (UAV cluster)
- Shreveport, LA (neighborhood regeneration)
- Granite City, IL (City regeneration)

43

UEDA Awards with Strategic Doing





Association conducts a peer-reviewed awards program to recognize leading edge university initiatives in building Each year, the University Economic Development dynamic ecosystems.

UEDA has recognized the work of several universities using Strategic Doing. They include:

- University of North Alabama (http://www.shoalsshift.com/)
- University of Northern Illinois (NIU Engineering@RVC)
- Lehigh University (Kern Entrepreneurial Engineering Network)
- New Jersey Institute of Technology (<u>New Jersey Innovation Institute</u> <u>MarketShift</u>)
- Selkirk College (Regional Workforce Development in Rural British Columbia, Canada)
- Purdue University (Pathways to Innovation)

You can learn more about the UEDA Awards of Excellence program here.

Innovation Program **Pathways** to



Testimonials



Strategic Doing

Do More Together.

tegic Doing offers a tool that nentation quickly
Janyce Fadden G.-Strategic Initiatives Honiversity of North Alabama and tify an interested ecosystem problem. In today's collaborative management culture Strategic Doing offers a tool that allows team members to advance ideas to implementation quickly

Strategic Doing allows a business to quickly identify an interested ecosystem of local businesses to solve a defined customer problem.

Todd Tangert by Lockheed Martin Beat Systems Architect Beat Business Architect Beat Business and Concise open Innovation, but the Mark Scotland Mark Scotland Chief Operating Officer Beat Book Todd Tangert Beat Business and Concise open Chief Operating Officer Beat Book Todd Tangert Beat Business and Concise Operating Officer Beat Book Todd Tangert Book Todd Tangert Beat Book Todd Tangert Beat Book Todd Tangert Strategic Doing process is unique. This is the most clear and concise open I've worked with large companies trying to do open innovation, but the innovation process I've seen.

The best methodology I have seen in 20 years.

Appendix

Testimonials



Strategic **Doing**

Do More Together.

Strategic Doing gives us the power to change our lives, our neighborhoods and our communities. Bob Brown

Associate Director

Michigan State University Center for Community and Economic Development

The Strategic Doing (SD) approach might be one of the most effective ways of

implementing change on campus.

University of Wisconsin-Milwaukee BB University of Wisconsin-Milwaukee BB Independ assets for greater Rockford Area Aerospace Network.

Sunderstand that they need only to Rena Cotsones Bociate Vice President for Engagement Bartnerships impact is at the heart of the success of the Rockford Area Aerospace Network. Strategic Doing has helped regional leaders understand that they need only to Strategic Doing's core principle of linking and leveraging assets for greater ook to one another for solutions.

and Innovation Partnerships Associate Vice President for Engagement

Northern Illinois University

Northern Illinois University

panies need to collaborate
theed or the companies in
Is a roadmap - a set of
leed to compete in the 21st protocols to start forming the behaviors companies need to compete in the 21st The reality of our innovation-driven world is that companies need to collaborate to compete. This as not a natural orientation for Lockheed or the companies in he NJ defense supply chain. Strategic Doing gave us a roadmap - a set of

Michael van Ter Sluis Executive Director, Innovation Services New Jersey Innovation Institute

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Strategic Doing University Network

A list of trainings in 2018 is available at

strategicdoing.net/events

To expand the training in Strategic Doing, Purdue has formed partnerships with colleges and universities to teach the discipline. Strategic Doing is an open source discipline that is shared among colleges and universities committed to developing and expanding the discipline.



Strategic Doing Workshops: A Global Reach

countries.

Since 2009, principals of the Purdue Agile Strategy Lab have given workshops in 48 states and 7 foreign Strategic Doing in Australia launched in 2017. Strategic Doing Europe and Strategic Doing Canada are launching in 2018.





Strategic Doing Credo

Strategic Doing, the discipline that stands at the core of this work, emerged over twenty years of practice.

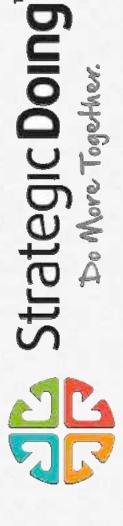
Since 2005, the discipline has been developed at Purdue University.

Since 2008, a core team of practitioners has worked to strengthen the discipline.

In 2011, the practitioners drafted a credo that expresses the "Why" of Strategic Doing. The core team has founded a non-profit institute to accelerate the deployment of this discipline across colleges and universities internationally.

The core team of practitioners include:

- Bob Brown, Michigan State University
- Rena Cotsones, Northern Illinois University
- Janyce Fadden, University of North Alabama
- Kim Mitchell, Community Renewal International Tim Franklin, New Jersey Institute of Technology
 - Nancy Franklin, New Jersey Innovation Institute
 - Liz Nilsen, Purdue University
- Scott Hutcheson, Purdue University
 - Ed Morrison, Purdue University



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country gathered at Indiana's Turkey Run State Park. They composed a In 2011, a group of Strategic Doing practitioners from all over the credo, a set of beliefs that drive our work.









Next Steps

and strategy in open, loosely, connected networks, please pioneering new approaches to innovation, collaboration The next steps are up to you. If you would like to learn more about how the Purdue Agile Strategy (Lab is visit our web site and then contact us:

Purdue Agile Strategy Lab

www.agilestrategylab.org

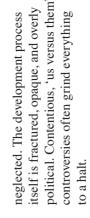
Ed Morrison Director edmorrison@purdue.edu

Scott Hutcheson Associate Director hutcheson@purdue.edu Liz Nelson Senior Program Director nilsen@purdue.edu

Planning for a bright future

🌃 You have to have big ideas... we are building regions for global competitiveness – not only for ourselves but for our kids and our grandkids – so we have to take that long term view. 👭

Purdue University, Regional Economic Development Advisor, Dr Ed Morrison



future that preserves the region's intimate balanced with shared, civic interests. Or the Sunshine Coast, we can envision a A second, alternative scenario comes connection with the environment, as well as the authentic character of the dynamism of the market economy is quality, civic' scenario, in which the to mind. We can call this the 'high

unique settlements within the region. We

Networks move us to new opportunities

experienced a prosperity has trajectory for together, we the majority of its history. this growth. By working Australia's

"Someone is sitting in the shade today, because someone planted a tree a long time ago."

- Warren Buffet

In the years ahead, the citizens of the Sunshine Coast will be confronting an escalating series of challenges. Keynote Speaker Dr Ed Morrison looks torward the Sunshine Coast of the future. narrowed to a single project on a slender development agendas in the years ahead. the first, private interests dominate the quality' scenario, and we have all seen disjointed, chaotic construction. Other to mind for the Sunshine Coast. Under When we fast-forward 20 years, there out along Florida's coastline. Private are two possible scenarios that come In America, this scenario has played dimensions of prosperity are largely We can call this the 'high-rise, lowplot, create a patchwork pattern of developers, each with their vision the consequences.

Image credit Sarah Pye

increasing returns

region, the better

the returns. Innovation

innovation in a

The more

between sectors.

collaboration

requires

 \equiv

smart investments in more efficient public activities, citizens both promote and value entrepreneurial companies thrive within can see a region that is not choked with traffic, because civic leaders have made transportation. It is a region in which beauty, preservation, and sustainable a unique backdrop of environmental development. With ample outdoor their health and wellness.

historic, coastal community has preserved its unique character, while becoming a In the States, places like Charleston, South Carolina come to mind. This internet-based companies. hotspot for fast growth,

Coast – The Natural Advantage: Regional 2033 provides a roadmap for the region's thinking differently, behaving differently no doubt that most citizens would prefer news is that the region's civic leadership high quality, civic development. Yet, the three times in the last 18 months, I have this second scenario. The challenge, of Economic Development Strategy 2013 question remains: How do we get there has already taken steps down this path of high quality civic development. The Having traveled to the Sunshine Coast regional strategy outlined in Sunshine course, involves implementation. How from here? The answer boils down to we do get there from here? The good and doing differently.

our universities in a new light. In regional Thinking differently starts with seeing provide both a payroll and demand for goods and services that power smaller role. They are a major employer. They economies, universities play a vital

they export education and import money ies. Yet, today, they businesses. With international students, this traditional view, universities are no to quantify these economic impacts. In universities have turned to economists into the region's economy. Routinely, different from factor are so much more.

role of our universities. These changes are . We have moved into economy has transformed and with it, the businesses are mature and in some cases an era in which brainpower, innovation sustainable economies in the future, we economies, these prosperity. While traditional industrial and extractive businesses continue to dying (manufacturing automobiles in Australia comes to mind). To build and networks generate sustainable Over the past 30 years, the global must abandon old thinking and profound and lasting power some regional look elsewhere.

footloose factories with a butterfly net full of incentives. Instead, they are turning to brainpower into wealth through networks their universities as engines of economic In the United States, smart communities means that any region with a significant However, the increasing dynamism and are unique to each region. Universities brainpower and the ability to turn that bring these assets together and power them forward. This lesson is not new: Silicon Valley learned it decades ago. of innovation and entrepreneurship connectivity of the global economy and regions are no longer chasing growth. In our global economy, university can prosper in the decades ahead.

Framework for col

me about the Sunshine

What has impressed

understands the role of collaboration to shape

Coast is that it

the SC in unique ways

its strengths. 11

and build off

Collaboration

between different exponentially.

sectors helps regions grow

laboration

earning power of our graduates. For each education improves earnings by hundreds we need to measure the economic impact of our universities differently. The major Changing our thinking also means that from their direct economic transactions graduate over a lifetime, a university benefit of our universities comes not but from the dramatically improved of thousands of dollars.

a prosperous region. We must also change industrial economy, development has been can slow down and even reverse a region's a highly compartmentalised process. This toward high quality, civic development of our pattern of behavior. In the traditional, progress. People behave to protect their organisational and political boundaries Changing our thinking is only the first fact leads to numerous 'turf wars' that step that will move us down the path

from encroachments. With accelerating change, they shy away from risk. Faced

with growing turbulence, they

shelter in place.

Dimensions of prosperity

- Strengthening education, Promoting health and
 - Creating supports for wellness
- Providing adequate businesses to thrive transportation and

reality because this region could not have

developed a concise, coherent regional

strategy without leaders skilled in

engagements and sustained collaboration. prosperous region involves sophisticated

I suspect that civic leaders across the Sunshine Coast understand this new

can isolate itself from these challenges.

Today, designing and guiding a

challenges alone and no community

organisation can tackle regional

increasingly dysfunctional. No single

These patterns of behavior are

Preserving the authentic character of the region

communication linkages

Maintaining sustainable linkages to nurture our natural environment boundaries respectfully.

development requires people willing and able to span organisational and political

Moving down the path of high quality

managing complex, open consultations.

assumes that a small group of people can do all the thinking and tell everyone else Building high-quality, prosperous region on the Sunshine Coast not only requires strategy: the doing. Traditional methods called strategic planning, are costly and that characterise a regional economy. A new patterns of thinking and behavior. We must also learn new approaches to the open, loosely connected networks process like strategic planning, which inflexible. They are not well suited to what to do, does not work well

designed specifically for open and agile complex collaborations quickly, moving of the Sunshine Coast to bring this new collaborations. We are now working on change. My work at Purdue University making adjustments as circumstances a new partnership with the University focuses on a new strategy process

them toward measurable outcomes, and We need a new approach to designing

Our approach focuses on the two central duscipline, (which we can Strategic Doing) to the region.

Our approach focuses on the two central questions of strategy: Where are we going? How will we get there? We answer these questions not once, but iteratively, as we learn by doing. With Strategic Doing, we quickly translate ideas into action to figure out what worksp.

We move forward with fast 'think – do' recycles that are typically only 30-days long. This process is simple, but not easy.

We move forward with fast 'think – do' recycles that are typically only 30-days long. This process is simple, but not easy.

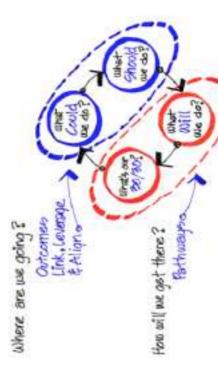
Ultimatedy the answers we struggle to the sophisticated, open, and adaptive collaborations that the 'high quality, civicide scenario demands.

Ultimately, the answers we struggle to find today are not for us. They are for future generations. Moving ideas into action will require expanded networks of actively engaged citizens committed to new ways of thinking, behaving and doing. Universities are in a unique position to design and support these networks. Along with teaching and research, it is our public responsibility.

We at Purdue stand ready to partner with the Sunshine Coast, as you move down the pathway to high quality development and sustainable prosperity.

you build momentum. 77 move towards. As more that are easy to start or people get engaged, Easy' - the big ideas Look for the 'Big

Simple, not easy questions



Strategic doing translates ideas into action using two important questions.

building trust and getting things done Doing more together

with measurable outcomes, returns to the Sunshine Coast and reflects on the mammoth task of leading 200 Ed Morrison, 'father' of Strategic Doing, a methodology that allows people to form collaborations quickly leaders through a Strategic Doing workshop.

Can the Sunshine Coast become the healthiest region on the planet by 2030? There's no doubt. The energy and commitment I saw during our Futures Conference demonstrated that. Over 200 people became fully engaged in figuring out both big outcomes and small next steps.

be the healthiest terrain in the world, but Sunshine Coast to the world's healthiest larger challenges. We will transform the mobilise a network of 30 people. That's attended the Futures Conference could We can develop the Sunshine Coast to only if we keep our emerging networks each month we need to take small and and develop — as our bonds of mutual trust build — we will take on larger and a network of 6,000 engaged citizens. focused and moving ahead steadily. to concentrate on 'doing the doable'; Let's assume that each person who steady steps. As our networks grow Within each collaboration, we need region in 15 years.

Still skeptical?

Try this little thought experiment.
Recall a moment in your life when you accomplished something very meaningful. Maybe it was reaching an educational milestone, a graduation day for yourself or your children. Or perhaps it was starting a new business or successfully completing a difficult

project or pulling off a complex event.
As you think back, you can undoubtedly remember some of the steps you took down the path. Your success did not magically appear. It took work, focus, and the continuous commitment to taking small steps.

As it is with each of us, so it is with regions. Success takes persistent effort.

I speak from experience. In 1993, a small group of us began the transformation of Oklahoma City. This old oil town had stagnated for a decade before we started our work. Today, Oklahoma City with a population of over 600,000 anchors a dynamic and vibrant metropolitan region. We started this transformation with six people. Now Oklahoma City is an internationally recognised hot spot.

Or take Charleston, South Carolina. In 2001, two of us developed the initial design of the Charleston Digital Corridor. Now Charleston stands out as a hotbed of technology companies. Oklahoma City and Charleston are now models that others follow. In both places, we used a dramatically new approach to regional transformation.

Instead of working for the perfect plan, we started with a set of informed guesses about what might work.

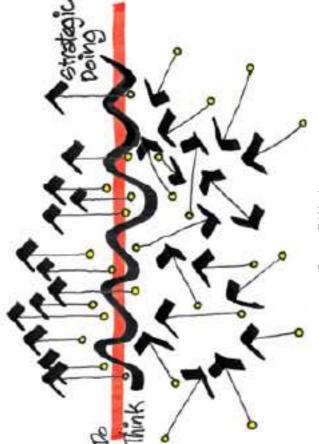


L Strategic Doing is fast, agile and relentlessly experimental. \[\]

Regional Economic Policy Advisor Ed Morrison Purdue University

ue Center for Regional Development | Agile Strategy Appendix C-5: P

Alignments emerge from thinking and doing together



Source: Ed Morrison

The Strategic Doing Credo

responsibility to build a We believe we have a

the idea and moved on to something

else. This strategy approach is designed specifically to build

made adjustments or abandoned

When our ideas faltered, we quickly

When we saw promising outcomes

from a collaboration, we put more

energy and resources behind it.

or place can build that future alone.

the type networks that characterise a

regional economy.

productive collaborations quickly in

open, loosely connected networks,

is the path to accomplishing among diverse participants valuable, shared outcomes. and caring collaboration Open, honest, focused

in talking — and in behavior in We believe in doing, not just alignment with our beliefs.

> methodical and linear, Strategic Doing is fast, agile and relentlessly experimental.

Whereas strategic planning is slow,

new discipline, called Strategic Doing,

is fundamentally different from the conventional approach to strategy.

approach and teach it to others. This

and regions for 20 years, I came to Purdue University to distill this new

After consulting with communities

Strategic Doing Design Team

sustainable future for ourselves No individual, organisation and future generations.

Turkey Run State Park, Indiana

> easy questions, each table generated Doing. By answering simple, but not experienced a few hours of Strategic In this 2015 Futures Conference, we

10 rules of Strategic Doing

Before you start:

Create and maintain a safe space for deep, focused conversation.

> remarkably diverse and sophisticated Yet they are all aligned. Each one will

move us toward a healthier region.

table discussions, the strategies are

everything they needed for a strategy

to build a new collaboration. When

you look at the results of these

Frame a conversation around an appreciative question.

Uncover hidden assets that might m Link and leverage your assets to create new opportunities.

What could we do?

workshops in 35 states within the United

States and five foreign countries. We

are developing a handful of deeper

Strategic Doing is expanding globally.

In the past four years, we conducted

help you answer your question.

work with the University of the Sunshine

Coast stands at the top of our list.

partnerships in order to do things. Our

4

What should we do?

civic leaders of the Sunshine Coast "do

things differently". We are betting that

for other regions throughout the world

the Sunshine Coast can be a model

on how to engage citizens to build a

prosperous region.

thinking. He said he wanted to see the

Scott, one of the students interviewed

onstage by Ted O'Brien during the

Futures Conference, captured my

Rank all your opportunities to find your 'Big Easy'. ம

an outcome with measurable characteristics (Where you Convert your Big Easy into are going). (

What will we do?

the Sunshine Coast will become a place

that others will follow.

I'm sure of it.

Just like Oklahoma City and Charleston,

Define at least one Pathfinder Project with guideposts (How you will get there). Draft a short-term action plan with everyone committed to taking a small step. ∞

What's our 30/30?

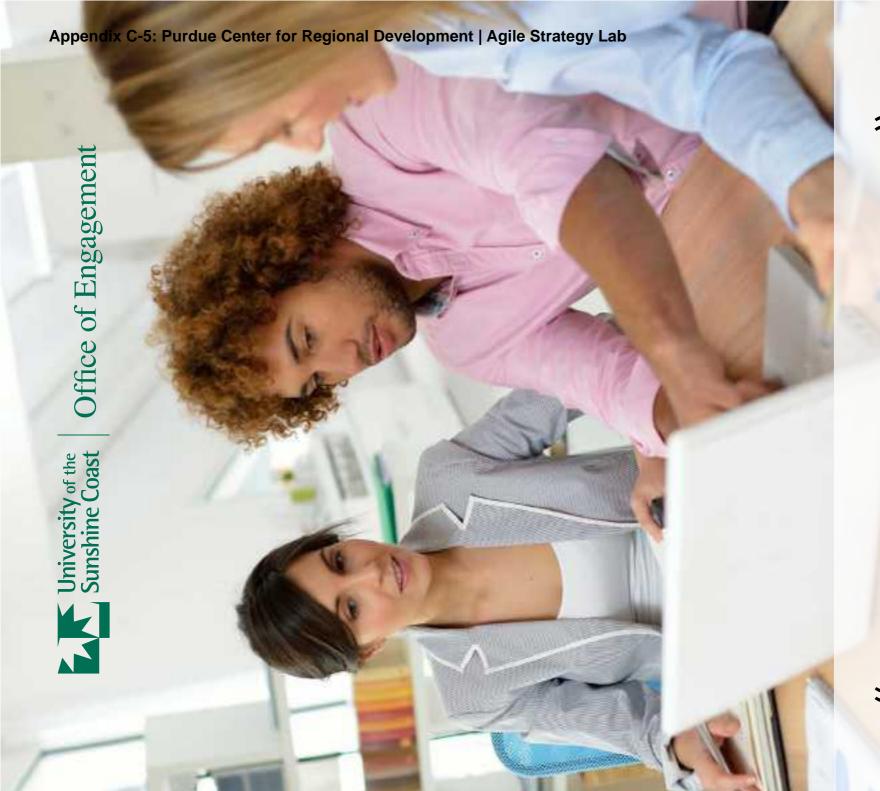
တ

Set a 30/30 meeting to review your progress and make adjustments.

Notch, connect and promote spread your new habits of relentlessly to build and collaboration. 2







66 Building and cultivating productive partnerships

Strategic Doing workshop

delegates with a new tool to their skills set. The *Strategic Doing* workshop achieved those two goals - a hands-Aside from gathering leaders to discuss the future of the region, the organisers aimed at empowering the on learning experience as well as providing a platform to collaborate on a real issue.

This article is written from the perspective of Ed Morrison who led the workshop.

Creating the healthiest region on the planet

The youth of the Sunshine Coast have posed a big question for us. "Imagine that the Sunshine Coast is worldfamous as the healthiest place on earth. What would that look like?"

This is a compelling and complex question. To answer it, we need tap into our collective ingenuity.

Strategic Doing helps us do that.

A strategic discipline incubated at Purdue University, this approach mobilises the strength of collaboration. It enables loose networks of people to design complex projects quickly. By guiding their conversations, people generate powerful new ideas. They then create an action plan to test their ideas and keep their collaboration on track.

Through its partnership with Purdue, the University of the Sunshine Coast is now introducing this discipline to Australia. We can use *Strategic Doing* to answer the big question that the next generation has posed for us. On November 27, we saw the power of simple rules at work. In a matter of hours, over 200 civic leaders began designing 15

collaborations, all designed to answer the big question that the next generation has posed to us.

As we move forward, we will continuously ask and answer these four simple (but not easy) questions.

What could we do?

Opportunities emerge when we connect our assets. By 'assets' we mean our gifts: our experience, our resources, our connections, our passions.

Strategic Doing begins with careful listening, so we can identify the assets in our network. We explore how we might "link and leverage" these assets in new and different ways. As we do, new opportunities emerge.



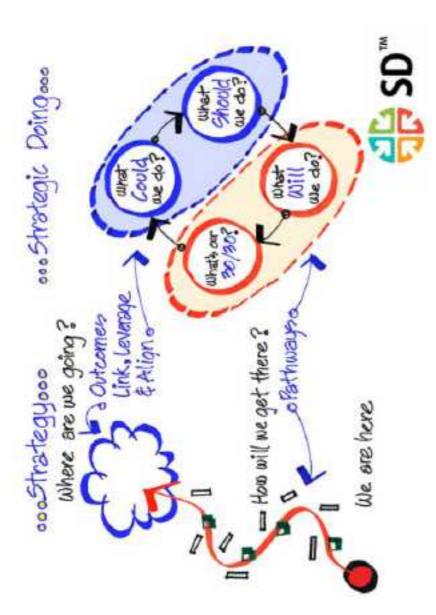
Imagine that the Sunsine Coast is world famous as the 'healthiest place on Earth.'

What would that look like?

Regional Economic Policy Advisor

Sunshine Coast assets

Lifestyle
Natural environment
Weather
Villages of close-knit communities
Distinct identity
Education opportunities
Wide spaces
Friendly people
Family oriented
Cafe culture



Source: Ed Morrison

What should we do?

We cannot pursue every opportunity. We need to start our collaborations by focusing on one. We call it our 'Big Easy'. It's a big opportunity that will be relatively easy to start.

Once we have identified our 'Big Easy', we convert it into a clear outcome with concrete characteristics. Clear, concise and descriptive words help us see where we are going in our mind's eye. By exploring and building upon each other's ideas, we can agree on what success looks like.

As the participants in the 2015 Futures Conference discovered, finding our 'Big Easy' takes only a few minutes if we follow a simple scoring system.

At the same time, if we're careful and write down all our other opportunities, nothing gets lost. If we find out that our 'Big Easy' opportunity is not so easy after all, we can quickly move to our next opportunity.

What will we do?

Translating ideas into action involves defining a Pathfinder Project with clear guideposts to mark our path forward. We need to figure out how we can get 'there' from 'here'. Thinking through a logical sequence of steps helps us agree on what we need to be doing to move together.

At the same time, each of us needs to make a small commitment to move our words into action. In networks, execution is a shared responsibility. We have all seen what happens when we start to move together. If we each take small steps, collectively we take a big step.

What's our 30/30?

Answering our questions is an ongoing challenge. It is a continuous process of 'learning by doing'. Only by committing to this continuous learning and adjustment can we figure out what works. As we collectively learn by doing, we build our collective

intelligence. We also make another important contribution to each other: we build trusted connections. *Strategic Doing* works because it is both simple and fun. At the same time, *Strategic Doing* is a discipline. It takes practice to master. The more people that work together to improve their skills of collaboration, the faster the region will move to seize its opportunities to build a healthy region.

Over the long run, regions that are capable of building more trusted relationships will be more prosperous. They will spot their opportunities faster. They will moving into action faster. They will learn faster and be more resilient.

No one organisation, no one initiative will lead us to the healthiest region on the planet by 2030. Instead, meeting this challenge for the next generation of our children and grandchildren is a collective responsibility and a high calling. We will all have the opportunity to contribute.

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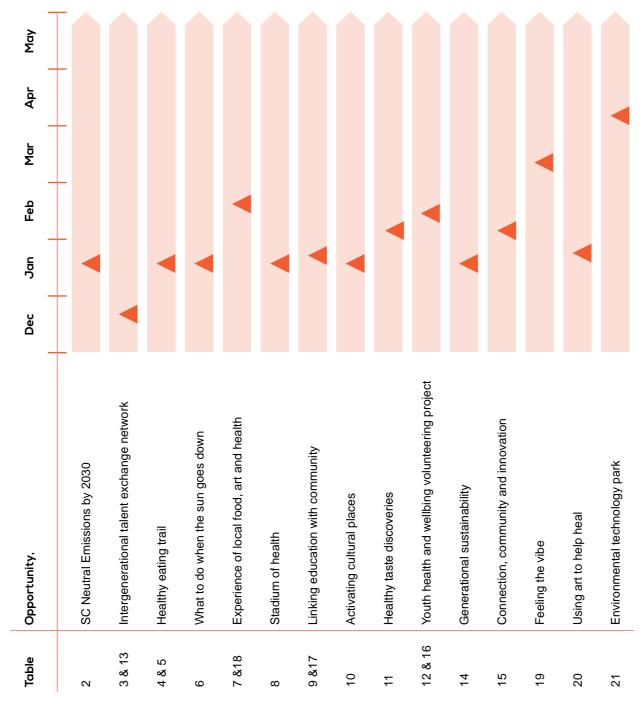
Workshops outcomes

Led by a trained table guide (named below), each group followed the Strategic Doing format to identify one feasible 'Big Easy' project based on their combined skills and assets.



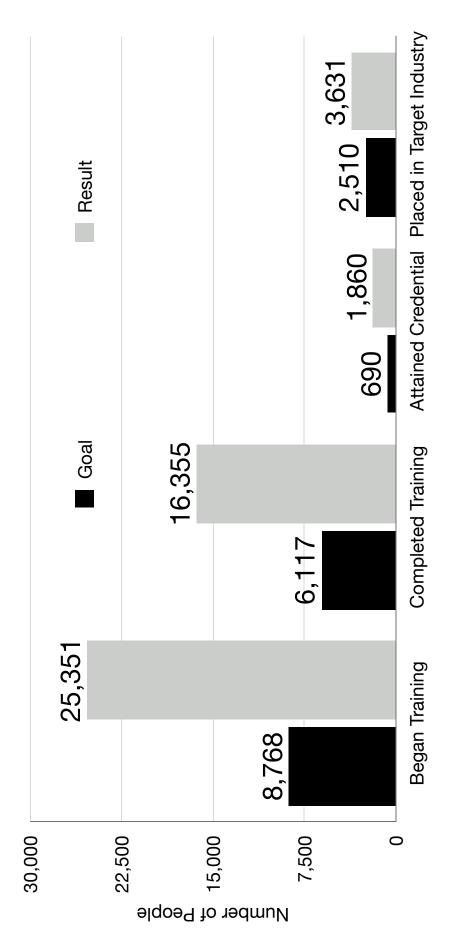
Commitment to change

It became evident that some tables' 'Big Easy' opportunities were very similar. Groups were given the chance to merge before committing to one hour action each towards their project. Teams then identified a time they will reunite to move forward.



ask the team in our next gathering, "What have we each done in the past 30 days and what do The 30/30 (or 7/7; 60/60 depending on urgency and need) is the learning by doing cycle. We we plan to do in the next 30 days?" 3

Sunshine Coast Futures Conference 2015



Source: Purdue University: Workforce Innovation in Regional Economic Development Grant, 2008

WIRED Outcomes For Education/Training Goals

North Central Indiana	Began Workf	Began Workforce Training Completed Workforce Training		Attained Degree/Certificate		Placed in Target Industry		
	Projected End of Grant <mark>Goal</mark>	Cumulative Grant to Date Result	Projected End of Grant Goal	Cumulative Grant to Date Result	Projected End of Grant Goal	Cumulative Grant to Date Result	Projected End of Grant Goal	Cumulative Grant to Date Result
Q2 (June 30) 2008	8,768	5,398	6,117	4,815	690	340	2,510	1,825
Q3 (September 30) 2008	8,768	6,056	6,117	5,499	690	436	2,510	1,836
Q4 (December 31) 2008	8,768	13,641	6,117	6,594	690	1,044	2,510	3,130
Q1 (March 31) 2009	8,768	15,118	6,117	7,600	690	1,198	2,510	3,165
Q2 (June 30) 2009	8,768	15,042	6,117	13,519	690	1,262	2,510	3,165
Q3 (September 30) 2009	8,768	22,133	6,117	14,037	690	1,525	2,510	3,230
Q4 (December 31) 2009	8,768	24,333	6,117	16,325	690	1,709	2,510	3,230
Q1 (March 31) 2010	8,768	25,351	6,117	16,355	690	1,860	2,510	3,631

Note: RESULTS determined by totaling entries in worksheets enclosed as shown below:
all 'b' entries in Column F: Are included in Began Workforce Training
all 'c' entries in Column H: Are included in Completed Workforce Training
all 'd' entries in Column H: Are included in Attained Degree/Certificate
all 'p' entries in Column I: Are included in Placed in Target Industry

Worksheet Calculation through 4.15.10 (FINAL)								
	Goal Began Training Goal Completed Training Goal Degree/Certificate Goal Placed							
Business Innovation		1851		1343		1129		0
Civic Leadership		75		75		0		0
Entrepreneurship		2384		2353		216		0
Talent		21041		12584		515		3631
TOTALS	8768	25351	6117	16355	690	1860	2510	3631

Worksheet Calculation for Q4,2009:								
Goal Began Training Goal Completed Training Goal Degree/Certificate Goal Placed								
Business Innovation		1749		1268		1054		0
Civic Leadership (no totals)		75		75		0		0
Entrepreneurship		2303		2222		216		0
Talent		20206		12760		439		3230
TOTALS	8768	24333	6117	16325	690	1709	2510	3230

Worksheet Calculation for Q3,2009:								
Goal Began Training Goal Completed Training Goal Degree/Certificate Goal Placed								Placed
Business Innovation		1749		1268		1054		0
Civic Leadership (no totals)		75		75		0		0
Entrepreneurship		2272		2189		191		0
Talent		18037		10505		280		3230
TOTALS	8768	22133	6117	14037	690	1525	2510	3230

Worksheet Calculation for Q2,2009:								
	Goal Began Training Goal Completed Training Goal Degree/Certificate Goal Placed							
Business Innovation		1284		1085		849		0
Civic Leadership (no totals)		75		75		0		0
Entrepreneurship		2058		1955		142		0
Talent		11625		10404		271		3165
TOTALS	8768	15042	6117	13519	690	1262	2510	3165

Worksheet Calculation for Q1,2009:								
	Goal	Began Training	Goal	Completed Training	Goal	Degree/Certificate	Goal	Placed
Business Innovation		1227		1040		802		0
Civic Leadership (no totals)		68		68		0		0
Entrepreneurship		1942		1695		142		0
Talent		11881		4797		254		3165
TOTALS	8768	15118	6117	7600	690	1198	2510	3165

Worksheet Calculation for Q4, 2008:								
	Goal	Began Training	Goal	Completed Training	Goal	Degree/Certificate	Goal	Placed
Business Innovation		1220		1015		777		0
Civic Leadership (no totals)		0		0		0		0
Entrepreneurship		1812		1648		142		0
Talent		10609		3931		125		3130
TOTALS	8768	13641	6117	6594	690	1044	2510	3130

ENTREPRENEURIAL HIGH PERFORMANCE PRODUCTION IN NORTH CENTRAL INDIANA

IMPLEMENTATION PLAN

NORTH CENTRAL INDIANA WIRED

VERSION 2.0

JUNE, 2007

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Indiana WIRED Implementation Plan

Executive Summary

This Implementation Plan outlines how North Central Indiana will integrate education, workforce, economic development to support innovation and "high performance production". This important concept underscores that the economic future of North Central Indiana will be driven by our ability to produce high value products.

Our approach

We will be aligning our resources through networks that we will intentionally design, map and strengthen.

Our regional opportunity

Through connecting our resources in new and different ways, we will generate higher rates of income growth. We will bring successful innovations to regional scale by expanding our civic networks.

Our focus

We are focusing on the following dimensions of high performance production.

- Strengthening entrepreneurship networks
- Developing entrepreneurial high performance clusters
- Strengthening 21st century skills with new talent networks
- Building civic collaborations to translate ideas into action quickly
- Investing in promising civic entrepreneurs and innovations

Governance

We will be adopting a model of "loose hierarchy" to guide these initiatives. A Core Team of partners will be responsible for design and implementation. We will guide in-

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dividual initiatives through "initiative charters". A Policy Team will hold the Core Team to account and remove obstacles to stronger alignments within the region.

Budget allocations

The following table outlines our budget allocations (in \$ millions).

Strategic Activities	Current 3 Year Budget Allocation (\$MILLIONS)	Percent
OPERATIONS	1.45	9.7%
INDUSTRY CLUSTERS	2.00	13.3%
ENTREPRENEURSHIP NETWORKS	3.50	23.3%
21ST CENTURY TALENT	2.00	13.3%
CIVIC NETWORKS	0.45	3.0%
OPPORTUNITY FUND	5.00	33.3%
SUB TOTAL: REGIONAL OPERATIONS	14.40	96.0%
STATE DWD	0.60	4.0%
TOTAL	15.00	100.0%

Overview of Strategic Initiatives

(1) Strategic Activity: Strengthen entrepreneurship networks

Initiative 1.1: Educate Future Entrepreneurs

- 1.1.1: Entrepreneurship Youth Institute
- 1.1.2: STEM focused Entrepreneurship Summer Camp

Initiative 1.2: Support Emerging Entrepreneurs

- 1.2.1: Regional Business Plan Competition
- 1.2.2: Entrepreneurship Business Information Network (eBIN)

Initiative 1.3: Equip Businesses to Act as Entrepreneurs

• 1.3.1: Eureka Winning Ways

Initiative 1.4: Strengthen Entrepreneurship Support Networks

- 1.4.1: Regional Angel Investor Network
- 1.4.2: Wealth Transfer/ Community Development Venture Capital Fund

Initiative 1.5 Promote Entrepreneur-Friendly Communities

- 1.5.1: Energizing Entrepreneurs
- 1.5.2: Entrepreneurship and Innovation Compact
- (2) Strategic Activity: Develop high performance clusters

Initiative 2.1: Accelerate Innovations in Advanced Manufacturing

- 2.1.1: Health Care Cost Control
- 2.1.2: Energy Efficiency

Initiative 2.2: Accelerate Innovations in Advanced Materials

• 2.2.1: Nano-structured Coatings

Initiative 2.3: Accelerate Innovations in Agribusiness

• 2.3.1: Supply chain innovations

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- (3) Strategic Activity: Create new talent networks
- **Initiative 3.1: Promote Skill Development in Older Workers**
 - 3.1.1: Maturity Matters
 - 3.1.2: Lifelong Learning Institute
- **Initiative 3.2: Develop K-12 STEM Skills**
 - 3.2.1: New Tech High
 - 3.2.2: Project Lead the Way
- **Initiative 3.3: Provide Value Added Services to Business**
 - 3.3.1: REACH Business Centers
 - 3.3.2: REACH Business Advisors
- **Initiative 3.3: Promote Skill Standards and Internships**
 - 3.3.1: Manufacturing Sill Standards Council
 - 3.3.2: Indiana InternNet
- (4) Strategic Activity: Build civic networks
- Initiative 4.1: Build a regional network of civic entrepreneurs
 - 4.1.1: Conduct regional forums
 - 4.1.2: Establish renewable energy network
 - 4.1.3: Create regional leadership learning network
- Initiative 4.2: Launch region wide communications plan
- **Initiative 4.3: Develop Regional Scorecard**
- (5) Strategic Activity: Seed innovative collaborations and build sustainability
- Initiative 5.1: Launch and operate an Opportunity Fund

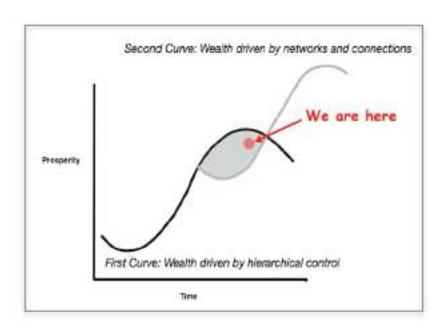
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Our Regional Opportunity

Indiana's economic transformation

Like other states in the Midwest, Indiana is undergoing a major economic transformation. In the past, we created wealth through large, hierarchical organizations. These First Curve industrial businesses generated enormous wealth by moving large volumes of products: coal, steel, automobiles.

Beginning in the 1980s, the accelerating integration of global markets placed these businesses under increasing pressure. Lower-cost locations provided high-volume products, which displaced US manufacturers. Large U.S companies began shifting production to these lower cost locations in a continuous search for competitive advantage.



The advent of the personal computer and the rapid growth of the Internet in the 1990s accelerated pressure on traditional First Curve businesses. At the same time, the exploding power of information technology created opportunities for new business models based on collaboration and networks. These Second Curve businesses create wealth by "linking and leveraging" assets across organizations.

Indiana's economic transformation is not a transition from manufacturing to services.

Rather, we are innovating toward high-performance production on the Second Curve.

Competitive Indiana businesses are "linking and leveraging" their assets to achieve competitive advantage. They are innovating aggressively with partners outside the four

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walls of their business to generate high levels of value added per worker. These businesses combine a commitment to innovation with continuous improvement in high-performance workplaces.

State and federal economic development and workforce development programs have been designed around First Curve businesses. Our WIRED initiative is redesigning these systems to support high-performance production on the Second Curve.

Our approach to regional transformation

Our WIRED region will generate higher rates of income growth by linking and leveraging our assets to accelerate innovation in key areas:

- Industry clusters;
- Entrepreneurship;
- Talent networks developing 21st century skills; and
- Civic leadership and regional governance.

To accomplish our purpose, we will need civic networks that will enable us to leverage our assets across our region. So, for example, new networks of angel investors will be able to link quickly to promising entrepreneurs coming out of our colleges and universities. Our community colleges will be able to provide "just-in-time" training, so businesses will not miss emerging market opportunities. We will enable older workers to assess and upgrade their skills easily, so that businesses can quickly leverage the talent of these older workers.

Civic networks are important, because economic development and workforce development takes place in a "civic space". This space exists outside the four walls of any one organization. Within the civic space, no single organization rules. Nobody can tell anyone what to do. Instead, we need to create fast alignments within the civic space in order to take advantage of the business opportunities in front of us.

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Thick civic networks accelerate our learning and generate speed. Fast learning promotes innovation and improvements in productivity: We can do more with less. Improved productivity pushes up our incomes.

Building these business, entrepreneurship, talent and civic networks is an emergent process. We will create and strengthen these networks through collaborative activities and dialogue. A portion of our WIRED funding is set aside in an Opportunity Fund to invest in these emergent opportunities.

Integrating education, workforce and economic development

On the Second Curve, formal distinctions blur among old categories of education, workforce development, economic development and community development. In a networked world, everything is connected to everything else. The challenge of civic leadership comes down to focus and alignment.

We need focused networks in three key areas areas. First, we need to build a a work-force with 21st century skills. In a global economy in which low-cost labor can be purchased for pennies a day and capital can circle the globe in seconds, the only truly unique asset we have left is our talent. Next, we need to convert our talent into wealth through dynamic business and entrepreneurship networks. Entrepreneurs and innovative businesses need access to resources. Through our networks, we can identify these resources and deliver them quickly.

Third, Second Curve economic development demands new civic leadership skills. We need to strengthen our civic networks through both open participation and leadership direction. To be sustainable, leadership needs to be collaborative and dispersed, rather than directed by a single person. Collaborative leadership means working with others to decide what to do and how. Effective civic leaders provide inspiration and encouragement, create opportunities for joint action, and encourage others to become leaders in their own right. Their strength derives from an ability to work with others to develop shared outcomes, initiatives, and action.

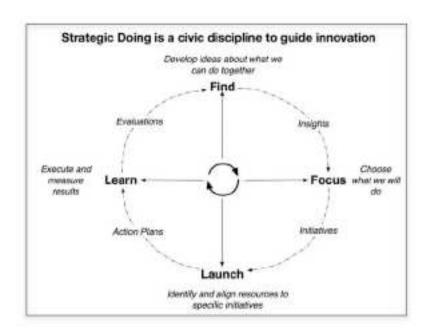
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Strengthening innovation with "strategic doing"

Strategy involves answering two questions: Where do we want to go? How will we get there? Formal strategic planning approaches will not work well in aligning our civic networks in education, workforce and economic development. Instead, we need to

adapt to a far more flexible approach to making strategic decisions. We call this new approach "strategic doing."

This approach focuses on identifying strategic opportunities and translating ideas into action quickly. "Strategic Doing" is a civic discipline that represents the ability to explore opportuni-



ties, pick opportunities that are truly transformative, launch practical initiatives, and learn what works. Too often, we miss opportunities as we are mired in endless meetings, delays, or bickering. Strategic doing builds our capacity to act quickly in the civic space. These civic networks strengthen, as more people are drawn into our networks with information and learning that is more widely shared.

Strengthening connections and alignments

Integrating education, economic development and workforce development through civic networks requires continuous alignment. We will maintain alignments among our civic networks through a disciplined, continuous process of examining our goals and metrics. When automobile is out of alignment, the vehicle slows down and begins to wobble. In much the same way, a regional economy out of alignment slows down: innovation and productivity improvements are harder to implement. For example, when

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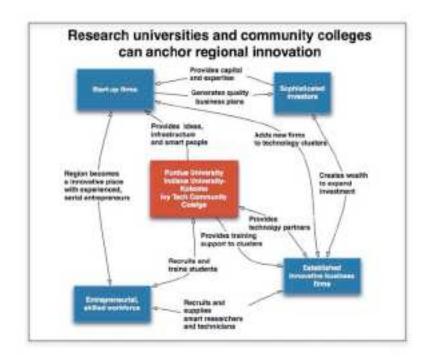
the local community college is not aligned with the needs of local manufacturers, highperformance growth become more difficult to achieve.

Achieving alignment requires continuous "strategic doing". This process involves refinement of outcomes and performance metrics. Shared outcomes and metrics enable conversations to span organizational boundaries. People begin to focus on what the region needs, as opposed to protecting their organizational turf. Metrics also enable civic leaders to understand how to make improvements and allocate scarce resources. In this new world of networks, effective strategies "connect and develop" different organizations to accomplish common objectives.

Leveraging our research university

Research universities can play an important role in driving a regional economy. The range of influence extends far beyond the commercialization of intellectual property. With extended connections from the campus to businesses, a research university can provide people and technologies to propel innovation in a number of different ways.

Indiana WIRED is engaging in a number of initiatives to extend the connections of Purdue into the



regional economy. (In much the same way, Indiana WIRED promotes extended engagement of Indiana University-Kokomo and Ivy Tech Community College. However, because Purdue's asset base is so much larger than these other institutions, the impact from Purdue on the region will likely be proportionately greater.)

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Measuring accountability and learning

As we evolve our implementation plan, we will be developing regional benchmarks to guide our efforts. The purpose of these benchmarks will be to define the different dimensions of our activity and to define the critical dimensions of an entrepreneurial, innovative region. We are using metrics both to establish aggressive goals and accountability for Indiana WIRED investments. We are also using our metrics to learn "what works".

We will be looking for four types of outcomes:

- 1. **Tangible outcomes for each initiative.--** Each initiative funded under Indiana WIRED focuses on quantifiable outcomes. So, for example, we target the number of students who will participate in an entrepreneurial summer camp. Or, we set the goal of establishing Project Lead the Way in every high school and middle school in the region.
- 2. Tangible outcomes for the WIRED initiative.-- We have four areas of strategic focus: entrepreneurship networks; business clusters; talent networks; and civic networks. In each area of strategic focus, we have a set of metrics we are tracking. For example, across all four areas, we are tracking the number of people who receive various different types of training under Indiana WIRED.
- Stronger civic networks within the region. An underlying purpose of strengthening the civic networks across the region. We are measuring these networks in a variety of ways.
- 4. **Spin-offs.--** We expect to have one or more spin-off organizations, including new business starts, that will operate independently after Indiana WIRED funding is completed. These spin-offs will sustain some of the innovations that Indiana WIRED starts.

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Strategy: Purpose, Outcome, Activities and Initiatives

Our strategic purpose

We will use networks to align and leverage our resources to support entrepreneurial high performance production. We will create new opportunities to generate wealth by connecting high performance people, businesses, and organizations.

High performance production leverages our traditional strengths in manufacturing. The popular business press has mischaracterized the economic transformation taking place in our region and across the country. The transition is not away from manufacturing to services. Rather, it is a transition in business models: the disciplined processes by which businesses create wealth.

High performance businesses use networked business models to accelerate learning and adapt quickly to changing circumstances. They connect with customers, suppliers, and other companies to deliver high value, high quality products and services with faster cycle times. We can see the differences in old and new business models by looking at the evolution of the auto industry in Indiana in the past two or three years. General Motors, an auto company with a more traditional hierarchical business model, has been losing market share and closing plants. Honda, a company operating with a more networked business model, has been gaining share and expanding production capacity.

Increasingly, companies are looking to "open innovation" with partners as a strategy to develop new products more quickly. For example, Proctor and Gamble has abandoned its traditional closed innovation model in which products emerged from inside the company through tightly controlled intellectual property. The company has launched "connect and develop" a strategy that embraces "open innovation" in which intellectual property is more widely shared.

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High performance production generates higher value added per employee -- more productivity -- through networked business models. These business models are, however, demanding to operate. They require:

- An entrepreneurial, skilled workforce well-grounded in the STEM disciplines;
- Close collaboration with complimentary companies and organizations operating in networks that share information (clusters);
- Business development networks willing to fund entrepreneurial ventures both inside existing companies and as start-ups.

Indiana WIRED is moving toward high performance production by funding a number of connected strategies. These strategies include:

- 1. Strengthening entrepreneurial education and networks;
- 2. Building industry clusters in advanced materials, manufacturing and agribusiness;
- 3. Developing a stronger commitment to STEM education and the development of 21st century skills; and
- 4. Creating more supportive civic networks of leaders who understand that preoccupations with organizational and political boundaries can dramatically undercut entrepreneurship and innovation.

We will be successful in achieving our purpose if we see improvements in the following regional characteristics:

- Our region's civic leaders recognize that building a globally competitive region is a shared responsibility that transcends organizational, political and geographic boundaries -- no one organization controls our solutions;
- We see more collaborations in our region that "link and leverage" our assets across organizational, political and geographic boundaries;

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- We are focused on a relentless effort to build collaborations that improve the talent of all residents in our region from early childhood education to older workers over 45 years old...from GED to PhD;
- We create dynamic networks to train, support, mentor and invest in entrepreneurs of all ages;
- We create active, dense networks of researchers, students, investors, entrepreneurs and innovative companies committed to high performance production.

Our strategic outcome

We will generate rates of income growth within our region that are consistently above state averages.

We are building a region of civic networks committed to entrepreneurial high performance production that will have the following characteristics:

- A region with a deepening pool of world class talent characterized by:
 - Increasing levels of performance in science, technology, engineering and mathematics (STEM education);
 - Increasing innovation in middle and high schools with expanded projectbased learning, stronger career guidance and more collaborations between schools and businesses;
 - Increasing commitment of high school graduates to post secondary education;
 - Increasing participation of older workers in post-secondary training to provide new opportunities for older workers to restart their careers, and assisting companies with new strategies to employ these workers.
- A region with thick networks to train, support, mentor and invest in entrepreneurs characterized by:

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- Increasing numbers of high school students receiving entrepreneurship training in every high school in the region;
- Investor networks committing increasing levels of early stage funding to promising companies;
- An increasing number of high quality, mentor reviewed business plans and new business start-ups.
- A fast and flexible networks to link entrepreneurs quickly to the resources they need;
- A region skilled at forming, guiding and focusing clusters of businesses characterized by
 - Increasing rates of new product and service introductions among companies in the region;
 - Expanded employment among "traded businesses" in the region; and
 - Expanded collaborations between innovative firms and colleges and universities in the region.

Our strategic activities

- Strengthen entrepreneurship networks.-- We will strengthen entrepreneurship
 education and support networks to accelerate innovation and high performance
 production among start-up and existing businesses.
- Develop entrepreneurial high performance clusters.-- We will develop collaborative clusters of companies committed to accelerating innovation and high performance production.
- Strengthen 21st century skills with new talent networks.-- Among other steps, we will leverage the talent of older workers to support innovation and high performance production.

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- Build civic collaborations to translate ideas into action quickly.--We will launch and guide a new discipline of "strategic doing" to develop our civic networks.
- Invest in promising civic entrepreneurs and innovations.-- We will accelerate innovation by integrating workforce, economic development and educational resources to support high performance production activities. These collaborations will focus on creating the type of value that will lead to long term sustainability.

All of these strategic activities will require us to map -- and maintain maps -- of the assets networks within our region and the resources flowing into our region from the state and federal governments. We will also engage in a continuous process of interactive Internet interviews to gather insights into how perceptions of collaboration are changing in the region.

OUR STRATEGIC INITIATIVES

(1) Strategic Activity: Strengthen entrepreneurship networks

- Our strategic purpose in engaging in this activity: Accelerate the rate of new business formation in the region.
- Our strategic outcome from this activity: Increase the number of trained, connected entrepreneurs and the number of business starts in the region.
- Initiative 1.1: Educate Future Entrepreneurs

Key performance metrics: Number of students participating in the program. Number of business plans produced. Participant evaluations.

- Initiative 1.1.1: Create an Entrepreneurship Youth Institute
- SMART Goal: Establish an entrepreneurship program in all 49 high schools in the region.

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- Initiative 1.1.2: Establish STEM Focused Summer Camp
- SMART Goal: Conduct a camp with at least 60 participants from throughout the region.

Initiative 1.2: Support Emerging Entrepreneurs

Key metrics: Number of participating in the program. Number of business plans produced. Participant evaluations.

- 1.2.1: Regional Business Plan Competition
- ▶ SMART Goal: Create a region-wide business plan competition by 1Q 2008.
- 1.2.2: Entrepreneurship Business Information Network (eBIN)
- ▶ SMART Goal: Create a region-wide network of information centers with nodes in all 14 counties. Use a series of business plan competitions to catalyze the network.
- Initiative 1.3: Equip Businesses to Act as Entrepreneurs
 - Key metric: Number of small to mid-sized companies engaging in new product and process development through Indiana WIRED networks
 - 1.3.1: Eureka Winning Ways
 - ▶ SMART Goal: Establish a region-wide initiative by December 2007
- Initiative 1.4: Strengthen Entrepreneurship Support Networks
 - Key metric: Volume of early stage capital; number of business plans developed
 - Regional Angel Investor Network
 - SMART Goal: Establish a region-wide initiative by December 2007
 - Wealth Transfer/ Community Development Venture Capital Fund
 - ▶ SMART Goal: Develop a business plan for a fund by December 2007

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Initiative 1.5 Promote Entrepreneur-Friendly Communities

- Key metric: Number of communities with a commitment to entrepreneurship. Number of LEDOs agreeing to terms of the Compact; the percentage of the total population base covered by the Compact.
 - 1.5.1: Energizing Entrepreneurs
 - SMART Goal: Launch EE initiative by December 2007
 - 1.5.2: Entrepreneurship and Innovation Compact
 - SMART Goal: Create compact with all LEDOs as signatories by December 2007

(2) Strategic Activity: Develop high performance clusters

- Our strategic purpose in engaging in this activity: Accelerate the rate of innovation among high performance companies in the region.
- Our strategic outcome from this activity: Improve the performance in traded clusters in the region by gearing training directly to the needs of companies in targeted clusters. Help these companies innovate faster become more productive. Increase the investment in innovative, high performance processes and products, defined as products and processes introduced into the market within the past three years. We will define high performance production in terms of revenues per employee or value added per employee.

Initiative 2.1: Accelerate Innovations in Advanced Manufacturing

- Key metric: Number of small and mid-sized manufacturing firms engaged in Indiana WIRED initiatives. User evaluations based on TAP model.
 - 2.1.1: Health Care Cost Control
 - ▶ SMART Goal:
 - 2.1.2: Energy Efficiency
 - ▶ SMART Goal:

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Initiative 2.2: Accelerate Innovations in Advanced Materials

- Key metric: Key metric: Number of small and mid-sized manufacturing firms engaged in this Indiana WIRED initiative. User evaluations based on TAP model.
 - 2.2.1: Nano-structured Coatings
 - SMART Goal: Launch initiative by December 2007.

Initiative 2.3: Accelerate Innovations in Agribusiness

- Key metric: Number of small and mid-sized agribusiness firms engaged in this Indiana WIRED initiative. User evaluations based on TAP model.
 - 2.3.1: Supply chain innovations
 - ▶ SMART Goal: Complete baseline analysis by December 2007.

(3) Strategic Activity: Create new talent networks

- Our strategic purpose in engaging in this activity: Enable companies in the region to increase their productivity by building and leveraging the talent of people in our region.
- Our strategic outcome from this activity: Increase the earnings potential of workers in the region.
- Initiative 3.1: Promote Skill Development in Older Workers
 - Key metric: Number of older workers participating in these intiatives. Number of companies participating in these initiatives.
 - 3.1.1: Maturity Matters
 - SMART Goal: Complete business plan by September 2007.
 - 3.1.2: Lifelong Learning Institute
 - SMART Goal: Launch the institute by January 2008.

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Initiative 3.2: Develop K-12 STEM Skills

- Key metric: Number of students, middle schools and high schools participating in these initiatives.
 - 3.2.1: New Tech High
 - SMART Goal: Conduct successful launch of training program by December 2007.
 - 3.2.2: Project Lead the Way
 - ▶ SMART Goal: Extend PLTW to all middle schools and high schools in the region by December 2008.

Initiative 3.3: Provide Value Added Services to Business

- Key metric: Number of businesses seeking value added services through a growing REACH business network.
 - 3.3.1: REACH Business Centers
 - ▶ SMART Goal: Launch second REACH business center by 2Q 2008.
 - 3.3.2: REACH Business Advisors and Executive Pulse
 - SMART Goal: Establish metrics for regional calls completed by business advisors.

• Initiative 3.3: Promote Skill Standards and Internships

- Key metric: Number of participants in these initiatives.
 - 3.3.1: Manufacturing Skill Standards Council
 - ▶ SMART Goal: Engage 20% of the manufacturers in each county to adopt the skills standards framework by December 2008.
 - 3.3.2: Promote Indiana Intern NET
 - ▶ SMART Goal: Engage companies from every county in the region in the Intern NET initiative to place both college and high school interns.

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(4) Strategic Activity: Build civic networks

- Our strategic purpose in engaging in this activity: Develop self-sustaining civic networks to facilitate the integration of workforce, economic development and education resources in the region.
- Our strategic outcome from this activity: Stronger civic networks as measured by social network analytics.
- Initiative 4.1: Build a regional network of civic entrepreneurs committed to innovating with collaborations in education, workforce development and economic development.
 - ▶ Key metric: Size and density of civic networks.
 - 4.1.1: Conduct regional forums
 - SMART Goal: Conduct regular quarterly forums through the WIRED process with expanding numbers of participants.
 - 4.1.2: Establish a renewable energy network
 - ▶ SMART Goal: Use BioTown as an anchor investment to establish a regional network of civic entrepreneurs interested in renewable energy.
 - 4.1.3: Create a Regional Leadership Initiative
 - SMART Goal: Establish a process for regional leaders to learn about new approaches approaches to civic leadership and what leading regions are doing.
- Initiative 4.2: Launch a creative, long term communications program that provides visibility about the region's strengths and opportunities
 - ▶ Key metric: Density of civic networks within and across counties.
 - SMART Goal: Engaged civic networks of at least 200 civic leaders working on the various dimensions of regional transformation: talent, innovation, infrastructure, branding and collaboration by December 2008.

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Initiative 4.3: Develop Regional Scorecard

- Key metric: Awareness of regional competitive position measured by newspaper, radio and other placements.
 - SMART Goal: Completed regional scorecard for regions and the 14 counties by September 2007.

(5) Strategic Activity: Seed innovative collaborations and build sustainability

- Our strategic purpose in engaging in this activity: Respond quickly to promising initiatives that further the purpose of accelerating the integration of workforce, economic development and education resources in support of high performance production
- Our strategic outcome from this activity: Increase the amount of private and public sector investment in collaborative initiatives designed to support high performance production
- Initiative 5.1: Create and operate an "Opportunity Fund" to leverage public and private sector investment in initiatives that align with our Strategic Purpose.

Note: We discuss the operation of the Opportunity Fund below.

- Key metric: Volume of funds leveraged by the Opportunity Fund.
 - SMART Goal: Create a plan to sustain the Opportunity Fund by December 2007.

Governance

The WIRED initiative in North Central Indiana will be guided by a Core Team reporting to a Policy Advisory Team. The Core Team represents the key partners who must come together to innovate: move ideas to action. The Policy Advisory Team represents the in-

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dividuals who can, working together, shape the policy environment to make the Core Team's innovations move more quickly into the market.

Because we are promoting the importance of civic networks, we are organizing the WIRED initiative to follow a model of "loose hierarchy". Loose hierarchies share these characteristics:

- Dense communications;
- Relative lack of centralized control;
- Membership in the networks are flexible and "task driven".

The Core Team

The Project Manager will guide the Core Team.

The Core Team will meet monthly to hear reports from the five initiative teams. These monthly meetings will facilitate information flows across organizational and political boundaries. Members of the Core Team include:

- Scott Hutcheson, Purdue University
- Mark Smith, Purdue University, Project Manager
- Fred Hakes, Indiana University, Kokomo
- Cinda Kelley, Lafayette / West Lafayette Development Corporation
- Jason Hester, City of Kokomo
- Greg Aaron, Kokomo Howard County Development Corporation
- Roger Feldhaus, Tecumseh Area Partnership
- Jan Bailey, Ivy Tech Community College Kokomo

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¹ For more on loose hierarchies, see Thomas Malone, The Future of Work, (Harvard Business School Press, 2004).

Craig Lamb, Ivy Tech Community College - Lafayette

The Policy Advisory Team

The Policy Advisory Team will serve as a "board of directors" for the Core Team. Meeting quarterly. the Policy Advisory Team will guide the Core Team and align resources needed to make the Core Team more effective. The members of the Policy Team include:

- David Bathe, Ivy Tech Community College Lafayette
- Steve Daily, Ivy Tech Community College Kokomo
- Tom Easterday, Subaru Indiana Automotive, Inc.
- Roger Feldhaus Tecumseh Area Partnership
- Nate Feldman, Indiana Economic Development Corporation
- Jeffrey Kellam, Kellam, Inc.
- Vic Lechtenberg, Purdue University
- Gary Lehman, Fairfield Manufacturing, Inc
- Paul Mitchell, Office of the Governor
- Terry Munson, Foresight, Inc.
- Jean Neel, Haynes International, Inc.
- Ruth Person, Indiana University Kokomo
- Kyle Salyers, Indiana University
- Andrew Penca, Indiana Department of Workforce Development
- Bob White, USDA Rural Development Indiana Office

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Communications

We will be continuing to develop our communications and branding campaign around three key messages:

- Message 1 (focused to individuals): Prosperity will knock on the door of entrepreneurial Hoosiers determined to get and keep 21st century skills.
- Message 2: (focused to entrepreneurs and innovating businesses): We will reignite our Hoosier prosperity with innovative, entrepreneurial businesses committed to high performance production.
- Message 3: (focused to educational organizations and intermediary organizations, such as LEDOs): Our region will be transformed by entrepreneurial learning organizations dedicated to relentless collaboration.

Our initiatives act as "proof points" for these messages. The table on the next page outlines how our initiatives align with these messages.

We are working to develop appropriate tactics to deliver these messages continuously.

Communications Plan Matrix

	Message 1:	Message 2:	Message 3:
Strategic Focus	Prosperity will knock on the door of entrepreneu- rial Hoosiers determined to get and keep 21st cen- tury skills (initiatives focusing on individuals)	We will re-ignite our Hoosier prosperity with innovative, entrepreneu- rial businesses commit- ted to high performance production (initiatives focusing on businesses)	Our region will be transformed by entrepreneurial learning organizations dedicated to relentless collaboration (initiatives focusing on educational and intermediary organizations, like LEDOs or clusters)
Entrepreneurship Networks	Entrepreneurship Youth Institute STEM-focused Entrepre-	Eureka Winning Ways Regional Angel Network	eBIN: Entrepreneurship Business Information Network
	neurship Summer Camp	Community Development Venture Fund	Energizing Entrepreneur- ship
			Entrepreneurship and Innovation Compact
Innovative Business Clusters	Nano-structured coatings	Health care cost control collaboration	Health care cost control collaboration
	Energy efficiency collabo- ration	Energy efficiency collaboration	Energy efficiency collaboration
	Supply chain innovations	Nano-structured coatings	
		Supply chain innovations	
Talent Networks Committed to 21st Cen-	Project Lead the Way		REACH Business Centers
tury Skills	Mature Worker Initiative		New Tech High
			Lifelong Learning Institute
Civic Leadership Networks			Regional Forums
TO THO THO			Regional Leadership Training
			Entrepreneurship and Innovation Compact
			Renewable Energy Collaboration: BioTown

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The Opportunity Fund

This section provides an overview of the Opportunity Fund and its operations. We have a range of important issues that we will need to address over the next two years. These include: What is the strategy to move to self-sufficiency? What will be the on-going institutional arrangements and governance of the fund? Our region has no pre-existing regional organization, so how will this organization evolve?

The Opportunity Fund is designed to encourage a culture of innovation by investing in new initiatives that fit our strategic focus areas. We have designed the Opportunity Fund around the model of the Small Business Innovation Research (SBIR) program. The SBIR program is designed to develop ideas and move them across market boundaries where they can be sustained by the market. In the same way, the Opportunity Fund is designed to identify co-investors early. These are entities that will find value in the innovation and be willing to sustain it, based on a demonstrated record of success.

The Opportunity Fund is structured into three parts:

- **Exploratory grants** up to \$35,00 enable civic entrepreneurs to develop their ideas more completely by conducting research and testing new ideas.
- **Demonstration grants** up to \$100,000 enable civic entrepreneurs to demonstrate their initiative on a plot basis. During this phase, co-investment is helpful, but not mandatory. During this phase, the grantee must develop a plan to deploy the initiative across the region. In other words, the Opportunity Fund is not designed to fund initiatives that impact only one or a handful of counties in the region.
- Implementation grants are designed to replicate successful initiatives across the region. These grants require co-investment. The limits and conditions on these investments are set on a case-by-case basis.

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Exploratory grants are approved directly by Purdue as the project lead. Core Team members can provide advice and guidance to Purdue on these investments, but the goal is to move quickly to test new ideas.

Demonstration and Implementation grants are reviewed by the Core Team and the Core Team makes recommendations to the Policy Team to approve these investments. The Core Team scores each grant proposal to evaluate how well the proposal aligns with the objectives of Indiana WIRED. The Core Team encourages grant applicants to communicate directly with the Core Team prior to submitting a proposal. In this way, the proposal can be designed to meet the innovation purpose of Indiana WIRED.

Budget Allocation

The budget allocation is set forth in the following table. We anticipate our deployment of WIRED funds will follow these characteristics.

- Year 1: Focus on developing action plans and relationships. Build up Opportunity Fund.
- Year 2: Invest to ramp initiatives to sustainability.
- Year 3: Reduce commitment to initiatives as co-investments are made. Move toward self-sufficiency in Year 4.

Strategic Activities	Current 3 Year Budget Allocation (\$MILLIONS)	Percent
OPERATIONS	1.45	9.7%
INDUSTRY CLUSTERS	2.00	13.3%
ENTREPRENEURSHIP NETWORKS	3.50	23.3%
21ST CENTURY TALENT	2.00	13.3%

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Strategic Activities	Current 3 Year Budget Allocation (\$MILLIONS)	Percent
CIVIC NETWORKS	0.45	3.0%
OPPORTUNITY FUND	5.00	33.3%
SUB TOTAL: REGIONAL OPERATIONS	14.40	96.0%
STATE DWD	0.60	4.0%
TOTAL	15.00	100.0%

Measuring Performance

Traditional measures do not work well

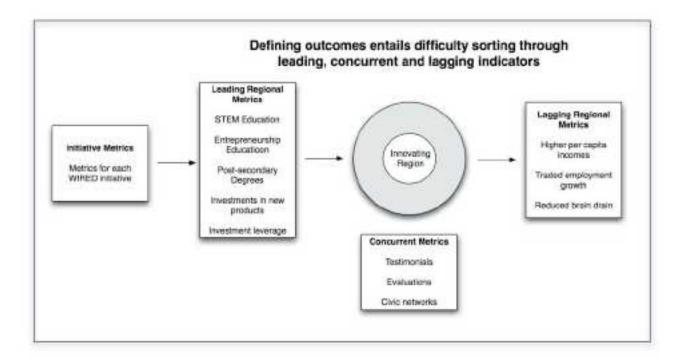
Measuring performance is for Indiana WIRED poses challenges. First, WIRED is a workforce development program and there are traditional metrics -- such as the number of people trained -- used to evaluate these programs. These traditional metrics are well documented, complex, and tailored to existing workforce programs. We have incorporated these metrics to the extent we can. Yet, they were designed for a different purpose, and they do not fit well the public policy objectives of WIRED: to innovate with new arrangements among professionals in education, workforce development and economic development to produce significantly higher levels of workers with 21st century skills.

Leading, Concurrent and lagging Indicators

In evaluating performance using metrics, we need to distinguish between leading, concurrent and lagging indicators. Our model of regional transformation ties all three together. For example, economists tell us that education levels are tightly tied to income performance. We also know that technical skills are in short supply, and that people

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with technical skills are likely to earn more than people without them. By increasing education levels, we will likely increase regional income level. The process takes time, however, so we are confronted with the challenge of evaluating leading, concurrent and lagging metrics.



Four types of WIRED performance measures

We are dividing our performance measures into four categories:

We will be looking for four types of outcomes:

- 1. **Tangible outcomes for each initiative.--** Each initiative funded under Indiana WIRED focuses on quantifiable outcomes. These are set forth in the work plan for each initiative.
- 2. Tangible outcomes for the WIRED initiative.-- We have four areas of strategic focus: entrepreneurship networks; business clusters; talent networks; and civic networks. In each area of strategic focus, we have a set of metrics we are tracking. In addition, across all four areas, we are tracking the number of people who receive

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various different types of training under Indiana WIRED. The table below outlines these metrics which are both leading and concurrent metrics. We will be adjusting these metrics, but we will keep them in place long enough to learn whether we can easily and reliably gather the data needed to make them useful.

- 3. **Stronger civic networks within the region.--** An underlying purpose of strengthening the civic networks across the region. We are measuring these networks in a variety of ways. This is a leading metric.
- 4. **Spin-offs.--** We expect to have one or more spin-off organizations, including new business starts, that will operate independently after Indiana WIRED funding is completed. These spin-offs will sustain some of the innovations that Indiana WIRED starts. This is a leading or concurrent metric.

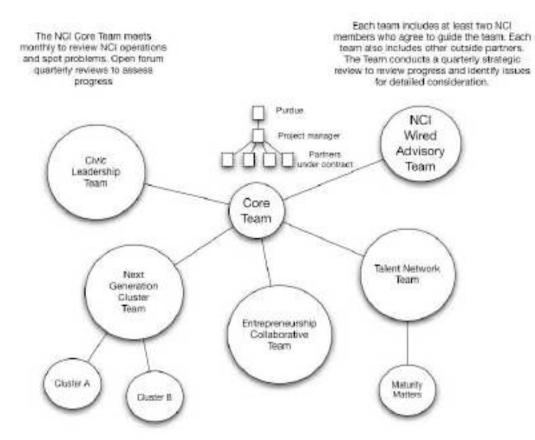
The following table outlines our current approach to metrics. This table does not include the metrics that are designed for each initiative.

Type of Metric	Entrepreneur- ship Networks	Business clus- ters	Talent Net- works	Civic leader- ship networks	Opportunity Fund
Leading					
		Number of People	Receiving Training		
		Co-	investment in initiat	tives	
	Number of business plans	Number of companies participating in WIRED cluster initiatives	Number of students participating in STEM education	Number of civic entrepreneurs and volunteers involved in WIRED initia- tives: Social network metrics	Number of spin- offs
	Number of new business starts and investment in those starts	Investments by these companies in new training, products and processes	Number of mature workers getting 21st century skills	Spin-off civic forums	

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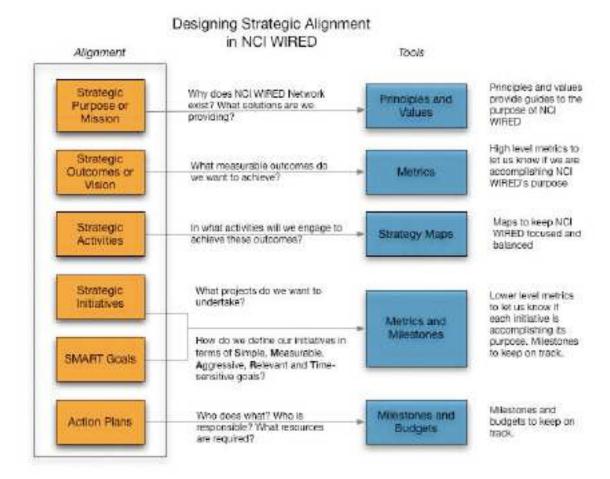
Type of Metric	Entrepreneur- ship Networks	Business clus- ters	Talent Net- works	Civic leader- ship networks	Opportunity Fund
			College continuation rates from regional schools to regional schools		
Leading and Concurrent		Participant	evaluations		
Lagging	Empl	oyment in traded se	ectors	Emergence of sustainable re- gional govern- ance	Replacement of WIRED funds in a sustainable Opportunity Fund spin-off
			Per capita incomes		

Appendix: Organization

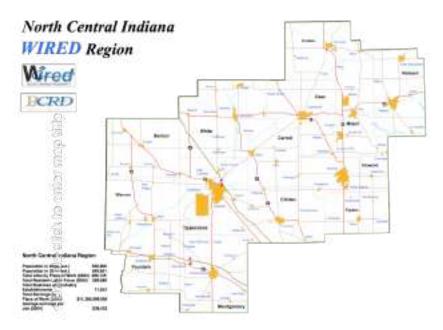


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Appendix Framework for Alignment



Appendix: Map of the WIRED Region





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TRANSFORMING REGIONS THROUGH STRATEGIC DOING

Scott Hutcheson and Ed Morrison

JEL Classification: O21

Keywords: Economic Development, Networks, Regional Transformation, Strategic Planning

Regional communities are made up of thousands, even millions of people, without an official hierarchy and with no single individual in charge. The establishment of a change agenda for such an entity and management of an action plan to implement the change are formidable challenges even for highly skilled organizational development experts. Virtually all individuals, however, belong to just such an organization, because they live and work in a regional community. According to the Brookings Institution (2011), 83% of the U.S. population lives in metropolitan regions, 85% of jobs are based there, and these regions represent the nation's hubs for economic growth. Because they are home to such high concentrations of population and economic activity, it is important to understand how regions function. This article examines a new model for regional transformation, Strategic Doing, and offers North Central Indiana as a case study.

A New Framework for Regional Transformation

Perhaps one of the best chances for regions to transform their economies is through innovation (Council on Competitiveness, 2005), and most need help to develop and guide these innovations strategically. Conventional strategic planning, which is mechanistic and linear, does not work well in this context. The process is too rigid, too costly, and too tightly tied to a "command-and-control" mindset to be effective in complex environments that are constantly shifting. Strategic Doing (Purdue Center for Regional Development, 2011) enables people organized in loosely joined open networks, to think, behave, and act strategically. Instead of developing broad visions, they pursue measurable strategic outcomes. Instead of focusing on problems and deficits, they define new opportunities by connecting their assets, both economic assets in the community and their own assets—experience, expertise, passions, and personal networks. Instead of looking for a visionary leader, they recognize that leadership in open networks is a shared responsibility. Strategic Doing is simple but not easy. It asks four basic questions: (1) What could individuals do together, (2) What should they do together, (3) What will they do together, and (4) How will they continue to learn together.

It takes time for members of communities to learn these new approaches. Old habits, born in a silo mentality, fade as civic leaders practice the common-sense disciplines of collaboration. As civic leaders learn how to cross old boundaries, they come to understand the power of "linking and leveraging" their assets to define new opportunities. Eventually innovations emerge that transform entire regions. Civic leaders focus their energies on initiatives that are replicable, scalable and sustainable. In Strategic Doing, metrics take on new importance. In order to "learn by doing", civic leaders use metrics to measure progress and figure out what works. They focus more on facts, and less on politics and personalities. Perhaps most importantly, Strategic Doing emphasizes the importance of civility as a strategic asset. Without civility, people cannot perform the complex thinking needed to innovate.

Transformation in North Central Indiana

One of the first large-scale implementations of Strategic Doing occurred in North Central Indiana where civic leaders were launching a four-year regional transformation initiative. Like many other communities, the cities of Kokomo and Greater Lafayette experienced steady growth during the industrial boom occurring after World War II and like many of these same communities, the restructuring that has occurred in the manufacturing sector over the last 25-30 years has caused tremendous social and economic distress, especially in auto-dependent Kokomo. The condition of these and other Midwestern cities is documented in Caught in the Middle: America's Heartland in the Age of Globalism (Longworth, 2007) describing communities in which family farms, steel mills, and auto plants have virtually disappeared; and referring to these types of regions as places in which "reinvention is yet to come" (pg. 44).

In 2004 new data on commuting and trade patterns indicated that a regional strategy for economic growth, one that encompassed both Greater Lafayette and Kokomo, could make sense. In 2005, Civic leaders from both communities as well as those from nearby smaller cities and towns came together in an attempt to explore how their communities could function as a region.

As this understanding of regional interdependency evolved, an opportunity emerged to respond to a federal request for applications from the U.S. Department of Labor's Employment and Training Administration (DOLETA). Staff from the Purdue Center for Regional Development (PCRD) helped to craft a proposal and the region was funded in the first round of DOLETA's Workforce Innovations in Regional Economic Development (WIRED) initiative (United States Department of Labor, 2010). PCRD was asked to serve as both the fiscal and programmatic lead for the region.

Unlike most federal grant proposals, the North Central Indiana proposal did not detail how all the funds would be spent. Instead, it outlined a few broad areas of strategy and then described a mechanism for providing incentives for collaboration to the region's institutions and organizations; these incentives were targeted towards developing new ideas for regional transformation. Much of the funding was set aside in an Opportunity Fund from which these civic investments were made. Strategic Doing provided the framework for the partners to come together in a series of civic forums to consider the four simple questions listed earlier. The PCRD developed a phased investment mechanism and a streamlined contracting process to quickly provide the new partnerships with the resources needed to move into action.

Participants in these kinds of regional economic development efforts are often tempted to put too many eggs in one basket in the hope that one or two large-scale initiatives will lead to economic transformation. The North Central Indiana effort took a "swarm innovation" approach instead, launching dozens of smaller-scale efforts all focused on moving the region forward in one of the previously agreed upon strategic directions. Over the course of the four-year WIRED effort, over 40 partners worked together to launch 60 different initiatives. Over 80% of those initiatives continue today, long after the federal funding was exhausted.

Each of the 60 different initiatives represents a compelling story. Two of these are provided here:

- KokomoInnovates

 When Kokomo-based Delphi Electronics announced a massive layoff that included 600 engineers a solution was quickly developed and funded to assist some of those engineers to become entrepreneurs. Several new businesses emerged and new jobs were added to the regional economy. The following link is to a YouTube video that tells more of that story. http://www.youtube.com/watch?v=vl9LpKVQEs4
- Guitar Workshop

 In one of the WIRED civic forums a few individuals had the idea of exposing young
 people to advanced manufacturing. The result was a summer workshop in which students learned and
 applied advanced manufacturing skills in building their own electric guitar. The following link is to a YouTube
 video that tells more of that story. http://www.youtube.com/watch?v=s4G5mWbYjQE

The North Central Indiana WIRED effort focused on four strategies, and all of the initiatives aligned with one or more of them. Metrics were tracked and collected. What follows in an overview of those strategies, including the goals and metrics achieved. These metrics were reported and verified by the U.S. Department of Labor Employment and Training Administration.

Entrepreneurship Strategy

The purpose of this strategy was to create a vibrant entrepreneurship culture in the region by: (1) Providing existing and emerging entrepreneurs with new learning opportunities and new resources; (2) Educating future entrepreneurs, including high school students as well as adults; and (3) Helping existing businesses become more entrepreneurial by helping them to develop their in-house capacities to innovate. Over 20 entrepreneurship initiatives were launched as part of this strategy with dozens of partners – universities, community colleges, high schools, Small Business Development Centers, and local economic development organizations - contributing to this strategy area. The following are some of the aggregated metrics achieved by the partners:

- 1,537 existing and emerging entrepreneurs trained
- 708 new business/growth ideas developed
- 145 individuals in 11 companies using entrepreneurship strategies to increase top-line growth
- 18 new business plans created
- 17 new products or services developed

- \$1.2 million in sales growth
- 12 new start-up companies
- 45 new jobs created
- 52 new jobs retained
- \$510,000 in cost savings
- 47 school corporations offering new entrepreneurship programs
- 166 teachers trained to teach entrepreneurship
- 4,918 school-age students trained in entrepreneurship
- 22 entrepreneurship curriculum programs developed
- 10 angel investors engaged

21st Century Skills Strategy

The region's transition involved moving toward an economy that required a higher level of skills, especially in advanced manufacturing. This strategy area was designed to develop a regional workforce with 21st Century skills by: (1) Developing STEM (Science Technology, Engineering, and Math) skills in the emerging workforce, (2) Helping the existing workforce to acquire the skills, credentials, and resources needed to be part of the 21st Century economy, (3) Equipping older workers and the companies that employ them to be productive in this transitioning regional economy. The partners involved in this strategic area included universities, community colleges, and the regional workforce board. The following are some of the results of this strategy area.

- 15,042 workers trained
- 1,262 degrees or certificates awarded
- 1,634 individuals trained in global commerce—language, culture, business practices
- 9,534 individuals assessed for careers in advanced manufacturing
- 3,165 placed in employment within targeted industries
- 7,593 high-school students in new STEM education programs
- 126 scholarships awarded
- 33 "stop outs" back in college
- 130 new college internships developed

Innovation Strategy

This strategy area focused on moving innovations—new technologies, new business models, new skill profiles—into the region's key industry clusters by: (1) Linking and leveraging university and industry assets to make firms more globally competitive, (2) Developing leading-edge skills in workers at the same time that they were creating new industry demand for those skills through technology transfer, and (3) Implementing new training programs that demonstrate immediate return on investment to industry. The partners involved in this strategy area include universities, technology parks, and the Manufacturing Extension Partnership. The following are some of the results of this program area.

- 5 new training/certificate programs developed—nanotechnology, energy efficiency, health care cost control, supply chain management, green manufacturing
- 500 companies engaged in supply chain training for their workforce
- 23 university faculty newly engaged with industry
- 150 individuals with Nanostructured Coatings Technology certificates
- 67 individuals with Energy Efficiency certificates
- \$1.4 million in energy cost savings identified as a result of training program

Regional Civic Leadership Strategy

The focus of this strategy area was to create an infrastructure of regional leadership to support the continued economic transformation of North Central Indiana by (1) Creating a new regional network of organizations that can help foster regional leadership, (2) Engaging a growing number of regional leaders in developing a vision for the future and in the development of strategies to move the region toward that vision. Several new networks, coalitions, task forces, and other groups developed as spinoff efforts, most of which continue functioning today, launching new initiatives and securing new resources for the region. Indiana University Kokomo took the lead in this strategic area. The following are some of the metrics for this strategy area.

- 1,304 civic leaders engaged in regional collaborations and activity engaged in regional economic transformation efforts.
- Three new ongoing regional initiative spin offs—Clean Energy Forum, the Indiana Energy Systems Network, and the North Central Indiana IHIP Asset-Inventory Group
- Creation of regional communication tools—newsletters, blogs, collaborative workspaces, etc.
- Launching of a new Regional Leadership Institute

Lessons Learned from North Central Indiana

After launching the North Central Indiana effort, Purdue Center for Regional Development staff, along with partners, distilled the lessons learned (Hutcheson, 2008, 2010). In January, 2012 Purdue launched a national certificate program to train professionals from economic development, workforce development, higher education, and others to learn to utilize Strategic Doing in their own regions (http://www.pcrd.purdue.edu/What We Do/SD/default.aspx).

The following are three key lessons about the requirements for successful regional transformation.

Thinking Differently

Individuals today live and work in an environment in which the most effective work is done within networks that are embedded in still other networks; in order to meet the challenges they face and the opportunities presented to then, individuals need to learn to think differently. By understanding how transformative work gets done, they have the opportunity to build more dynamic and responsive businesses, communities, and organizations. Networks are different from conventional industrial-age organizational structures. In a network there is no top or bottom; instead, networks consist of hubs and spokes. Networks require a solid core group of organizations and institutions to function effectively, but they also need porous boundaries so that others can join at any time. Civic leaders need to understand how networks function (Vangen and Huxham, 2003; Bland, et al, 2010).

Behaving Differently

Thinking in new ways is not enough. Individuals also need to translate their thinking into different ways of behaving towards others. Collaborations are built on foundations of mutual respect. Individuals learn to trust by deciding whether a person's actions align with their words. Exploring their own behavior and the behavior of others enables individuals to build stronger, more enduring collaborations.

Working Differently

It is clear how a world of networks requires individuals to think differently. It is also evident that collaboration in networks calls participants to high standards of behavior that reinforce mutual understanding and respect. This leaves the biggest question. How can networks be guided strategically? How can collaborations be designed and managed to get big, complex projects underway? How is transformation through collaboration achieved? What are the civic spaces in which this work can occur? To answer these questions, it is necessary to understand how to design and implement strategy in open networks.

Managing a Generational Transition

Previous generations mastered the challenges of innovation by figuring out how to convert raw materials into useful products. They built large hierarchical structures capable of delivering massive volumes of products to giant markets. These hierarchical organizations operated with remarkable efficiency, generated enormous wealth for the U.S. economy, and met many of the needs of the masses. The results of this "Greatest Generation" are readily apparent in our communities: the factories, libraries, schools, grand courthouses, cultural institutions, and philanthropic organizations.

Industrial-age corporate hierarchies mirrored themselves in the civic life of communities. Government and nonprofits organized themselves into hierarchies too—a proven organizational formula for getting things done. Chambers of Commerce emerged to drive local economies and large social service organizations were established, in turn driving communities and the nation. These civic organizations can remain relevant but the environment in which they operate is changing and they must adapt by forming collaborative networks that can innovate more effectively.

It is now possible to see a future economy that is based on networks. At the same time, the demise of many institutions built by earlier generations is evident, as these stable, slow-moving hierarchies prove unable to adjust to

the faster world of networks. The challenge today involves connecting the assets of earlier generations, such as civic institutions, to the opportunities, such as new careers and new business models that will be available to in the future. These challenges play out in the corporate world every week: Barely a day goes by without a headline of a corporation moving to collaborate, even with its competitors. The same pressures are emerging in the world of education, nonprofits, and government. A growing pressure exists to collaborate, to find new ways of delivering value, and to innovate.

The consequences of corporations moving too slow to the new realities of globalization and networked competition are increasingly apparent. The same fate may await government and civic organizations too slow to move. New pathways to the economy and society are needed to enhance networks.

Designing new networks and building stable relationships takes time. People need to get to know each other and understand their respective interests. They need to explore the value of new connections and envision "what could be," and they require safe places to do this important work. Communities engaging in strategy development need to give careful consideration to the civic spaces—physical places and institutions—where these community conversations can occur. Neither city halls nor the local high schools are good choices. These are places where people at the top tell people at the bottom what to do. Places like libraries and county fairgrounds send a better message. There's no dumb question at a library, and the fairground is a place where all are welcome. That is both the challenge and the opportunity: creating civic spaces where transformational thinking can occur, where new behaviors can be practiced, and where a new way of working together can be initiated.

For More Information

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Strategic Planning

Ed Morrison

Oklahoma City, March 2003



Here is my course objective

At the end of the course you should be able to

- draft a "Plan for the Plan" in any strategic planning situation
- use a variety of tools to analyze strategic planning problems



 α

Today's schedule will follow this outline:

Introductions

A 5 minute history of a 100 years of planning

Strategic planning guidelines and key concepts

Case study

Case study presentations

Open questions



_

History: Different planning traditions

Publicly led

- Physical planning, zoning, comprehensive planning
- Smart Growth

Publicly led, Privately supported

- Infrastructure planning
- EDA

Privately led, Publicly supported

- Industrial market planning
- Chambers

Privately led

- Industry training consortia
- Clusters



Strategy outlines where you are, where you're going, and how you'll get there ...

- Start by studying the way things are now...
- What's working?
- What's broken?
- Figure out the way you expect things to be...
- What if we do nothing?
- What could go wrong?
- Design your future (that vision thing)....
- What are other communities doing? What projects can we copy?
 - - What is our brand?
- Create a way to get things done...
- What activities and projects make the most sense?
- Where will the resources come from?
- How do we keep the faith?

5



design a planning process for your community Here are some Key Concepts to use when you

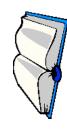
- SMART goals and action plans
- Product life cycle
- Plan for the plan
- Continuous improvement





Use SMART Goals and Action Plans to bring discipline to your planning process.

- Simple
- Measurable
- Aggressive, but achievable
- Relevant
- Time sensitive
- Example:
- By Dec 2001, we will complete a strategic planning process that leads to three new public-private partnerships



Doug Smith, Measuring Success

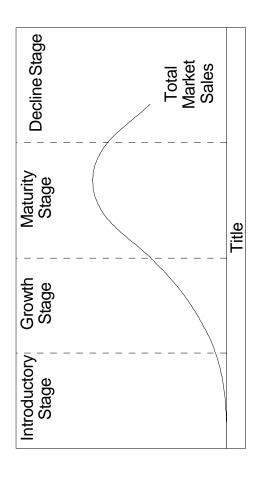




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The product life cycle explains how an innovation moves through a market.

- A strategic market planning tool
 - Measures how an innovation moves through a market
 - Think of strategic plan as an innovation

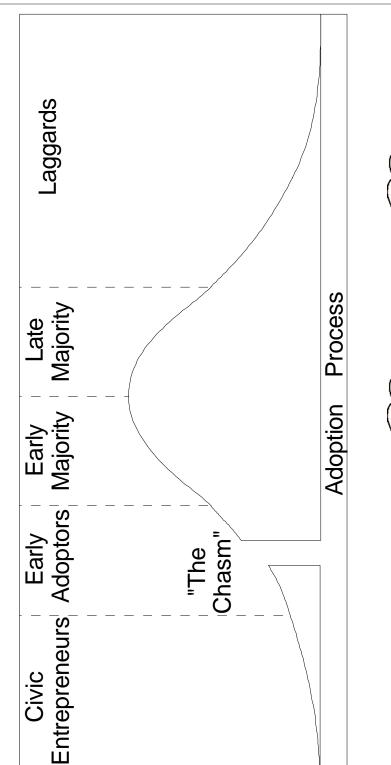


Use PLC to map recruitment and communications





Use the concept of a product life cycle to build momentum for your planning process





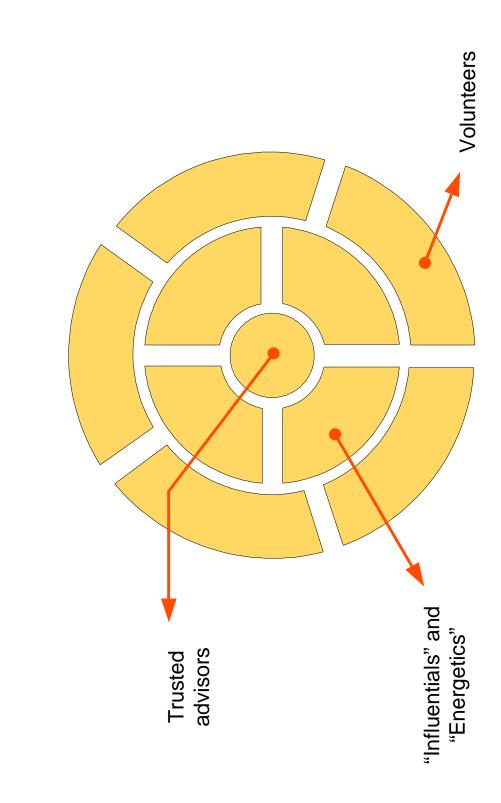








Build out your leadership from a central core of two or three people







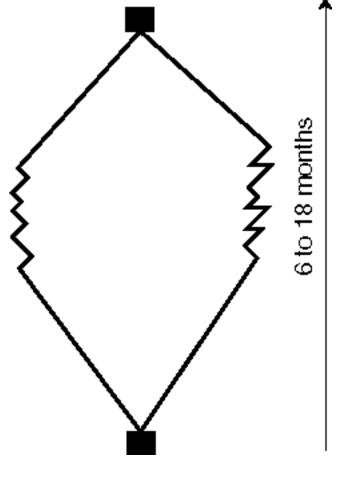
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Draft a Plan for the Plan to manage a dialogue

of engagement and Manage a process dialogue

Goal: one or more Include both

brainstorming and new partnerships synthesis





Daniel Yankelovich, The Magic of Dialogue



Roger Fischer, Getting Things Done





Plan

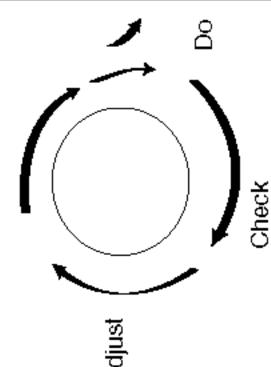
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Continuous improvement means that you will go through a planning cycle more than once

Manage expectations

Maliage expectations
 Continuous commitment

Implications for leadership succession



Beside these key concepts, here are some additional check list items...

- Develop a portfolio of SMART Goals
- Budget carefully: money, time volunteers
- Map a political coalition
- Draft your Plan for the Plan
- Recruit a management committee
- Design a brand and marketing strategy
- Adopt rules of civic behavior, if needed
- Use a SWOT to structure discussions
- Use working groups to engage volunteers Use public meetings to recruit volunteers
- Use visuals to distill data and tell a story
- Plan, finance and launch each initiative Monitor continuously for accountability
- Plan leadership succession



Develop a portfolio of SMART Goals

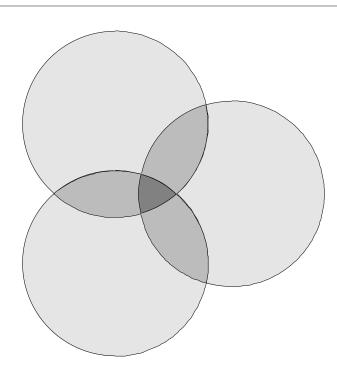
- Look for small victories early
- Combine early goals with aggressive marketing
- T-shirts
- Flyers
- Avoid tackling the development "myths"
- Excuses for leadership failures
- No highway, no natural gas
- Plan goal celebrations along the way

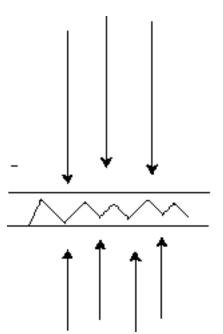




Use maps to understand the political terrain and assemble a coalition

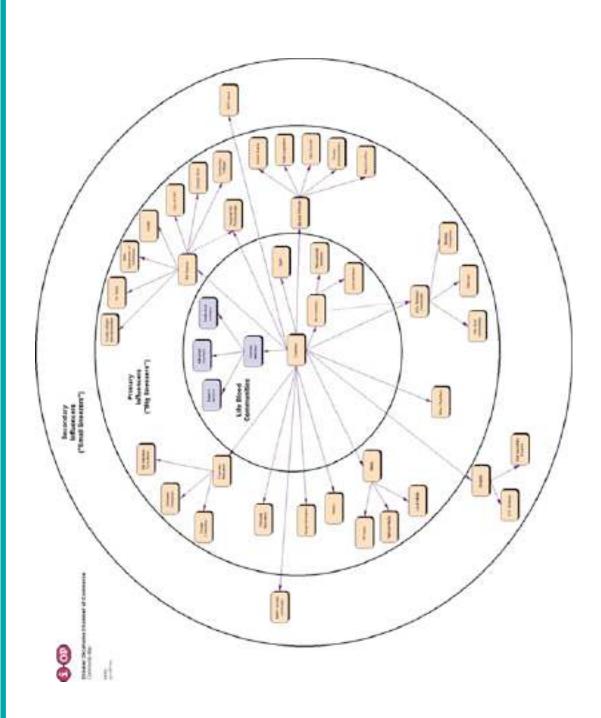
- Coalition driven by your **SMART** goals
- SMART goals driven by the coalition you can assemble







Draw a map to identify interest groups





Design a new brand and marketing strategy and launch it on the web

Woney magazine ranks Owensboro-Daviess County as having the third-lowest incidence of violent crime in its "best places to live" rankings

WEATHER NEWS

SPORTS

Please complete the survey below. If you have any problems or questions please contact Fred Reeves by calling (270) 691-0570 or sending an e-mail.

CHAMBER OF COMMERCE & INDUSTRY, INC.

Thanks for taking this interview from the Owensboro Chamber of Commerce. First, we'd like to explore your thoughts on the existing employees in Owensboro-Daviess County.

Please press NEXT to continue.

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not appear in 30 question does seconds, please click here If the first



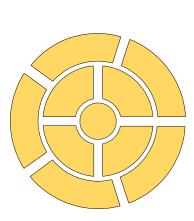
Recruit your core management committee

Profile:

- -35-20
- Career settled, looking for more
- Enough experience

2 year commitment

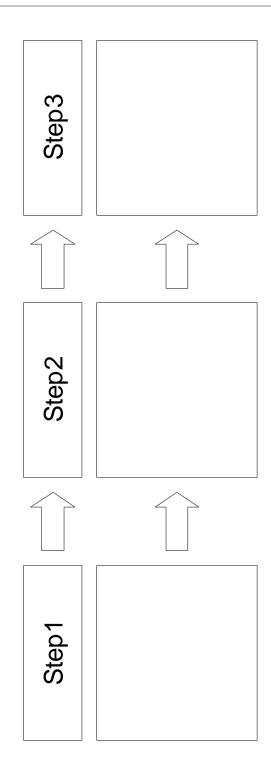
- Use Internet to reduce time commitments and meetings
- Provide advice and guidance
- 3 to 7 members







Define a simple Plan for the Plan...Complexity is the enemy of loyalty





Adopt rules for civic participation, if necessary

Basic rules of behavior

Often needed in deteriorated situations

Use a marketing twist: Sign a Compact

Discipline violators: don't invite them to the next meeting, no matter who they are

Use working groups

- 5 to 7 members works best
- Best chairs: Volunteer "pushers" with record of accomplishment
- Report and accountability to management committee
- Intervene quickly with inaction
- What can go wrong: hijacking by zealots





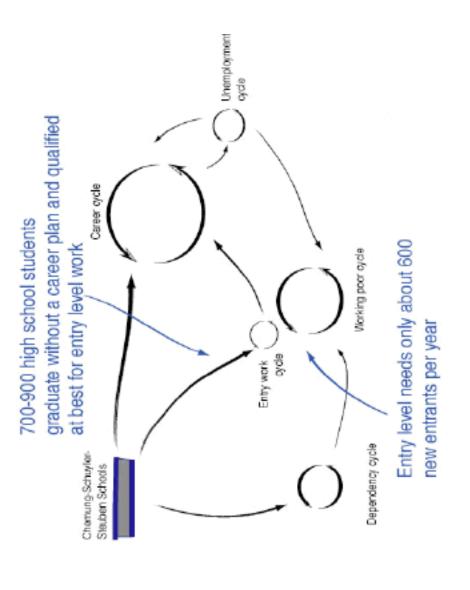
Plans
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Task Name D		Date	End Date	Who



Use visuals to explain data

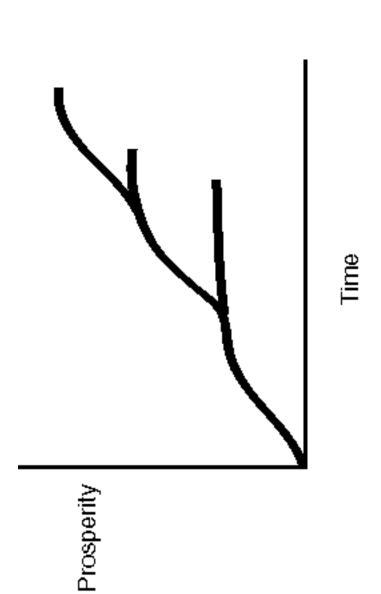
- Minimize data and paper
 - Find powerful insights





Plan for leadership succession, so that you can move to the next level

- Use board strategies, advisory committees and leadership development programs
- People get tired





Additional resources

You can get additional resources at:

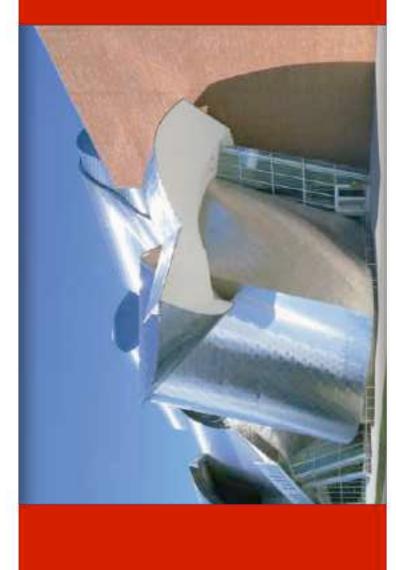
http//www.edmorrison.com/edi_strategy

You can review the Charleston project web site at

http://www.lowcountry-ed.org

Strategic Planning Lab

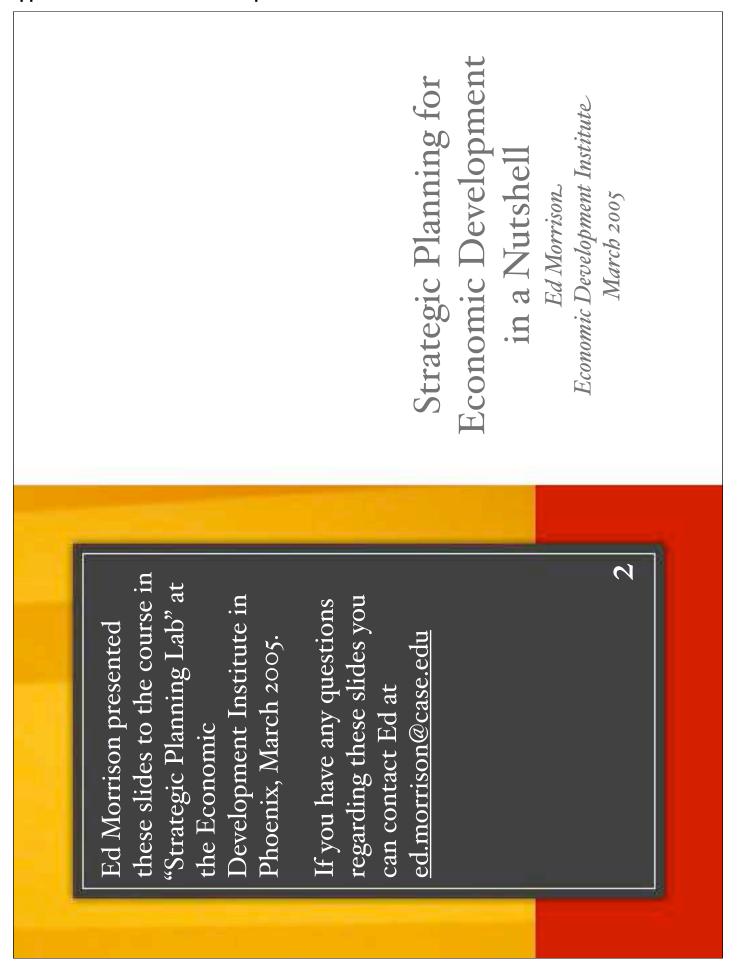
Center for Regional Economic Development

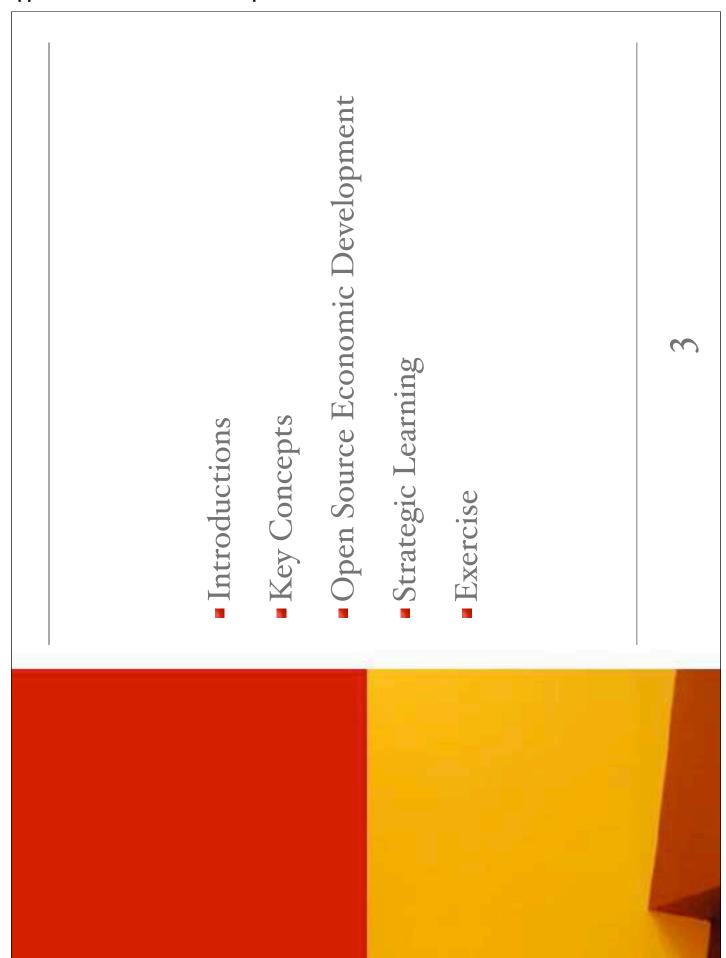


Strategy for Economic Development

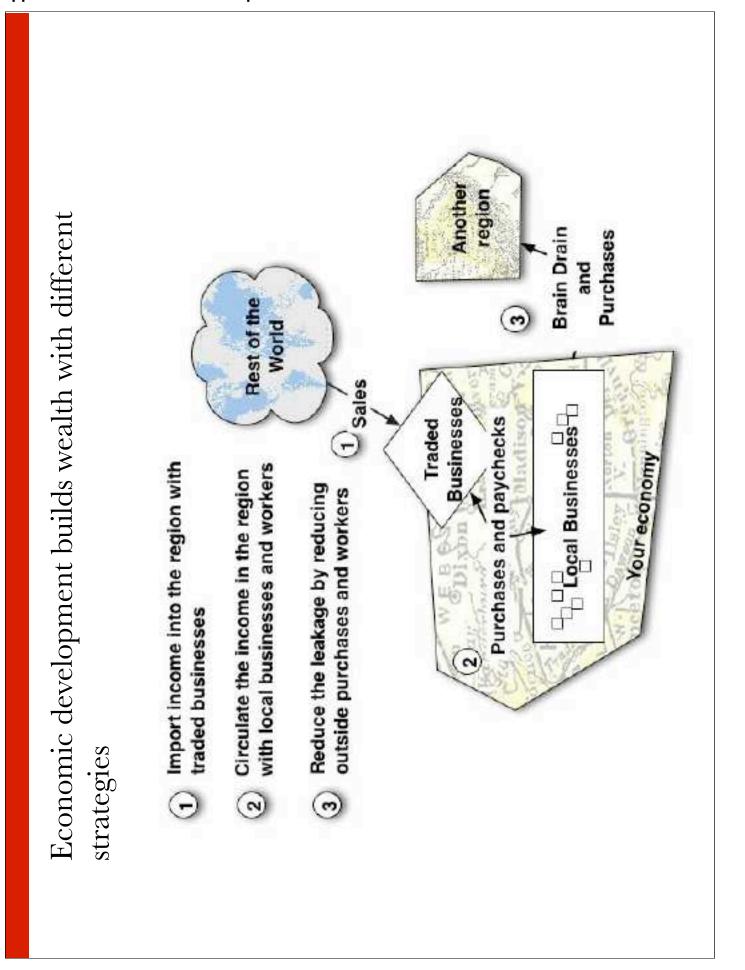
in a Nutshell
Ed Morrison.
Economic Development Institute

March 2005

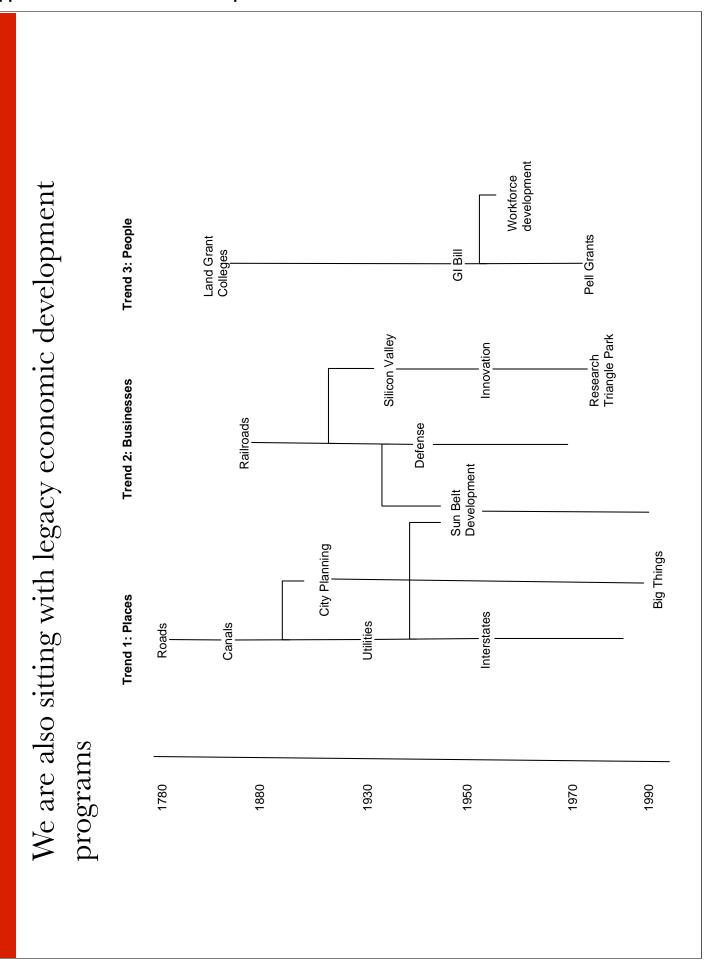


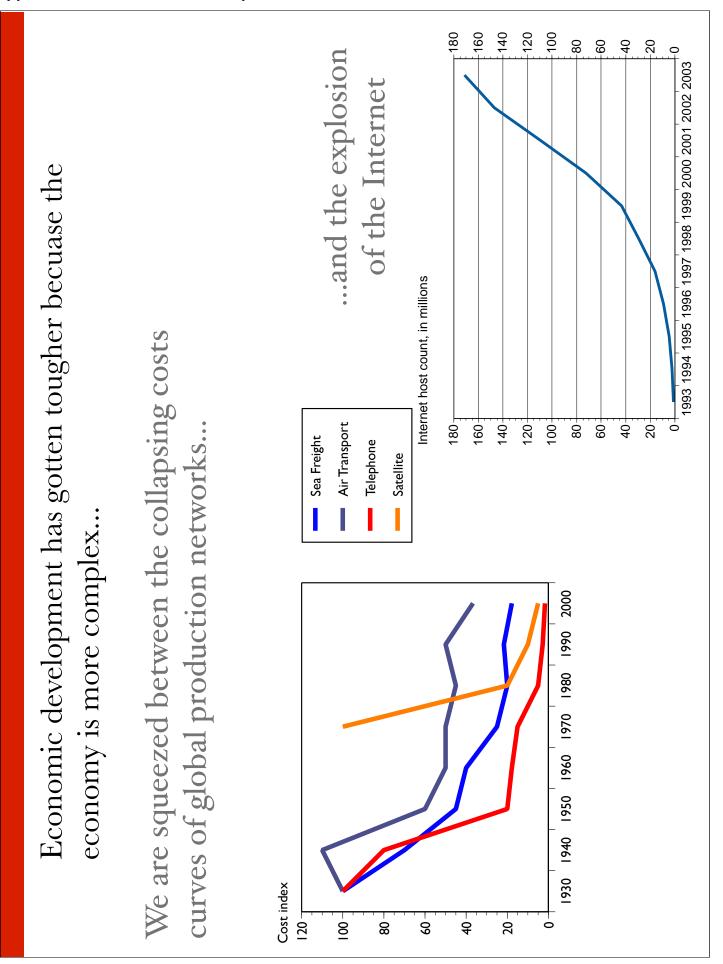


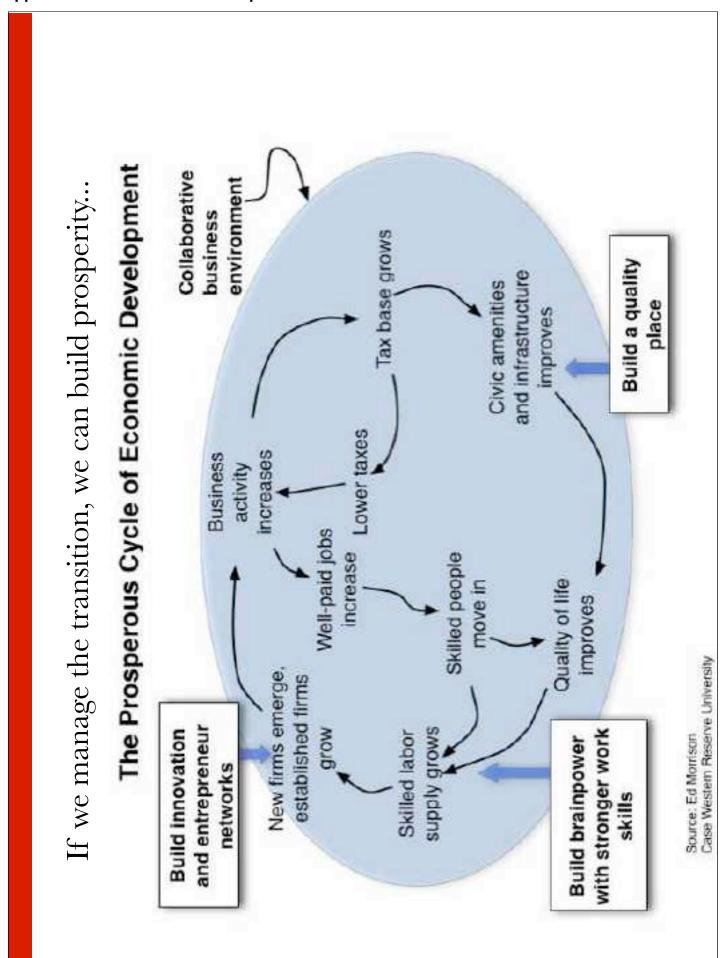
ppendix C-7:	Economic Develo	pinent institute		
Key concepts	Economic Develop	pment institute		
Key concepts				

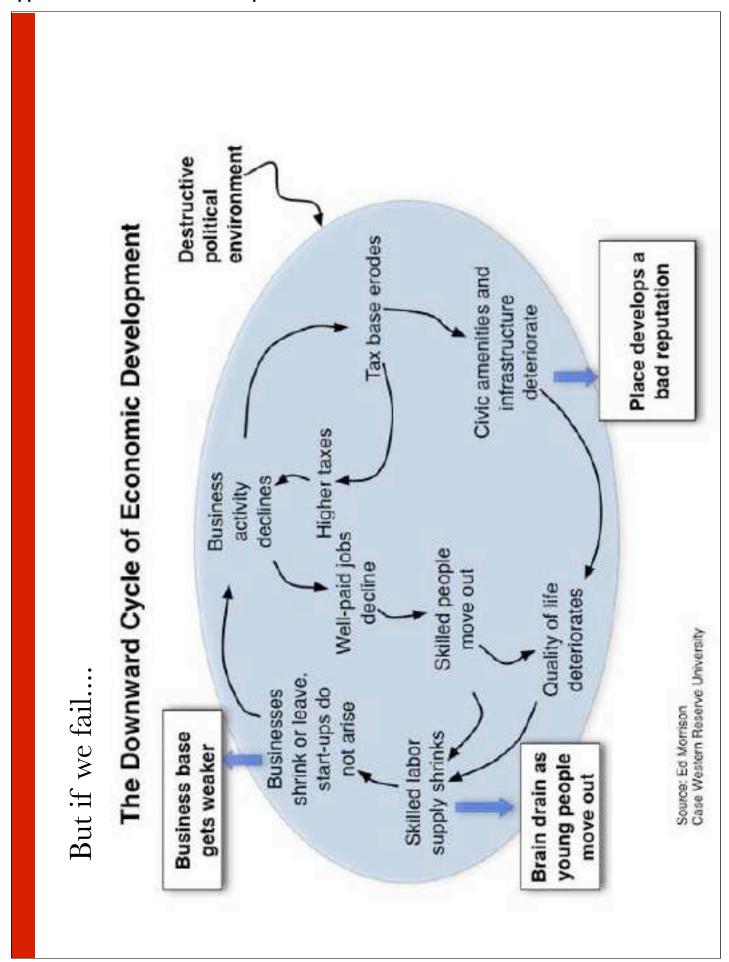


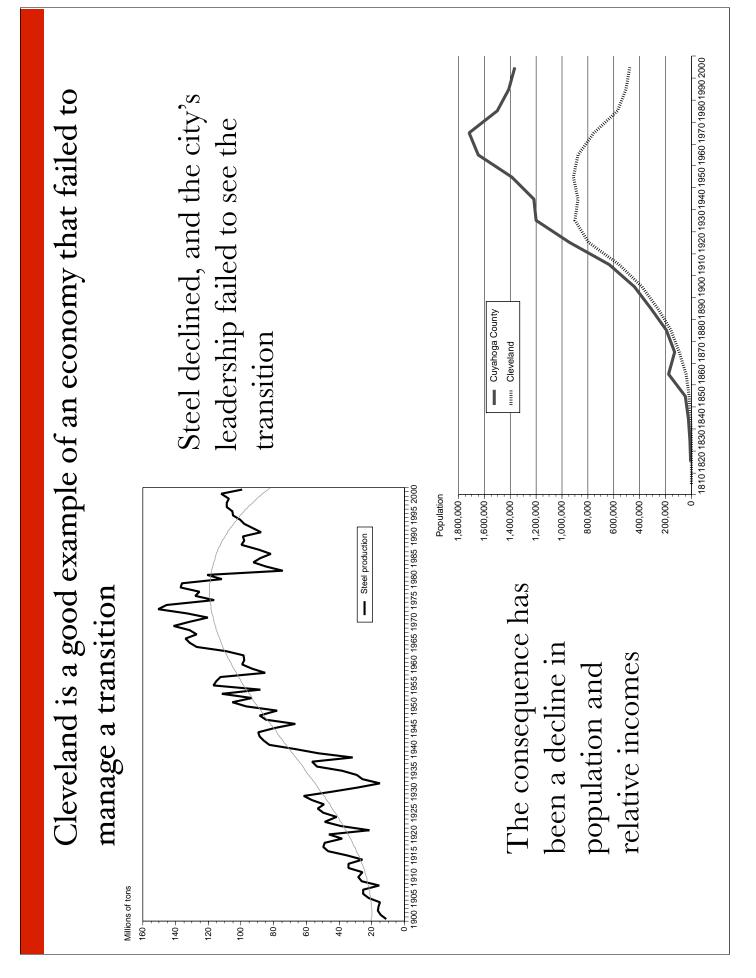
Anothe count Strategies are now more difficult to define and execute Braindrain Rest of th World Sales Businesses Traded 라 Local Businesses음 Purchases and paychecks Competition for traded businesses is Your economy now far more complex and global shopping a regional experience Young people moving out have Wal-Mart and the mails make created major brain drains (e) 3



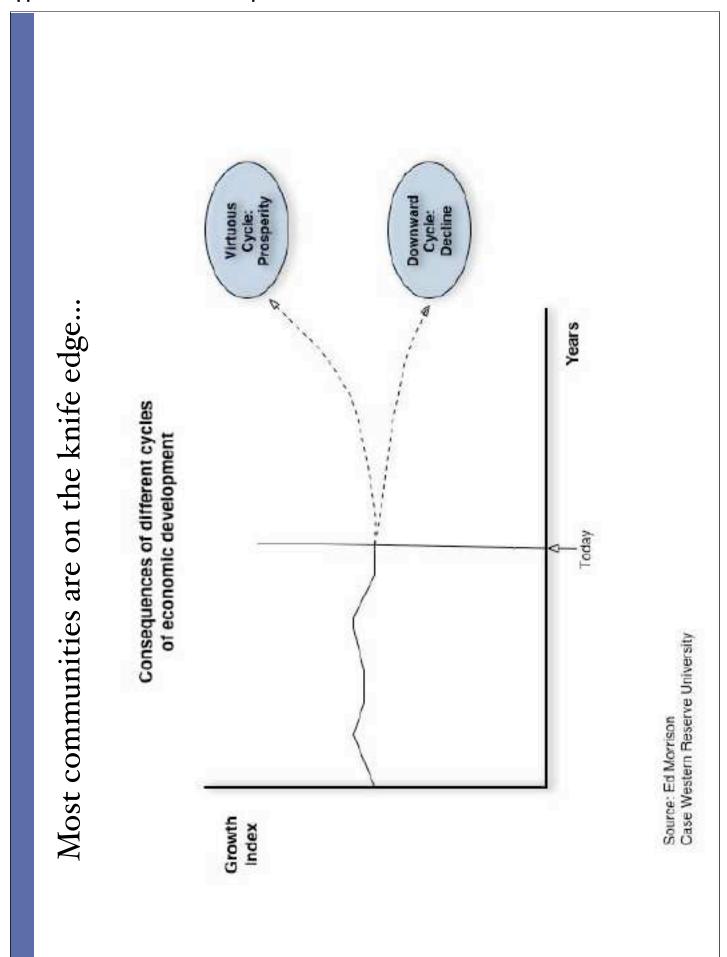




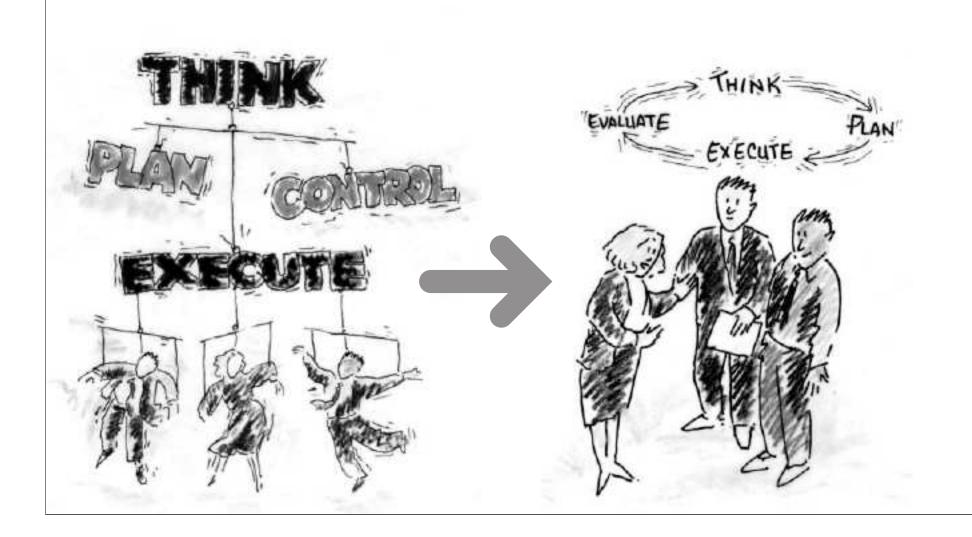




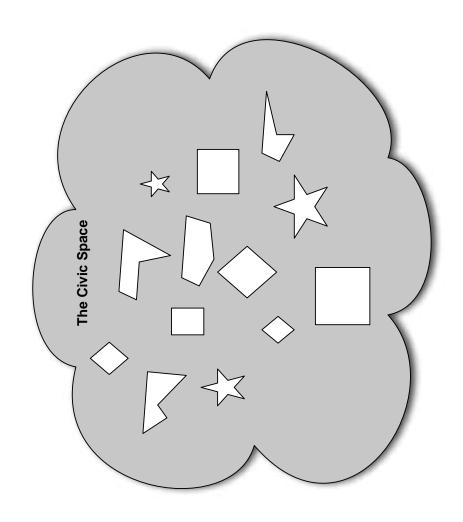
week as the Maytag plant there will roll out its last refrigerator GALESBURG, III. -- Hard times are hitting Galesburg, III., this Workers of America shows U.S. high-technology workers still face WASHINGTON—A new report funded by the Communications chronic unemployment and a serious jobs deficit despite an Galesburg Maytag Plant Closes Doors o lose their jobs. economic recovery being declared three years ago Our problem is that we think we have time. Report says high-tech jobs still in decline UPDATED: 4:40 pm COT September 14, 2004 POSTED: 3:19 pm CDT September 14, 2004 900 Workers Lose Jobs Employees at AT&T are expecting word of thousands of pink slips, perhaps AT&T will shed 7,000 jobs in consumer unit, and close its doors. Sept. 14, 2004 1:28 PM EST **Breaking News** by Jeffrey Silva Print This Story | Email this Story to a friend | Subscribe to the Observ. Oneida Ltd. closing Sherrill plant, 500 jobs gone Thursday, September 16, 2004 One analyst, Blake Bath predicts the announcem side of the business bet importance throughout our cempany's history," Oneida Ltd ecognizing the hardships this causes for our employees, as early as next week analyst says consumer plans. Officer Peter J. Kalist said in a prepared statement. been menufacturing flatware in Central SHERRILL - Oncida Ltd., which hes Oneida reached this decision while New York since the dawn of the Thursday it's cutting 500 of its The Crinida brand name will co The strugging silversmith anno management and workers hain Gilded Age, is closing its Sherr emaining local jobs. Company distribution tasks will be retain production here will and becal however, with the flatware pro what the company called unsustainably high costs." A historic loss by independent suppliers. factory early next year. Observer-Dispatch Fri. Sep 10, 2004 LINDA MURPHY

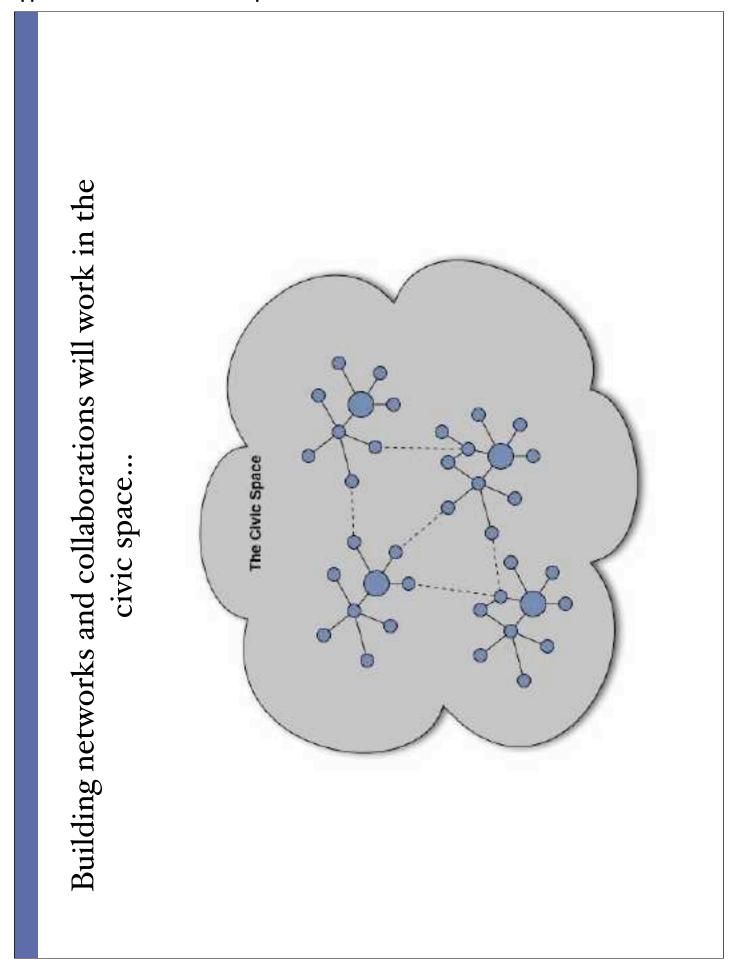


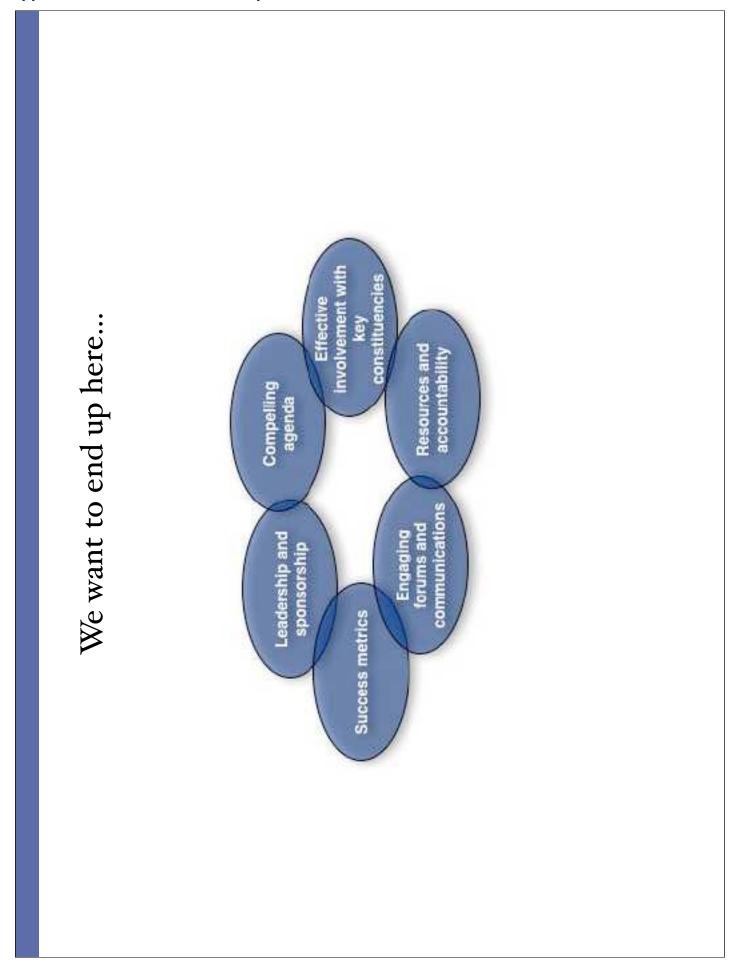
Defining a direction is not easy...We are moving from a world of command and control to a world in which we must collaborate to compete

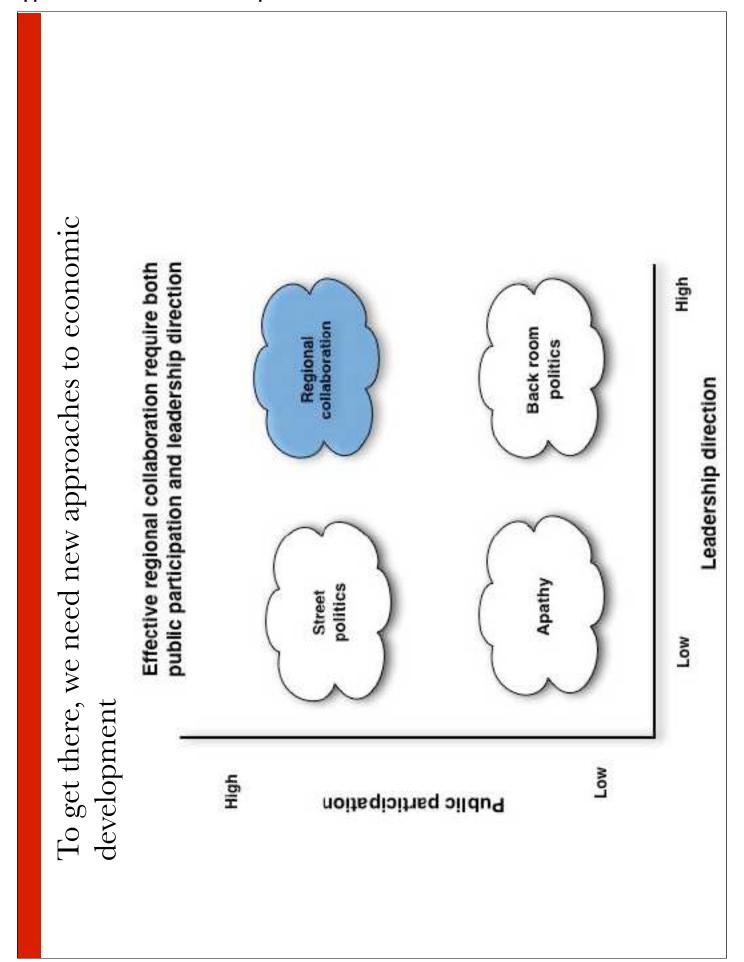


Economic development happens in the civic space... No command and control system works here...

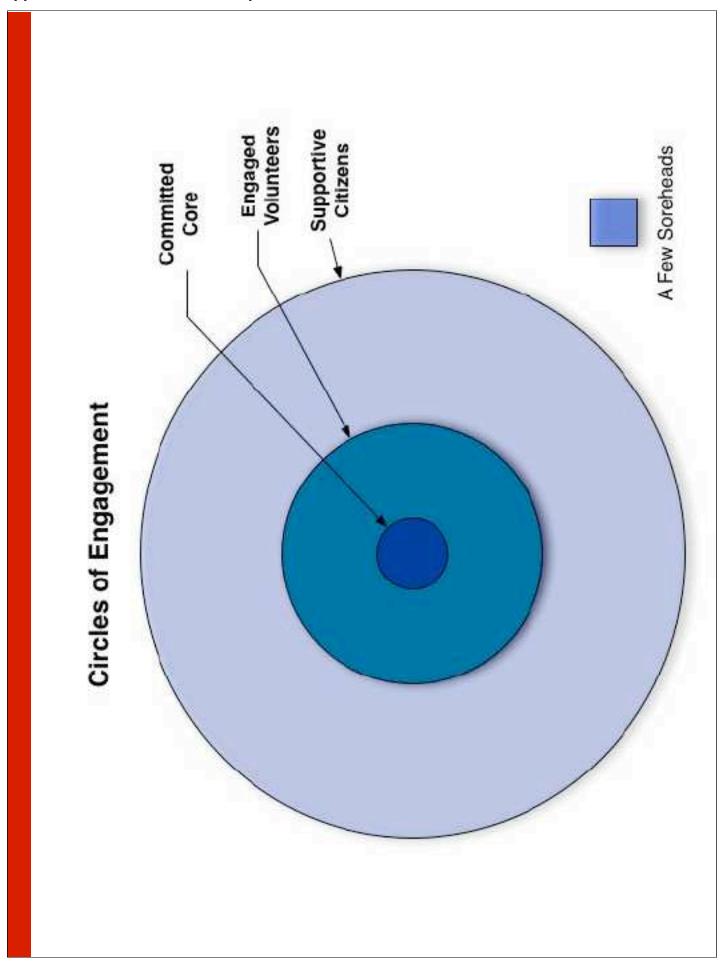


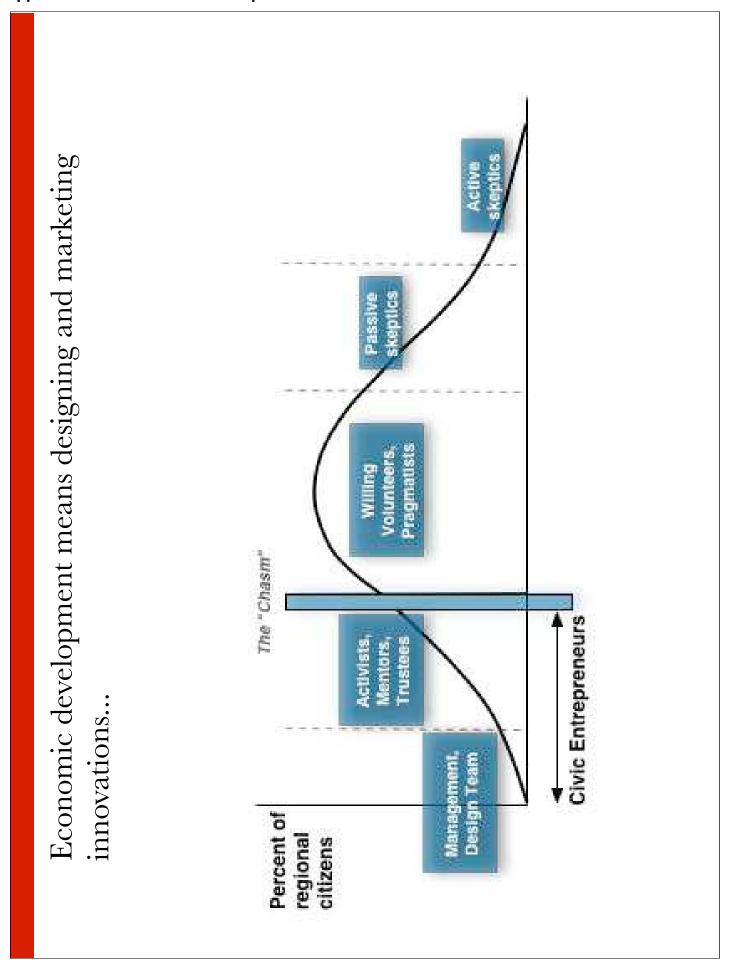


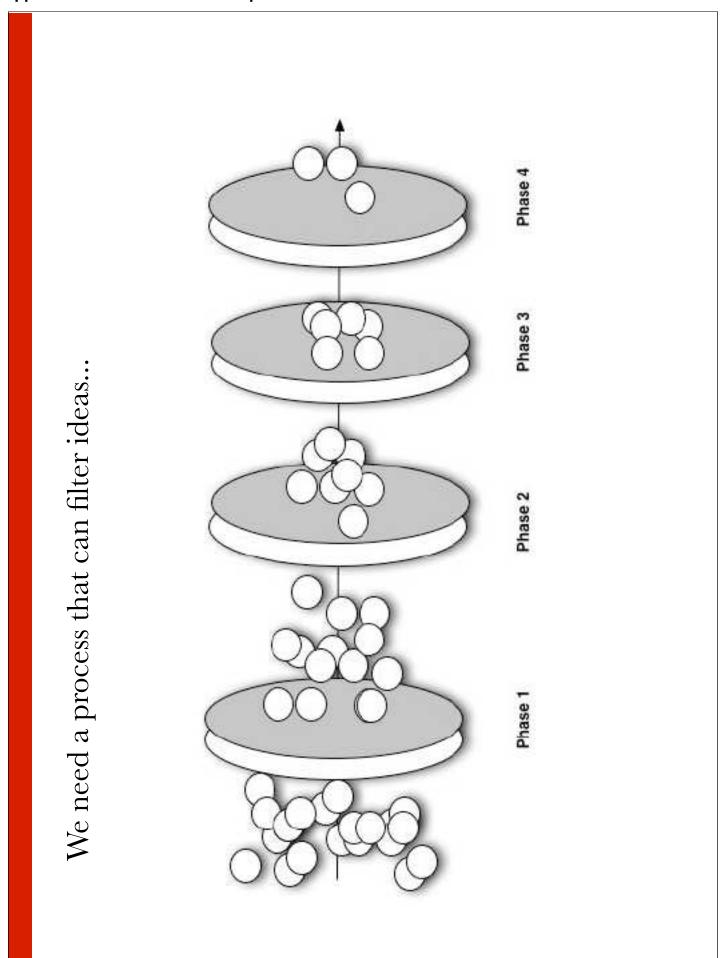




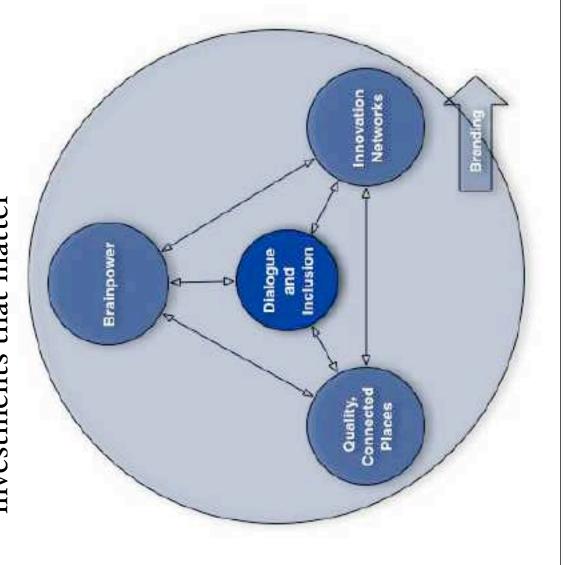
Economic development means defining a process to build Leadership direction Prosperity in a knowledge economy requires both public participation and leadership direction networks and convert ideas into action...







economic development that focuses our thinking on the To move ahead, we need a map, a new approach to investments that matter Open Source Economic
Development provides a
strategic framework for
building competitive
regional economies



Open Source Economic Development

economies need balanced strategies that encourage new conversations, networks, and investments in the following areas: in the late 1990's, has created a "perfect storm" of deep economic change. To thrive in this environment, regional Our economy is undergoing fundamental shifts. The integration of global markets, coupled with the explosion of the Internet

able to read and comprehend well by the third grade. Dropping out of high school creates a lifetime economic disability. economy, workforce development begins with a pregnant mother. Every child needs pre-school education and should be advantage. This fact presents us with some clear imperatives. Advances in brain science tell us that, in a knowledge Strengthening Brainpower.-- In today's global economy, brainpower provides the only basis for sustainable competitive

do not.

future opportunities.

into prosperity. entrepreneurship provides the skills to translate ideas markets. Innovation provides the process and wealth through new products, new services, new networks.-- These networks convert brainpower into Connecting innovation and entrepreneurship

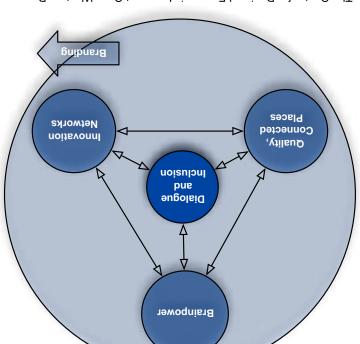
connections to other people, other markets. Equally important, quality places have thick that respect sound principles of physical development. can live anywhere. They will choose to live in regions Building quality, connected places.-- Smart people

understanding of core strengths, a shared view of unique experience, a special identity, a common have positive stories to tell. These stories create a Promoting an effective brand.-- Prosperous regions

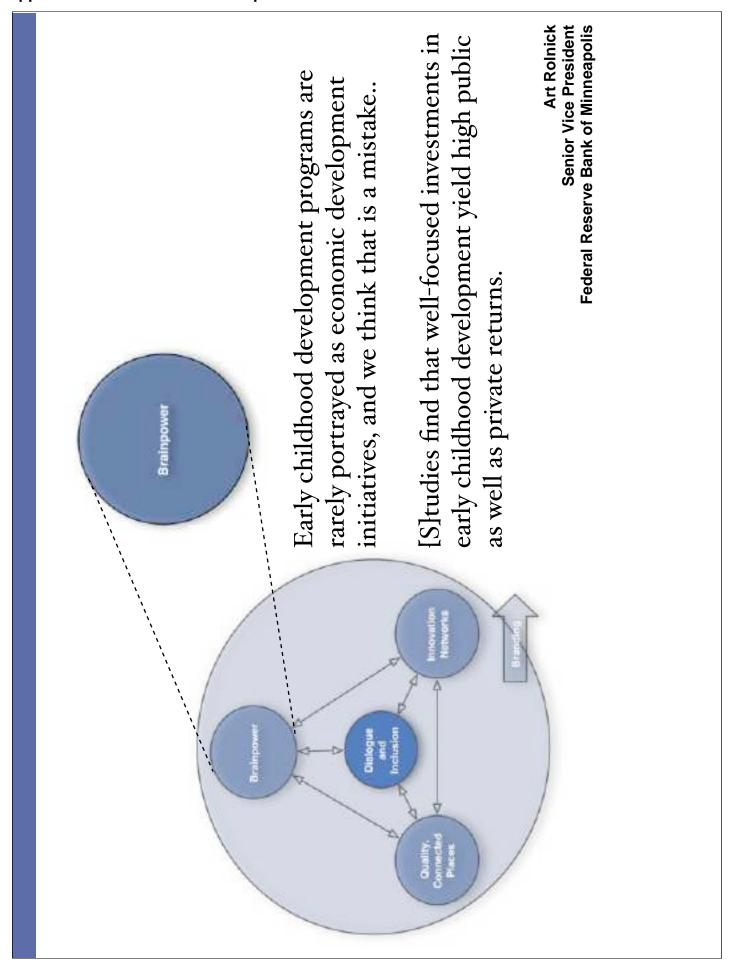
opportunities and move more quickly than regions that advantages: the regions that collaborate will spot collaboration and trust carries real competitive habits of thinking and acting together. Building can go it alone. Prosperous regions will develop civic inclusion.-- In a globally connected economy, no one Strengthening civic habits of dialogue and

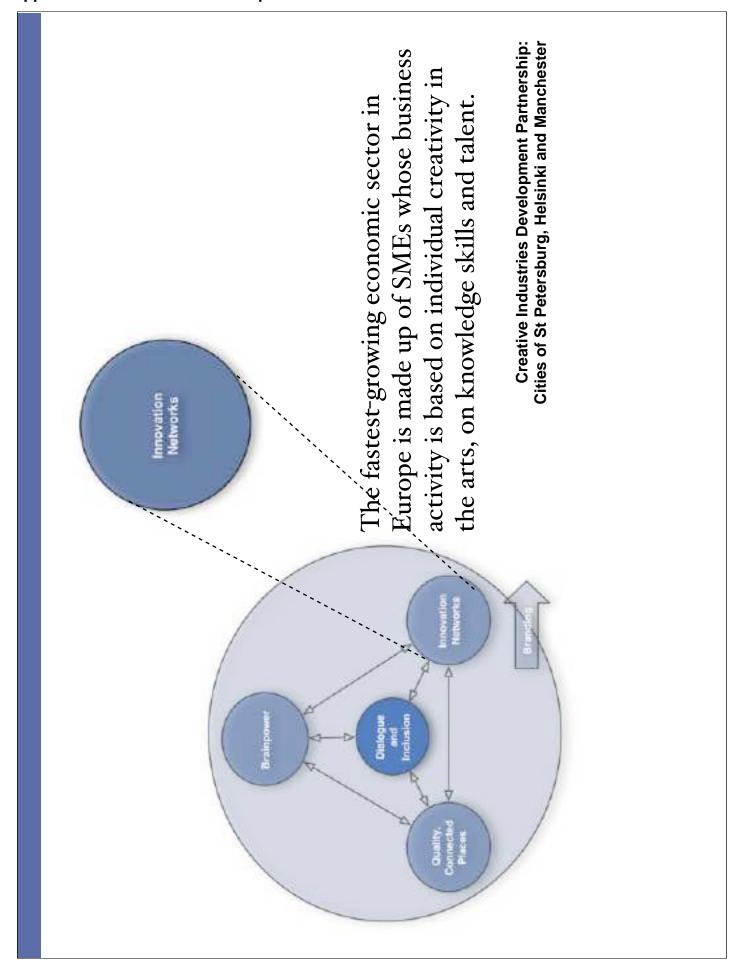
Appendix C-7: Economic Development Institute

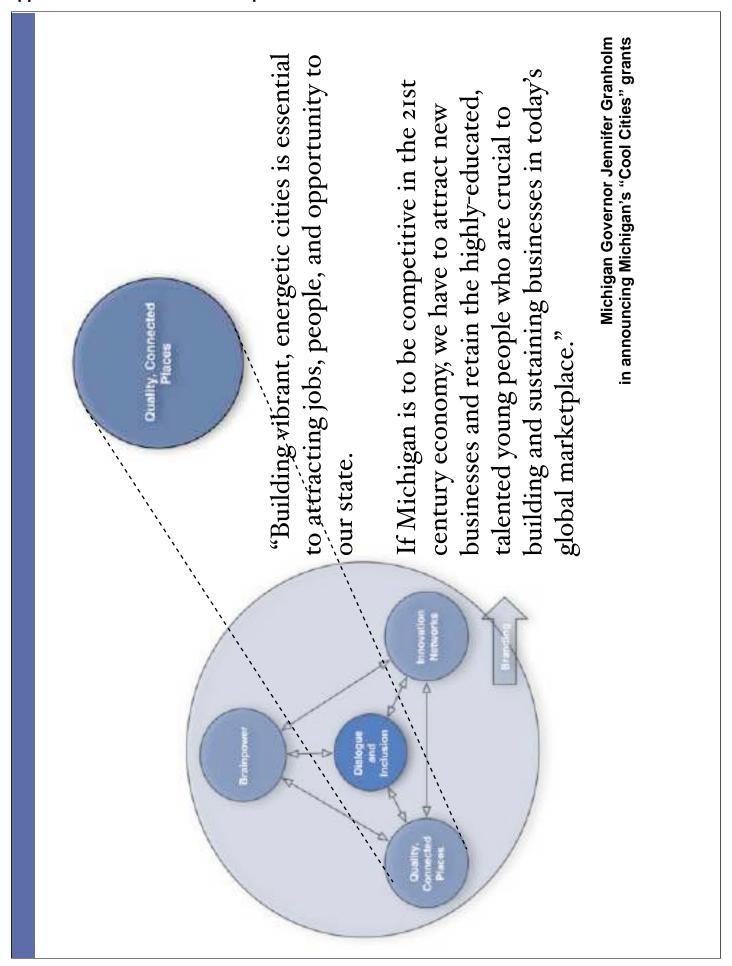
this license, visit http://creativecommons.org/licenses/by/2.0/ University developed Open Source Economic Development. It is The Center for Regional Economic Issues at Case Western Reserve Branding

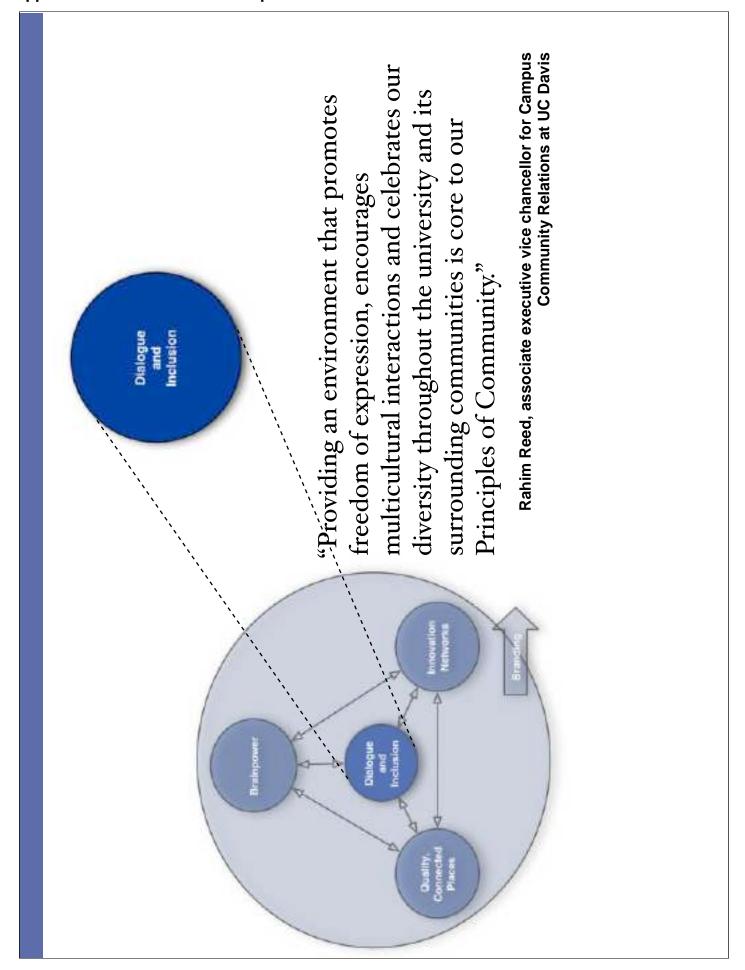


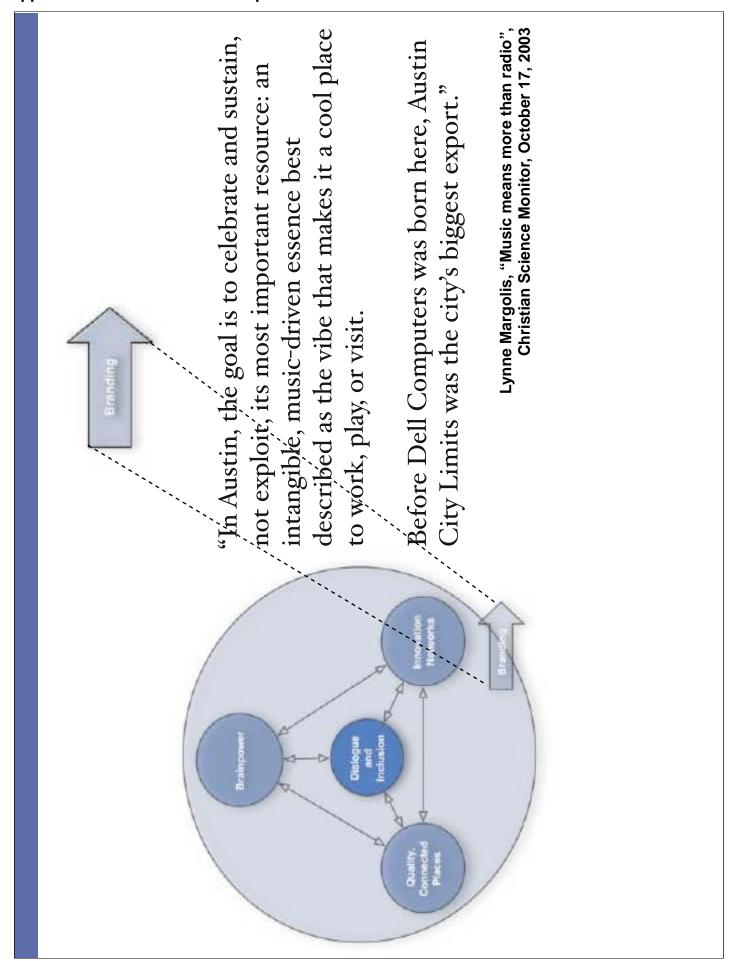
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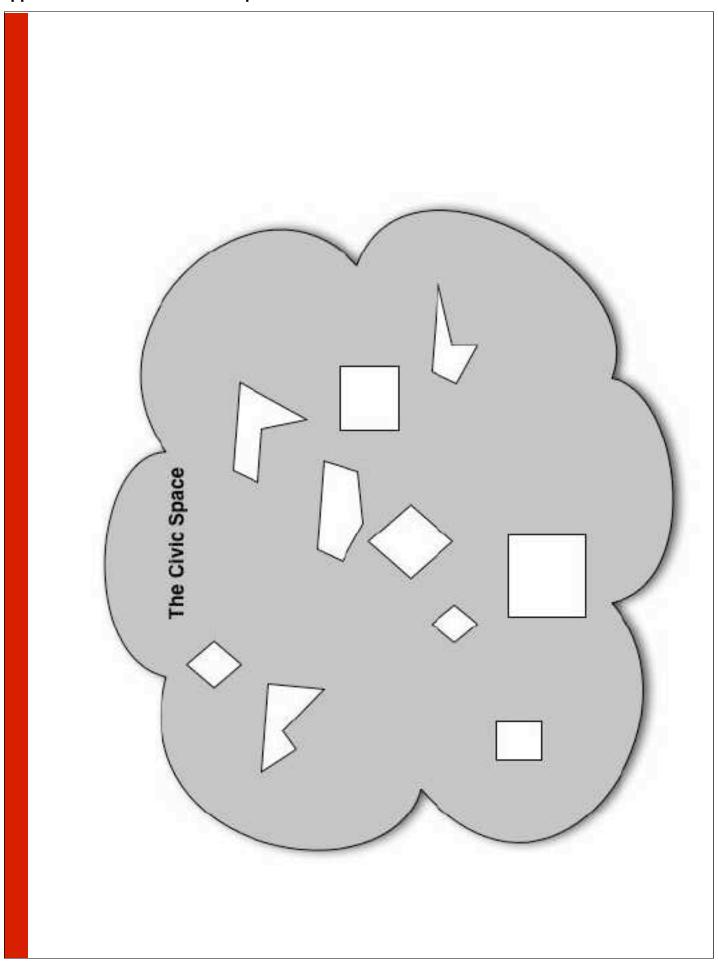


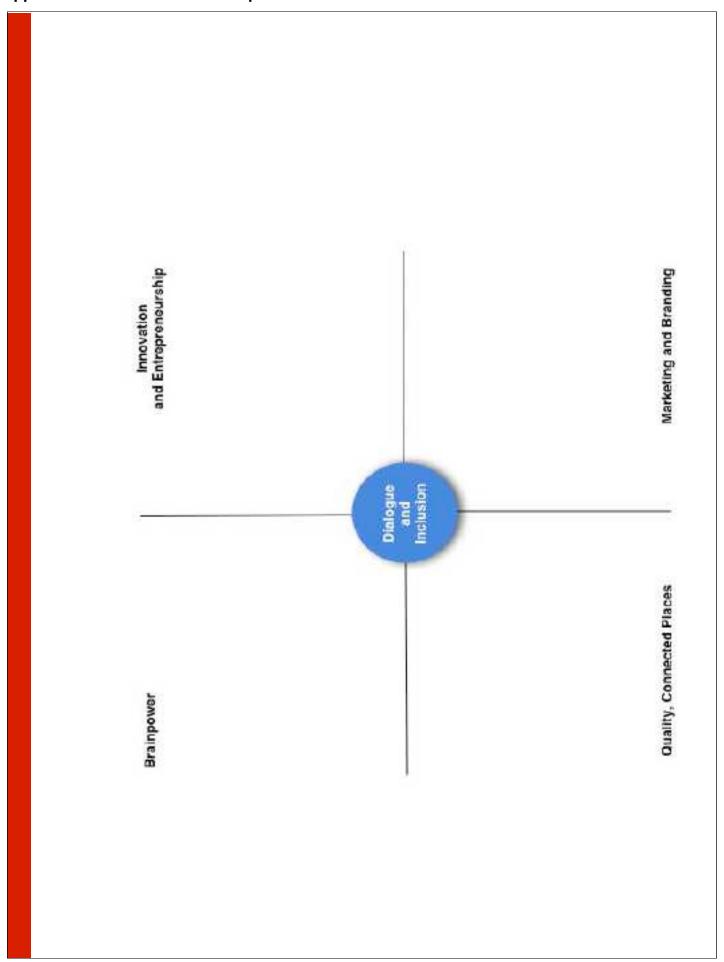


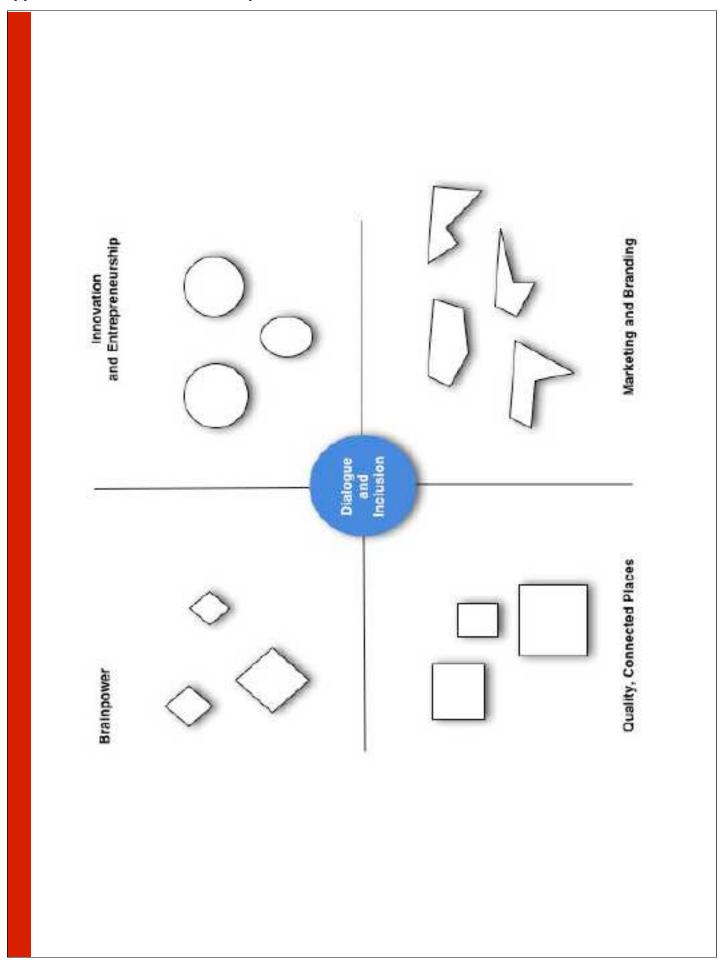


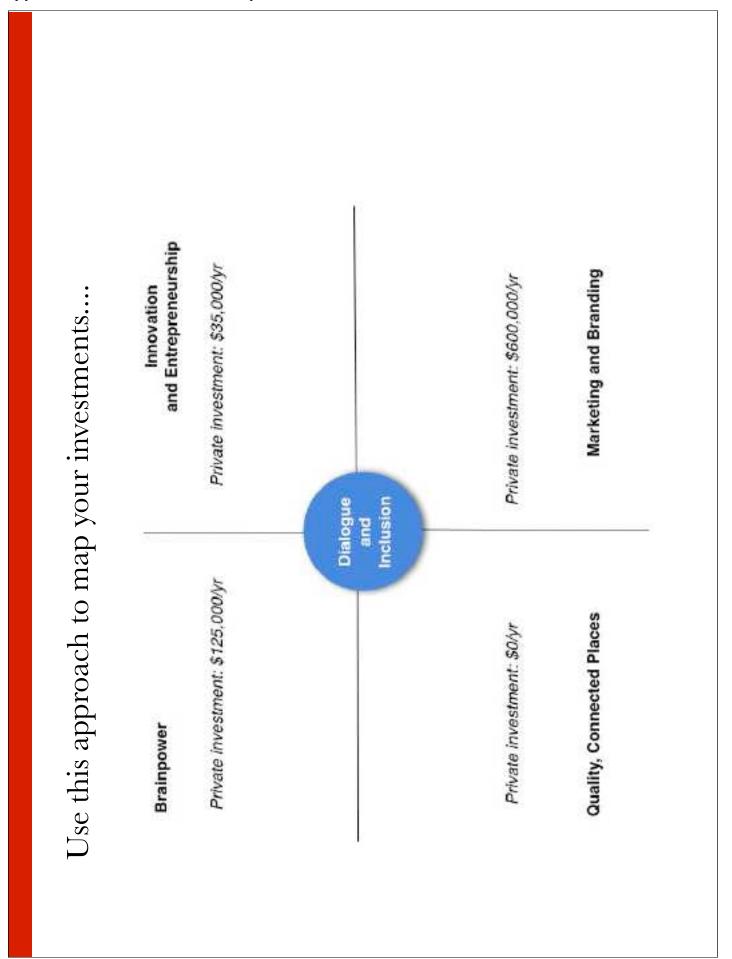




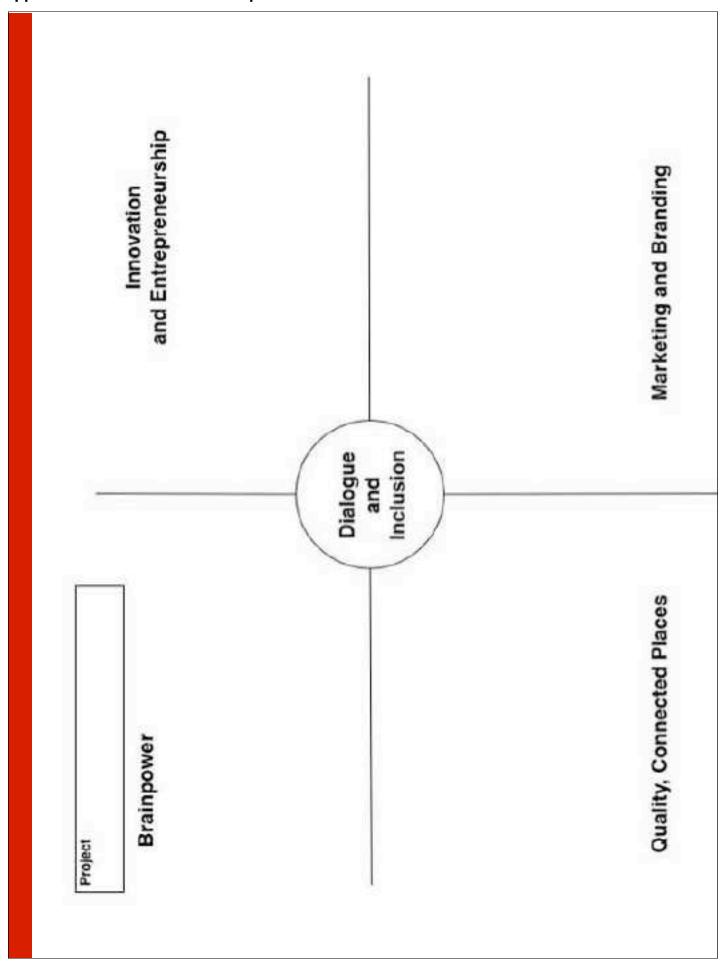




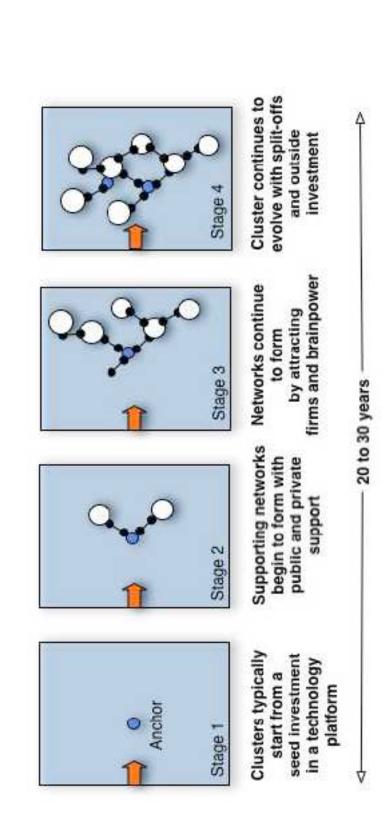


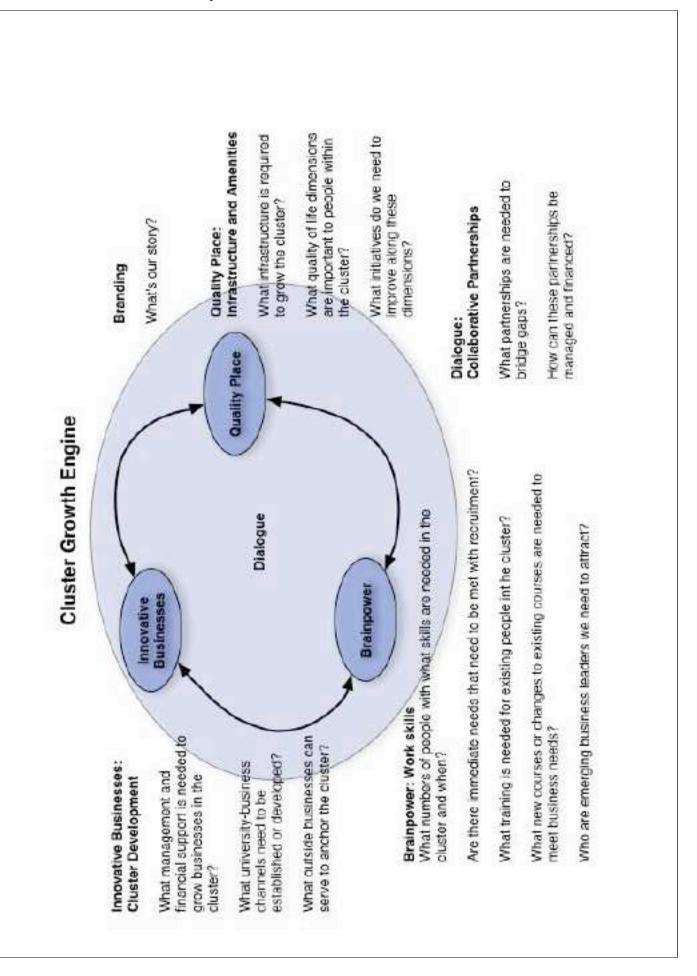


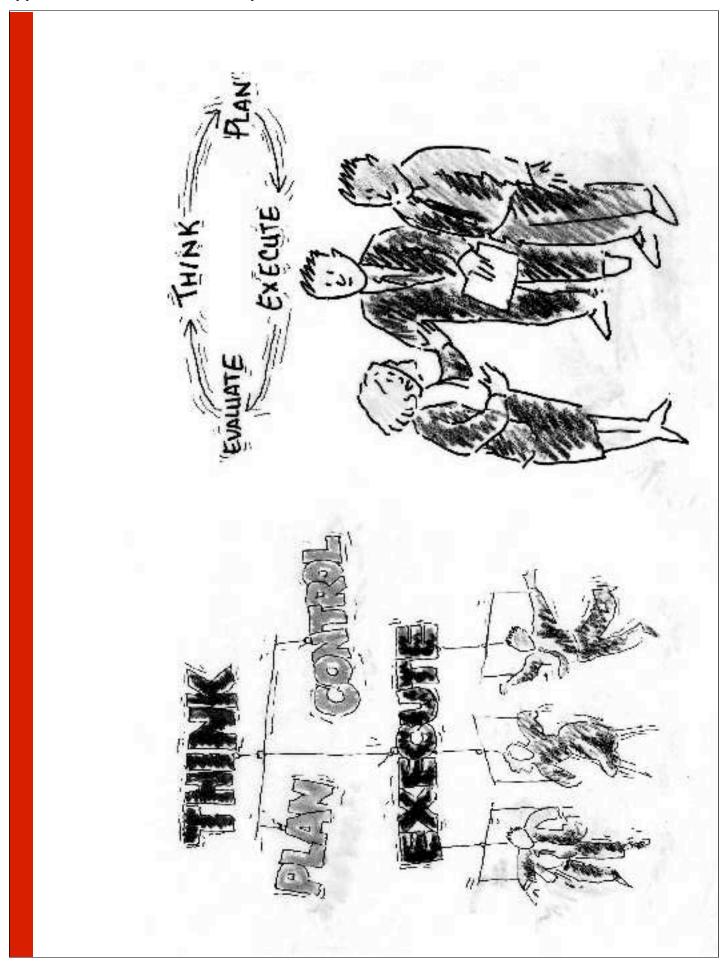
					17			2011		
Innovation and Entrepreneurship	Increase the number of high school students taking entrepreneurship courses by	300 per year	Increase the number of technology-based start-ups	by 20 per year		Develop 50 qualified	investment leads per year by 2010	Increase installed investment in wind energy systems to \$25 million by 2008		Marketing and Branding
				-	Dialogue and Inclusion)				-
Brainpower	Increase pre-school attendance by 1,500	Reduce number of children reading below grade level	in the third grade by 2,000	Reduce dropouts by 500 per year		Increase the number of	regional planning officials trained in sustainable growth concepts by 50 per year	Increase the penetration of broadband to 75% of	regional households by 2010	Quality Connected Places

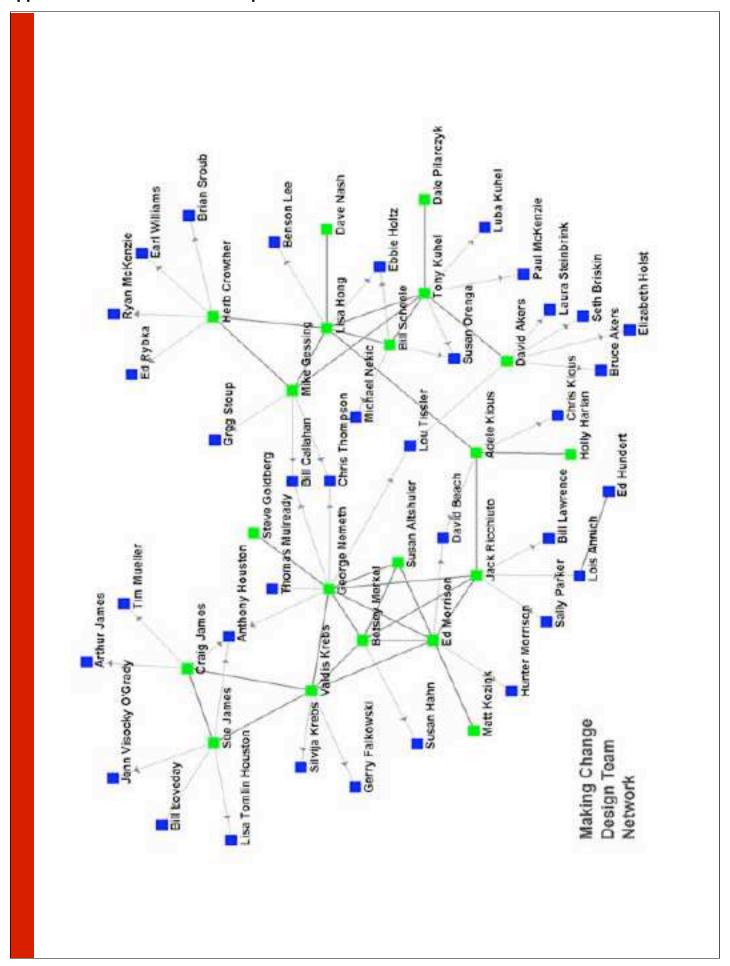


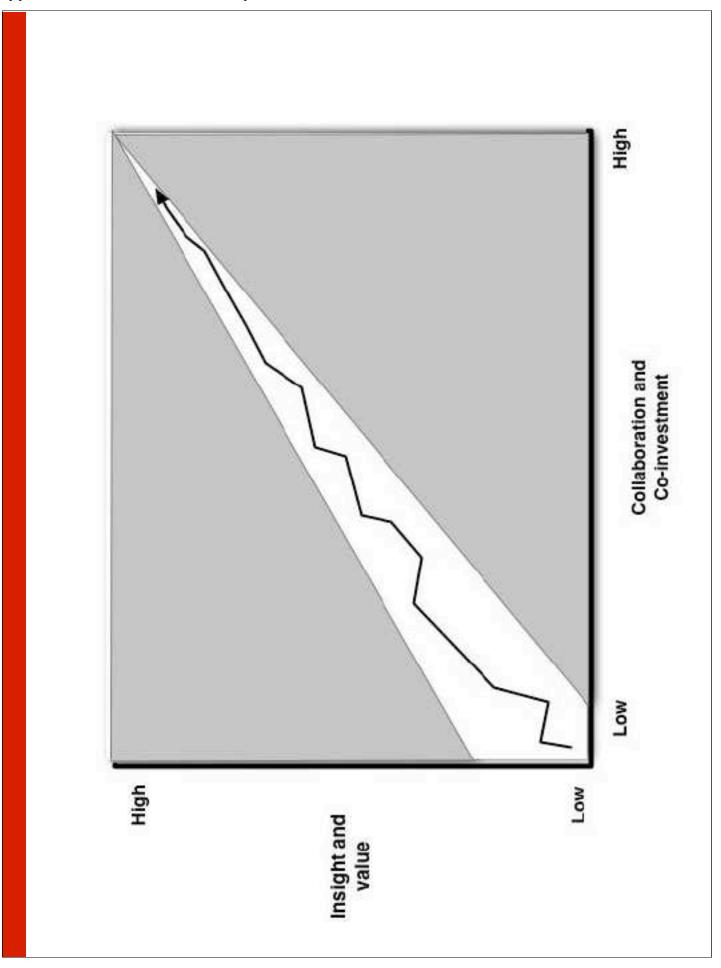
Forming clusters takes time...Can we accelerate the process through effective conversations?

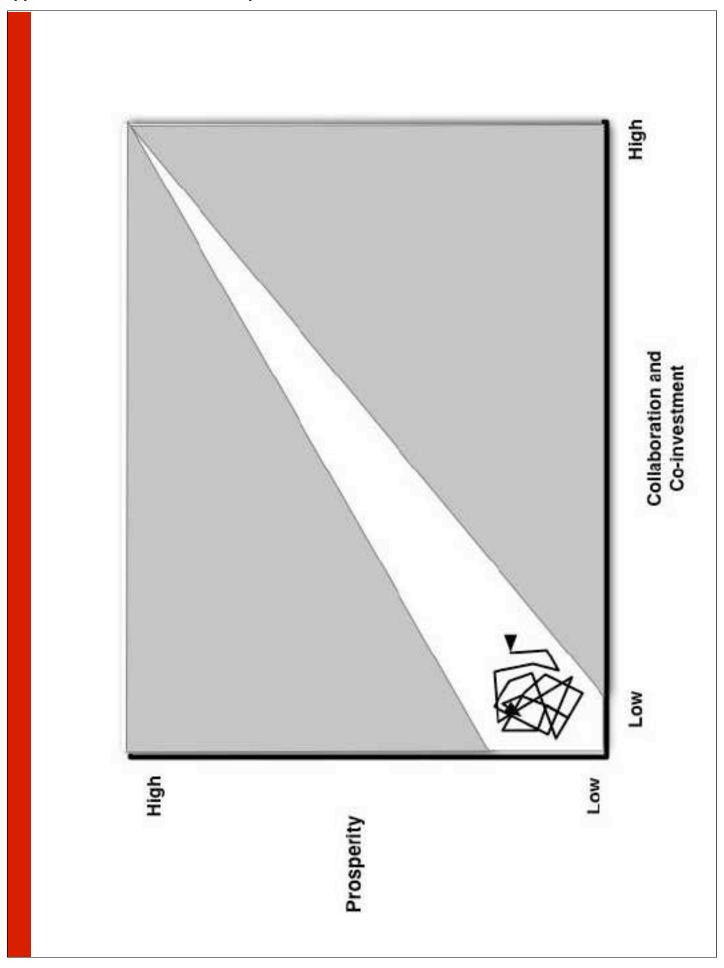


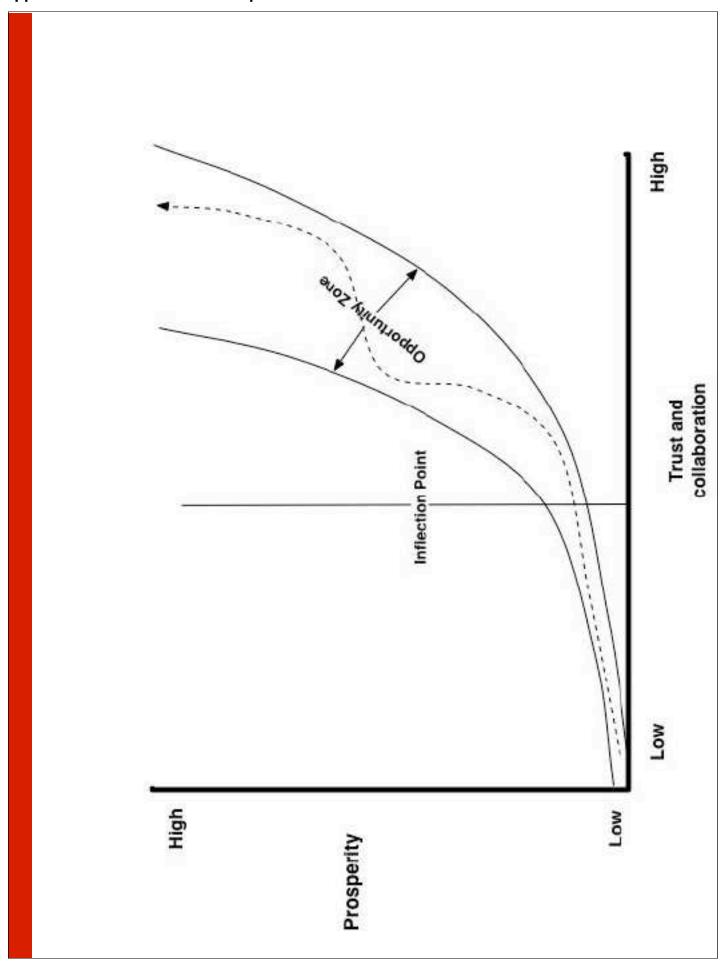


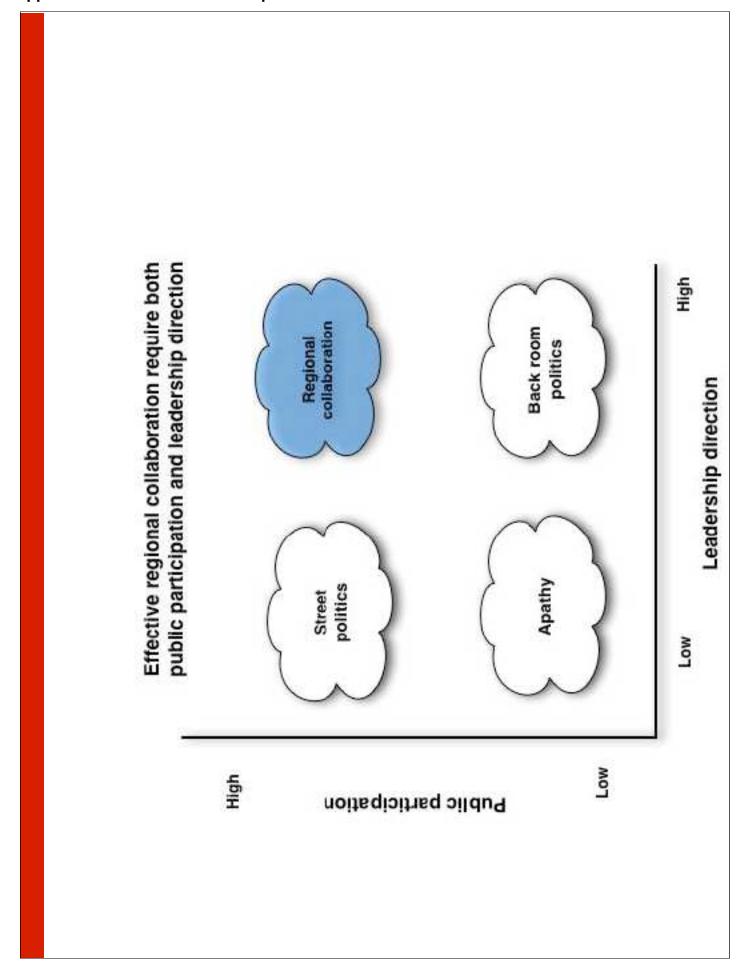


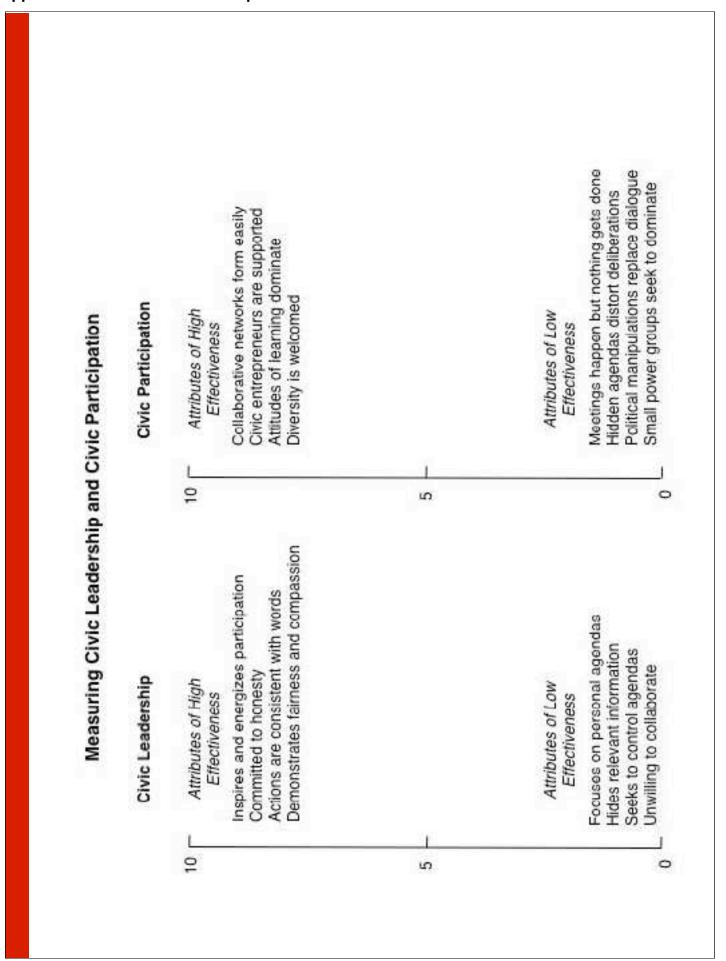


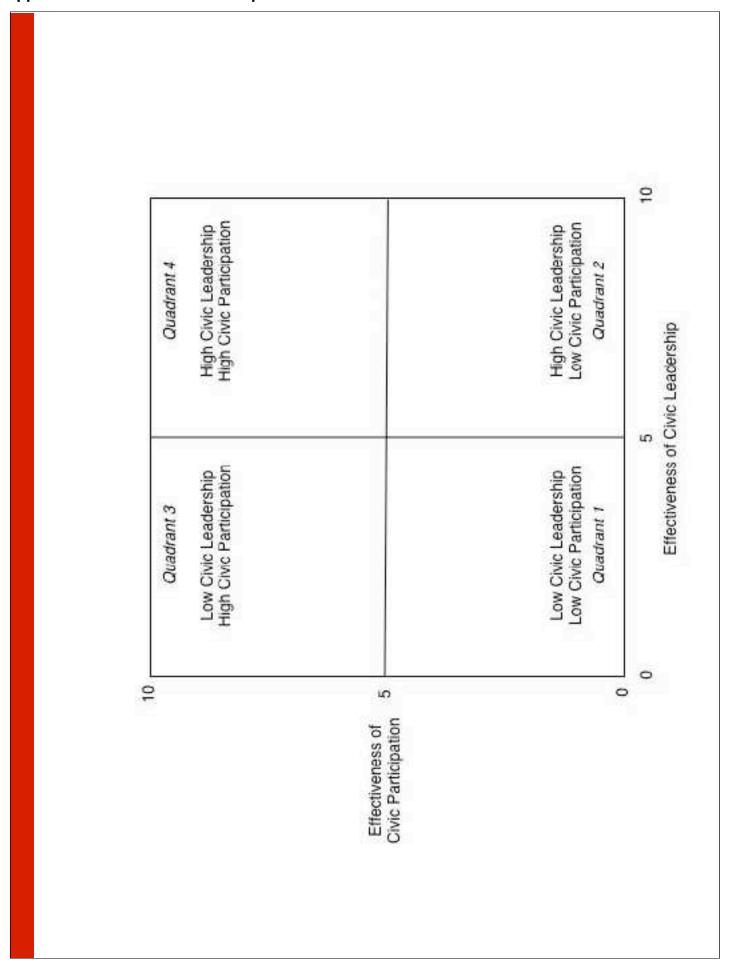


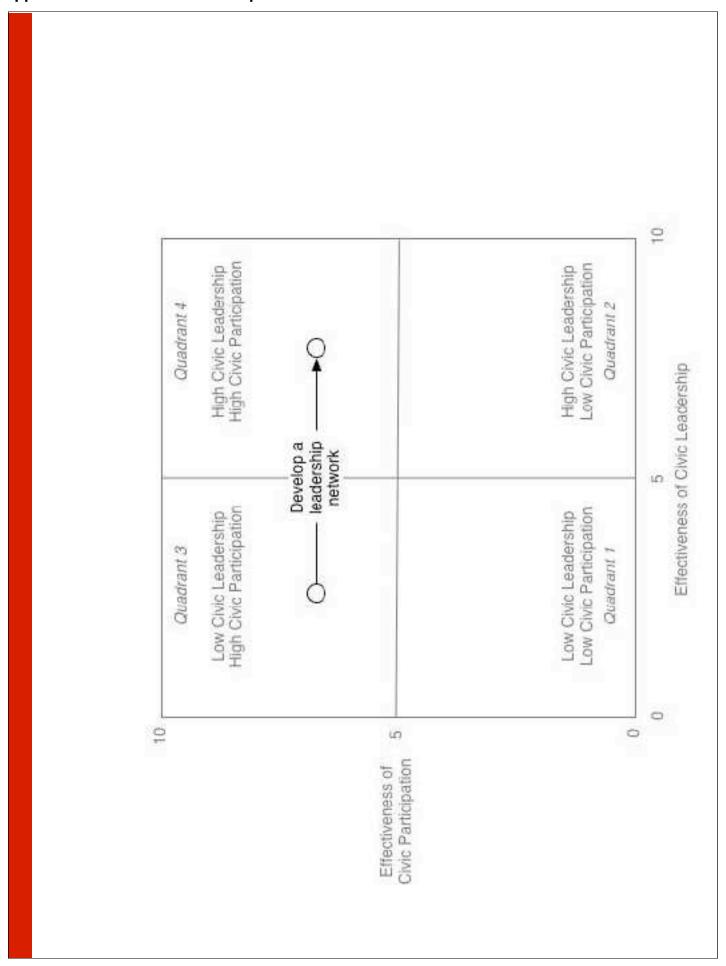


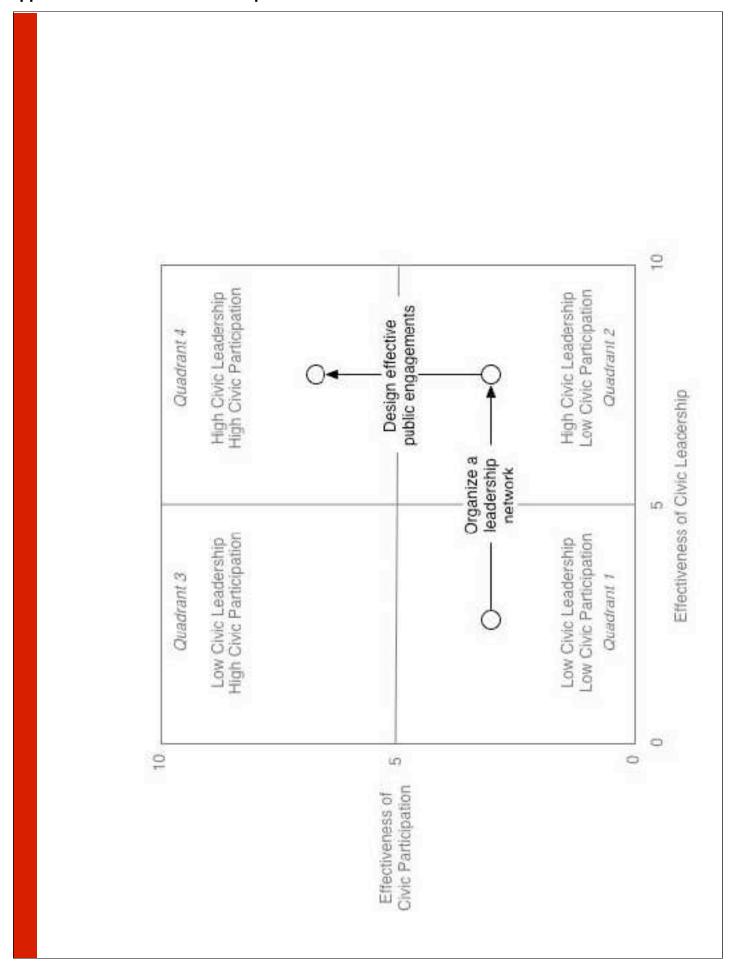


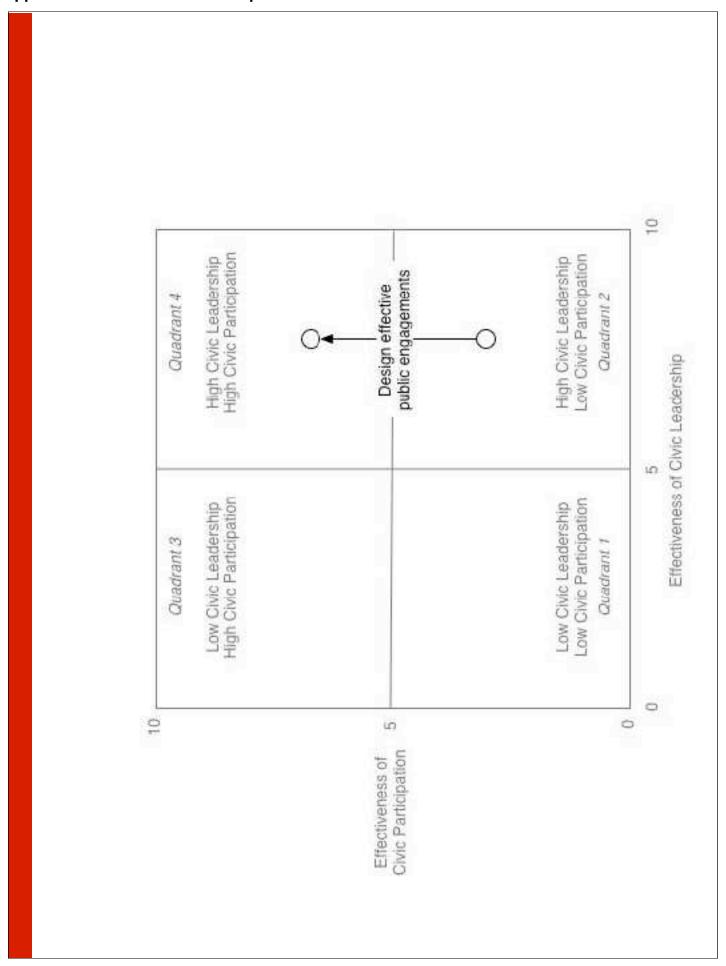


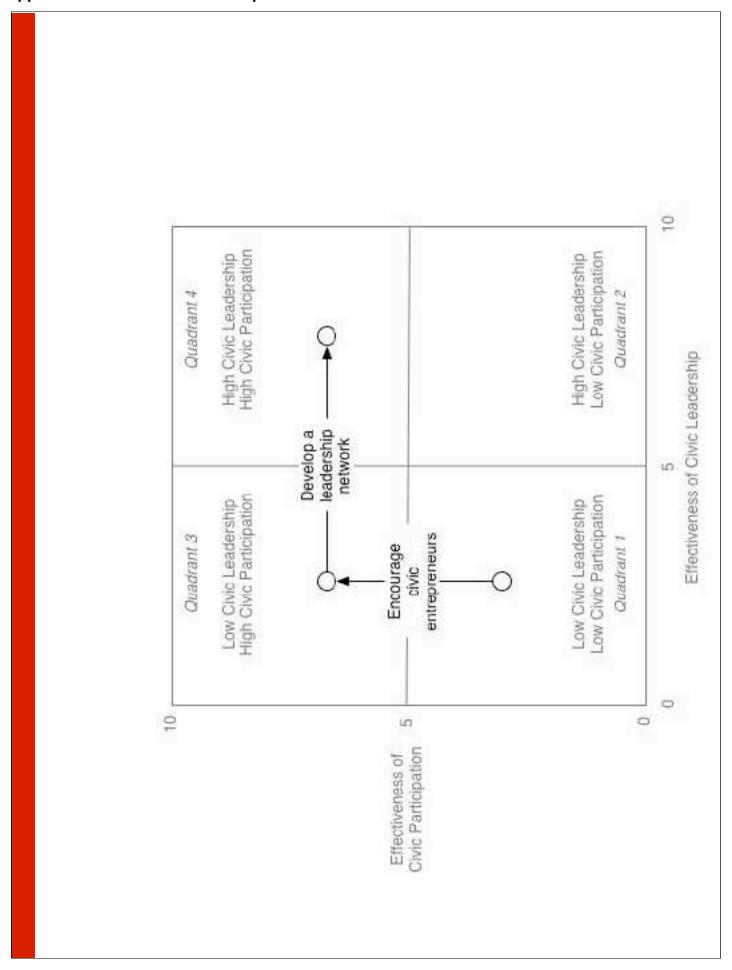


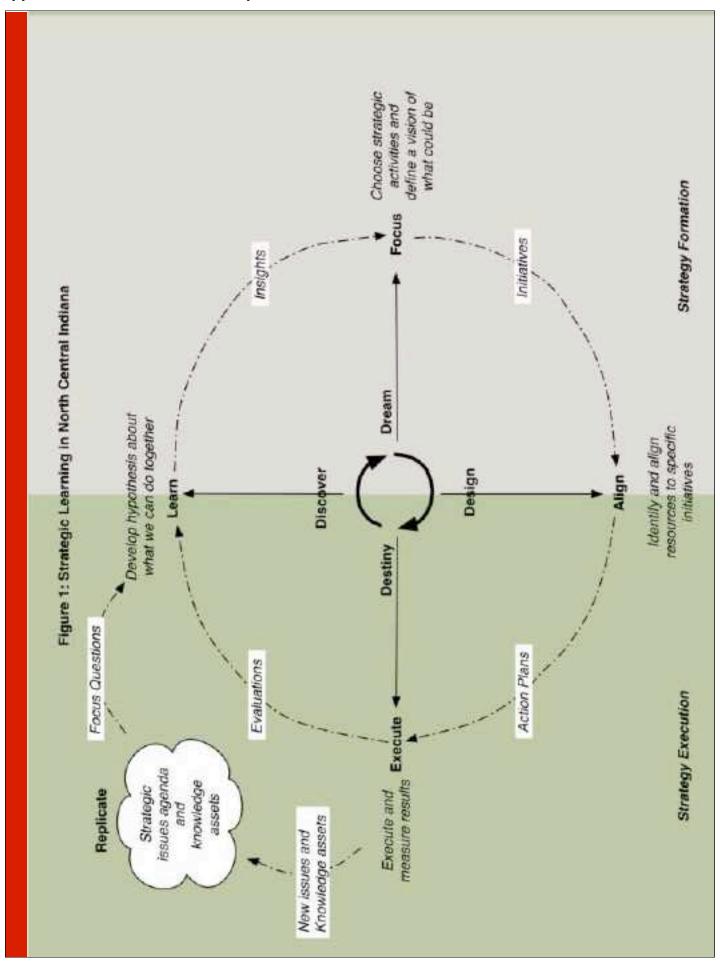


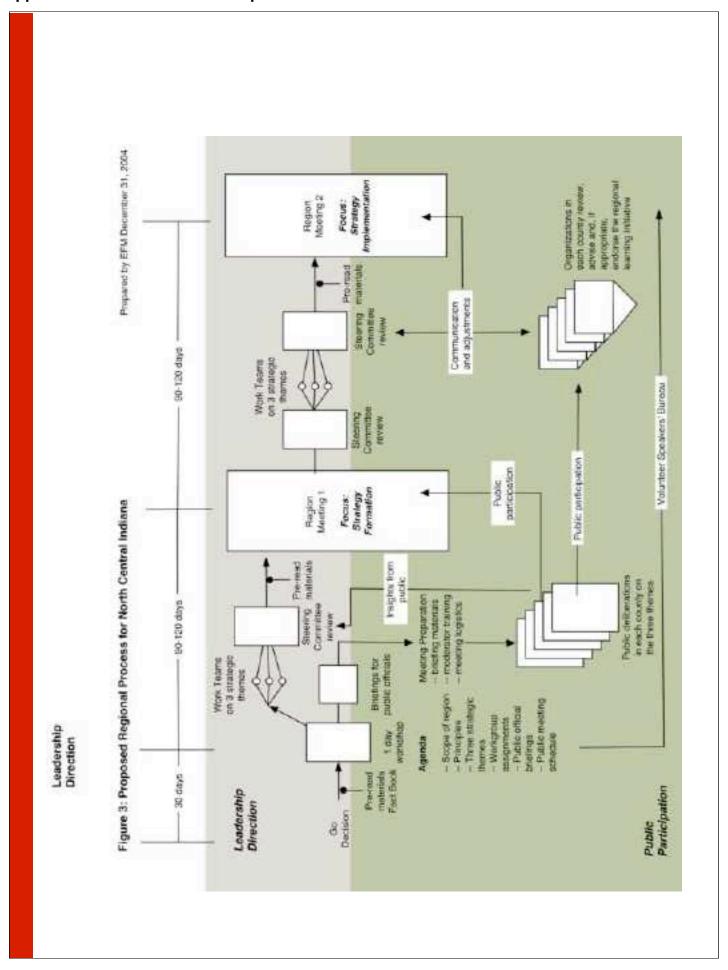


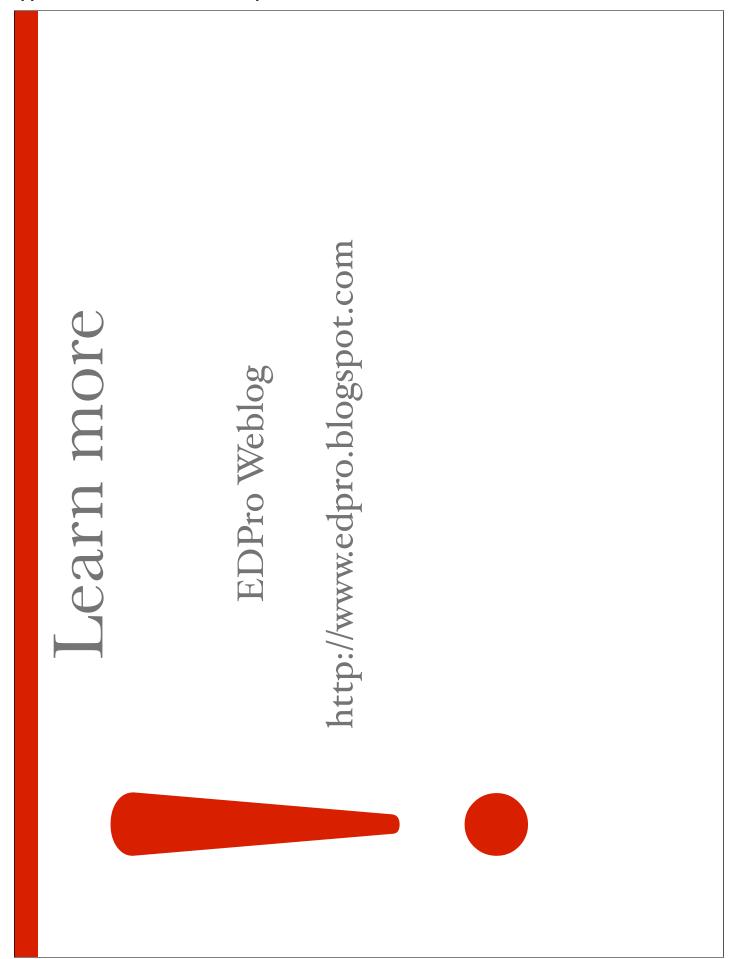












Strategic Planning Lab Strategic Doing Pack Ed Morrison March, 2007

Agenda

Introductions

Part 1: The Current Practice of Strategic Planning

Questions throughout

Part 2: Emerging Models of Strategic Doing

Questions throughout

Collaborative Workspace

Part I: Current State of the Practice

A call for volunteers

What is a strategy?

where you are and where you want to go A strategy draws logical links between

A strategy is a set of models, tools and civic processes to get you from here to there Vision

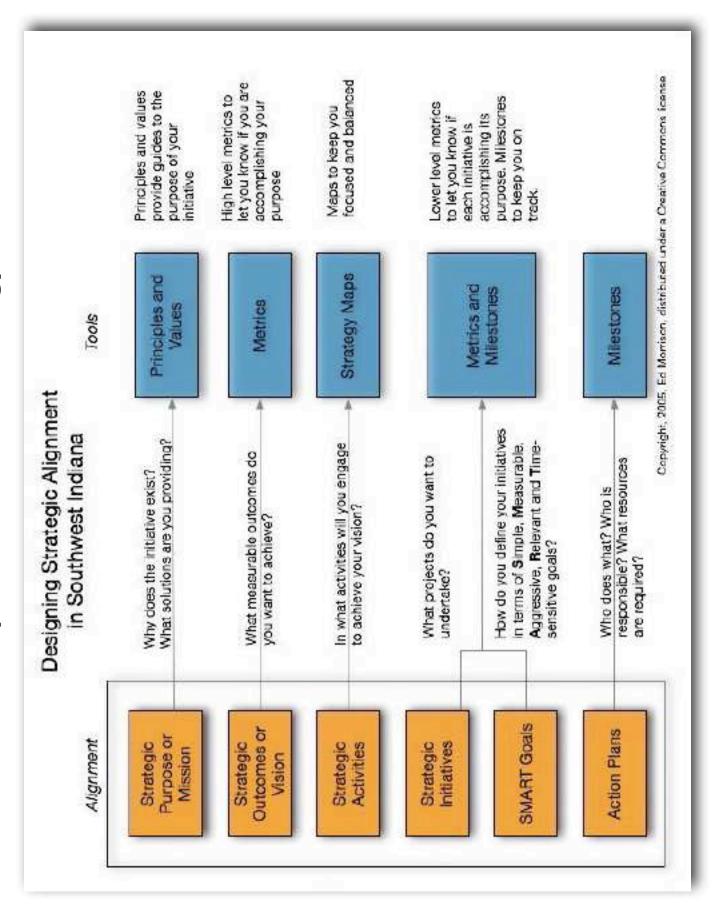
Mission

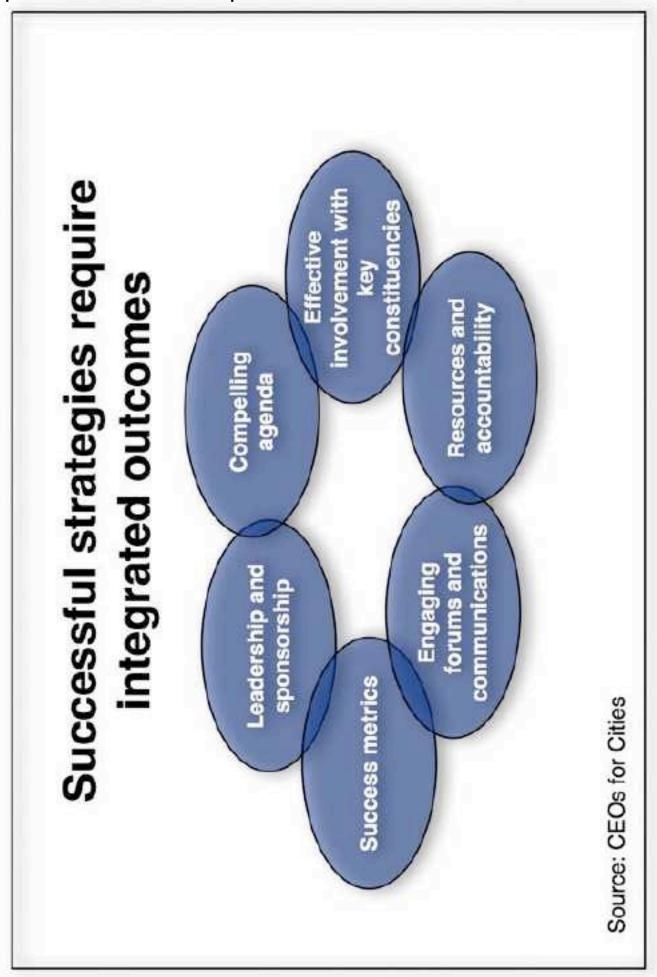
Activities: Core Competencies SWOT

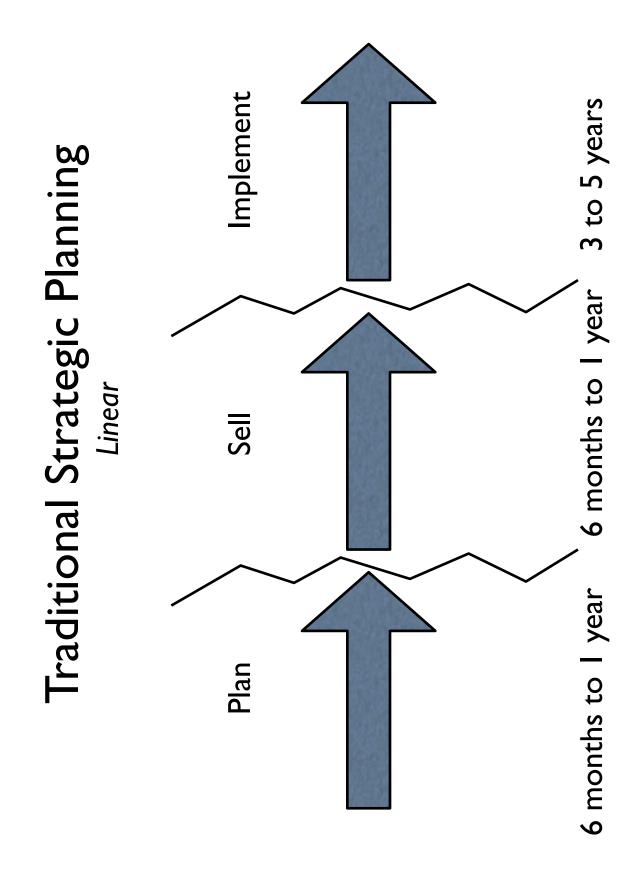
Strategic Initiatives: Projects

Action Plans and Budget

Components of a Strategy



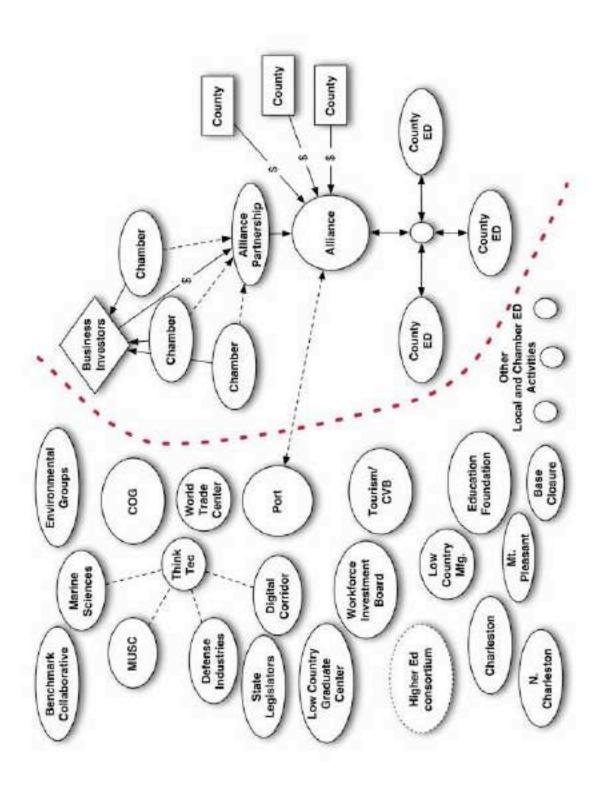




SWOT: Leverage strengths to opportunities and manage weaknesses to anticipate threats

	Strengths	Opportunities
Positive	Positive Internal	Positive External
	Weaknesses	Threats
Negative	Negative Internal	Negative External
_	-	- L

Straightforward concepts are hard to apply



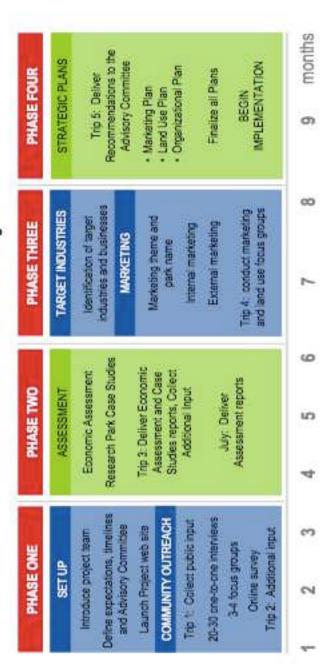
Economic development organizations in metro Charleston, SC

Examples: Manchester, NH and Tri-Cities, WA

Manchester's Global Economic Development Strategy



Process: Research District Land Use and Marketing Plan



Exercise 1 Developing a Plan for the Plan

What are you trying to accomplish? What does victory look like?	
What topic or issues need to be addressed	
Who are the stakeholders?	
How much time do you have?	
How much budget do you have?	
What staff resources do you have?	

Summary Plan for the Plan

Phase 4	
Phase 3	
Phase 2	
Phase I	

Estimated Elapsed Time in Months:

Estimated Budget:

Activity	Start Date	End Date	Who is responsible?
Phase 1			
Assemble a core team	June	July	Me

Steps in a Strategic Process

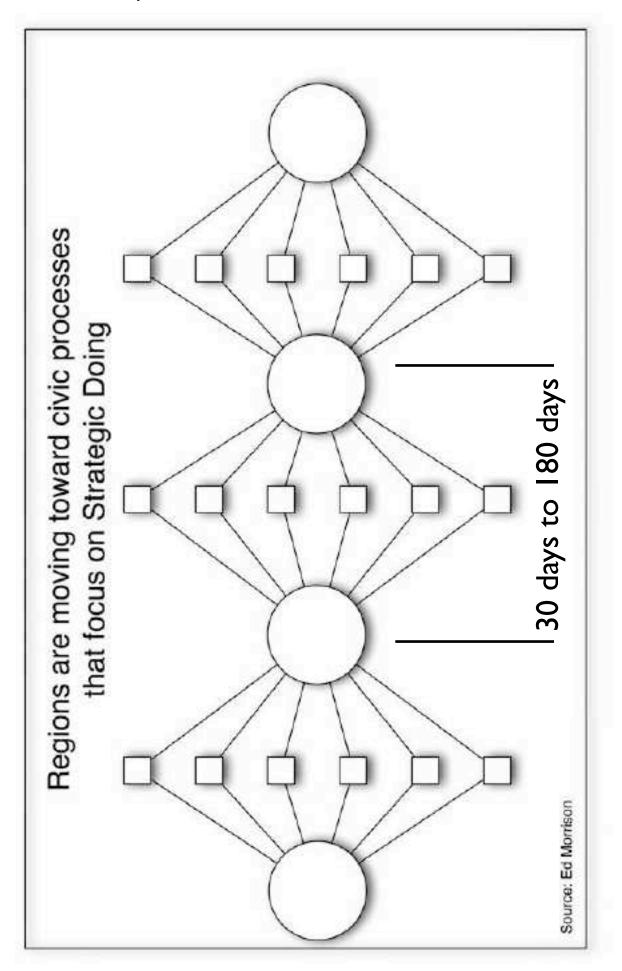
The current state of the practice

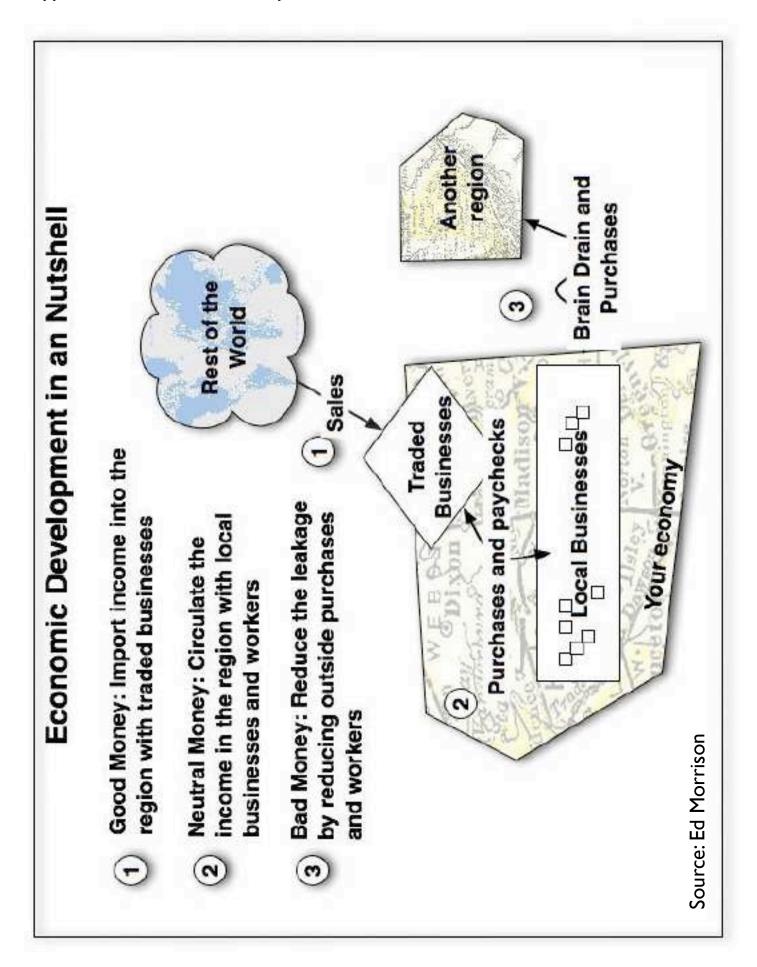
- Assemble a Core Team and Outline Scope for the Process: who, what, when, where, how
- 2. Draft a "Plan for the Plan"
- 3. Consult with stakeholders and revise the Plan for the Plan
- Conduct baseline research; Launch project web site
- Draft one or more Reports to Frame Issues and Opportunities
- Use Forums and Workshops to Refine Initiatives 9
- Define an Action Plan, Budget and Review Process
- 8. Launch and Celebrate

Part 2: Emerging Practices of Strategic Doing

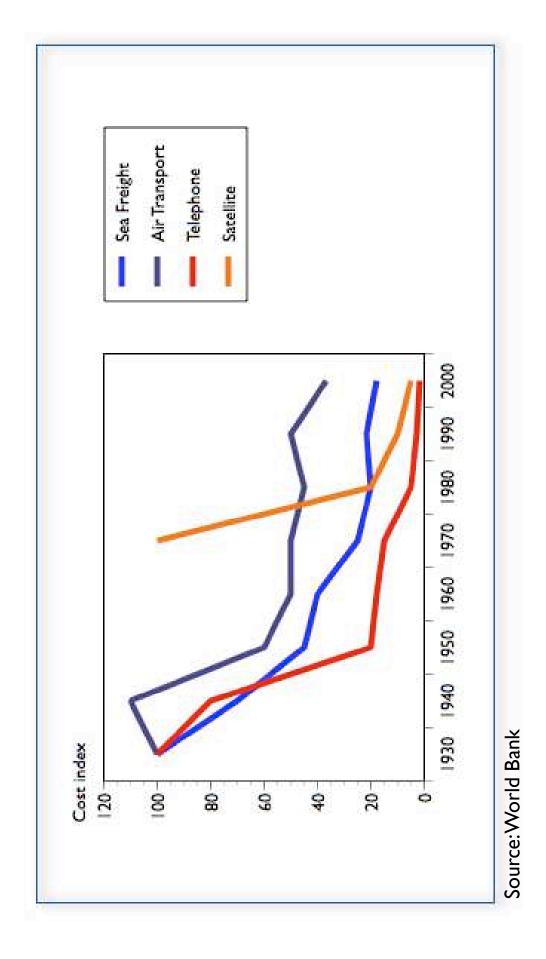


New Forms of "Strategic Doing" Networked

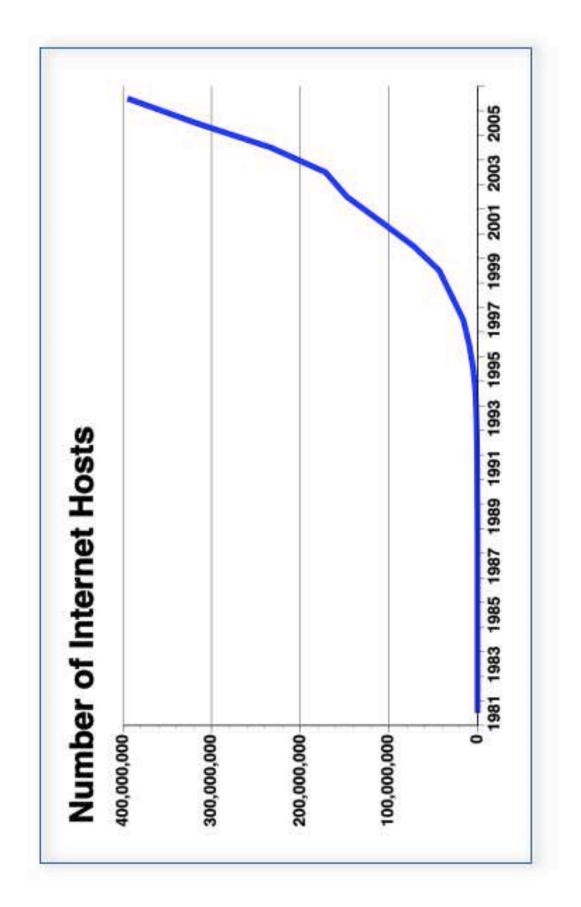




Costs have collapsed as global markets integrate... This process started in the mid 1950's



The Internet has exploded...Welcome to our first interactive mass medium

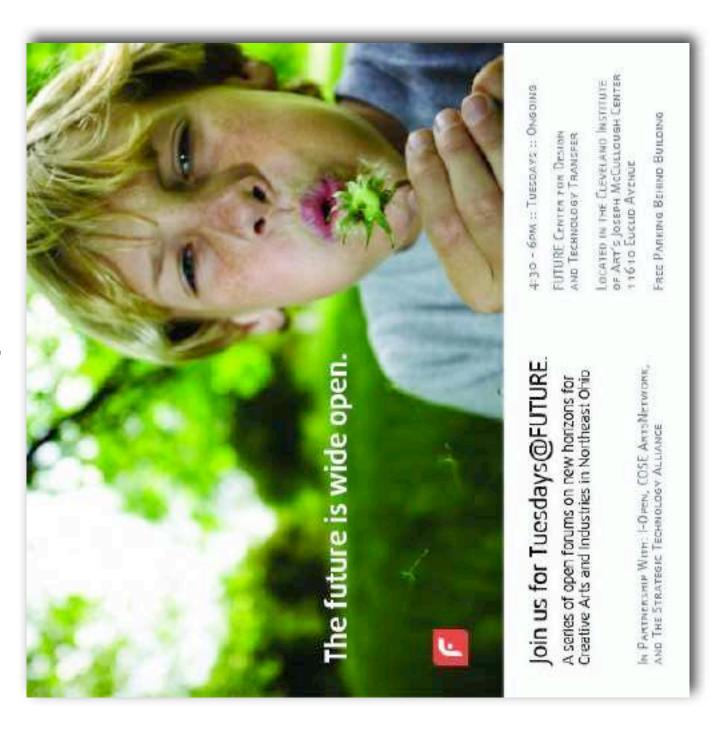


Source: Internet Systems Consortium

Source: Ed Morrison



The consequences....



Key Point 1

We need to shift our thinking from hierarchies to networks

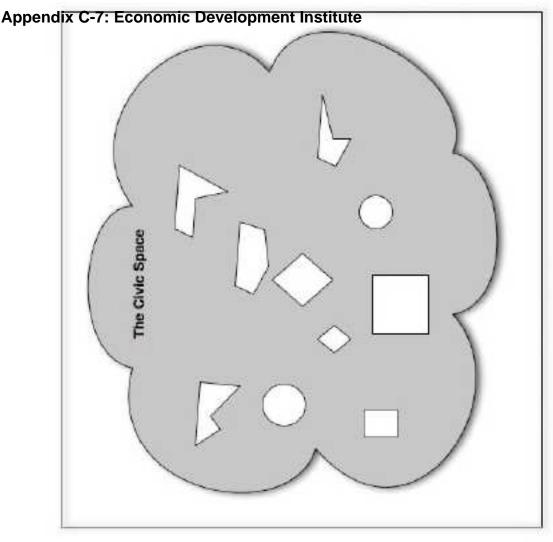
bottom...only links and nodes

There's no top...no

Key Point 2:

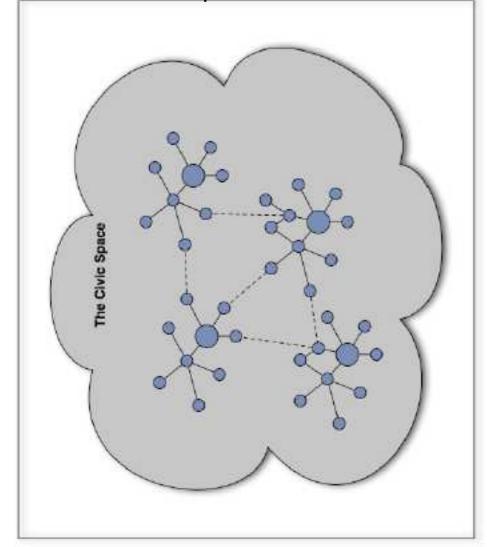
Command and control does not work in the civic space

We cannot argue our way to prosperity



Source: Ed Morrison

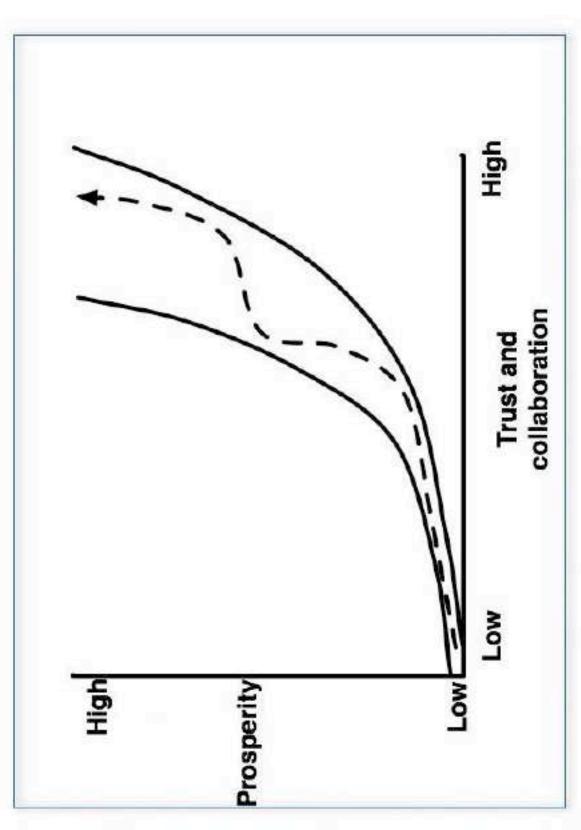
Appendix C-7: Economic Development Institute



Source: Ed Morrison

Key Point 3:
We need to
connect and align
our resources in
the civic space

The implications of **networked** business models

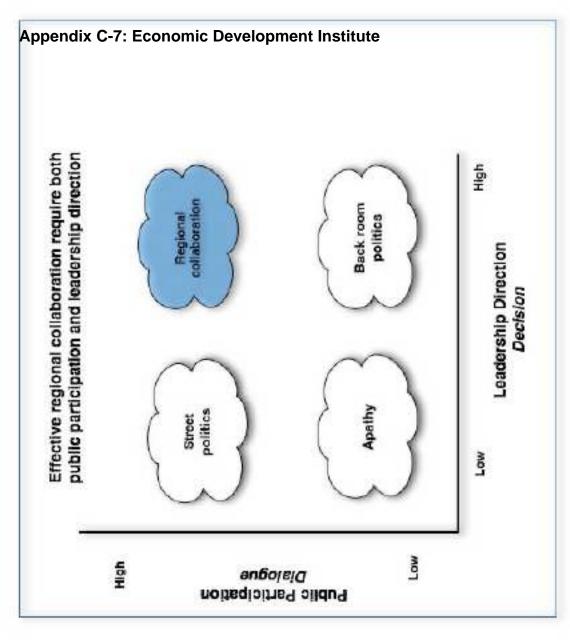


Source: Ed Morrison

Key Point 4:

We need continuous civic engagement...

New leadership habits of collaboration



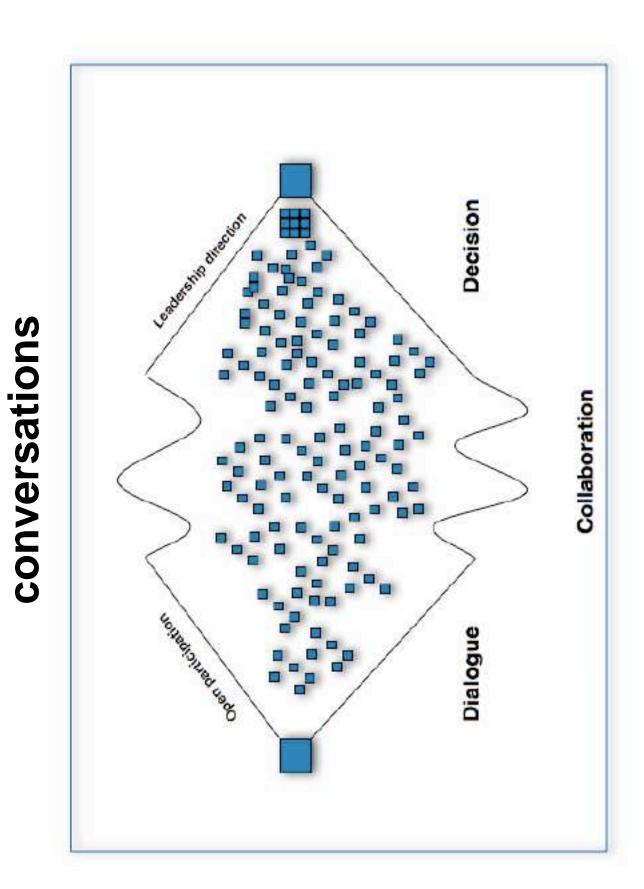
Source: Ed Morrison

Key Point 5:

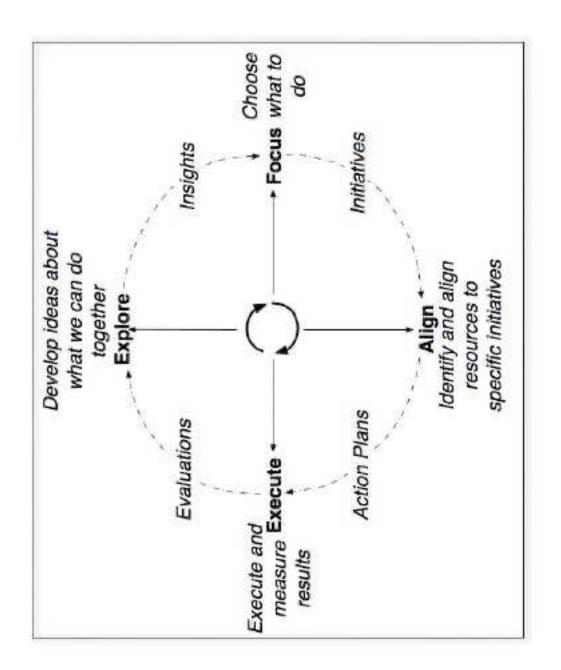
People move in the direction of their

conversations

Key Point 6: We need open participation and leadership direction to guide our



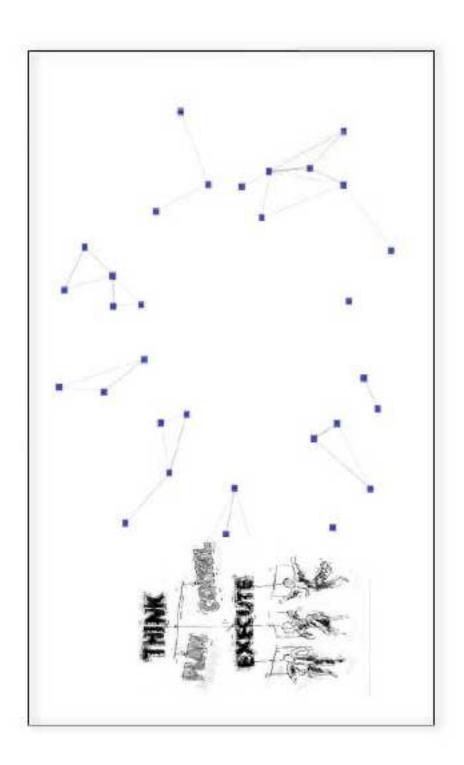
We need to develop the practice of "strategic doing" Key Point 7:



Source: Ed Morrison

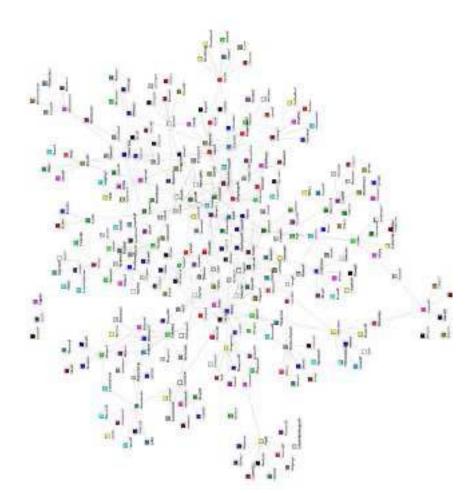
Key Point 8:

People are still living in a Curve 1 world Most regions are fragmented...



Key Point 9:

We can use network maps, new leadership skills and "strategic doing" to weave our networks



Source: Map of leadership network in Evansville, IN using Inflow software developed by Valdis Krebs

Key Point 10: To build regional collaboration, take the Shanghai perspective

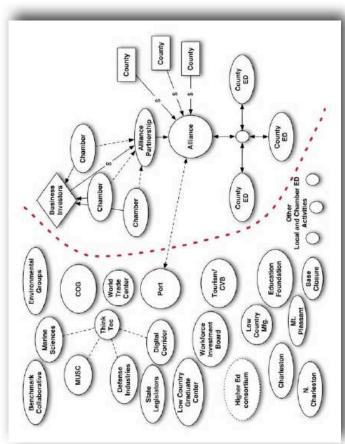


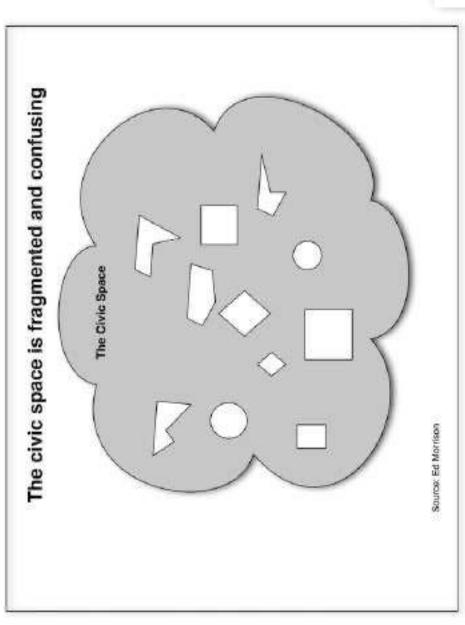
Their View

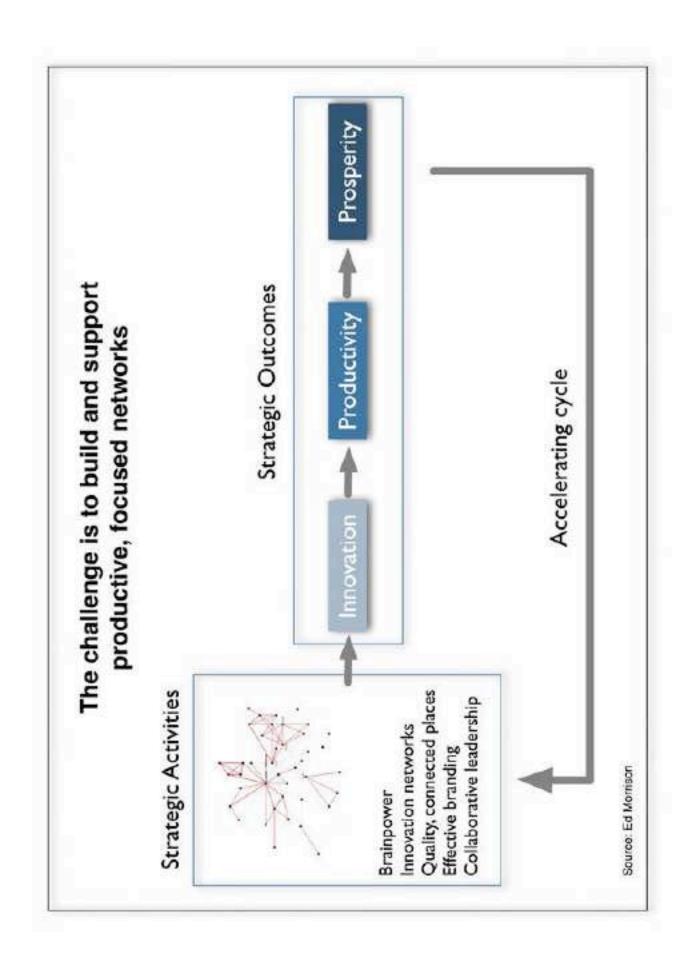


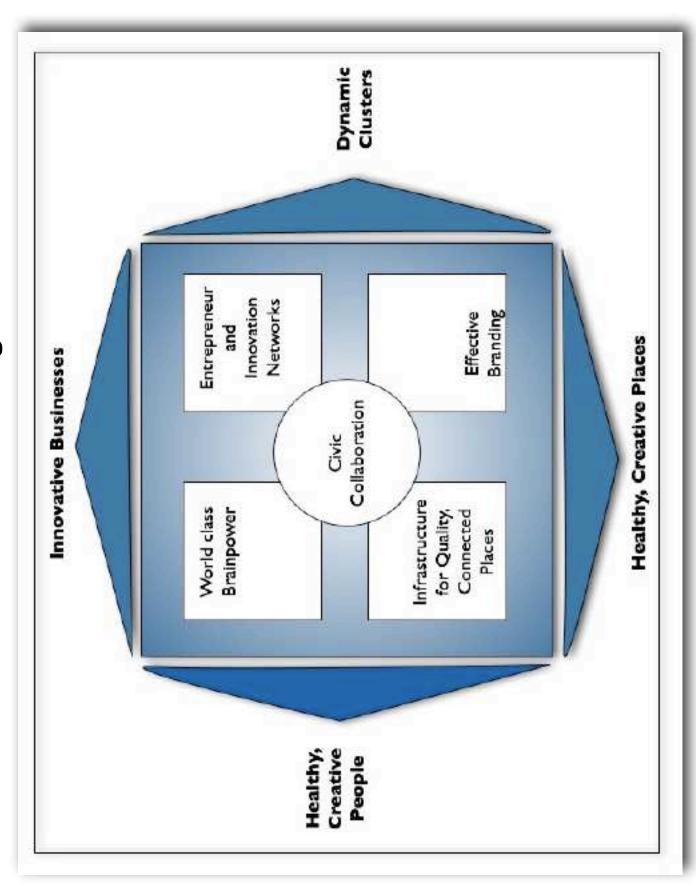
Our View

Appendix C-7: Economic Development Institute

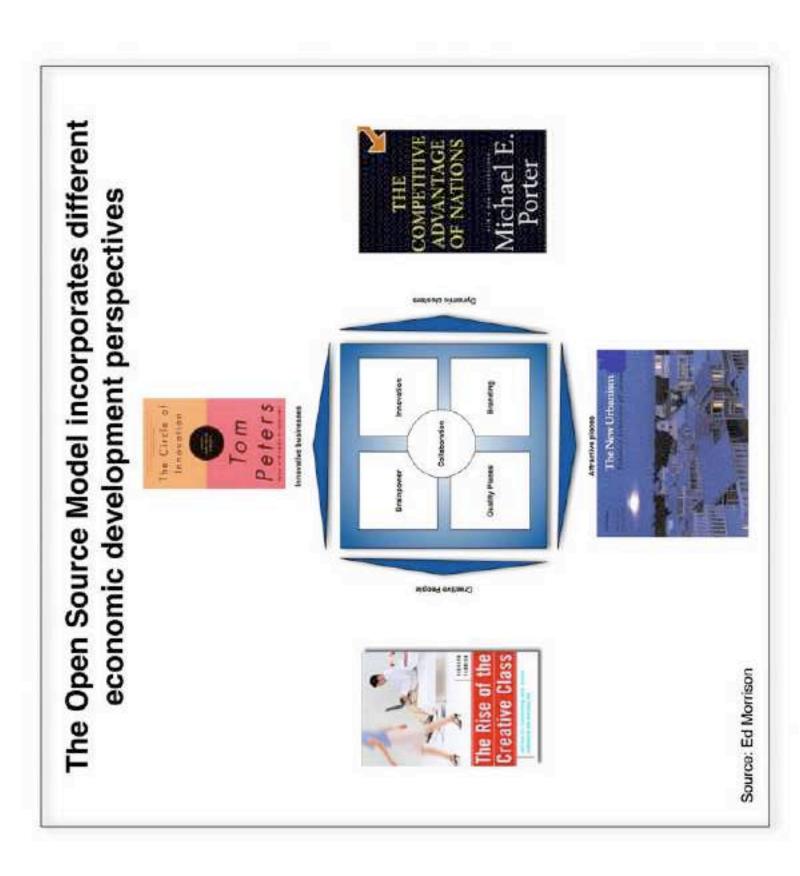




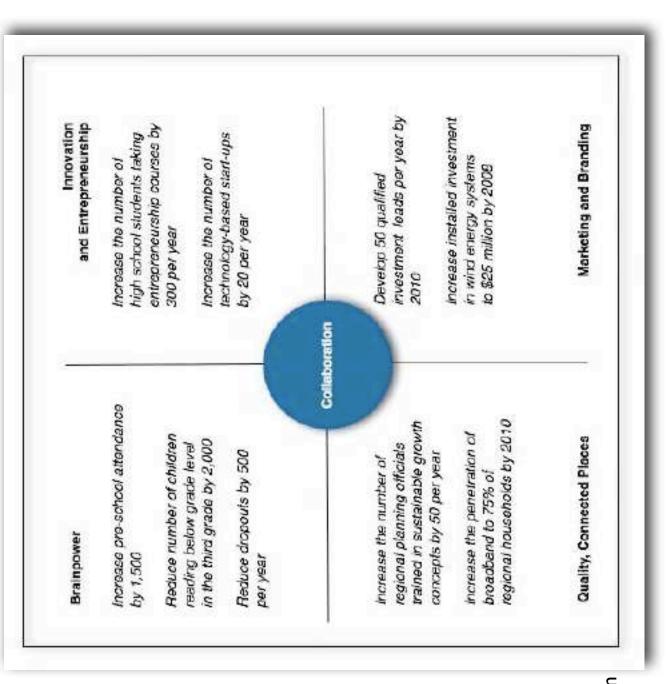


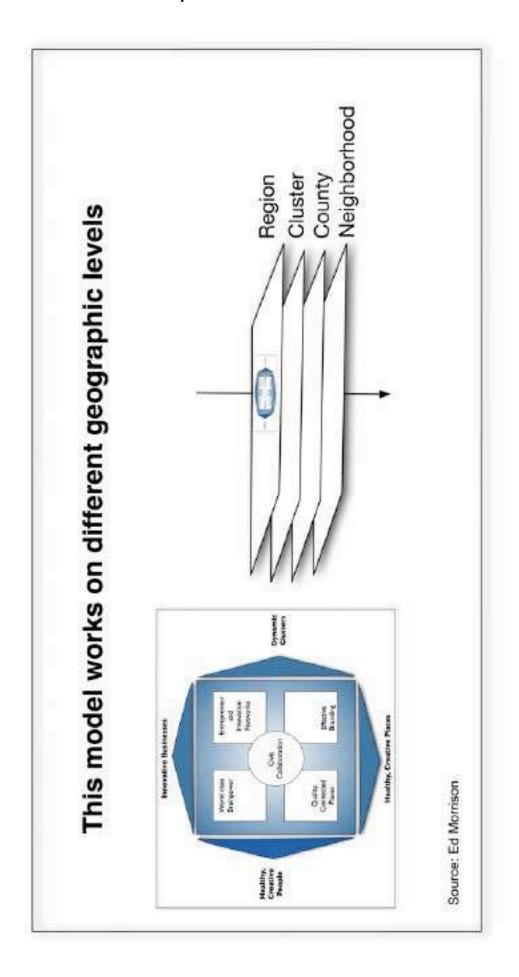


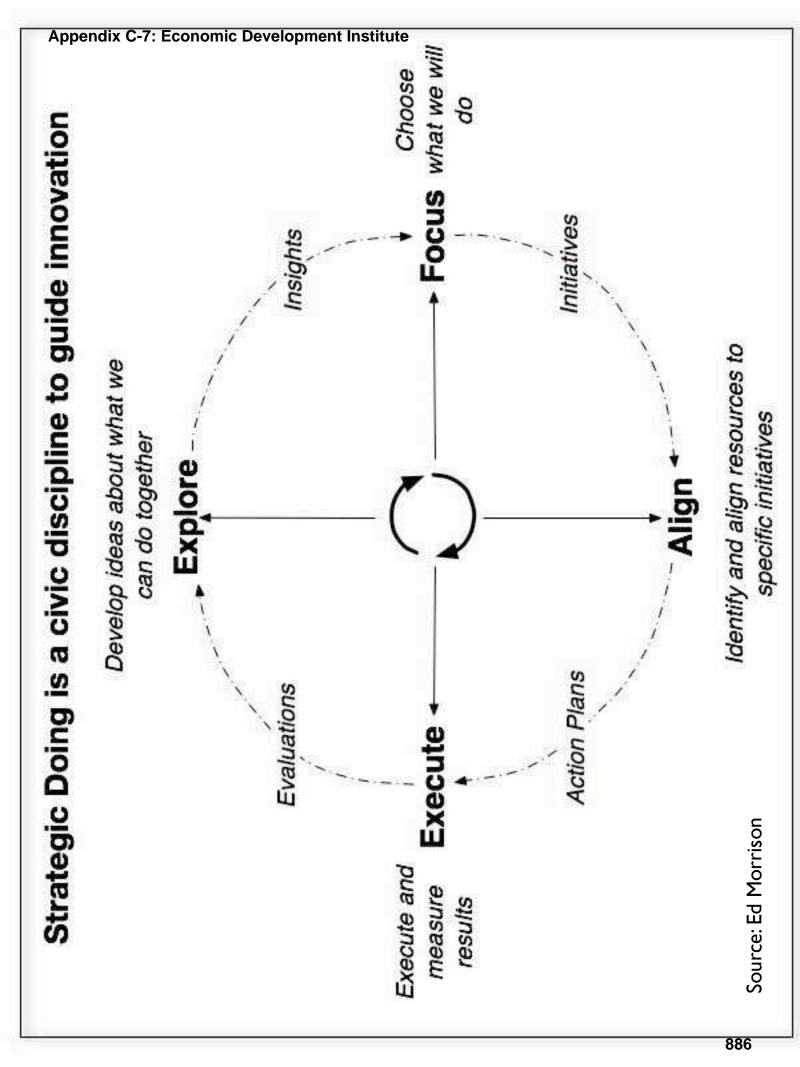
Source: Ed Morrison

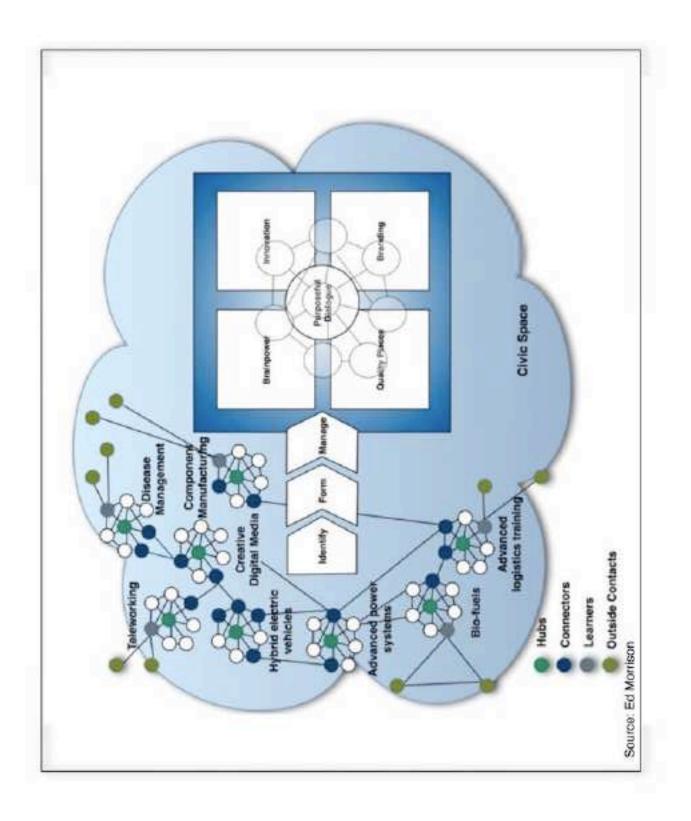


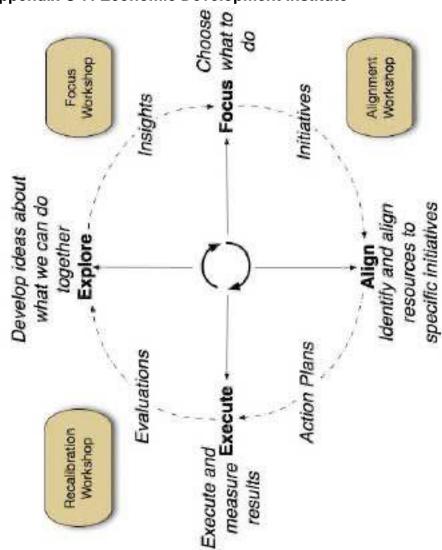
You can use this framework to map resources and goals











NEAD PARTNERS

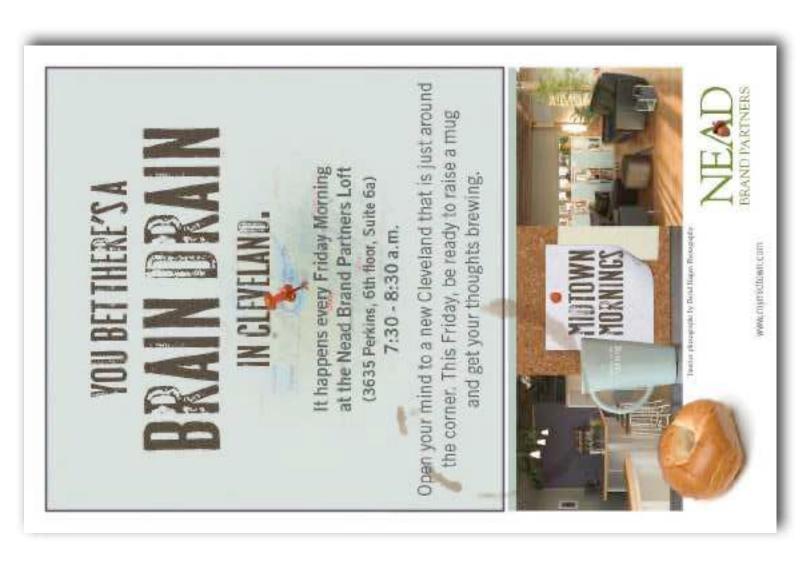
There's a buzz about Midtown.

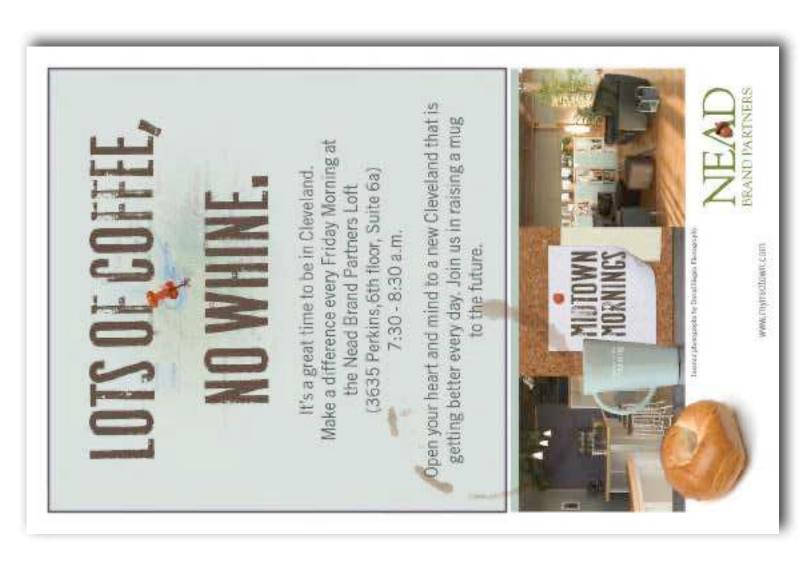
Civic forums provide the venue to define new opportunities and practice new civic behaviors

Use workshops and workshop exercises to move people around the circle. Use civic forums to build habits.











EVERYONE LEAVES WITH A R 1177

(Which is only partly due to the coffee.)

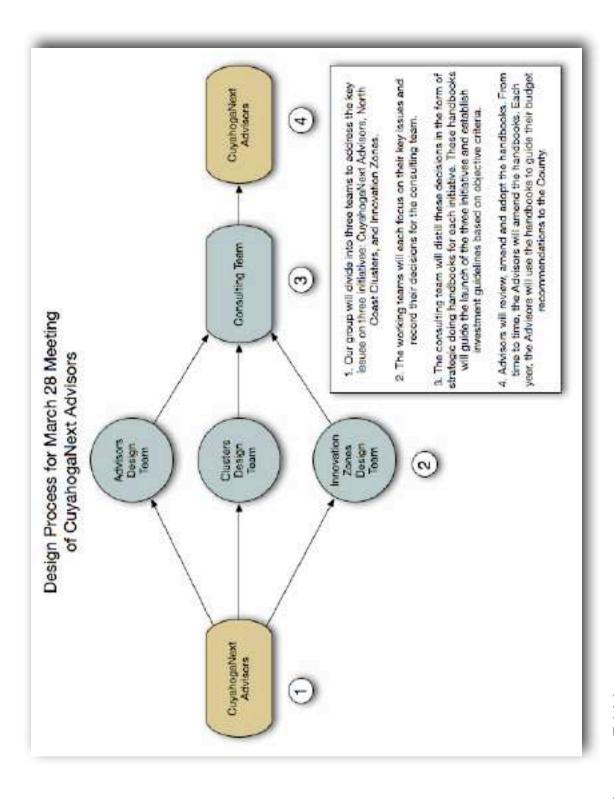
Bigger and better ideas for accelerating Cleveland's innovation and growth are brewed right here, every Friday Morning at the Nead Brand Partners Loft (3635 Perkins, 6th floor, Suite 6a)

7:30 - 8:30 a.m.

Open your mind to a new Cleveland that is just around the corner. This Friday, be ready to raise a mug and get your thoughts brewing.

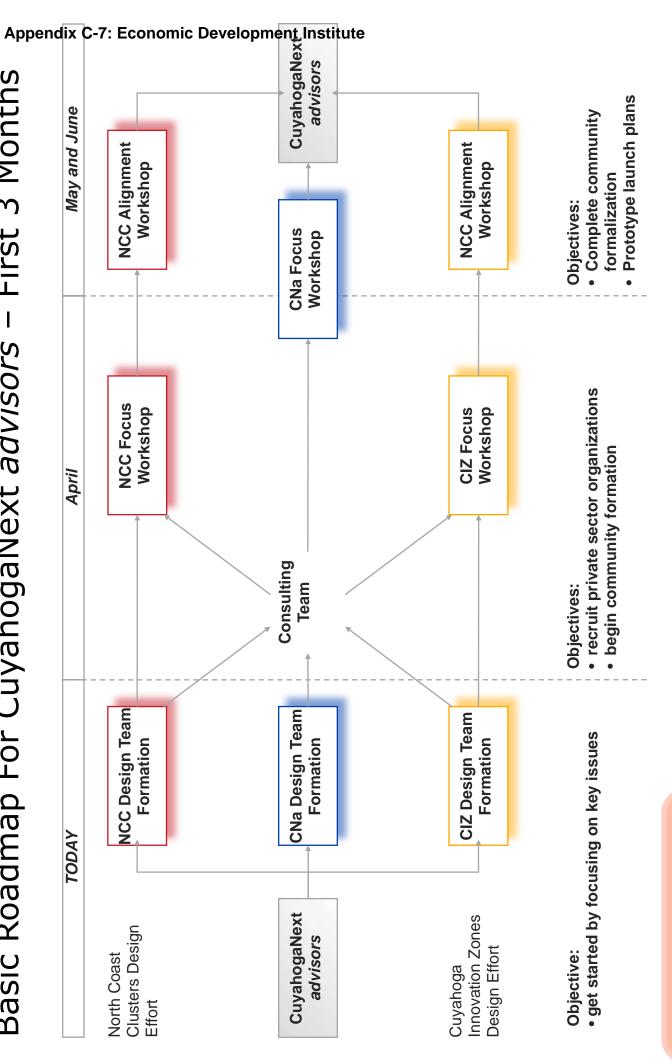


Case 2: CuyahogaNext: Cuyahoga County, Ohio



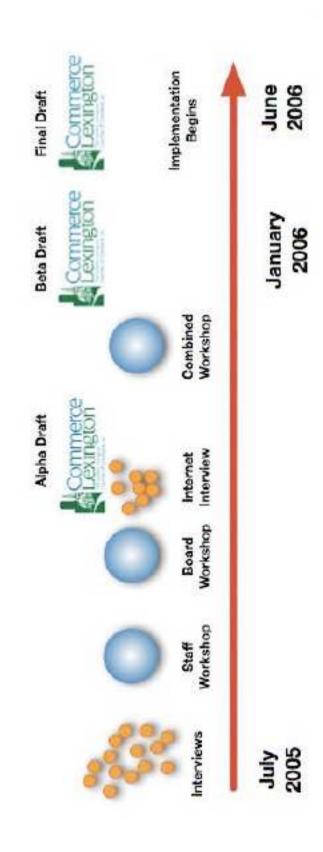
Source: Ed Morrison

Basic Roadmap For CuyahogaNext advisors - First 3 Months



Page | 03.28.06 Getting Started

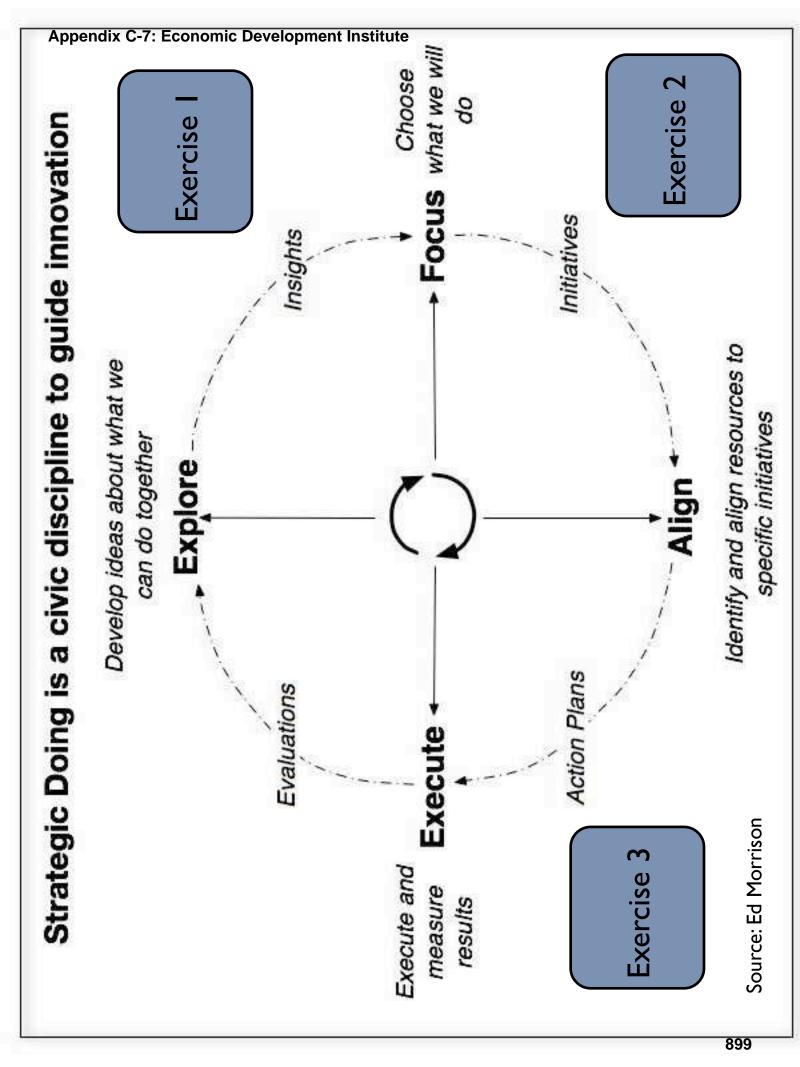
Case 3: Commerce Lexington, KY



Ground rules for today

- Move fast: Focus on the task at hand: Don't get hijacked: Limit digressions: No speeches: No whining
- legacy, your children, your grandchildren: Get your eyes off the rearview mirror Stop thinking only about today's issues: Focus on outcomes in 10 years, your
- Encourage "stretch" thinking: Generate new ideas: Don't burn ideas: Don't recycle old opinions
- Push for specifics: Get beyond rhetoric: No bumper sticker thinking
- No blame game: No simplistic solutions: Think in terms of connections, incentives and systems
- Balance the participation: Hold each other to account: Speak up if you feel the group is heading off course: Disagree
- Fill out your worksheets so others can read them: We need to capture today's "knowledge assets"

898



Strategic Outcome

Strategic Outcomes describe a desired state in the future. Descriptions of the desired state should include the idea of stretch, measurable goals.

"A well-educated workforce" is not as good a strategic outcome as "a workforce in which less than 10% of young people drop out of high school and more than 70% continue on to postsecondary school".

Worksheet I:

List your focus:_

Strategic Outcome I	Strategic Collaborations Describe the strategic partners which we
	can engage to accomplish this outcome

Strategic Outcome:	
Key Metrics What do we measure?	1. 2.
	ř
Key Milestones What marks the path forward?	1. 2.
	κi

Who

What

Time frame

Workshop Exercise 3: Align

Your focus area:

:	
utcom	
egic O	
Our Strategic O	
סת	

				66
In the next 6 months	In the next 3 months	In the next 30 days	Next week	

9

Collaborative Workspace and EDPro Weblog

If you would like to join a collaborative web space to continue working on these concepts, please e-mail Ed Morrison at edmorrison@earthlink.net Visit the EDPro Weblog at http://edpro.blogspot.com for article on strategies that regions and communities are developing.

Appendix C-8: Edward Lowe Foundation





Workshop Leader Resource: Point the Finger

This is an experiential activity designed to demonstrate several principles. A primary outcome is the understanding of a complex system; a secondary insight is that a very simple rule can be used to guide that system. To prepare, buy thin wooden dowels at a home supply store. They should be $\sim 4-6$ feet long and $\sim 3/8$ " thick. You'll need at least one; you can run multiple games (each with one dowel) if you have a co-leader or someone else who is prepared to help. At least two groups is preferred – it turns the exercise into a bit of a competition.

Instructions:

For each dowel, get 6-8 volunteers. Make sure no one's done the exercise before.

Have them stand in two rows facing each other. Introduce the game by instructing the volunteers:

"Hold one arm out with your hand pointing across the row toward the opposing line of participants. Your thumb should be pointing up and your index finger pointing at the person across the row from you. You cannot place your finger on the top or the ends of the dowels."

Place the wooden dowel across the row of hands. All fingers need to be spaced out underneath the dowel and pointing at each other.

"I have a task for you to complete. The goal is to lower the stick (with every hand remaining under the stick) to the ground without anyone letting their finger lose contact with the stick."

"There are two rules: you can't put any downward (or lateral) pressure on the stick, and fingers have to remain in contact with the stick. If you break either of those rules, you'll have to start over."

Place a little downward pressure on the dowel and let up as you say "Ok, go!" to the group. As soon as you take your hand off the stick it will inevitably go up. The groups will most likely struggle and have many quality issues. Let them work on the process...be sure you point out any finger(s) that comes off. Make them start over.

Eventually the group will solve the problem; there are a number of ways to do so – the most obvious are for the participants to move their hands together so that they're moving more as a unit and there are fewer points of contact to deal with, or for pairs of people to hold their fingers in such a way that they form a "V" in which the stick can rest.

Debrief:

After each group has lowered their stick, debrief the exercise. Some questions to ask:

What happened when I took my hand off the stick? Sometimes the opposite of what you intend happens.

I noticed you blaming each other, but who is at fault? The tall person? The person on the end? Everyone?

How did you find the solution? What was the key? Who came up with the idea?

Point out that although the task seems simple, it is actually illustrating a very complex system in which there is a network of individuals, each operating independently, that determines whether the stick goes down or not. Having a single leader trying to direct everyone usually doesn't work – the leader can't really make the others "behave" in the way they'd like. However, if the group can operate with a few simple rules, it is possible to achieve the desired outcome. An additional useful concept that often arises is that while there were only two explicit rules, groups often act as if there are other rules (eg, "your fingers should not touch one another.")





Appendix C-9: The Water Council

Case Study: Milwaukee Water Cluster

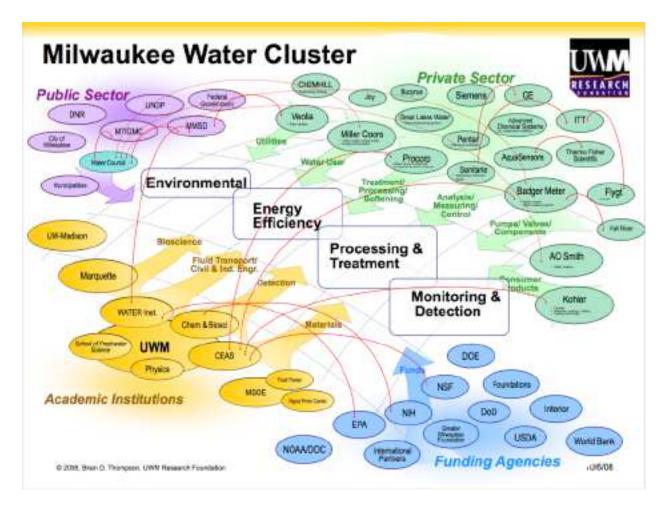
In September, 2005, civic leadership of Southeast Wisconsin came together to form the Milwaukee 7 Regional Economic Development Advisory Council (M–7). The core idea involved developing a cooperative regional economic development platform for the seven counties within the region. About the same time, Rich Meeusen mucin the CEO of Badger Meter Company, the nation's largest independent water meter manufacturer, and Paul Jones, CEO of A. O. Smith Company, the nation's largest hot water heater manufacturer, met to discuss areas of potential collaboration.

This conversation prompted them to approach Sam White, Associate Dean for Continuing Education at the University of Wisconsin – Milwaukee. Meeusen and Jones asked White to conduct some research on the number of water related companies in the region. White and his students identified over 150 locally-based water – related businesses. They learned that the region was the home of five of the world's 11 largest water technology companies. At the same time, dozens of water research specialists from engineering, science, law, and business operated out of the region.

In October 2006, Meeusen, Jones and White organized the first Water Summit to bring together diverse interested individuals to discuss the region's potential as a water hub. About 65 people showed up to this initial conversation, clear evidence that a cluster could form. Nearly 2 years later, White approached Ed Morrison at Purdue to explore whether Strategic Doing could be used to organize a workshop for the second Water Summit to be held in July 2008. Purdue had been working with others in the M-7 region to apply Strategic Doing to develop workforce collaborations. Morrison worked with White to organize an afternoon Strategic Doing workshop for the July Summit.

During the workshop, Meeusen and Jones sat at the same table. When asked to identify assets that they could share, the CEOs quickly focused on their research labs. Meeusen offered that he had the largest cold water testing lab in the nation. Jones had the largest hot water testing lab in the nation. They realized that both labs operated with spare capacity. When they linked and leverage these two assets together, they decided to provide their research laboratory facilities free to any water – related startup. In less than two hours, the two CEOs had, in effect, devised a virtual incubator for water-related businesses, the largest of its kind in the nation. Meeusen announced the collaboration during the report-out of his table.

The Water Council has gone on to grow into an internationally recognized cluster for water technology. Many other connections formed out of the initial Strategic doing workshop. In October, 2008, four months after the workshop, Brian Thompson at the University of Wisconsin – Milwaukee Research Foundation drew an insightful map to illustrate how these connections had begun to form.



Today, Milwaukee and its region are a global water hub. The Global Water Center in Milwaukee provides a state-of-the-art water business development and research facility. On the first floor of the Global Water Center, as you walk in to your left, you will see smaller versions of the hot water testing lab from A.O. Smith and the cold water testing lab of Badger Meter, a testament to the power of linking and leveraging assets.

WATER COUNCIL



The Water Council is working to align the regional freshwater research community and water-related industries to establish the Milwaukee Region as the global capital for freshwater research, economic development and education by:

- Establishing the Milwaukee Region as the global "water capital"
- Providing outreach to water companies looking to move into the area
- Advancing water-related industry, research and business opportunities, and
- Working with Brookings Institution to publish a white paper

To help put the Milwaukee region at the forefront, the Water Council has created three key committees:

- The Research/Emerging Technologies Committee will identify opportunities for development and resources that exist, and find SBIR and other funding sources to help research projects and generate the economic development benefits coming from it. They will work to establish networks and contacts between academic and research facilities and water-related businesses, and are discussing better ways to use science and technology to address our water issues
- The <u>Marketing/Branding Committee</u> will identify the "rock stars" of the water-related businesses, education and research resources in the region. They will research what and how the Silicon Valley and the Research Triangle got started and how it can apply to establishing our region as the Global Freshwater Capital.
- The <u>Education/Outreach Committee</u> will help connect research and academics with water-related companies to fuse knowledge and talent in a seamless system designed to boost our ability to get things devised, developed, produced and sold from the minds of talented employees to the markets around the world in need of water-related goods and services. The Education and Outreach Committee will work with the RWA first on fully identifying the existing programs available for education and outreach in the region to make full use of them, and to develop additional, customized programs only if deemed necessary.

Update

- The RET group have focused their work on identifying up to three possible opportunities for development. A Master Agreement was signed for the City of Waukesha for new water treatments, the City of Milwaukee for developments in ultrasound technology for water purification, and MMSD for development of storm water disinfection including road salt removal and algae control for cleaner beaches.
- UW-Milwaukee's new School of Freshwater Sciences is under development and may include a water technology business accelerator.
- Initially, 15 companies are being approached for the Water CEO Call Program a report on these will be given at the annual Water Summit, **July 14**th at **The Pilot House**.
- Frederick Dubee, Senior Advisor, United Nations Global Compact Program confirmed to speak at Water Summit.
- UW-Milwaukee is working on a Milwaukee Region Water Cluster white paper for distribution at the Water Summit.
- A mapping of Milwaukee's academic institutions with resources for water technology will take place, (similar to the CEO Call Program).

AGENDA - WATER SUMMIT II



July 14, 2008 8:00 a.m. – 3:00 p.m.

8:00 - 8:30

Registration/Networking

8:30 - 8:45

Welcome Julia Taylor, GMC

Water Council Update

Paul Jones, AO Smith & Rich Meeusen, Badger Meter

Committee Reports
Intro of Water Industry Specialist/WIRED
Website/Water Patent of the Month
Waukesha MOU/Patent Announcement

Colin Scanes, UW-Milwaukee

8:45 - 9:05

Water Cluster White Paper Sammis White, UW-Milwaukee

9:05 - 9:35

Growing a Water Cluster Strategy Ed Morrison, Center for Regional

Development at Purdue University

9:35 - 9:45

Water Patent Overview Barry Grossman, Foley & Lardner

9:45 - 11:00

Roundtable I: Local Problems – Global Solutions Barry Grossman

11:00 - 11:15 Break

11:15 - 11:45

CEO Compact Kim Marotta, Miller Brewing

Noon - 1:30

Keynote: The Role of Business Fred Dubee, Senior Advisor, U N Global Compact

Reactor Panel: The Role of the Public Sector

who moderates reactor panel?

Matt Frank, Secretary, DNR Jack Fischer, Secretary, Commerce Carlos Santiago, Chancellor, UWM

1:30 - 1:45 Break

1:45 – 2:45 Roundtable II: Let's Build Our Future

Ed Morrison

(Strategic Action Session)

2:45 – 2:55 What's Next ? Water Specialist (name TBD)

2:55 - 3:00 Closing Remarks

Rich Meeusen

Overview: Ed Morrison role

Round table II: Let's Build Our Future (Strategic Action Session)

- Likely will "shuffle" the mix of people to create different groups than the morning according to how many stay for the "doing" session
- He will bring a strategic doing packet for each table, will have slides
- Would like a recorder at each table (no facilitator needed)
- Will design the roundtables to guide participants toward outcomes we would like to see
- Below are some ideas from past planning sessions.

(Ed would like any additional information or background material you may have to Help him better understand each of the concepts/deliverables listed below, or additional ideas you may have. I've numbered each, so if you can "fill in the blanks" on any particular concept – please reference the number)

- 1. How to convert a.m. table discussion to business opportunities = patents?
- 2. How to promote/encourage/facilitate active collaboration via website and otherwise following the summit?
- 3. What deliverables do you foresee in the next 6-9 months? (Needs more detail under each bullet point)
 - a. Internships
 - b. Joint ventures
 - c. Finding/pursuing add'l federal funding
 - d. Design shop strategic planning session
 - e. Other?
- 4. What other things do you want to see at the end of the day? (Any thoughts you can share will help Ed design both sessions so they are purposeful and tie the entire session together. (The following were mentioned at earlier planning sessions_
 - a. Participants are able to see where they "connect" to the vision to establish the Milwaukee Region as the global capital for freshwater research, economic development and education
 - b. Participants have made connections to get a collaborative business project started
 - c. Other?

RE: Website

- Need to re-visit website and approve for launch at event (All)
- Who will ensure website is "ready"? Sam-will your student do this or should Eric?
- Need to create Camtasia-like instruction video on website use (GMC Eric & Rich Greene)
- Create bullet points on "why" using this new tool is a good thing: Ed
 M
- (Ed also offered to talk with the Water Specialist for a more in-depth conversation on the site)

White paper: Sammis please email to Ed when you can: edmorrison@purdue.edu

WATER SUMMIT II

July 14, 2008

INFORMATION FOR FACILITATORS & PANELISTS

Water Summit II:

Our Water Innovation Economy: Growing a Blue Business in a Green World

Purpose: Facilitate communication, innovation and collaboration among companies, researchers, engineers, investors and other interested parties to generate ideas and specific strategies and goals toward accomplishing the following mission of the Water Council.

Mission: Build an economic and research cluster that will result in more jobs, research, educational opportunities and investment in the region's water industry, earning the Milwaukee Region the acknowledged title of "Freshwater Capital of the World."

The Summit will include two roundtable discussions. The first will take place in the morning at 9:45; the second will begin at 1:45. During lunch, the Summit will feature several speakers, including a keynote address from Fred Dubee, Senior Advisor to the UN Global Compact.

Morning Session Presentations:

Water Cluster White Paper; Sammis White, UW-Milwaukee

Growing a Water Cluster Strategy; Ed Morrison, Center for Regional Development at Purdue

University

Water Patent Overview; Barry Grossman, Foley & Lardner

Facilitators: Roundtable Discussion will follow these presentations. Someone at your table should be designated to record information on the sheets provided. (A small number of staff members will also be available if needed.) The questions below are designed to help you facilitate dialogue on the water-related topic assigned to your table. (See complete list of table topics on back side of this sheet.)

- I. Introduce yourself and identify your area of expertise.
- 2. What are you doing now that is innovative or needs innovation?
- 3. What needs or particular challenges are you facing that need to be met?
- 4. In what ways can you link and leverage with others here? Please be specific.

Suggested Timing:

9:45 – 10:00 Questions I - 3: Should be posed to each participant at your table and brief, bullet point responses should be recorded on the sheet provided.

10:00 – 10:30 Question 4: Based on the overview information obtained in the first round of questions, this time frame should be used for finding ways to connect with each other.

10:30 - 11:00 Facilitator: You or someone at your table will be asked to give a brief 2-minute bullet point

Appendix C-9: The Water Council

	_			11. C	I' '
report-out on what	VALIR GRALID TI	reels are the most	significant finding	s resulting trom	valir disclissions
report out on what	Joan group n	ccis aic the most	Jigi illicarit illiali ig	resulting norm	your discussions.

Suggested topics within each category

<u>Municipal Wastewater Treatment</u> Increased muni efficiency of treatment Remove pharmaceuticals Remove higher percentage of phosphates Speed treatment Eliminate sludge Utilize sludge Reduce chemical use in treatment Remove RCBs in sewer pipes <u>Business Wastewater</u>

Treatment

<u>Municipal Wastewater Treatment</u> Increased muni efficiency of treatment Remove pharmaceuticals Remove higher percentage of phosphates Speed treatment Eliminate sludge Utilize sludge Reduce chemical use in treatment Remove RCBs in sewer pipes <u>Business Wastewater</u>

Treatment

Dispose/use liquid farm manure Clean/recover food processing materials Recover metals from process water Aquaculture water cleaning Industrial waste water efficiency

Storm Water Treatment

Disinfect storm water runoff Limit storm water sewer overflows Remove road salt from storm water Primary treatment at storm water discharge Containing storm water on site

Water Process Issues

Increasing beer brewing water efficiency Increase ethanol water use efficiency Increase efficiency of utility water heating Increase efficiency of industrial water heating Eliminate scaling in boilers Reduce energy use in electricity production

Water Quality Issues

Water softening without salt
Develop real-time sensor for detecting life
Renive radium in ground water
Desalinization for multiple uses
reduce/eliminate chemical use in treatment
Meet int'l needs: tar sands, quality

Residential Water Quality

Increase efficiency of heating water Water filtration at user's location Phosphate removal from home wells

Water Security

Real-time monitoring Detection sensor

Quality of Life Issues

Removing PCBs from river and lake beds Greatly limiting growth of algae

Water Conservation

Technologies to make it easier

Non-tech issues/Other

Getting new tech adopted more quickly by governments

Appendix C-9: The Water Council

Getting new tech adopted more quickly by businesses Getting more scientist and engineers focused on water Increasing efficiencies in moving water Utilizing grey water

Luncheon Keynote: Fred Dubee, Senior Advisor to the UN Global Compact Program, will discuss the role of business in developing a water cluster whose influence can be global. Following his address, a reactor panel will respond to Mr. Dubee's comments and discuss the role of the public sector in water cluster development.

Reactor Panel: Moderator, Rich Meeusen

Each panelist will have 3-5 minutes to respond to Mr. Dubee's address.

Panelists:

Matt Frank, Secretary, Wisconsin Department of Natural Resources Jack Fisher, Secretary, Wisconsin Department of Commerce Carlos Santiago, Chancellor, University of Wisconsin-Milwaukee

Panelists will be asked for their input on the following questions:

- I. What do you see as the 3 largest challenges to building this cluster?
- 2. What can the public sector (your department/institution, for example) do that would help this sector grow and overcome the challenges?
- 3. Any big ideas?

A question-and-answer session will follow the panel discussion.

Afternoon Session: Ed Morrison will facilitate the afternoon roundtable with the subject of "Let's Build Our Future", where participants will combine their ideas, knowledge and content from earlier roundtable conversations. From these conversations, elements will be developed that contribute to the strategic roadmap the Water Council uses to pursue its mission.

Summit July 14, 2008

Milwaukee 7 Water Council Strategic Doing Pack

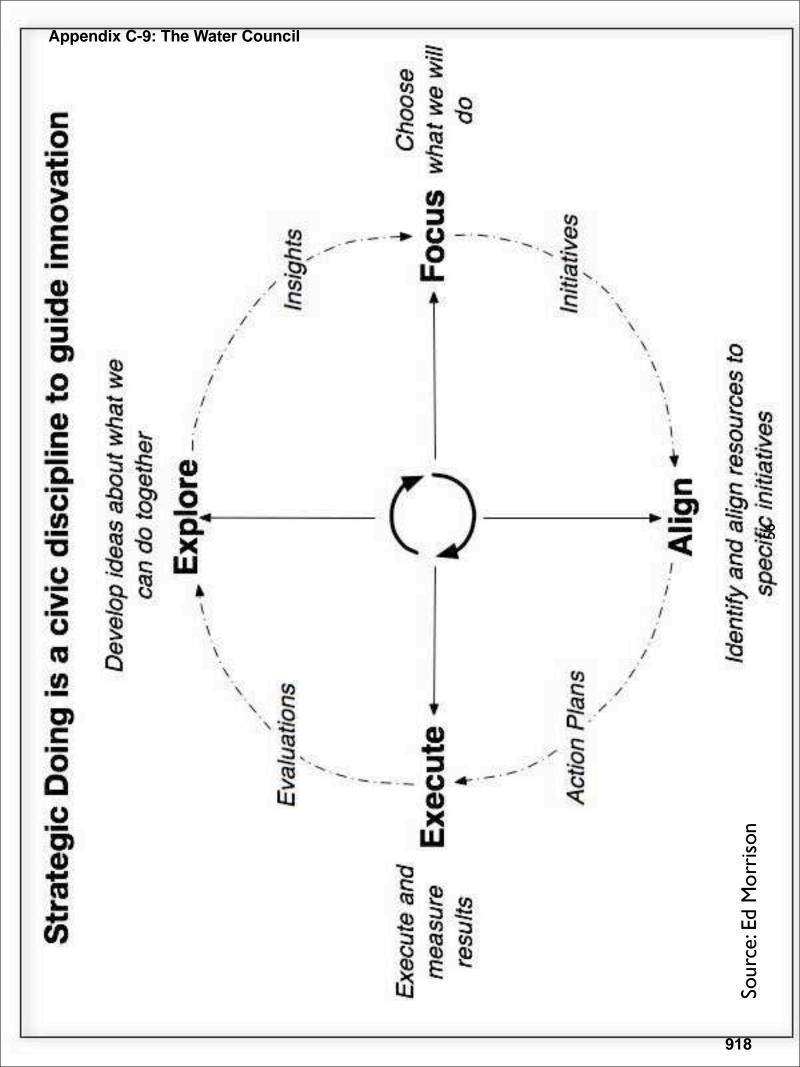
This Water Council Strategic Doing Pack provides guidance to a workforce alignment workshop held in Milwaukee, WI on July 14, 2008

Questions? Please contact: Ed Morrison,

Step 1: List the names of people at your table.

Put a asterisk next to the name of your scribe.

e-mail					
Name					



Strategic Doing: Some Background

Strategic Outcome

Strategic Outcomes describe a desired state in the future. Descriptions of the desired state should include the idea of stretch, measurable goals.

"A competitive water cluster" is not as good a strategic outcome as "a cluster that includes the largest network of companies in fresh water remediation".

Strategic Attribute or Characteristic

Something people can see, feel, experience, do or understand....An ideal attribute or characteristic is measurable,

Strategic Initiative

An activity that members of the Water Cluster will do to achieve our strategic outcomes. The best outcomes have embedded metrics. (e.g. "Create a working group to double the volume of federal research dollars in three years.)

Milestones or SMART Goals

The measurable goals that define a strategic initiative. SMART = simple, measurable, aggressive, time-sensitive. (e.g., By September 2008, we will have assembled a working group of 6 people representing industry, universities and state government...")

Workshop Exercise I: Your Strategic Outcome: Alpha Version

Describe a Strategic Outcome for the Water Council Describe an outcome in year 3 to 5 for the Water Council What will be different in the M7 region? Through our efforts we envision the M7 region will be a global leader in"
Characteristics or Attributes of Your Outcome Describe three characteristics or attributes of your outcome. How will we know we have arrived? What will be lifferent? What metrics come to mind?
The first key characteristic is
The second key characteristic is
The third key characteristic is

Workshop Exercise 2: Strategic Initiatives: Alpha Version

Describe one Strategic Initiative for the Water Council Describe an initiative for the Water Council that will help us achieve your outcome. What do you think members of the Water Council should be willing to do together to achieve your strategic outcome? "To achieve our strategic outcome the Water Council should" (e.g., establish a working group to double federal funding in three years)
Milestones (SMART Goals) for Your Strategic Initiative Describe three milestones that can define your strategic initiative
The first milestone is
The second milestone is
The third milestone is

Work Exercise 3 Strategic Action Plan

Time frame	What	Who
	Define the action step	Use names, if possible, not organizations
In the next 6 months		
In the next 3 months		
In the next 30 days		
Next week		

Work Exercise 4 Strategic Partners

Quickly list the Who are we n	e names of organizations and people who counissing?	Quickly list the names of organizations and people who could be part of the Water Council's strategy process Who are we missing?
	Organization	Contact name
	80	

Our Next Steps

- I. Distill the Strategic Doing Packs into a first version of a Strategic Action Plan.
- 2. Put this information and supporting materials on the Water Council workspace

-9: The Water Council Fall River Flygt World Bank 10/6/08 Thermo Fisher Scientific Kohler AO Smith Interior Badger Meter Funding Agencies Pumps/Valves/ AquaSensors onsumer USDA oducts Chemical System 병 Foundations Private Sector Monitoring & Detection 8 Siemens Sanitarie 8 Pentair Analysis/ Measuring/ Control Onate Miwakee Foundston NSF Great Lakes Water Procorp Bucynus Processing & 를 International Partners Treatment Processing/ Soffening Treatment Miller Coors ò EPA Milwaukee Water Cluster Materials CHZMHILL Regid Proto Center NOAA/DOC Energy Efficiency Veolia **Fuld Power** Detection Jillities MSOE Fluid Transport Civil & Ind. Engr. Environmental CEAS Federal Chem & Biosci © 2008, Brian D. Thompson, UWM Research Foundation DSWM Bioscience Academic Institutions Physics **S** UNDP WATER Inst. M7/GMC Water Council Public Sector School of Freshwater Science Marquette DNR Municipalities **UW-Madison** City of Milwaukee 925

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PRINCIPLE BY THE ARE



Advisers ready to help space workers

Pair helped others survive tough times

Brevard headlines

BY KEYONNA SUMMERS • FLORIDA TODAY • APRIL 30, 2010

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Two powerhouse consultants who steered Kokomo, Ind., and Milwaukee through massive layoffs and economic hardship will turn their focus today on Brevard County and the fate of workers at Kennedy Space Center.



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Economic and workforce development consultants Ed Morrison and Linda Fowler are credited with guiding both cities through dark economic times created by the layoffs of thousands of auto and manufacturing workers.

In Brevard, leaders seeking ways to cope with the anticipated loss of 7,000 to 8,000 space worker jobs when the shuttle program ends later this year have tapped the pair to help local business and community leaders quickly craft a plan to soften the blow of the layoffs.

Morrison and Fowler spent months helping facilitate smaller-scale plans in Kokomo and Milwaukee, but leaders here said they believe the consultants can garner the same results on the Space Coast during a half-day summit being held today in Viera.

The summit, titled "Overcoming the Space Challenge Through Regional Innovations," is being hosted by Brevard Workforce and the Economic Development Commission of Florida's Space Coast and sponsored by FLORIDA TODAY

"In Brevard, we're probably farther ahead (than Kokomo and Milwaukee were) as far as collaborative efforts. We've had Space Florida, the EDC, the chambers all working together for years," said Brevard Workforce President Lisa Rice.

"You walk out (of the workshop) with an actual



Two powerhouse consultants who steered Kokomo, Ind. and Milwaukee through massive layoffs and economic hardship will turn their focus today on Brevard County and the fate of workers at Kennedy Space Čenter.

FACING THE CHALLENGES

An economic and work force summit for business and community leaders will be held today, where participants will help determine ways Brevard County can leverage its assets to offset the pending loss of several thousand jobs at Kennedy Space Center.

The forum, entitled "Overcoming the Space Challenge through Regional Innovations," will be from 8 a.m. to 1 p.m. at the Holiday Inn in Viera.

WATCH IT LIVE

Floridatoday.com will bring live video coverage of today's Space Challenge summit beginning at 8 a.m. Attendees scheduled to speak on a panel include Frank DiBello, president of Space Florida, and Mark Nappi, vice president of United Space Alliance. Tune in to floridatoday.com for the coverage as well as extensive coverage in Saturday's FLORIDA TODAY.

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plan on who's going to do what over the next 90 days. And there's a follow-up within 30 days, where the teams are accountable and share their progress on it," she said. "I think this is something we can move quickly on, get some action out of, and if we're able to bring them back over the next year to continue this effort, I would certainly want to do that."

Morrison, an economic policy adviser at Purdue University's Center for Regional Development in Indiana, said his career in economic and work force development began in the 1980s. Back then, a large part of his work as a corporate strategy consultant with large multi-national companies, such as General Electric and Ford Motors, included shutting down manufacturing plants.

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Transforming Brevard County:

Our First Year Plan

Version 1.00

Brevard County, Florida July 2010

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Appendix C-10: Space Coast Brevard County, Florida

Transforming Brevard County: Our First Year Plan

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Transforming Brevard County: Our First Year Plan

This first version of our strategic action plan puts Brevard County on the road to a growing regional economy. As all first version plans, this plan is subject to revision. As a "living document," we will continually adapt it to changing conditions, serving us as a guide to what we do and how we do it.

We are organizing our investment initiatives into six strategic focus areas:

- 1. *Entrepreneurs and early stage companies*: Networks to support both entrepreneurs and early-stage companies
- 2. *Training and education:* New networks to create a more flexible and responsive set of options for individuals
- 3. *Company support:* Support for existing companies, especially in the second stage (employment of 10 to 99)
- 4. *Clean energy:* Investments to develop new clusters of companies developing clean energy technologies
- 5. *Public place-making:* Investments in infrastructure to advance Brevard as a quality, connected place for future investment
- 6. *New narratives:* New, coherent stories of how Brevard leverages its strengths to transform its economy

Based on our work to date, we expect to achieve the following measurable objectives over a one-year timeframe:

- An increase in startup and small business financing.
- An increase in the number of companies and jobs in the region.
- Higher level of youth engagement in exploring careers in technology-driven businesses.
- New investment partnerships in advanced energy technologies, stimulated by a Clean Energy Summit.
- More focused training and education, coordinated through a community resource center for training and education.
- Progress toward including Brevard in the state's high speed rail initiative.

There are many obstacles to overcome in achieving our objectives, including legislative changes and raising the appropriate funding from multiple sources. We propose the establishment of a \$15 million *Opportunity Fund* to provide early stage financing to support promising collaborations emerging from our strategy process. The Opportunity Fund, structured similar to the Small Business Innovation Research grant program, will provide staged financing to promising initiatives. Developed by the Purdue Center for Regional Development, this Opportunity Funds have helped both North Central Indiana and the Milwaukee 7 region stimulate the collaborations required for economic transformation. Initial seed funding of \$2 million will be enough to get started with the initiatives outlined for our first year. We will draw down the remaining funds over the course of 12 months, as new initiatives develop and we achieve milestones in our plan.

Like a thread through fabric, we wove the latest thinking and practices in economic development, *linking* and *leveraging networks of people and other assets*, throughout our plan. Moving from an industrial-style economy to an information-based global economy is crucial to the future of our county. For us, this means developing new relationships and global networks to leverage the best our county has to offer.

Appendix C-10: Space Coast Brevard County, Florida

Transforming Brevard County: Our First Year Plan

Linking and leveraging the new networks we form will remake our approach to economic development and begin the transformation of how we grow our economy.

We embarked on this path using *Strategic Doing* with the help of the Purdue Center for Regional Development. Strategic Doing combines the best elements of strategic planning with project planning and execution.

The imminent transformation of NASA focused our effort on what to do with the influx of highly talented people into the available labor pool. Rather than looking at consolidation approaches to deal with the challenges, we decided to turn this event into an opportunity to rethink growth and innovation in our region. Our answer? Creating *re-engagement networks* (linking our county's resources) as a way to grow our economy (leveraging our county's resources to achieve measurable economic growth.) Through re-engagement networks, we can create an environment that encourages innovation. As innovation flourishes, it will attract increasing amounts of capital into old and new businesses, which will lead to economic growth and high-value jobs.

Appendix C-10: Space Coast Brevard County, Florida

Transforming Brevard County: Our First Year Plan

Our Challenge

Similar in scope to what many regions in the US are experiencing, unemployment in Brevard County is rising due to employer dislocations. Ranked in the bottom fifth of the nation's top metro areas by the Brookings Institution, our economic performance as measured by unemployment, gross metropolitan product, housing prices, and foreclosed properties is unacceptable.

Unemployment is only the most visible part of our challenge. The bigger challenge is transforming our economy from our current relationship with NASA and the military into a new set of relationships that create a new foundation for growth. Our work is focused on answering the simple, but difficult question, "What's next?"

We know this much: Our future depends on connecting our assets to define new opportunities. Our county includes diverse array of assets on which to build. They include, for example:

- Space Coast location and the infrastructure for space launches,
- Military infrastructure to support defense-related investments,
- Strong tourism infrastructure, including six cruise terminals,
- A highly skilled engineering workforce,
- Innovation output, as measured by patent density,
- A strong base of technology companies,
- An attractive quality of life, measured by affordability and short commute times.

Our simultaneous challenges are to:

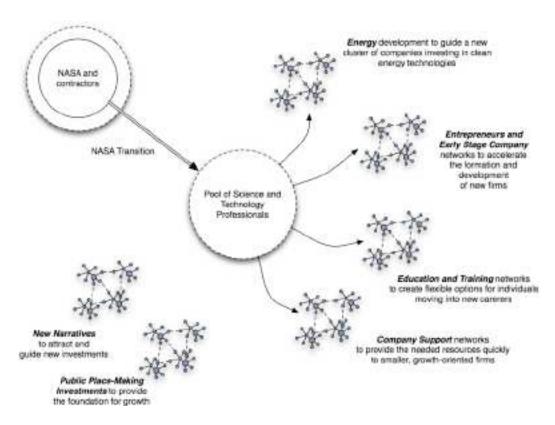
- Short -term: Address our short-term employment dislocations caused by NASA's transformation,
- **Longer-term:** Reconfigure our region's assets to diversify our economy and position our county for global competition.

Transforming Brevard County: Our First Year Plan

Our Opportunity

Re-engagement networks are a good way to address short-term employment issues while achieving better utilization of our regional assets.

Re-engagement networks form purposeful new connections between existing and new organizations, within our region and beyond. Through these networks, participating organizations can better leverage our highly skilled talent pool to drive innovation and diversify our economic base.



Re-engagement networks can move Brevard County from an economy in which we create wealth through the control of resources, to an economy in which we create wealth through ideas, knowledge, and innovation. Andrew Carnegie and John D. Rockefeller created wealth by controlling resources with huge industrial complexes. Bill Gates generated wealth from new ideas and software you can carry in your pocket.

We start with a clear recognition. Federal and state governments can offer only limited help. Budget cuts mean we cannot rely on outside public funds indefinitely. The strategy for our economic transformation must emerge from our local civic leadership and be driven predominantly by local investment, both public and private.

In sum, we will have to think and act in new ways. No one individual, no one organization has all the answers. There are no "silver bullets," no magic solutions, no One Big Project that will guarantee that our transformation will succeed.

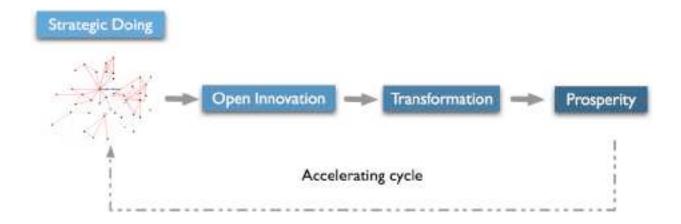
Transforming Brevard County: Our First Year Plan

Our Foundation for Change

Over the last decade or so, the software industry demonstrated that it is highly productive to collect the best ideas from anybody, anywhere, and act on it for the benefit of the entire industry. New competitors, with new business models and value propositions, benefit customers and create the incentive for existing competitors to compete more effectively. Incumbent competitors react by redoubling their efforts to compete, also benefit customers. This approach and its resultant products is called "open source" software.

In economic development, there is a similar renaissance underway. The economic development theory simply states that:

- There is no monopoly on the sources for new, potentially productive ideas.
- Connecting the people with these ideas can and will result in networks that have specific purpose.
- Interacting in these networks to achieve clear and measurable outcomes will result in innovation potential.
- Organizing around the best ideas and making them work will result in innovation that can be transformative.
- Transformation results in prosperity.



Transforming Brevard County: Our First Year Plan

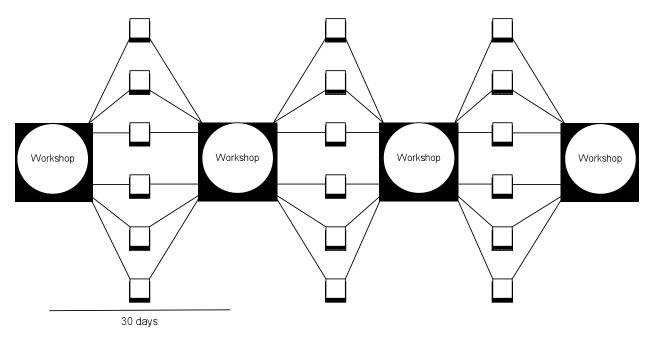


Strategic Doing is a discipline that guides open innovation. It implements "open source" economic development. The Strategic Doing cycle moves people through a process in which they:

- Connect their assets to define new market opportunities and create new value.
- Develop clear outcomes together, and learn to share information.
- Help each other on projects to accelerate the translation of ideas into action.
- Commit to an on-going process of strategic thinking, testing and evaluation to figure out "What works".

The goal of this strategy process is to identify joint investment initiatives that are *replicable*, *scalable and sustainable*. Repeating the Strategic Doing cycle until it is second nature builds the strong connections between people and organizations needed to support these transformative investments. With stronger connections, the more likely that new clusters forming within the county will reach the critical mass needed to attract resources and yield tangible results. *Communities and regions with stronger open networks will be more competitive in the long run: They will learn faster, spot opportunities faster and act faster.*

Putting Strategic Doing into practice involves a workshop-driven approach until the workshop participants learn how to practice Strategic Doing on their own. The process encourages planning and action in monthly iterative loops. Short cycles are necessary for Strategic Doing participants to learn, begin practicing the new discipline of collaboration, and produce results to keep them motivated.



Transforming Brevard County: Our First Year Plan

With guidance from the Purdue Center for Regional Development, it took two workshop-based cycles to get to the point where a core group of people, with some help, could produce this first version of a strategic action plan. This plan will steadily improve as we move forward.

Closely coupled to Strategic Doing is a *framework of economic transformation*. The framework consists of 4 quadrants that together capture the 4 necessary investments for enduring and resilient economic growth. At the center is the requirement of goal-driven civic leadership and collaboration. Strategic Doing first focuses on building the skills to practice civic leadership and collaboration, and then on putting those skills into practice. Without this center-led leadership and collaborative practices, initiatives mapped to the other 4 quadrants will produce sub-optimal results at best, and, at worst, will fail.



This framework depicts a regional economy as a network of collaborative networks. To thrive in this environment, regional economies need *a balanced portfolio of investments* that encourage new, purpose-driven networks that collaborate with each other in the following five areas:

- Strengthening Brainpower to ensure a continually strong foundation for building sustainable competitive advantage.
- Connecting innovation and entrepreneurship networks to attract and convert brainpower into wealth through new products, new services, and new markets.
- **Building quality, connected places** to attract and retain the wealth a region builds through innovation and entrepreneurship by offering the best combinations of healthy "live, work, and play."
- **Promoting new narratives and networks** to tell positive stories about a prosperous region and to use its connections to attract more brainpower and capital.
- **Strengthening collaboration** to develop civic habits of thinking and acting together to quickly spot and capture growth opportunities.

Our planned initiatives, although well-balanced, focus on the highest priority for our county, "innovation and entrepreneurship." Our initiatives are "strategy mapped" in this framework.

Transforming Brevard County: Our First Year Plan

Our Focus Areas

For the next 12 months, our strategy will emerge from six (6) focus areas, some of which have transformational potential:

- Company-support projects
- Energy
- Early-stage firms and entrepreneurs
- New Brevard narratives
- Public place-based investments
- Training and Education



In addition to our 6 initiatives, Brevard County will continue to develop a strong core team of people through Brevard Strategic Doing Forums to provide the civic leadership and implement the best practices of collaboration across all initiatives.

The core team's long-term goal will be to become an important hub for economic development conversations and action. For it to become a hub, the core group will have to find a way to provide value to all the stakeholders. This value is rooted in three important dimensions:

- **Focus**: the core group will guide a regional economic development process and portfolio-based approach to managing initiatives.
- **Scale**: Through a process that focuses on measurable results, the core group will open new avenues for investment.
- **Alignment**: Through the engagement of different parties involved in regional transformation, the core group will enable our region to recalibrate and learn continuously about what works.

Company-Support Focus: First Year Initiative

Outcome and **Metrics**

Freer flowing capital as measured by growth in small business lending and credit. The initial outcome involves increasing small business lending in the county by 25% in 2011 over 2010.

Initiatives and Milestones

We are currently structuring specific initiatives and milestones around the following activities that align to our outcome.

• Identify the sources of funds.

Transforming Brevard County: Our First Year Plan

- Gather information from the business community to identify and prioritize their funding issues.
- Develop leadership team who will build stronger relationships with banks, other institutional lenders, and the Small Business Administration.
- Evaluate lending guidelines and determine how to make them more realistic where needed.
- Determine how to deal with situations where there is little or no collateral.
- Determine how to change the prevailing formula-driven lending approach to more creative lending.
- Develop and execute a plan for promoting our region to the venture capital industry.
- Develop stronger relationships with elected representatives to explore legislative changes.
- Devise a way to facilitate the pairing up of companies to better leverage their resources for projects and bids, and to boost their sales.
- Devise a way to make it attractive for aerospace companies to expand their operations or move to the Space Coast.

Stronger Connections Needed

We recognize the importance of development stronger networks to support business growth within the county. These networks enable companies to 1) identify and acquire resources more quickly; and 2) remove the obstacles to growth. The key participants in these networks include:

- Banks.
- Elected representatives.
- Small Business Administration.
- EDC Industry Council.
- Chambers of Commerce.

Next Steps

- Recruit and develop a leadership team to meet with banks, the SBA and others.
- Move our work into an online collaboration space.

Recommended Federal Action

- Appoint a *Brevard Business Financing Working Group* of federal representatives from the Small Business Administration, the Economic Development Administration, the Federal Reserve Bank in Atlanta, U.S. Department of Treasury and other federal agencies to develop practical steps to accelerate the flow of financing to growth oriented businesses.
- This Working Group should develop initiatives and protocols that other regions of the country, saddled with the same obstacles to commercial lending, can follow.

Transforming Brevard County: Our First Year Plan

Energy Focus: First Year Initiative

Outcome and Metrics

Establish a new cluster of companies in emerging energy technologies. Metrics: 1) Investment in new energy technology companies; 2) Number of companies actively engaged and financially supporting the cluster.

Initiatives and Milestones

Host an Energy Summit in September 2010.

Training and Education: First Year Initiative

Outcome and **Metrics**

Brevard Training and Education Network, a hub and spoke network operating in the county to provide expanded training and education choices from multiple educational institutions. Metrics: 1) Financial commitments from members of the network; 2) number of individuals served.

Initiatives and Milestones

Entrepreneurship and Early Stage Company Focus: First Year Initiative

Outcome and **Metrics**

Establishment of an angel capital network and early stage venture funds with \$5 million in available financing for early stage companies.

Initiatives and Milestones

Recommended Federal Action

 Extend the JumpStart initiative that is currently supported by the Economic Development Administration to Brevard. (This initiative is currently focused in the Midwest and upstate New York.)

Public Place Making: First Year Initiative

Outcomes and Metrics

- 1) Eliminate the liability issues that prevent Amtrak from expanding into Brevard County. The outcome metric: An agreement among the parties that resolves liability issues that are freezing development of Amtrak.
- 2) Establish a strong support network to focus Florida's high speed rail plans to include Brevard. The outcome metric: Inclusion of Brevard in the state's high speed rail network.

Initiatives and Milestones

Transforming Brevard County: Our First Year Plan

New Narratives: First Year Initiative

Outcome and Metrics

Initiatives and Milestones

Transforming Brevard County: Our First Year Plan

Resource and Funding Needs

We have two requirements to:

- Continue to revise and detail our plans,
- Become self-sufficient in Strategic Doing,
- Achieve our first year objectives.

The first requirement is to continue working with the Purdue Center for Regional Development to build out our network of support for Strategic Doing. Purdue's role will be to provide guidance, including workshop and coaching support until we can implement Strategic Doing on our own. Purdue will also link with the University of Central Florida and a broader national network of universities practicing the disciplines of Strategic Doing. This national network, based at Penn State University and called Transformative Regional Engagement networks (TRE Networks), focuses on building open innovation disciplines to transform regional economies. Purdue will also help us implement project management and collaboration best practices so we can start to manage through metrics with minimal overhead.

The second requirement is access to \$15 million in federal funding during our first year to create an *Opportunity Fund* to finance promising initiatives emerging from this process. In the following years, we will secure an increasing percentage of matching private sector funds to diversify our economy and position our county for global competition.

We expect to draw down on \$2 million immediately for use to:

- Continue investment in Strategic Doing to learn and apply the best practices of strategy in open networks.
- Support open innovation with the national network of universities (TRE Networks) with the University of Central Florida as our anchor institution.
- Support the work of the Brevard Business Financing Working Group.
- Host the planned Brevard Energy Forum and provide initial seed financing for the most promising initiatives emerging from this session.
- Develop and implement a business plan for a Brevard angel capital network.
- Support the formation and operation of the Brevard High Speed Rail Network.
- Draft the business plan and provide initial planning financing for the Brevard Network for Training and Education.

Our understanding is that the \$15 million dedicated to our economic turnaround will be supported by funds allocated to existing national emergency grants.

Accounting for funds used, and reporting on financial status and progress on a monthly basis will become one of the core group's responsibilities. Initially, we will adopt the Purdue model for monthly reviews.

Transforming Brevard County: Our First Year Plan

Brevard Opportunity Fund

This section of the plan details the structure and operation of the Brevard Opportunity Fund. The Fund will operate under similar structure and operating principles to the North Central Indiana Opportunity Fund, designed and operated by Purdue University by the Purdue Center for Regional Development.

The Fund is designed to follow the structure of the SBIR program with staged grants for promising initiatives. The Fund is targeted to triggering co-investment in these promising initiatives. The Fund focuses on identifying transformative co-investments that are replicable, scalable and sustainable.

Transforming Brevard County: Our First Year Plan

Risk Management

In our August workshop, we will address the possibility that funding is either too far into the future, or will not be enough.

The core team will take on the responsibility of managing risk.

Transforming Brevard County: Our First Year Plan

Appendix

- Lexicon of Economic Development Terms
- Open Source Economic Development
- Economic Development Primer: Foundation for Transforming Regional Economies
- Strategic Doing Forum Civic Involvement

For More Information:

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- » Melbourne village» Melbourne doppler radar
- » Memoriams
- » Merritt island
- » Metromix » Metromix videos

- » Metromix: events
- » Metromix: music
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- » Port canaveral web cam
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- Restaurant reviews
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Table 1

Kelly Delmonico
Rich Farace
John Stone
Laura Canady
Rue LaFure
Grissou Ghaeenzadeh
Amir Ghaeenzadeh
Monica Teran

Each of the participants in this group appears to have a deep, practical, professional background and strong professional networks. The conversation, however, does not appear to have gotten very detailed about how these assets could be linked together to create new opportunities. The three opportunities listed by the table are not specific enough to explain how the assets could be connected.

The group may want to define some specific opportunities in more detail.

The Outcome on which this group focused is, again. too vague to motivate people to join the work of this network: "sustainable employment in Brevard County". The table did not come up with clear characteristics, and, as a consequence, we have no way to measure our success. We don't know what success looks like.

You then selected a particular project: Entrepreneurship Fair/Speed Fair: "Bring together talented and leaders/entrepreneurs who can together start diversified business opportunities." There are no specific actions set forth and no commitments made.

For this group to become more effective leaders, you will have to be more clear about where you're going, how you will get there, and who is committed to moving forward.

Suggestions for the group:

- 1. Define a clear outcome with three characteristics. Tell people where the region should be heading.
- 2. Tell us how we will get to that outcome with a project to find with clear milestones. If the project is to have an Entrepreneurship Fair, tell us how this event will be organized. When do you plan to launch?

3. Set a schedule for refining your strategy -- for example, meeting every 30 days -- so you can realign and refine your strategy.

Table 2

Sandi Scannelli Scott Jackson Clay Richards Fernando Rendon Debbie Carpenter Pete Kaiser Eric Gasnell Doug Barclay Kevin Sharkey

This table does a good job of outlining the possible opportunities that emerge from connecting the assets within this network. You defined three potential opportunities that I can start to visualize: 1) Outreach to apprenticeship programs with unions; 2) education in financial planning; 3) helping people connect with banks and mortgage companies in a new support network.

The Outcome on which this group decided to focus is also clear: a career support center for the next generation aerospace workforce. You envision a building with staff (and volunteers?) who can offer broad services to individuals and families. You see this facility offering a community center that provides forums, a meeting space, and a space for new networks to form.

The top project involves developing a facility in the Rockledge area, and you set out an ambitious set of milestones. As you move forward, you will need to adjust these milestones, since there is likely to be slippage. At the same time, your project plan outlines that you will be hoping to replicate your first facility in a second location. Finally, you do a good job and in outlining individual responsibilities for moving forward.

Suggestions for the group:

1. Define the characteristics of your outcome more clearly: for example define "broad services"; and define and what you mean by "facility". For example, it's clear from your discussion that the term facility includes common areas that can be used for convening people. Finally, I think you're missing one important

characteristic: you are looking for a model that can be replicated in various locations.

2. You've done an excellent job with milestones. Make sure that you continue to adjust these milestones as you move forward. Milestones make a project real and credible.

#

Table 1

Jack Sidoran
Suzanne Baker
Kymberly Lietzow
Matt Chesnut
Mark Ryan
Bob New
Mary Wallis

The table clearly has a lot of expertise in developing communication strategies and building a new narrative. The table discussion outlines three potential opportunities, two of which go beyond the "bumper sticker" level of thinking. Specifically, the notion of building a narrative around arts and culture and promoting a "Greenwich Village" indicate to me that there are important strands of a new narrative that can emerge from the region.

It's not clear to me how the particular Outcome connects. It seems to me that we may be running into a problem here of mixed strategic doing packs. This outcome seems to be more tightly connected to government than to building a new narrative.

I'd like the members of this table to explore this strategic doing pack more carefully and tell us how we got off track.

Suggestions for the group:

- 1. Redo its strategic doing pack and answer all of the questions as clearly as possible.
- 2. Ask for help if you need guidance on completing the pack

Table 2

Dale Ketcham

Eddie Ellegood Gwendolyn Auello Percy Louel (?) Bob Stover Linda Brandt Dave Teek Steven Maklousky Mike Godfrey Edward Castina

This table also has a good group of skilled professionals and communications. At the same time, the conversation at this table was not focused clearly enough on the opportunities that could emerge from connecting the assets of the table. The opportunities listed are not opportunities but activities, and these activities are not very clearly defined: "create a compelling narrative" and "disseminate that narrative globally".

The general level of thinking does not get more specific when we turn to an Outcome. The outcome is explained as a "a network with buy-in". The characteristics are still too vague to be measurable. The top project is left blank, even though the specific milestones seem clear. Finally, there is no specific commitment for any action steps.

Suggestions for the group:

- 1. Pick up your conversation and focus on a clear outcome. If you are successful, what will Brevard County look like and feel like? Think about both the content of the new narrative and how this new narrative will be formed, refreshed, and communicated. You are talking about a new narrative network. Focus intensively on what this new narrative network might look like. Who would be involved? What would it do? If I you return to Brevard County in three years what evidence would I have of this new narrative network? What would you take me to see? Who would you take me to listen to? What types of events or venues would you have me visit?
- 2. This is not easy to define or articulate, but we need some clear outcomes to keep people aligned. One suggestion is that the group investigate how other regions are communicating an effective message. How would a new network help us capture the emerging stories of the region? What kinds of events would reinforce the new narratives we are building? How could people come together to shape this new narrative? How could the region use the extraordinary resources of Florida Today to help build this new narrative?

#

Table 1

Tim Franta
Celene Morgan
Jay Carson
LaDonna Netery
Celesta Gushe
Karin Jamison
Mark Nappi
George Hauer
Tracy Yates

This table offers a dense network of aerospace expertise. The table discussion seemed to focus on one opportunity: building an inventory of the aerospace skills and physical infrastructure to support aerospace development within the region.

Answering Question 2, the table got a little sloppy. Rather than focus on a clear outcome and characteristics of that outcome, the discussion focused on a project and activities (Question 3). So, for example, the answers to Question 2 set forth milestones requested in Question 3.

This misstep is not surprising. Generally, we are more comfortable talking about what we can do, as opposed to where we are going. Your group would have a better impact if it spent more time clarifying your outcome for the region -- where we are going -- and how we will measure success.

The table discussion returns the clarity in Question 3. The project is clear and the milestones are focused.

The short-term action plan is also clear, and this group did a good job in identifying the next time it will come together.

Suggestions to the group:

1. Focus on defining your outcome more clearly. It seems to me that you have a clear understanding among your group of what this outcome looks like, but you have not communicated it very effectively. Focus on defining this outcome clearly: it is your "elevator pitch" to the region. The stronger your language -- the more clearly you define your outcome -- the more powerful it

becomes to attract and align people and assets within the region.

2. Think about the characteristics of your outcome and how you measure those characteristics. Metrics are only a test to determine whether you have defined success clearly enough that you can measure it. If you cannot translate a characteristic quickly into a metric, the characteristic is too vague.

Table 2

Susan Glasgow
Ron Bontwell
Larry Clark
Lee Solid
Marshall Heard
David Pearce
Brad Loft
Les Leckron
Jennifer Ogburn
Mary Bolin

Although this table also had a very strong group of aerospace professionals, the group did not outline opportunities that could emerge from connecting the assets within their network. The group also did a weak job in outlining a clear outcome. It's not possible for me to visualize a "streamlined and timely range access process".

The team also did not define a very clear project, and it did not find this project with any milestones.

The team did specify a short-term action plan, but without a clear project, this action plan is detached from any logical connection to a project or an outcome. A strategy draws logical links from where you are to where you want the region to go. Given the talent at the table, this group should be able to do a much better job in specifying where we are going and how we will get there. Finally, the group did not complete Question 4.

Suggestions to the group:

1. Consider joining forces with the group at Table 1. That group seems to have a very good sense of where it is going. From what I can tell, your discussion aligns fairly closely with the discussion that took place at Table 1. You are also looking at trying to streamline access to a set of assets -- skills and facilities -- to support further aerospace development. If you

decide to join the conversation at Table 1, simply introduce yourselves through the One Hub space.

- 2. If, on the other hand, you feel that your conversation is sufficiently different from what is taking place at Table 1, you will need to define your conversation more clearly. Start by focusing on a strategic outcome with three clear characteristics.
- 3. Once you have defined that outcome, define a project that will lead to that outcome. Define your project clearly by specifying three milestones. Next, develop a short-term action plan for your project. Focus on the next 30 days. Finally, set up a regular meeting schedule so that you can continuously refine your strategic action. Your meetings can be short -- about an hour -- every month.

#

David Hosley
Ted Hartselle
Linda Wiggins
Mary Gobert
Carey Beam
Ben Yeargin
Tracy Anania
Valerie Guenther

This group does a good job of outlining new opportunities that can emerge from leveraging assets within the network at the table. The three opportunities -- reinvention of the local workforce; moving NASA to become more entrepreneurial; and encouraging the development of a "Federal city" at the Kennedy Space Center -- are all good and clear opportunities.

In defining the Outcome under Question 2, the group starts to slide into activities, as opposed outcomes. The difference appears subtle, but it is very important to keep in mind.

An outcome is a destination. An activity describes how you will get to that destination. With a strategy, you need to define both your destination ("Where are we going?") and a pathway ("How will we get there?").

You need to define an outcome clearly so that people are motivated to align their interests and their networks toward achieving your outcome. They will not move unless you have a clear, compelling outcome with which they can identify.

Next, you need to define a pathway with a practical project or initiative that will get you closer to your outcome. Again, you need to be specific. The best way to define a project with clarity is by specifying milestones.

As you move in your strategic doing pack from Question 2 to Question 3, the thinking of the group appears to get muddled. Your outcome, apparently, involves expanding research and development at the Kennedy Space Center.

Using that as a starting point, what are the characteristics of a Kennedy Space Center with an expanded research base? What would you see at the KSC, if you are successful in expanding the research base? How will you know we have arrived? How do we define success?

Suggestions to the group:

- 1. Bring more clarity to your Outcome. Define the characteristics of a KSC with an expanded research base. What are the key dimensions on which we should focus? (Is it expanded R&D investment? Different research disciplines? Crossdisciplinary projects? Cooperative R&D with industry? Incubators on the grounds?)
- 2. Once you have defined your Outcome more clearly, tell us what project will provide us a pathway to that outcome. Define that project with some clear milestones.
- 3. Don't forget the last two steps in this strategy process. They are critically important. You need a short-term 30 day action plan. The purpose of this action plan is to provide shared responsibility and transparency. It structures the critical step of moving ideas into action.
- 4. Finally, also pay attention to when you will meet again. This strategy process never ends. It's a continuous and rigorous process of making approximations. You need to come back together again to share what you've learned, realign, and set out the next steps along your pathway.

#

Kelley Rose Marie Julie Henry James Ana

Onena Amelia Jed (?) Dan

This group has a great deal of expertise to build a talent marketing network. The group's conversation initially focused on three opportunities, which are not mutually exclusive.

The discussion on opportunities is important. It is designed to enable us to start seeing how opportunities emerge when we link our assets together. In a network economy, opportunities emerge at the edge of networks.

The group did a good job in defining an initial Outcome and specifying characteristics that can be measured. Based on my reading of the strategic doing pack, the new Talent Marketing network represents really a network of networks. It includes new characteristics, like ambassadors, a speakers bureaus, and a web site all focused on promoting the extraordinary talent within the region.

This new Talent Marketing network will begin to take e shape when the individuals at the table make their networks visible to other members of the team. The group also did a good job in setting up project milestones to provide clarity and pragmatism.

The action plan could be clearer, and the group did not agree on a date to reconvene.

Suggestions for the group:

- 1. Define your outcome even more clearly. Focus on the characteristics that can help people visualize where you want to take the region. You have a short window of attention to grab people. They must be able to quickly see where you're heading. An outcome with three clear characteristics provides that clarity. Revisit your Outcome and come up with a second version.
- 2. Define your project more clearly. Your project description is vague. A clear project description is also important in order to answer the question "How will we get there?" With a clear project description people understand that you've thought through how to get from here to there. A clear project description is enhances your credibility as a leader.

Table 1

Ricardo Alvarez
Gary Neff
Kevin Brown
Jim Ball
Tambre Clark
Jenny Lucas
Larry Loschiaro
Pam Lutner
Doug Hilmes
Beth Giltin

The table clearly has deep and varied expertise in entrepreneurship and building new businesses. The table discussion on opportunities begins to demonstrate how these opportunities emerge when participants connect their assets together.

The Outcome has a number of important dimensions. Creating a Space Coast Emerging Business Network clearly involves developing in formal sources of venture capital through an Angel network. But what other characteristics are important? What about mentoring? Or incubators? Or connections to KSC? Or connections to universities? What do you see there?

The table's discussion of the project needed to get the outcome is a little vague. It's not clear to me what a Business Opportunity Series really means. Because the table did not identify milestones, I have no clear idea in my mind of how we move toward the Emerging Business Network on the Space Coast.

The table did not include any 30 day action plan or any commitment to follow up.

Suggestions to the group:

1. Go back to your outcome and describe it more clear detail what an Emerging Business Network really means. What are the characteristics of that network? Are there other networks in the other regions that can provide a guide? (The answer is, "Yes", of course.) Defining a clear outcome is critically important in aligning networks. Without a very clear outcome, people cannot fix their commitment. You can do a far better job of describing this Emerging Business Network.

- 2. Define a project that gets us to this new Network. What is the Business Opportunity Series? Define this project with a clear description that includes milestones.
- 3. A strategy requires an action plan. If you have not completed an action plan, you have not demonstrated how you translate ideas into action. Make sure that on the next version of your strategy, you include an action plan.
- 4. In addition, make commitments on a regular process to follow up and revise your strategy. Strategy is a continuous process that requires short bursts of focused thinking our regular basis.

Grade: B-

Table 2

This table did not complete the first question. Therefore, we do not know who was involved in this conversation. We also do not know what opportunities could emerge from the assets at the table.

The outcome is a bumper sticker: Create a culture of entrepreneurship through out Brevard County. The first specificity comes in a set of characteristics, "networking and education forums".

The top project is "Creating/improving entrepreneurial networking capabilities." It's only when I get to the milestones that I start to see where this group wants to take the region. Yet these milestones without the other context are difficult to interpret.

Suggestions to the group:

- 1. Start over from the beginning. Gather all the people who are potentially contributing to this network. Get their names down. Discuss the assets that each person brings to the network. Identify some of the assets that these people bring to a new network.
- 2. Next start to explore the opportunities that emerge from connecting these assets. In a network economy, opportunities emerge on the edge of networks. They emerge when two or more

people get together and start to explore options for connecting their assets and developing "link and leverage" strategies.

3. If this group is intent on developing a new entrepreneurial network, consider merging your efforts with Table 1.

Grade: Incomplete

#

Judy Blanchard
Rich Simonton
Hank Okraski
Patty Stratton
Jeff Schiff
John Porter
Jayne Burgess
Bob Porter
Frank Dibeldo
Kim Miller
Shannon Roberts

This table possesses a remarkable variety of expertise. Not surprisingly, the group came up with three compelling opportunities: 1) making Brevard County energy independent; 2) develop Team Space; 3) become world beaters in space transportation.

The table picked the last of these opportunities on which to focus. It's important to recognize that the other opportunities don't go away. If you capture them in your strategic doing pack, we can always come back to them and build new networks around these opportunities.

The table discussion focused on the key characteristics of becoming global leaders in space transportation. These characteristics were clear: strategic alliances across business and government; efficient launch activities; and a full range of launch related services. Because each of these characteristics is clearly defined, the metrics become easy to identify.

The project is also concise: Develop Team Space working with Team Orlando. The project is only defined by one milestone, however. It would be more credible (and understandable to outsiders) if your group had defined two additional milestones.

Your group did an excellent job identifying a second and third project that could also lead to achieving our outcome.

The group did a good job translating the project into a shortterm action plan. However, you forgot to answer question 4.

Suggestions to the group:

- 1. Your work stands at the top of all of the groups, and you can become mentors to other groups that are trying to define new strategies for the region to pursue. Think about adding your name to the other groups and providing guidance to them as they move forward.
- 2. Continue to clarify your Outcome. You've got a clear outcome, but as you work toward it, you may decide to clarify or add or drop characteristics.
- 3. Spend more time defining what you mean by Team Space. This is a term of art that you may understand, but most people probably do not. Explain what this project is and why it's important.
- 4. Make a commitment to regularly revise your strategic action plan. If you do not come together on a regular basis your good work will go nowhere.
- 5. Consider forming a new group that focuses on developing a strategic action plan for the future of Brevard County. You have the expertise within your group to guide strategies guickly.

Grade: A

#

Table 1

Angie Apperson Charles Billins Robert Allen Barbara Arthur Melissa Stains Dina Reider-Hicks

This table focused on tourism development.

First, some background: In the process of strategic doing, opportunities emerge from connecting the assets of existing networks together. In the process, we look for compelling opportunities that we can clearly define. If we can do that, we have a chance of building a new network that attracts assets and energy from people outside the room.

The opportunities that this group focused on seem to be relatively narrow. My sense is that the opportunity in tourism development can be more clearly expressed. The implication in your strategic doing pack is that the County needs a new direction in tourism development .

This group can usefully invest more time focusing on what the future of tourism development in Brevard County. What are the characteristics of the tourism cluster that we would like to develop?

Suggestions the group:

- 1. Meet together and tried to define some opportunities that are clear about the future of tourism in Brevard County. Once you have defined two or three opportunities, focus on one.
- 2. Define that opportunity in more specific detail. What would you like to see the tourism economy of Brevard County be in, say, 3 to 5 years? What are the characteristics of this tourism economy? What will people be doing, seeing, experiencing that will be different than what they do today? Give us some ways to explain what success looks like. Take each characteristic and ask yourself, "How would we measure that?"
- 3. Define for us a project that will get us closer to this outcome. Describe the project in terms of some milestones. How will we know that we are moving forward on our project?
- 4. Next, translate your project into a 30 day action plan. Without an action plan, we cannot translate ideas into action. Part of being a leader in today's network economy involves the ability to take big ideas and translate them into practical next steps.
- 5. Outline a regular meeting schedule to keep moving forward. Developing a strategy is an iterative process. It does not require a lot of time. It does require, however, some disciplined and focused thinking on regular basis.

Table 2

Dana Blickley Cane Exline Steve Burdett Walt Johnson Robert Verley

Carolyn Fausnaugh Wm Tuck Ferell Vincent LoPresti

This group appeared to focus on physical development and the intersection of infrastructure and business development. In all likelihood, your outcome can be more clearly defined by thinking about providing the infrastructure needed to support high growth businesses in the county.

It is not clear to me from your strategic doing pack what investments you would like the County to consider. It seems that you are looking to develop a capital budget geared toward supporting business development of high value employment. So, for example, you make reference to a visitor center, a research triangle, and smart growth.

What would it look like if this group were to focus on providing the physical infrastructure to support the development of quality, connected hotspots throughout the county? These hotspots are designed to become the home for new high-growth businesses.

It seems as if this group is telling the County that we need a plan of physical development to support these new types of businesses. That can include both extending the connections of the existing road system, building anchor "hotspots" in research parks and incubators, and providing mixed-use "live work" districts.

Suggestions to the group:

- 1. Continue your discussions to focus on an outcome that captures the scale of your thinking. It seems to me that you need to focus on defining this outcome more clearly.
- 2. Once you have defined an outcome with some clear characteristics and some metrics to tell us what success looks like, turn your attention to a project that will start moving the county in the direction of your outcome.
- 3. Continue with the discipline of translating your project into an action plan. Projects will never get done unless we can define short-term action plans.
- 4. Finally, you have taken on a big challenge. You cannot meet this challenge unless you come together regularly for short

bursts of strategic thinking. Consider coming together every month for least an hour or two.

#

Grade White
Margaret Lewis
Ann Wentworth
Diana Brimo
Bruce Forton
Mildred Cayne

Space Coast Energy Consortium Driving Clean Energy Jobs and Industry in the Space Coast and Central Florida

Space Coast Energy Consortium - Goals & Recent Accomplishments Update Feb 4, 2011

Consortium Goals:

- Develop and foster a new "innovation ecosystem" in the Space Coast and Central Florida region focused on energy-related products and services
- Build a clean, high-growth and sustainable energy economy with *global* impact!
- Assist the transformation of the Space Coast region and Central Florida by redeploying assets to be competitive in today's global knowledge economy

Recent Accomplishments:

- Convened two major events to highlight potential for energy-related industry in Space Coast and Central Florida
 - Sept 14, 2010 Space Coast Energy Symposium approx. 300 attendees from throughout Florida, including a trade show of local energy-related companies
 - o Jan 20, 2010 − Space Coast Energy Consortium Launch event − Approx 150 attendees from throughout Central Florida region, including several local elected officials
- Received funding from the Bill and Melinda Gates Foundation for STEHM Learn and Earn program design blueprint for the state of Florida
- Collaborating with Space Florida and Regionerate to identify and map Brevard and Central Florida's existing energy assets, stakeholders and competitive advantages
- Working to present a KSC Workforce Energy Showcase in March 2011 in cooperation with Brevard Workforce, local companies, NASA and KSC contractors
- Working with Brevard County government on programs to advance energy efficiency and create
 jobs in our local economy, including expanding the County's existing Weatherization Assistance
 Program to take advantage of new federal \$\$ and create new jobs providing energy retrofits to
 low-income households.
- Presenting a common calendar of community events and business development opportunities in clean technology, as well as a digest of recent news in the cleantech industry relevant to the Space Coast/Central Florida region
- New Facility! Hradeski Clean Technology Innovation Center in Cape Canaveral, Florida

The Consortium has convened a number of working groups comprised of business and community leaders and interested citizens to advance development of energy-related business opportunities in a range of sectors:

- Education and Workforce Training
- Emerging Tech/R&D
- Energy Efficiency & Renewable Generation

- Finance (Retail & Wholesale Finance)
- Manufacturing
- Market Development (Local & International)
- Policy
- Space-Energy

These groups are engaging a wide range of community partners and educational institutions to advance the Consortium's mission of driving clean energy jobs and industry in the Space Coast and Central Florida.

Community Partners:

Brevard County Government

Brevard Workforce

Central Florida Partnership

Chambers of Commerce (Cocoa Beach Area, Melbourne, Orlando, Palm Bay, Titusville)

Economic Development Commission of the Space Coast

Enterprise Florida

Florida High-Tech Corridor Council

Florida Solar Energy Center

Metro Orlando Economic Development Commission

NASA Kennedy Space Center

Orange County Government

Space Florida

USAF 45th Space Wing (Patrick AFB/Cape Canaveral Air Force Station)

Educational Institutions:

Brevard Community College Embry-Riddle Aeronautical University Florida Institute of Technology Rollins College University of Central Florida

For more information, please visit our website at www.SpaceCoastEnergy.org, or contact our offices:

Michael Aller, Executive Director

Space Coast Energy Consortium

166 Center Street, Suite 200

Cape Canaveral, FL 32920

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Coast Clean Energy Cluster How Regional Innovation Clusters Form: The Space

Ed Morrison March, 2011



Coast Clean Energy Cluster How Regional Innovation Clusters Form: The Space

March, 2011 Ed Morrison

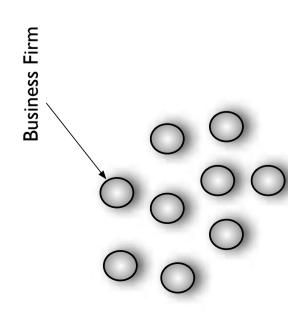
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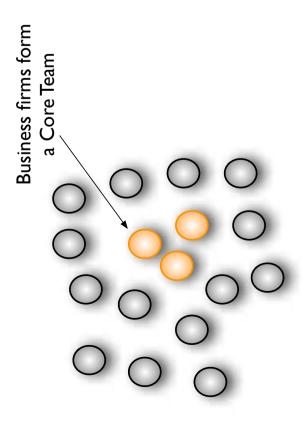
innovation. Clusters are defined by relationships, not memberships, and these relationships evolve as members of the Regional innovation clusters represent open innovation networks that transform regional economies by accelerating clusters interact. Clusters form through identifiable stages. We can view these development stages from different perspectives.

One approach looks at the density and scope of the network of interactions within the cluster.



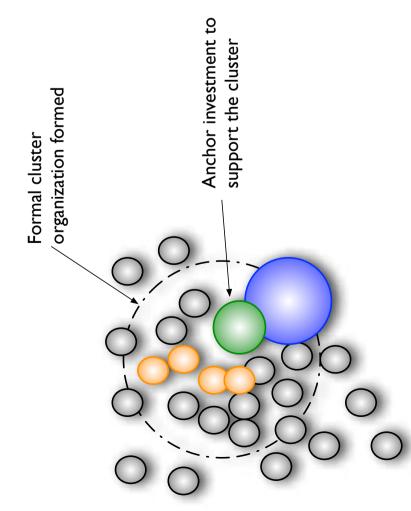
Conversation shifts.

Clusters begin to form with conversations among companies that share a similar "competitive space". These conversations typically focus on either 1) common problems, such as not having enough skilled labor; or 2) opportunities that could emerge by linking and leveraging assets.



Network emerges. Core Team forms.

among these firms become stronger. Participants become aware of an emerging network within the region. A handful of firms emerge to form a Core Team that start to concentrate shared assets within the cluster. The Core Team can also include representatives from clusters are privately-led, and publicly supported, not the other As more companies join these conversations, the connections government, education and non-profits. However, successful way around

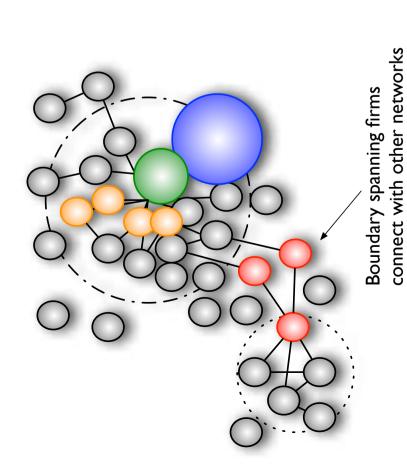


Strategic agenda emerges.

with strategic doing. Higher education institutions become active greater alignment through "link and leverage" strategies generated agenda. They move the network strategically to focus on specific Members of the emerging cluster begin to focus on a strategic joined network is called strategic doing. The cluster achieves outcomes. The strategic discipline to guide an open, loosely in supporting the cluster with knowledge transfer: training, research, and so on.

Cluster organization forms. Anchor investments made.

Members translate their strategic agenda into action: a portfolio of portfolio ranges from investments in talent; entrepreneurship and portfolio includes larger scale shared "anchor investments". The investments to strengthen competitive firms in the cluster. The innovation supports; marketing and branding; and physical facilities like incubators and research centers. The cluster formalizes its organization and governance.

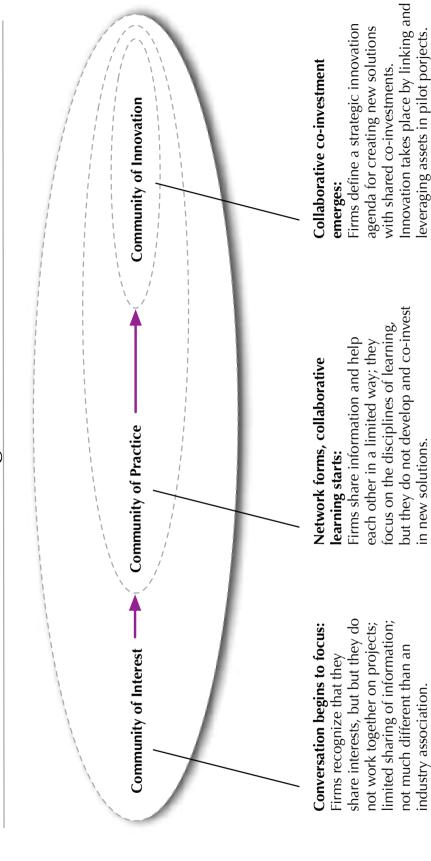


Cluster continues to invest, adapt and expand.

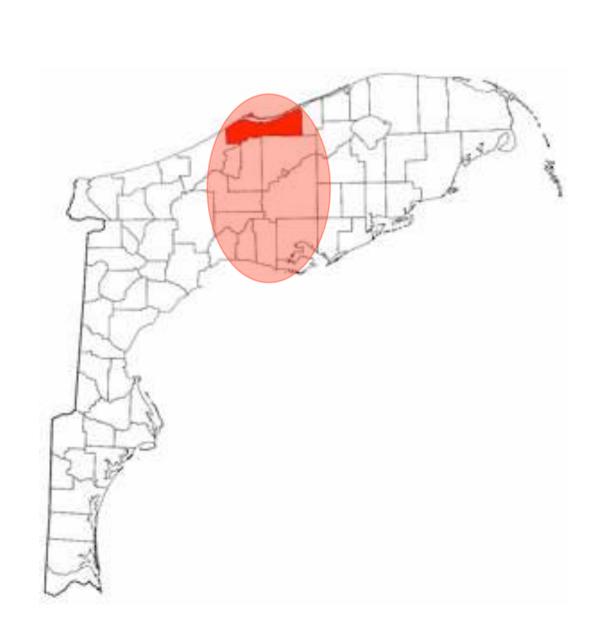
spontaneous. New anchor investments build out the infrastructure "boundary spanning" firms connect with other firms and markets of the cluster. In addition, new clusters emerge and connect as Connections within the network become more dense and and opportunities.

This process is underway on the Space Coast of Florida with a clean energy cluster, the Space Coast Energy Consortium.

Clusters share different characteristics as they move toward an innovation agenda



Driving Clean Energy Jobs and Industry in the Space Coast and Central Florida Space Coast Energy Consortium



The story of the Space Coast Energy Consortium.

We can see this pattern in the emergence of a clean energy cluster in Florida. Within nine months, a cluster of clean energy companies has formed on the Space Coast. The cluster is part of streeting or adjust to the shutdown of the NASA Shuttle. The cluster formed following a pattern of building the network out from a strong core.

The Space Coast Energy Consortium is a group of business and community leaders who are addicated to driving energy-related economic development in the Space Coast Energy Symposium, an event that brought together leaders from throughout our community and the state of Florida to discuss ways to diversity our economic base and promote new and sustainable pathways for economic development following the end of NASA's Space Shuttle program.

Our Mission:

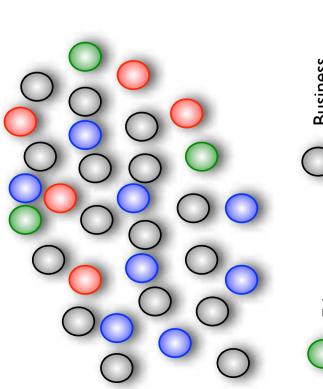
- Build a clean, high-growth and sustainable energy economy with global impact!
- Assist the transformation of the Space Coast region and Central Florida by redeploying assets to be competitive in today's global knowledge economy

Short-term Action Plan:

- Identification and Mapping of Brevard and Central Florida's existing energy assets. stakeholders and competitive advantages
- Educate the stakeholders on the local, regional, federal and global "Energy Landscape"
- Initiate "business to business" opportunities to leverage existing interests and assets in energy-related businesses
- Discover and Facilitate space industry transition opportunities

Consortium Goals:

- Develop and foster a new "innovation ecosystem" in the Space Coast and Central Florida region focused on energy-related products and services
- Establish a framework and focal point for the flow and connectivity of information for long-term economic development
- Serve as a "convening point" for discussion and collaboration among existing assets and programs across our region
- Identify opportunities for funding programs and provide information for businesses and institutions seeking such opportunities
- Accelerate opportunities to ameliorate job loss related to the Kennedy Space Center transition, and apply our space workforce's world-class skills to energy-related engineering challenges













The May 2010 Forum engaged Coast by using the light weight about 200 people to identify discipline of Strategic Doing. new networks for the Space

May 2010: Initial Strategic Doing Forum

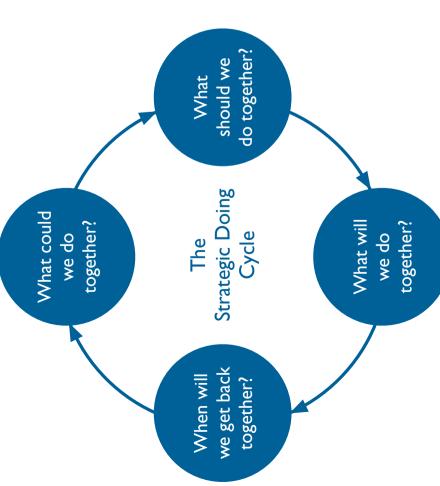
The process of forming the Space Coast Energy Consortiumbegan in May, 2011. A collaboration of organizations in Brevard County sponsored a Strategic Doing forum to beging the process of building new networks in the wake of the MASA Shuttle shutdown.

Strategic Doing, in contrast to Strategic Planning, enables people in loosely joined, open networks to think and act with purpose to meet challenges. This approach is a transformative experience for many who are used to working in a hierarchal fashion.

Strategic Doing provides a simple set of rules to guide the complex conversations needed to design and implement regional innovations quickly. The approach works with groups large and small. Strategic members make continuous adjustments in their strategy as innovations emerge from following simple rules. Network Doing workshops translate strategic thinking into action. Civic leaders learn that in open networks, sophisticated they learn "what works"

a strategic agenda for clean energy Clean energy network becomes more dense and connected Core Team for clean energy Core Team begins guiding cluster forms Non-profits Business Government Education

Larger group continues to develop new networks at a slower pace during the July workshop

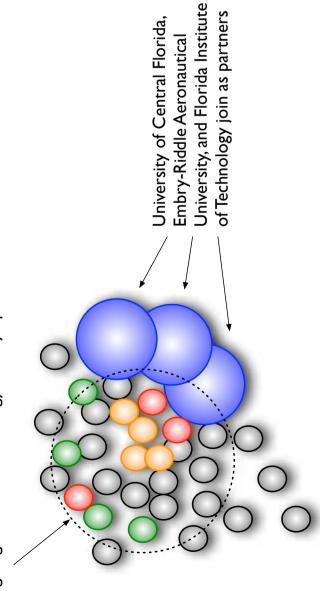


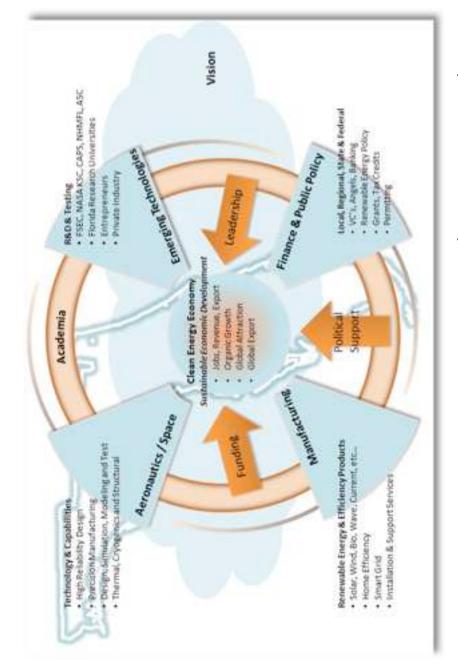
July 2010 Strategic Doing Workshop: Core Team forms; Plan doffor Consortium launched

In a second Strategic Doing forum held in July, the emerging network of clean energy companies and interested organizations began forming around a Core Team. The group initially planned for a formal organization of the cluster in a broader symposium focused on clean energy opportunities. During Strategic Doing workshops, participants engage in focused conversation on core strategic issues by following four focused workshop exercises teach the members how to conduct deep strategic conversations quickly members how to conduct deep strategic conversations quickly began to the process of the

action plan, much like a software program that is continuously As they complete these workshops, the members generate all subsequent workshops, the members revise their strategic the components they need for a strategic action plan. In improved

practice to master. Led by a Core Team, members of the clean The Strategic Doing discipline is simple, but not easy. It takes quickly and began designing on their strategic action plan. energy network absorbed the lessons of Strategic Doing





The Consortium visualizes its converging assets strategy with a map of

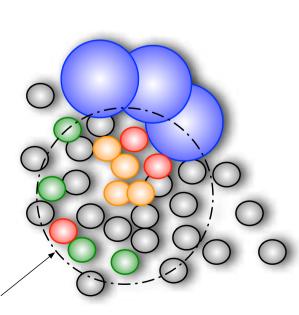
September 2010 Strategic Doing Workshop: Symposium announced
In a third Strategic Doing forum held in September, the Coreston announced its progress on translating its strategic action plan. The Team announced the formation of a formala organization: the Space Coast Energy Consortium. In addition, the Core Team announced its first initiative, a cleast energy symposium to continue uncovering and strengthening the clean energy assets in the region.

The Core Team also announced important partnerships with Embry-Riddle Aeronautical University, Florida Institute of Technology, and the University of Central Florida.

The Core Team organized the following Work Teams:

- Space-Energy
- Renewable Generation and Energy Efficiency
 - Manufacturing
- Finance
- Policy
- Education and Workforce TRaining
- Market Development (regional, national and international)
- Administration and Governance

At Clean Energy Symposium, Core Team announces formation of Space Coast Clean Energy Consortium

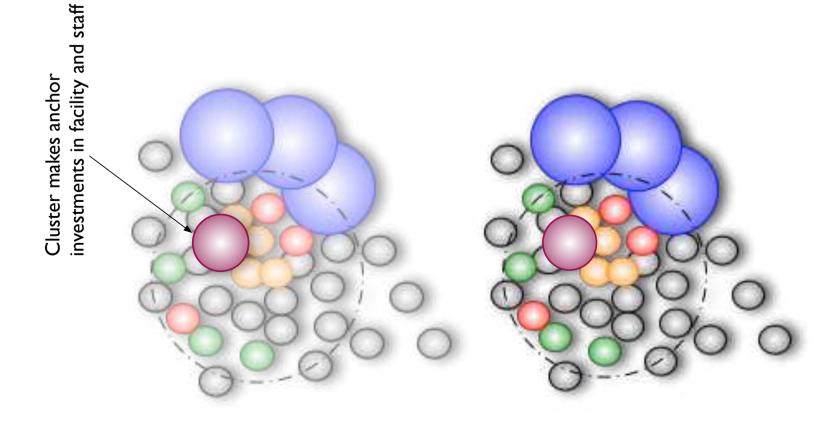




September 2010 Clean Energy Symposium; New organization formed

Clean Energy cluster forms a formal cluster organization: the Space Coast Energy Consortium. The Symposium further builds out the networks. Over 300 people attend. Symposium exhibitors include:

- Advanced Magnet Lab
- AeroIndustries
- **AML** Energy
- Brevard's GREEN Team*
- BT Manufacturing
- Clean & Green Enterprises
- Clean Cities*
- Embry-Riddle EcoCar*
- FBNCEE
- Florida Institute of Technology
- Florida Solar Energy Center UCF
- General Motors*
- Green Light Industrial Airpark
- ▶ Hayworth, Chaney & Thomas
- · Hills, Inc
- NASA KSC*
- Space Florida
- · Pratt & Whitney Rocketdyne
- Russell & Sun Solar
- Solar-Cool
- Structural Composites
 - . UMA Solar
- United Space Alliance
- * Vehicles on display



November 2010: The cluster makes anchor investments

By November, the Consortium, working closely with its advisor, Linda Fowler of Regionerate, had recruited Mike Aller as its executive director, secured office space, and started working on a grant from the Gates Foundation in science, engineering and math education.

The cluster continues to map clean energy assets in the region, including: precision manufacturing, sophisticated energy services; advanced expertise in high reliability design, simulation and modeling; thermal, cryogenic and structural engineering; and a strong research and development infrastructure.

January 2011: Formal launch event

At the cluster's formal launch event in December, over 100 participants continued work on the cluster's strategic action plan. Short term outcomes for the cluster include:

- 1. Continue developing a portfolio of pragmatic co-investment initiatives that deliver value to members of the cluster;
- Strengthen the cluster's strategic discipline of turning ideas into action rapidly and develop a sustainable business model;
- 3. Continue expanding the cluster relationships in Brevard County Central Florida and nationally through value-added services and experiences.



adapt this material with the understanding that that you attribute the source as follows: "Source: Ed Morrison and Strategy-Nets, The material is copyright, 2011, Ed Morrison and Strategy-Nets, LLC. Ed Morrison is Economic Policy Advisor to the Purdue entities wishing to enhance their efforts in regional economic development. Others are free to copy, distribute, transmit and Center for Regional Development and founding principal of Strategy-Nets, LLC, a for-profit company providing advice to

For more information on the Space Coast Energy Consortium

For further information on the Space Coast Energy Consortium, visit the Consortium web site at: www.spacecoastenergy.org or contact Mike Aller, Executive Director: michael.aller@spacecoastenergy.org; John Porter, founding board member: johnp@porterworldtrade.com; or Linda Fowler, Regionerate, at lindamariefowler@gmail.com

Space Coast Energy Consortium

Driving Energy-Related Economic Development in the Space Coast and Central Florida

Strategic Action Plan

Update May 2011

Overall Goal:

- Build a Clean/Sustainable Energy Economy in the Space Coast and Central Florida
- Develop and foster a new 'innovation ecosystem' in the Space Coast and Central Florida region focused on energy-related products and services

Action #1: Convene the Community

- Serve as a 'convening point' for discussion and collaboration among existing assets and programs across our region
- Identify local assets in energy-related fields (especially corporate and research resources) across the Space Coast and Central Florida and work to connect and leverage those capabilities
- Establish a framework and focal point for the flow and connectivity of information for long-term economic development
 - o Organized Energy Symposium on September 14, 2010
 - Space Coast Energy Launch Event in January 2011 inaugurated Consortium Working Groups
 - o Florida Energy Policy Forum February 2011

Action #2: Funding Opportunities

- Identify opportunities for funding programs and provide information for businesses and institutions seeking such opportunities
 - Space Coast Regional Innovation Cluster Opportunity October 2010
 - o I6 Green Proof-of-Concept Center for "Green" Technology May 2011
- Finance Working Group: Energy Efficiency Finance Programs
 - o St. Lucie County Solar & Energy Loan Fund
- Policy Working Group: Qualified Energy Conservation Bonds

Appendix C-10: Space Coast Brevard County, Florida

Action #3: Accelerate Transition/Diversification Opportunities

- Accelerate opportunities to ameliorate job loss related to the Kennedy Space Center transition, and apply our space workforce's world-class skills to energy-related engineering challenges
 - o Pathways to Energy Careers for the KSC Workforce April 2011

Action #4: Create a Sustainable Model for Future Programs & Activities

- Formal incorporation of the Consortium as a non-profit in late September
- Hired Executive Director Mike Aller
- New Facility Hradeski Clean Technology Innovation Center in Cape Canaveral
- Formalizing Infrastructure of the Consortium
 - Membership Program inaugurated May 2011
 - Sponsorship Program

Bottom Line: Building Business Opportunities!

- Connections with other companies
 - o Innovative partnerships
 - Major Firms Siemens, Harris, Utilities
- Connections with outside partners
 - o Universities
 - NASA KSC
 - o Federal Agencies
 - o Business Support Network
- Building Business Gravity

Accomplishments

During its first four months, the Consortium has:

- Established a permanent office in Cape Canaveral and hired an Executive Director as Cluster Coordinator;
- Received funding from the Gates Foundation for science, math and engineering education in Florida;
- Collaborated with Space Florida and Regionerate to identify and map Brevard and Central Florida's existing energy assets;
- Launched new initiatives with targeted working groups in space-energy; renewable energy and energy efficiency; manufacturing; finance; policy; education and workforce training; market development; and governance.

Short Term Outcomes

The Consortium is focused on the following short term outcomes:

- I. Continue developing a portfolio of pragmatic co-investment initiatives that deliver value to members of the cluster;
- Strengthen the cluster's strategic discipline of turning ideas into action rapidly and develop a sustainable business model;
- 3. Continue expanding the cluster relationships in Brevard County Central Florida and nationally through valueadded services and experiences.



Appendix C-10: Space Coast Brevard County, Florida

Space Coast Energy Consortium

166 Center Street, Cape Canaveral, FL 32920 www.spacecoastenergy.org | 321-613-2973 Mike Aller:

michael.aller@spacecoastenergy.org ohn Porter: johnp@porterworldtrade.com



Space Coast Energy Consortium

"Opportunity is missed by most people because it is dressed in overalls and looks like work ".

Thomas Edison

regional innovation **Creating a new** cluster on the Space Coast

growth and sustainable energy economy within Central Florida that has a global impact; and 2) began forming in the Space Coast. The cluster has a twofold mission: 1) to build a clean, high to accelerate the transformation of the Space In late 2010, a regional innovation cluster redeploying our assets to new market Coast region and Central Florida by opportunities in clean energy.

opportunities. Open networks of innovation regional innovation clusters—create pathways A regional economy becomes resilient only if for adaptation and economic transformation. it adapts quickly to new challenges and Clusters operate through trusted relationships, quickly formed. The Space Coast Energy Consortium provides a new cluster to recombine the considerable Florida. The Consortium links and leverages the region's assets to focus on new, exciting assets within the Space Coast and Central

market opportunities in the production, transmission and use of clean energy. These assets include precision manufacturing, expertise in high reliability design, simulation structural engineering; and a strong research sophisticated energy services; advanced and modeling; thermal, cryogenic and and development infrastructure.

In addition, the Consortium brings together local, state and national leaders in finance, higher education and public policy to align their contributions to this new regional nnovation ecosystem.

Fast, focused strategic action

defining cooperative actions that create value create value quickly for their members. The Regional innovation clusters thrive if they essence of a successful cluster comes in and then translating ideas into action.

companies emerged to form the Consortium. Strategic Doing. Through this discipline, a sponsored by Brevard Workforce. These Core Team of committed private sector workshops taught the new discipline of emerged from a series of workshops The Space Coast Energy Consortium

The first Strategic Doing forum took place in

May, 2010. A second forum took place in July. By September, the Core Team organized a symposium that attracted over three hundred participants. By November, the Consortium secured offices, an executive director, and its first project, funded by the Gates Foundation. In January 2011, the Consortium held its official launch.

The Consortium's Strategic Action Plan is organized around a series of work groups. Each workgroup is responsible for defining measurable outcomes and action plans. The Consortium continues to build its networks, define opportunities and strategic outcomes, revise its action plan, and measure its progress, all with a light-weight, agile strategic discipline.

Consortium Partners

Consortium Partners

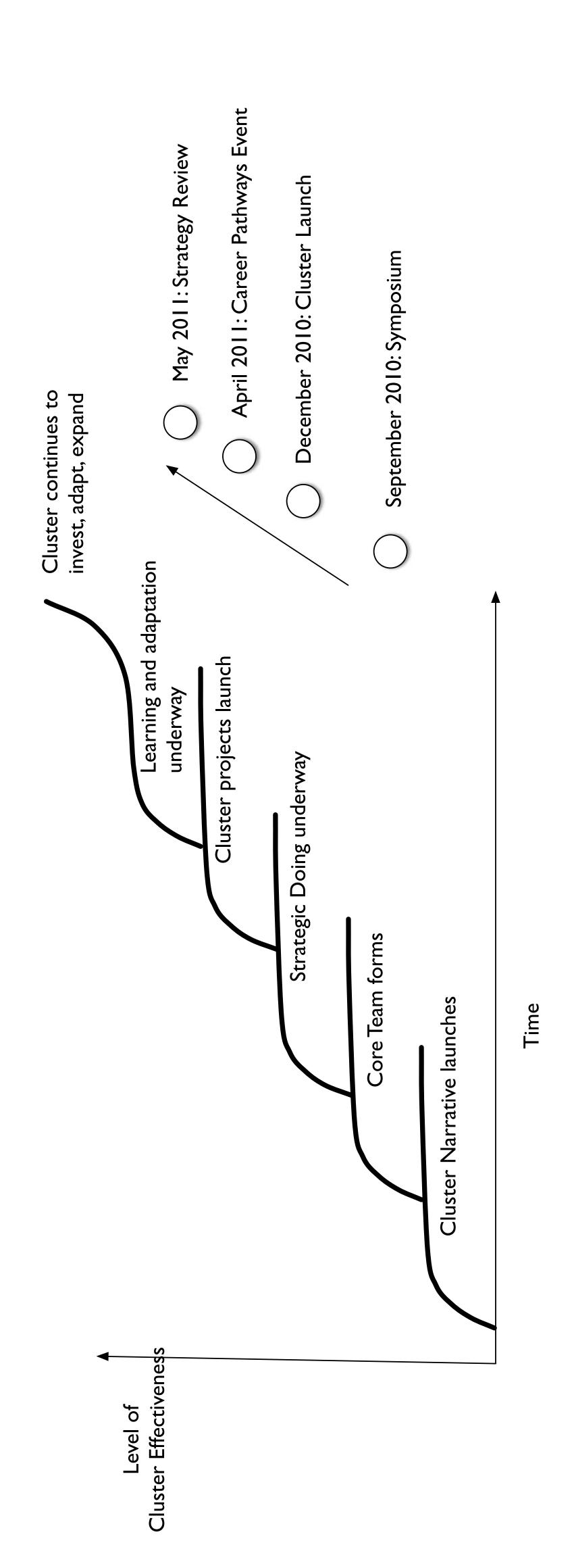
Florida Solar Energy Center
Florida Institute of Technology

- Space Florida
- University of Central Florida
- **Embry-Riddle Aeronautical University**
 - Rollins College
- Economic Development Commission of Florida's Space Coast
 - **Brevard Workforce**
- Central Florida Partnership
- Central Florida High-Tech Corridor Council

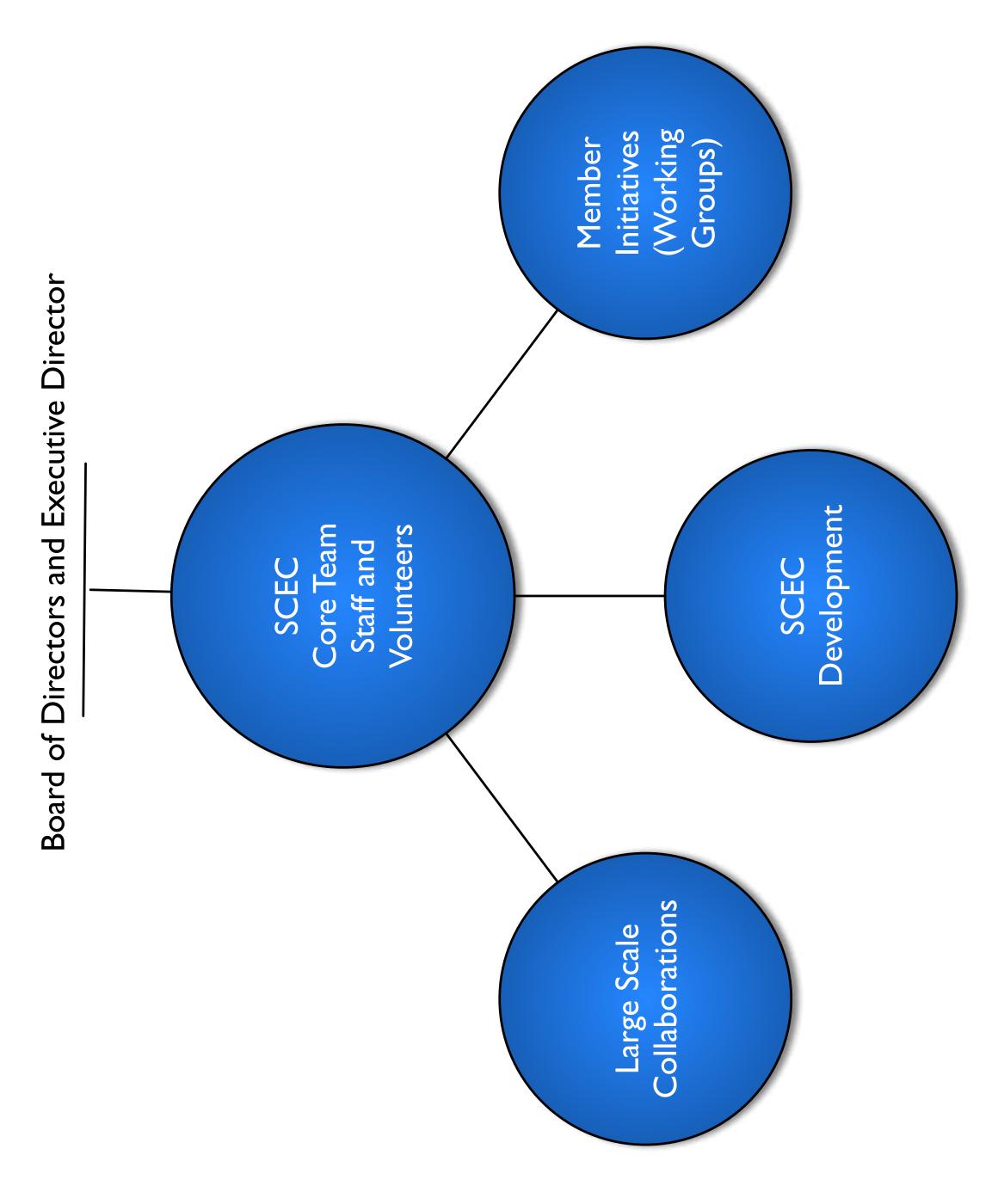


Space Coast Enel Consortium Slides from 2010-2011

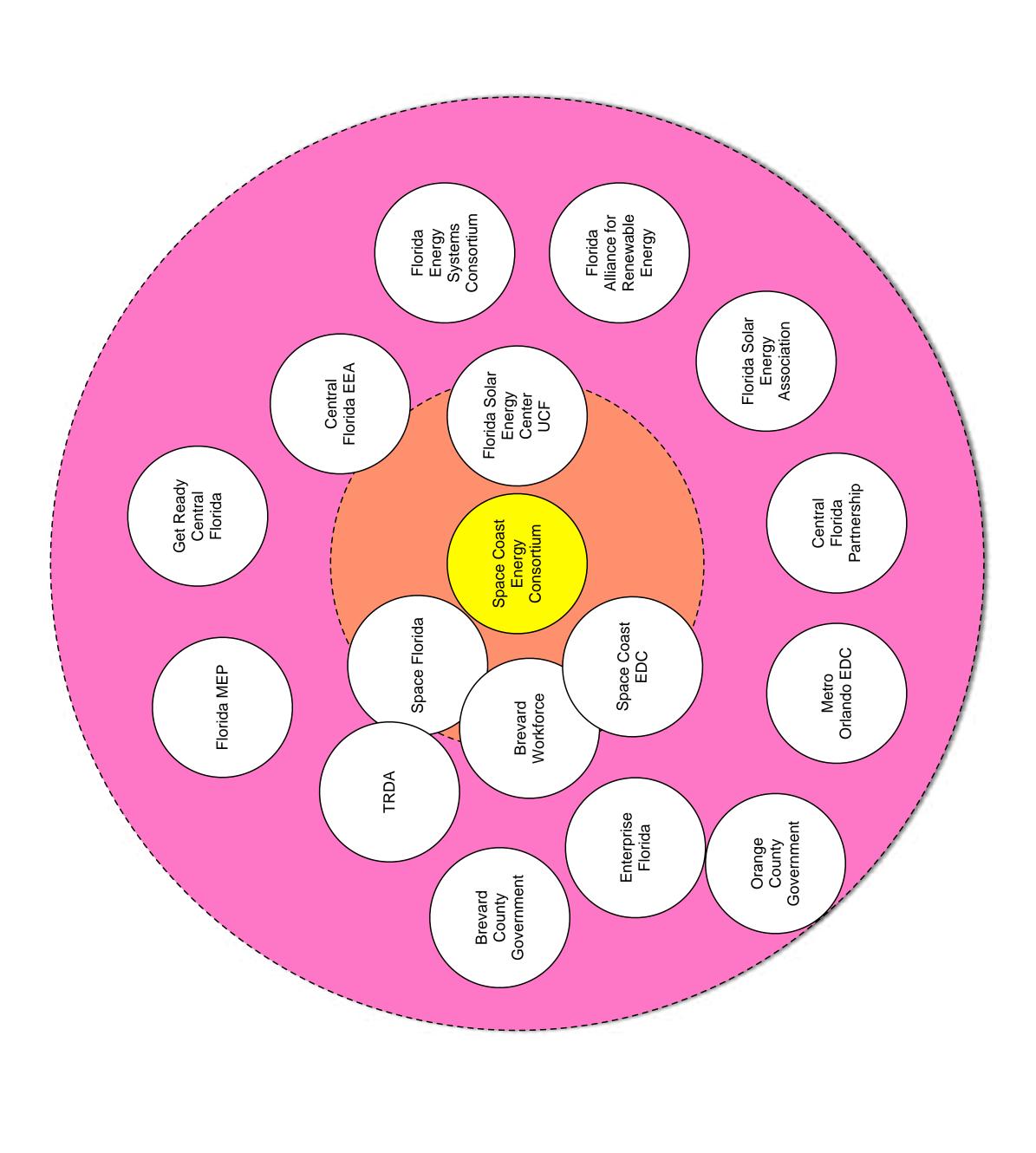
Morrison October 2020



Space Coast Energy Consortium (SCEC) Strategic Organization July 2011



Space Coast Energy Consortium Innovation Ecosystem December 2010



Strategic Doing In Action Case Study

Interview Questionnaire: Medora, IN

Interviewer: Nancy Franklin Date of interview: 9/18/17

Name of Interviewee: Scott Hutcheson

Organizational Affiliation: Purdue University Agile Strategy Lab

Role in case study: facilitated the use of Strategic Doing

Name of case study: Medora, IN

Location: Jackson County, IN

Start date: ~2010

Background: Jackson County, IN is one hour northwest of Louisville, on I-65. Seymour, home of John Mellencamp, is the largest city. Jackson County is dominated by agriculture. In the early 1980s leaders constructed a small scale outlet mall which never took off. It has been sitting underutilized for more than 15 years. Locals had an idea to make this mall an agricultural distribution hub. Through due diligence, they obtained grant money.

Catalyst for using Strategic Doing: Scott Hutcheson, in his role with Purdue's Cooperative Extension, was asked by the State of Indiana Department of Agriculture to help Jackson County. Scott began to inquire if the issue was really about the outlet mall? He learned that the real problem was the county's inability to take full economic advantage of its agricultural assets. While the outlet mall represented an asset, there were many other assets. Scott realized that Strategic Doing could provide a pathway to the opportunities the county imagined.

Organizations involved:

- Local economic development
- Tim Burton and his wife

Central issues addressed: By linking and leveraging assets as part of Strategic Doing, stronger connections were formed between consumers and agricultural producers. As they considered a

"Big Easy," the idea that rose to the top was to host a festival to highlight one of their products. An entrepreneur in town was making maple syrup. The group began to consister the idea of having a maple syrup festival, although other communities in Indiana also had maple syrup festivals. Someone in the group had attended the national cornbread festival in Pittsboro, TN and liked that model, which included a recipe contest. So the group wondered if they were thinking big enough, and through some research found out that no community in the country had a national maple syrup festival.

Significant outcomes, successes to date: The first national maple syrup festival was held 15 months later. As the years went by, word began to spread, eventually drawing several thousand visitors. The entrepreneur, Tim Burton, sold his IT business and now centers his work full-time on maple syrup production and distribution. Other landowners are producing maple syrup and selling it to Tim to meet the demand for Jackson County maple syrup. The festival grew too large for Medora to handle, so they now have a regional festival at Brown Park. People in the region have received USDA value-added grants to do maple syrup innovation.

Lessons learned:

- Powerful example of reframing moving the goal from filling a shopping mall to value added agriculture
- 2. Community and business development story

Photos, graphics, logos, etc.?

Rural Indiana

"Following the principles of Strategic Doing you can grow both communities and businesses. A small group of folks established Medora, Indiana (pop. 631) as the birthplace of the National Maple Syrup Festival and no amount of strategic planning could have helped my business, Burton's Maplewood Farm, launch a collection of artisan syrups, favorites of America's top chefs and and sold at exclusive farmers markets and other discriminating outlets across the U.S. It took Strategic Doing!"

Tim Burton, Festival Founder & Proprietor Burton Maplewood Farm







connections between complex social and environmental problems." he said "we solicited presentations us transdisciplinary modeling efforts involving the integration of knowledge and practice across the natural and social sciences, public health, and other disclosings in socition, we solicited presentations on purchaptery modeling efforts that directly involved plakeholders from a wide range of sections in efforts to manage complex problems. We strongly believe that transdisciplinary and participatory appears to modeling complex problems how the promise of non-dealing now knowledge at the intersections of discipline based and 'ocalismowledge, knowledge that will promote more effective efforts to manage the many complex problems facing communities in the 71st century."

Strategic Doing Workshops and Training

Originally developed at Purque University by Ed Morrison, regional aconomic development advisor in the Purque Center for Regional Development, Strategic Deinig is an approach designed for open, loosely connected networks (high teaches people how to form collaborations quickly, move them toward measurestic outcomes, and make edjustments along the very. According to Morrison, "Strategic Doing provides a new discipline for developing and implementing strategy within the toose networks that characterize our communities and regions. Where strategic planning is slow, linear and costly. Strategic Doing is fast, florative, and inexpensive."

Bob Brown, associate director of the Center for Community and Economic Development at MSU, provides training in Strategic Doing and facilitates Strategic Doing wysigns, in which participants are fed through a structured set of conversations that guide them toward realizing opportunities, deciding on nutronies, choosing initiatives or projects, and developing a complete action plan.

Brown introduced Strategic Deing into the Flint Michigan, area in 2019, while it has been instrumental in the down opment of several initiatives, such as Neighborhoods Without Borders and the Community Action Group.

According to the Flint Area Reinvestment Office website (reinvestflint ring). "The key to unlocking a more prospercius future for Flint rests on our ability to cultivate innovative collaborative partnerships that move quirkly toward solutions. We believe the practice of Strategic Doing is a vehicle that will help us get to where we want to op."

Strategic Pointy draws on the strengths and assols of the portropants, each of whom has an educil voice and equal responsibility to take action.

Community-Based, Participatory Research Training Modules

In 2013, Javoica Barnes-Najor, associate director of MSU y Community Evaluation and Research Collaborative, and CC2D associate director Bob Brown collaborated with national focustry, tribal leaders, and engagement specialists to develop a series of training modules, workshops, and webmars for community partners. The materials for the webmars and workshops were do designed and co-developed with, for, and by community partners with the goal of demystriying the conmunity-based, participatory research process. A collaborative consultative process was used to certify the main topics for the modules, which included:

- Community-Based, Participatory Research in Farily Childhood Programs, Process and Ethics
- The Context of Portnerships; Effective Structures (Part 1).
- Supporting Effective Teams in Partnerships (Part 2).
- Honoring antigenous Knowledge in Community-Based, Participatory Research and Evaluation

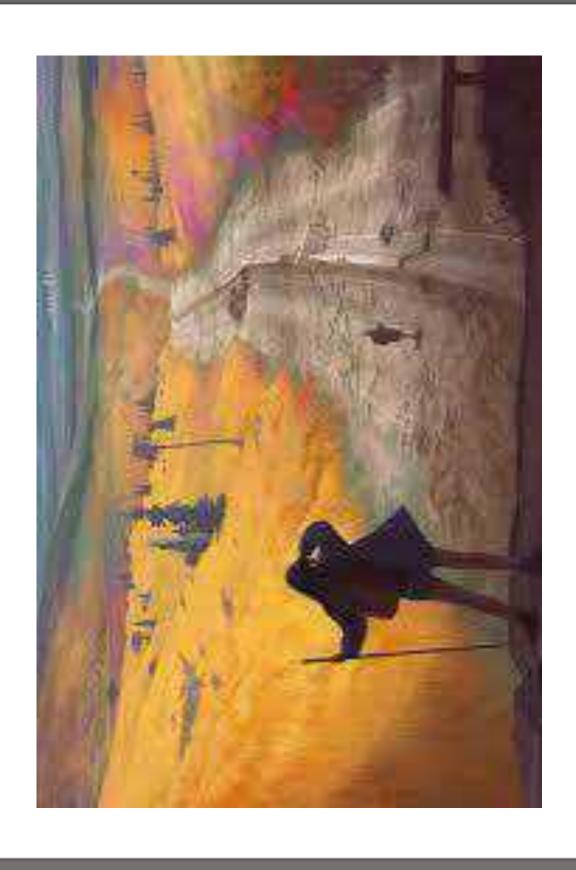
Throughout the moterials, developers reduced at Audained research jargon, included real-life examples, and addressed issues of power and privilege. The materials are also grounded in current scholar thip about ongagement and are responsive to concerns raised by community partners. Plans are underway to offer the workshops on a regular hapis



"In neighborhoods besieged by complex, wicked problems, Strategic Doing creates hope through the power of taking action with the assets and gifts that we already possess. In that moment when we combine assets we begin to tell a new story of opportunity and possibility. Strategic Doing gives us the power to change our lives, our neighborhoods, and our communities."

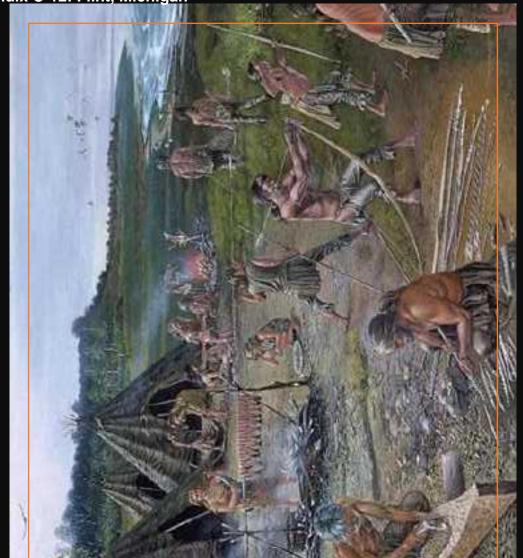
BOB BROWN ASSOCIATE (PRECTOR MS., CENTER FOR COMMUNITY AND ECONOMIC DEVELOPMENT

We start with the Journey



Strategic Doing and 2nd Curve: the Story of Flint

Bob Brown August 6, 2020 Appendix C-12: Flint, Michigan



Foraging Age



Horticulture Age

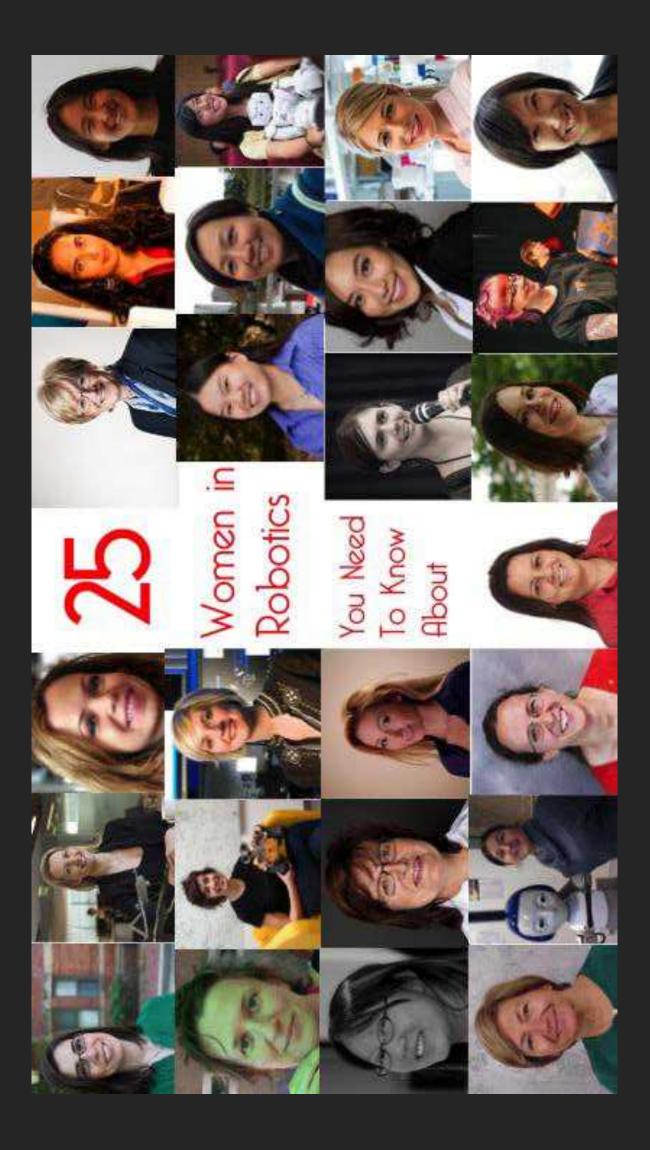


Industrial Age



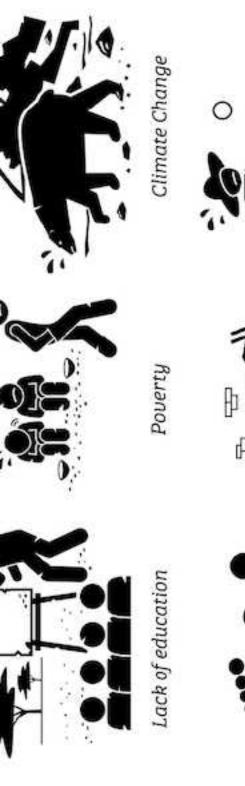
Each age includes yet transcends the prior age Each age has a predominate worldview which helps to produce amazing advances.







age finds impossible produce problems worldview of that These ages also to effectively predominate that the address





Water and Food Security

Homelessness

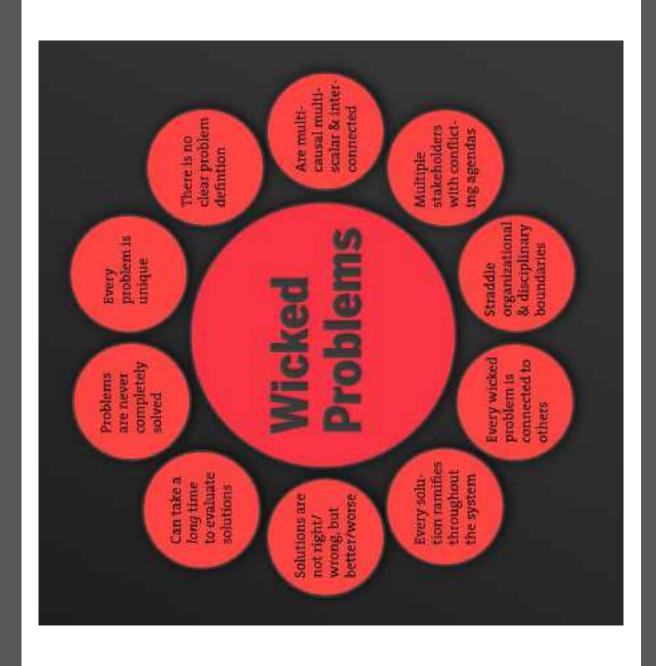
Public Health



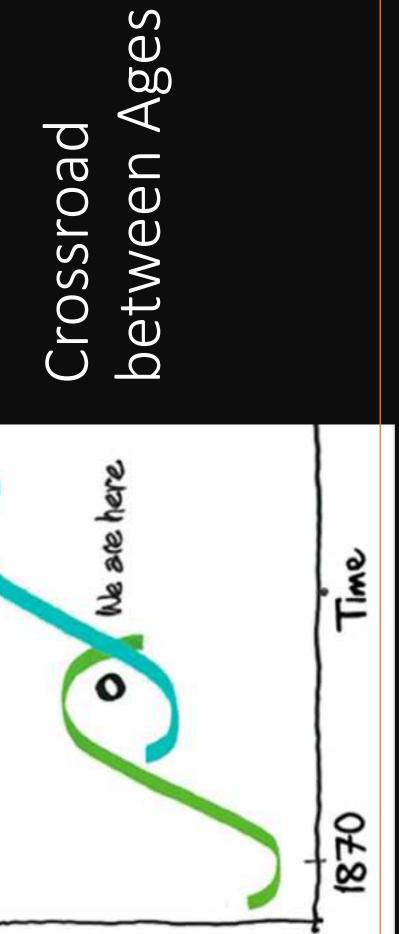












The current dominate s-curve is characterized by:

problems to solve

clients need help

funding driven

expert knowledge informs

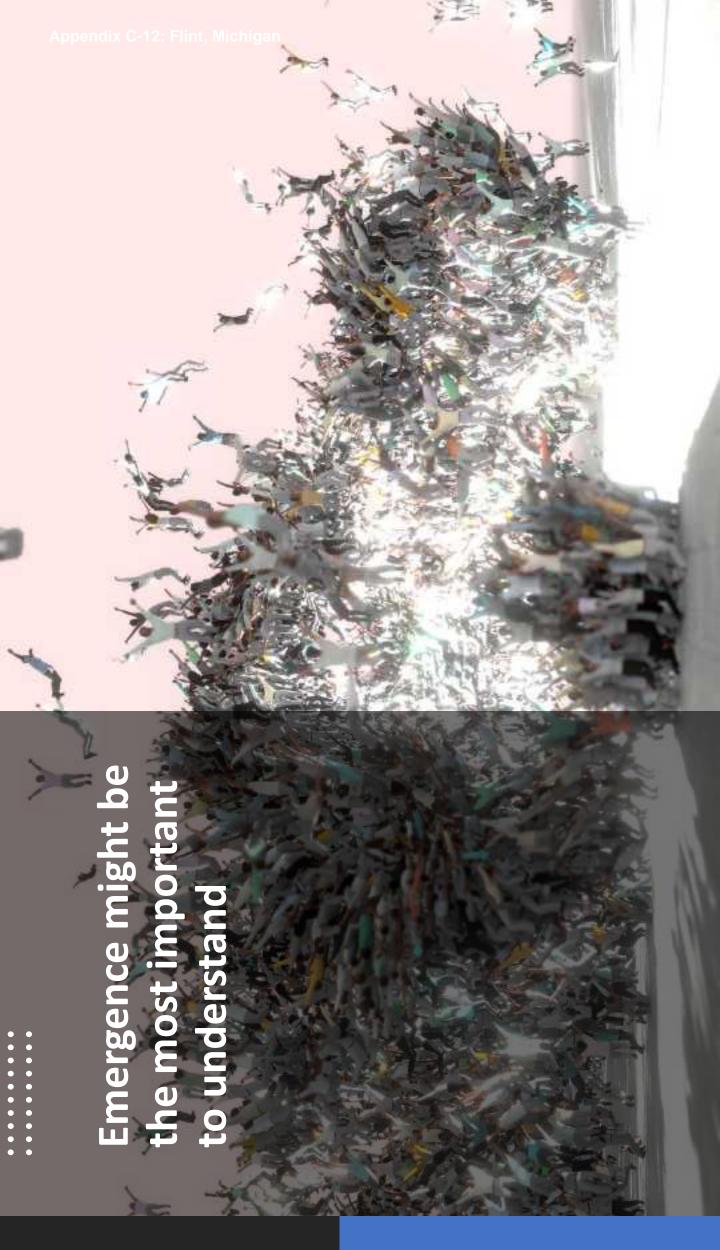
agency and program centered

strategic plans

professionals and experts operate the system

self-interested collaboration.

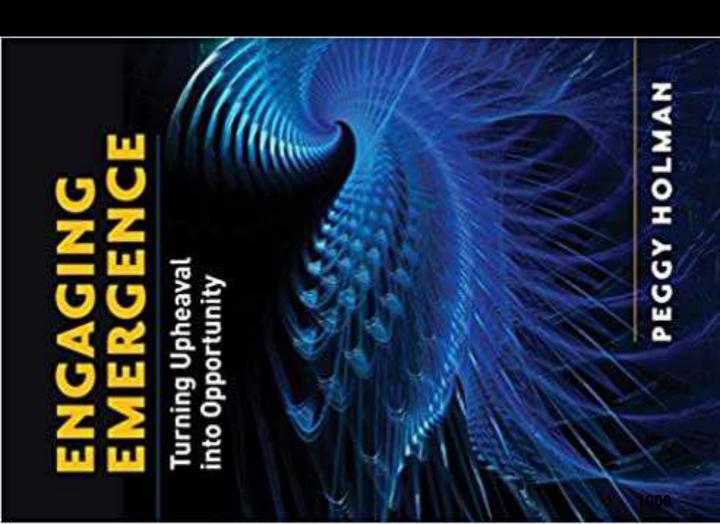
community wisdom and science informs gifts (assets) and generosity authentic, deep collaboration strategic doing emergence networks the neighborhood is the system operated opportunities to realize by those who live there people build capacity people and neighbor centered relationship driven characterize by: The next scurve is



Definition

"I defined *emergence* as simply as possible: order arising out of chaos."

Peggy Holman



Forms of Change

https://peggyholman.com/papers/engagir emergence/engaging-emergence-table-of contents/summary-of-key-ideas<u>/</u>

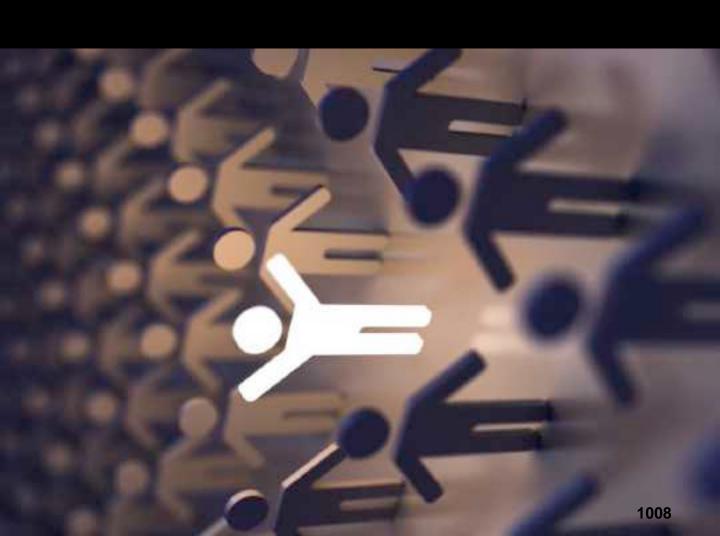
In order of increasing disruption:

- Steady state—Disturbance is handled within the existing situation.
- Incremental shifts—Disruptions interrupt the status quo.
- Emergence—Occasional upheaval results when principles that keep a system orderly break down.

Benefits of Engaging Emergence

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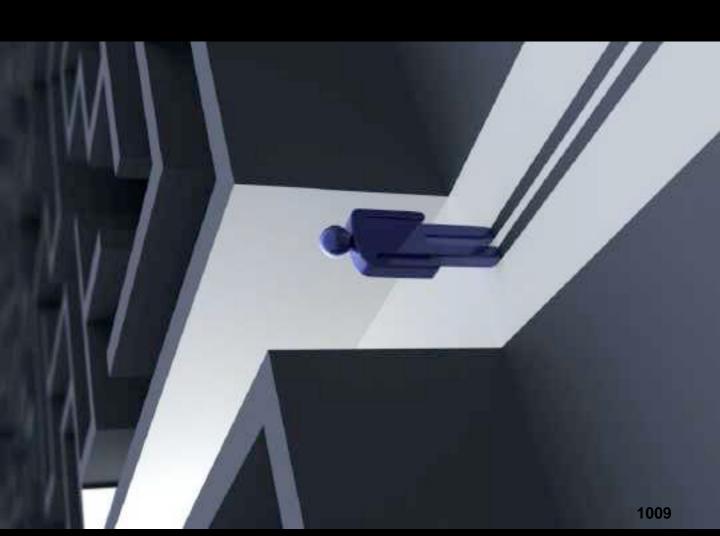
- Individually, we are stretched and refreshed. We feel more courageous and inspired to pursue what matters to us.
- New and unlikely partnerships form. When we connect with people whom we don't normally meet, sparks can fly. Creative conditions make room for our differences, fostering lively and productive interactions.
- Breakthrough projects surface. Experiments are inspired by interactions among diverse people.
- Community is strengthened. We discover kindred spirits among a diverse mix of strangers. Lasting connections form, and a sense of kinship grows.
- The culture begins to change. With time and continued interaction, a new narrative of who we are takes shape.



Some Catches When Engaging Emergence

https://peggyholman.com/papers/engaging-emergence/engaging-emergence-table-ofcontents/summary-of-key-ideas/

- Getting started is a leap of faith.
- Success can be a hurdle.
- . Outcomes can be elusive to recognize.
- What's most important is likely not on our radar screen.
- Not everyone makes the trip.
- Death or loss is usually part of the mix.



Characteristics of

Emergence

eggy Holmar

https://peggyholman.com/papers/engaging-emergence/engaging-emergence-table-of-contents/part-i-the-nature-of-emergence/chapte-1-what-is-emergence/

- Radical novelty
- Coherence
- Wholeness
- Dynamic
- Downward causation
- The phrase "The whole is greater than the sum of its parts" captures key aspects of these ideas.

Dynamics of Emergence

https://peggyholman.com/papers/engagingemergence/engaging-emergence-table-of-contents/part-i-thenature-of-emergence/chapter-1-what-is-emergence/

Situational leadership arising in context.

- Generally characterized as no one being in charge.
- Or everyone being in charge.
- In fact, what's in charge is the energy of the situation and of the people taking initiative, interacting in it.

Simple rules engender complex behavior.

 Randomness becomes coherent as individuals, each following a few basic principles or assumptions, interact with their neighbors.

Dynamics of Emergence

https://peggyholman.com/papers/engagingemergence/engaging-emergence-table-of-contents/part-i-thenature-of-emergence/chapter-1-what-is-emergence/

- Feedback among neighboring agents.
 Interactions that reinforce and balance the system.
- Clustering as like finds like. Diverse agents
 interact, feeding back to each other as like
 attracts like. Some individual agents bond
 around a shared characteristic, forming
 more complex systems, such as networks,
 over time.

Industrial Revolution Curve Guides

Using a musical metaphor, facilitation on this curve brings all the parts of the orchestra and choir together to perform a piece of music.

The endpoint is known — the music is written and our job is the help blend all the pieces together in an orderly fashion to create beautiful music.

Once again, using a musical metaphor, think of

improvised jazz. Facilitation here is more

about creating the relationships and

conditions/space where musicians bring their

talents together, play off one another, to

emergently create beautiful music.

Emergence

Knowledge

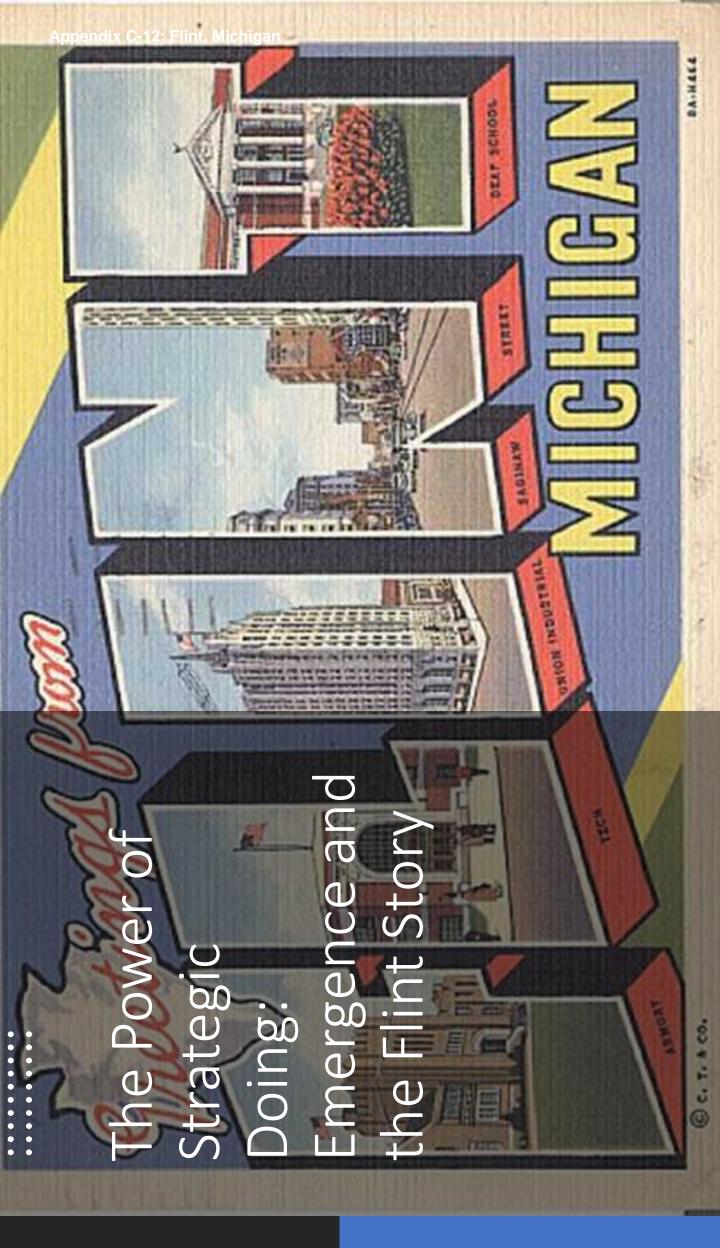
Age Curve

Guides

This is the new frontier. It is definitely driven by a different set of values.

In the World of Emergence

- Strategic Doing teaches people how to form collaborations quickly, move them toward measurable outcomes and make adjustments along the way. In today's world, collaboration is essential to meet the complex challenges we face.
- Strategic Doing enables leaders to design and guide new networks that generate innovative solutions. It is a new strategy discipline that is lean, agile and fast—just what organizations, communities and regions need to survive and thrive.



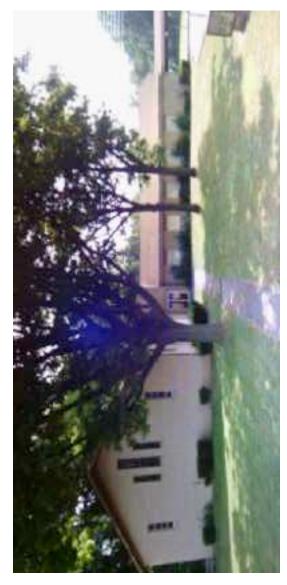


Home to Amazing People









Home to Deep Faith



Home to Never
 Ending Hope In
 The Face Of Big
 Challenges



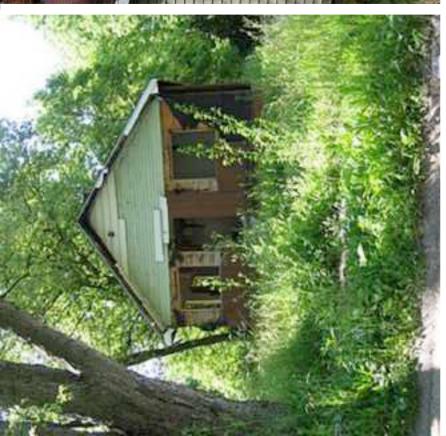












Decaying Housing



Unrelenting Violence



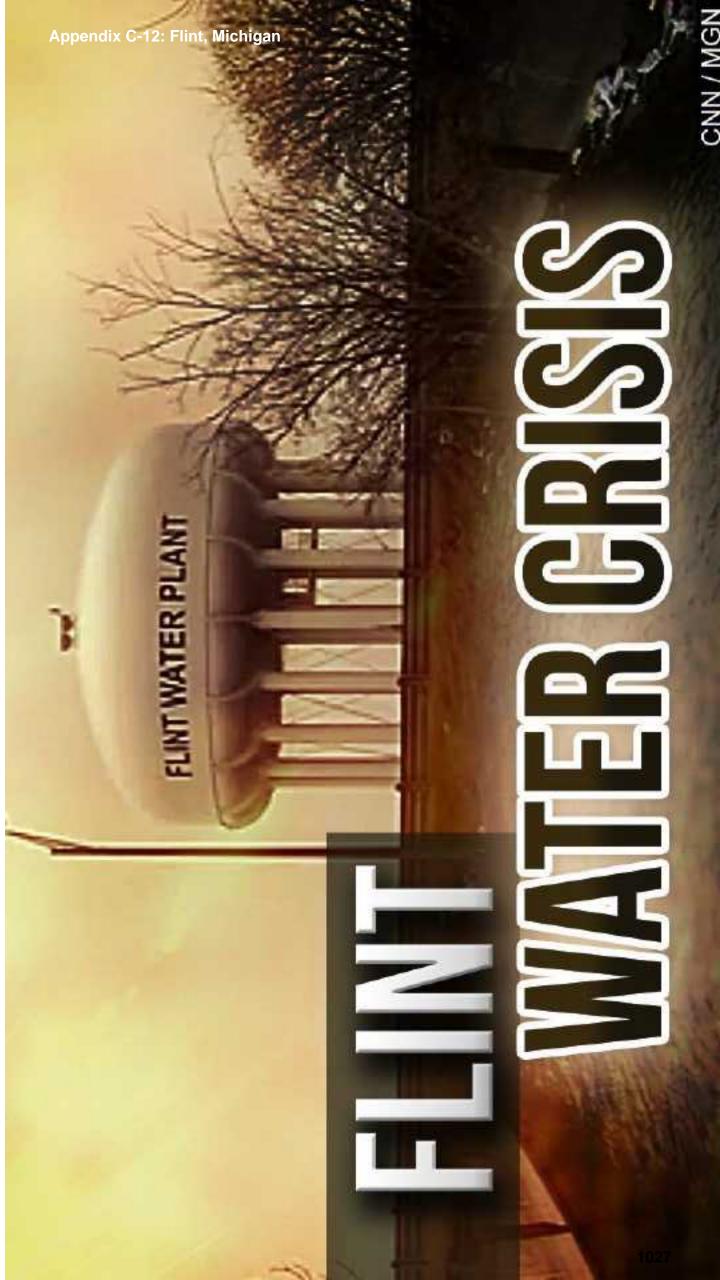






Racism Rears Its Ugly Face

This hen And



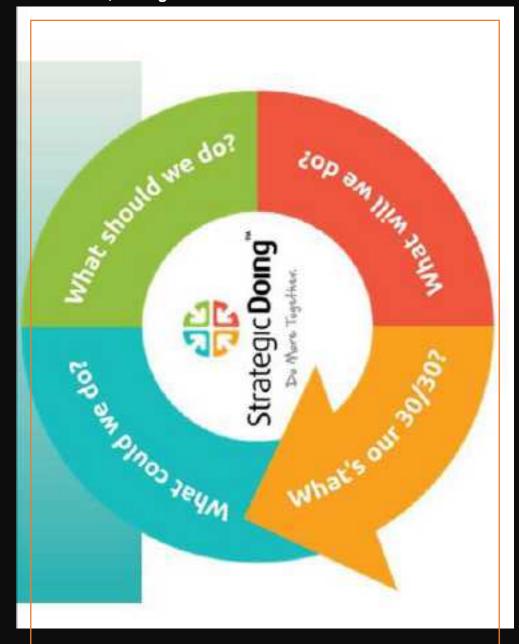




Michigan Civil
Rights
Commission: Race
and racism played
a significant role in
causing the Flint
water crisis.

Appendix C-12: Flint, Michigan





Strategic Doing Gives Us A Way To Respond

Igniting Collaborative Action

WOW Outreach uses the agile collaboration framework and strategy from SD to enact asset-based innovation and resident-driven action.



The Flint Model – WOW Outreach

- 1. Driven by Key Understandings and Values Opportunities to realize; relationship driven; people and neighbor centered; the neighborhood is the system operated by those who live there; people build capacity; community wisdom and science informs; gifts (assets) and generosity; networks; strategic doing; authentic, deep collaboration, emergence
- Enacted thru roles

The Flint Model: Key Roles

Role of Collaborator

WOW Outreach works to align, link, and leverage assets from individuals and organizations to quickly form complex yet agile collaborations that take on many of the "inequitable problems" faced by north Flint residents

Role of Connecter and Convener

One of the most important roles WOW Outreach serves is as a connector. We successfully reach out and connect people and organizations that are doing similar good work to create opportunities for greater synergy in addressing the wicked problem of interpersonal violence. The Teen Summit is a good example.

The Flint Model: Key Roles

The Flint Model: Key Roles

Role of Capacity Builder

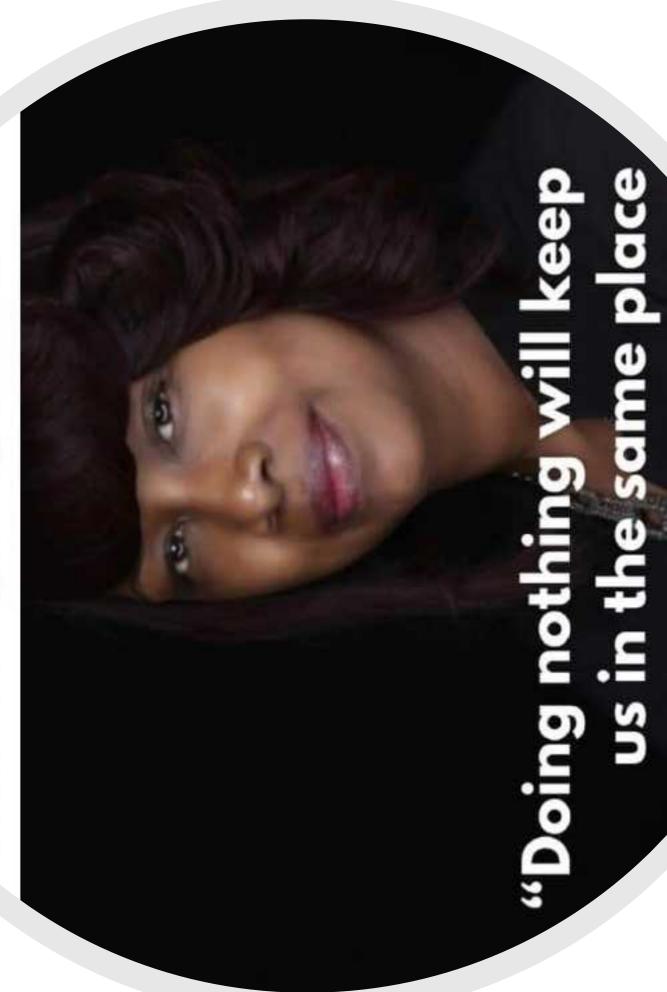
Community capacity building is an approach to social or personal development that focuses on understanding the obstacles that inhibit people and neighborhoods from realizing their development goals, while enhancing the abilities that allows them to achieve measurable and sustainable results.

Community capacity building strengths, overall competencies and talents of residents and neighborhoods to overcome the hurdles that cause exclusion and suffering. The Living Room Conversations are a good example.

Role of Engager and Community Builder

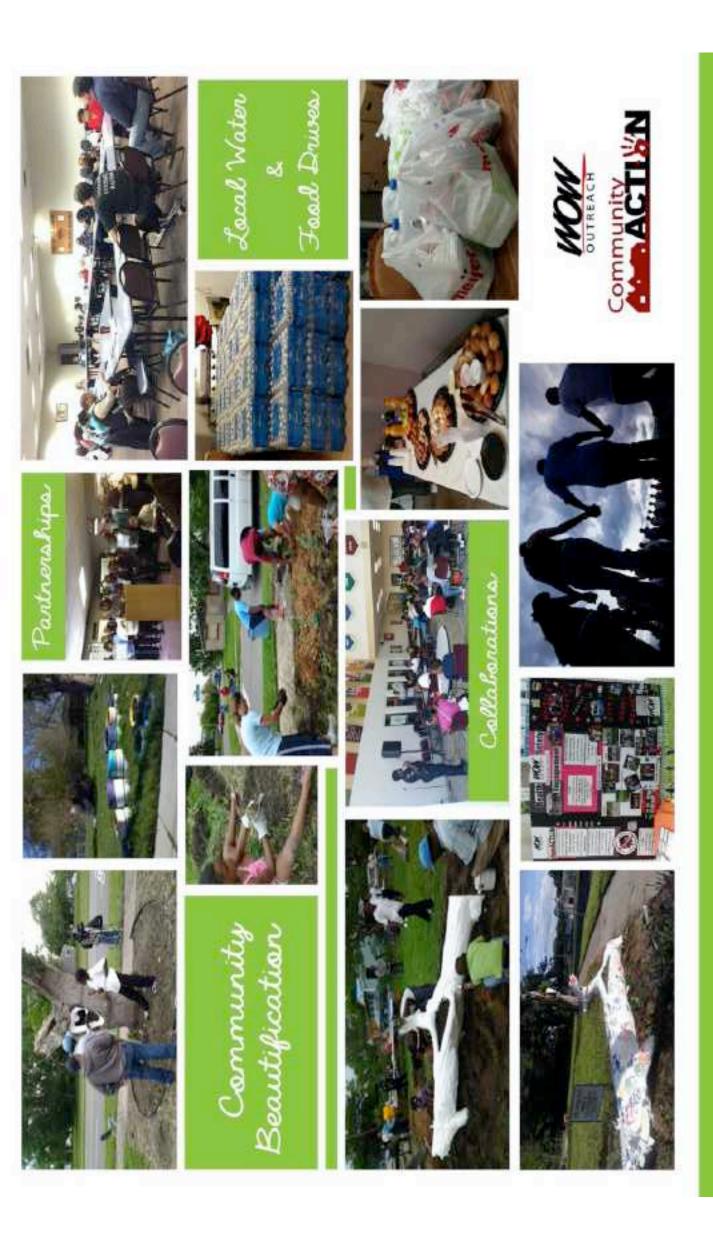
To change the culture and address the root causes of violence, WOW Outreach works to bring together people who are not in relationship with each other. WOW does this by organizing and convening platforms to discuss community needs, concerns, and identify ways to align, link, and leverage resources. By facilitating these platforms, WOW is instrumental in creating strong partnerships to create action-driven solutions to problematic issues. WOW's major platform is the Community Action Network.

The Flint Model: Key Roles





Strategic Doing in Flint: Building Resident Driven Collaborations







Strategic Doing in Flint:
Increasing
Connections —
The Living Room
Conversations



Strategic Doing in Flint: Increasing Connections — Conversations with Police



Doing in Flint:

Strategic

Capacity to

Succeed

Increasing





Strategic
Doing in Flint:
Increasing
Capacity to
Succeed





Strategic Doing in Flint: Convening Teens





Safe, Fun Experience for Youth!

ginning September 14, 2015* Center Operaton: **Every Monday & Tuesday** Hours: 4:30p.m. - 8p.m.

"Lite Meal Provided"

October is Career Month!
planning, learning, and leadership
in career building* (Dates TBA)

Positive Youth Programs!

Educational Activities Basketballi Mentors on Sitel Food! Food! Food!

Building Strong Youth Leaders Today

Every Monday & Tuesday:

Monday, September 14th Tuesday, September 15th Monday, September 21st Tuesday, September 22nd Monday, September 22nd Tuesday, September 28th

October, 2015

Every Monday & Tuesday:
CAREER MONTH
Monday, October 5th
Tuesday, October 12th
Tuesday, October 12th
Monday, October 13th
Monday, October 13th
Tuesday, October 20th
Tuesday, October 20th
Tuesday, October 20th
Tuesday, October 25th

Every Monday & Tuesday:

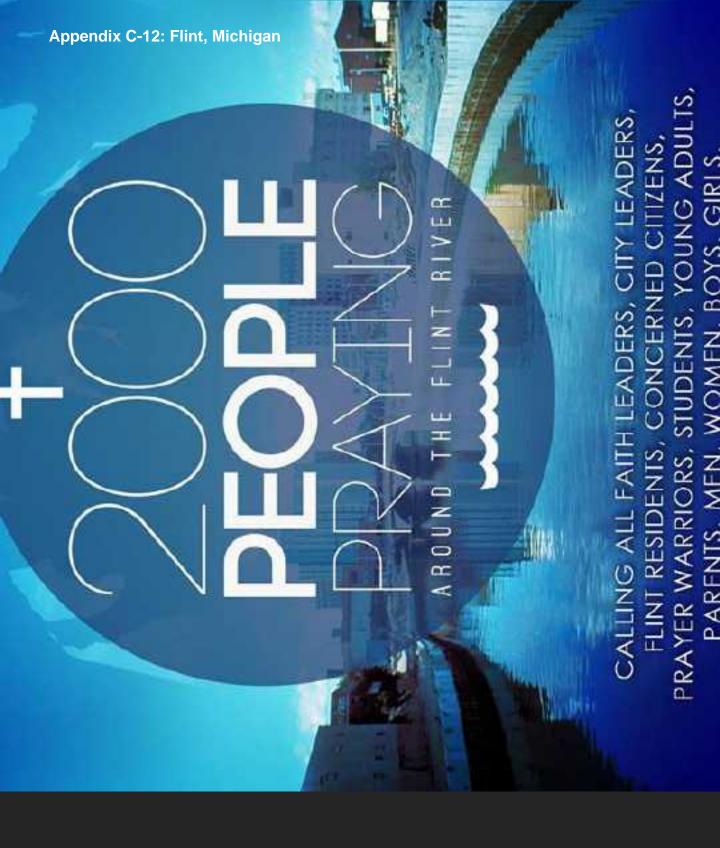
Monday, November 2nd
Tuesday, November 3rd
Monday, November 10th
Monday, November 10th
Tuesday, November 17th
Monday, November 23rd
Tuesday, November 23rd
Tuesday, November 23rd
Tuesday, November 23rd

Every Monday & Tuesday:

Tuesday, December 1st Monday, December 7th Tuesday, December 8th Monday, December 14th Tuesday, December 15th Monday, December 15th



To provide opportunities for the most challenged youth in our community to change their behaviors, attitudes, and perspective on life, in hopes of addressing increased violent behaviors, truancy, suspensions, and low academic achievement.



Strategic

Doing in Flint:

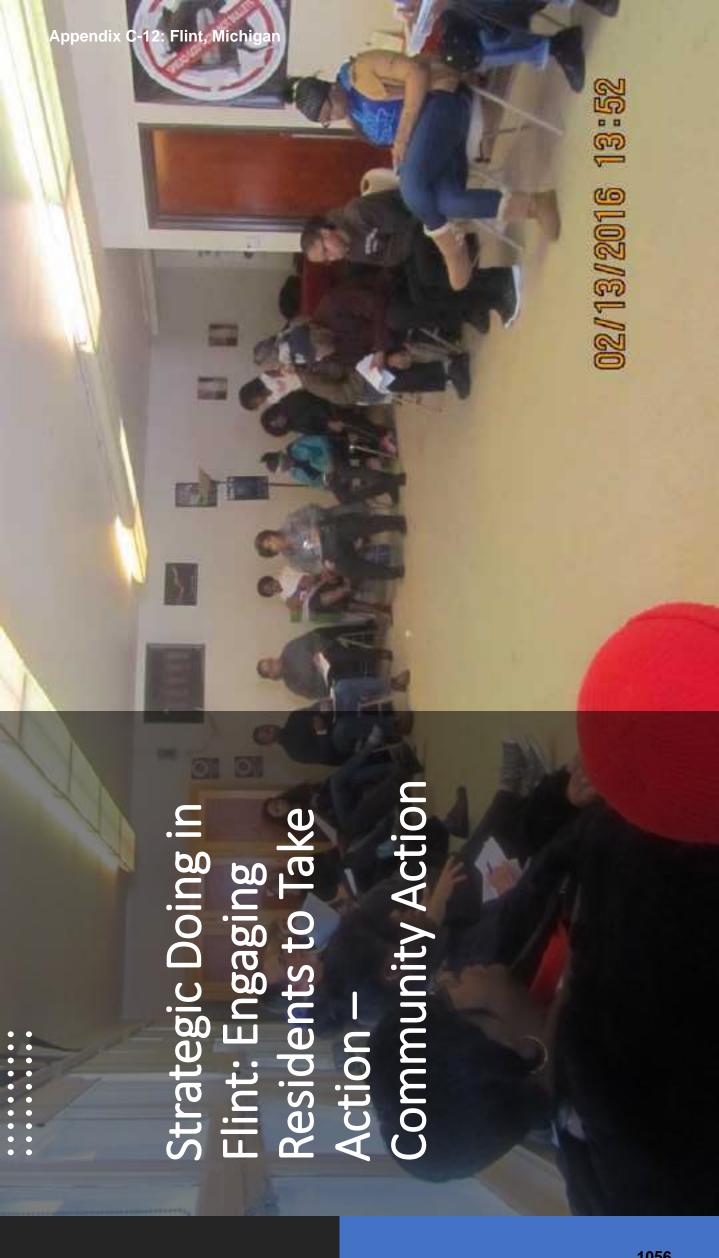
Convening

Residents



Strategic

Doing in Flint:
Engaging
Residents to
Take Action



Community Action Network

- A platform to address current community issues and neighborhood concerns.
- Residents use their personal and organizational assets creating action for positive change
- Residents pursue measurable strategic outcomes, goals, and a shared vision to address problematic situations which persist in our neighborhoods.
- Participants identify problems and deficits, in order to focus and define new opportunities by connecting assets, and personal strengths.
 - Instead of looking for a visionary leader, they recognize that leadership stems from within and is an open network where partners equally share responsibility.





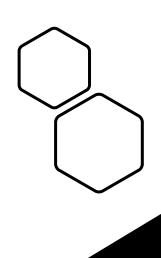
The Tendaji Talks

A lecture series focuing on systemic racism and African American history in Flint. In honor of Tendaji Ganges (1948-2015), whose efforts to educate young minds and the community continue through all those whose lives he touched.

"Leave a mark, not a stain."









Unity March and Community Expo









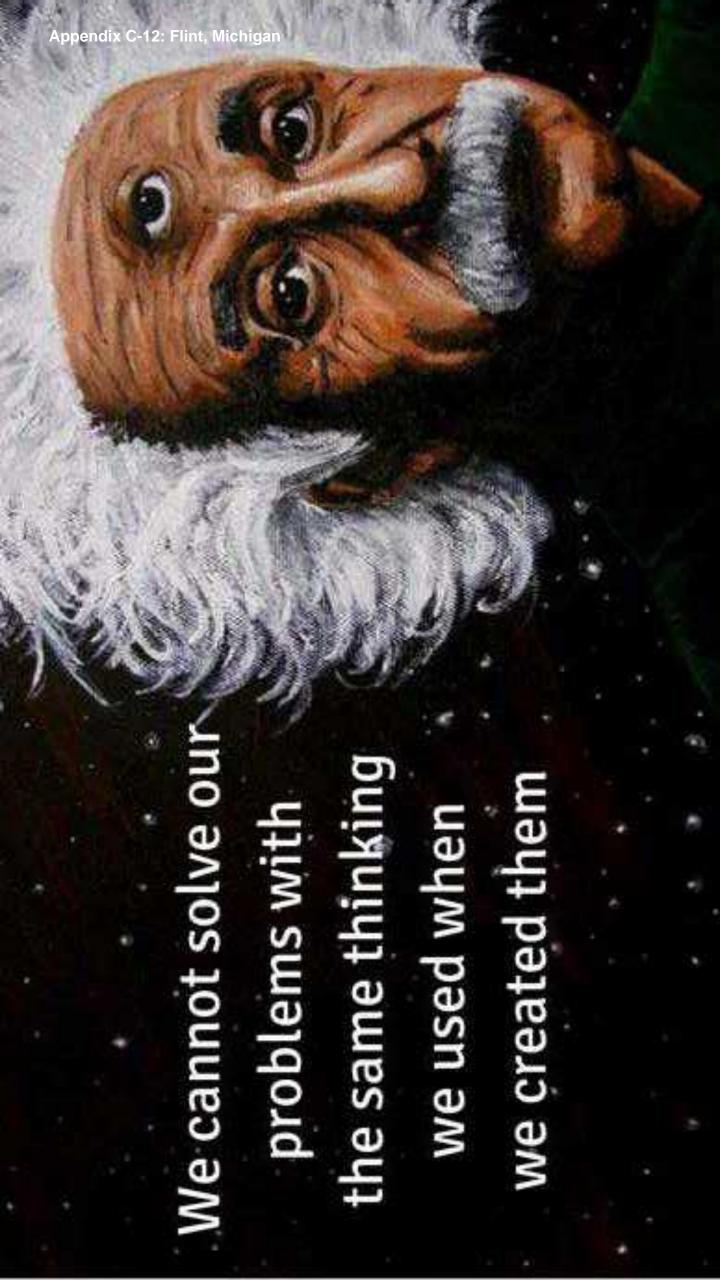




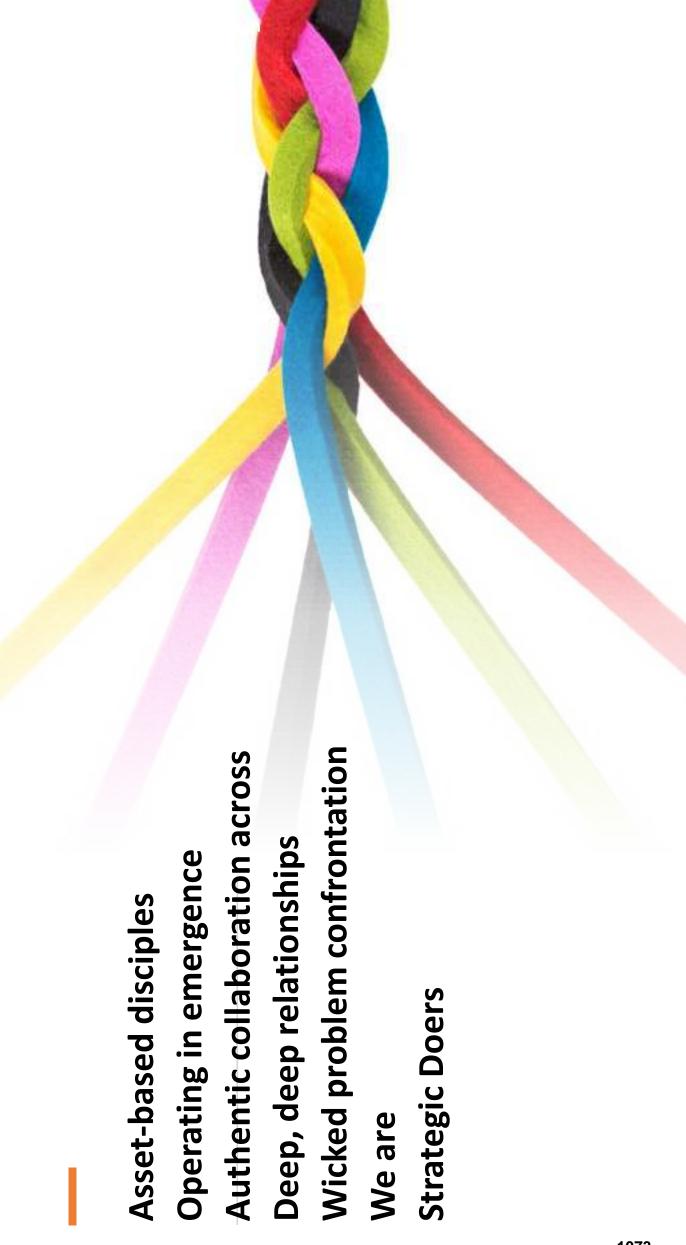


Community Prayer – A Faith Response

"Father God, please guide us as we work in unity to rebuild Your City. Help us to open our hearts to the needs of others. Teach us to love one another as You love us. Give us the courage to get involved using the gifts you have given us. Help us put an end to volence and help us reach out to the disconnected youth and families providing them with food, shelter, education, and employment opportunities. AMEN"



new way of being that enables us to move into the future: We need a new way of thinking, a Strategic Doing



A Vision for Authentic, Deep Collaboration

Kenyetta Dotson & Bob Brown November 2017, Flint, Mi.

"We are a community of possibilities, not a community of problems. Community exists for the sake of belonging and takes its identity from the gifts, generosity, and accountability of its citizens. It is not defined by its fears, its isolation, or its penchant for retribution. We currently have all the capacity, expertise, programs, leaders, regulations, and wealth required to end unnecessary suffering and create an alternative future."

Peter Block, Community: The Structure of Belonging

Collaboration is common in most communities. Individuals, groups, and organizations are working hard to achieve common goals. Sometimes it works, sometimes it doesn't. When it doesn't, attention is often turned to improving the structures, processes and skills that support collaboration. This, however, won't create consistent "working together" success. We believe there is a more fundamental reason why collaboration isn't all that it could be. Within collaborative efforts, self-interest at multiple levels — individual, group, neighborhood — is still prevalent. Collaboration infused with self-interest is almost impossible to achieve and the most daunting challenge is that many people don't see their own self-interest. It's much like implicit bias. According to the Kirwan Institute, "Implicit bias refers to the attitudes or stereotypes that affect our understanding, actions, and decisions in an unconscious manner. These biases, which encompass both favorable and unfavorable assessments, are activated involuntarily and without an individual's awareness or intentional control." Of course, explicit self-interest also enters into collaborations, but perhaps not as often as implicit self-interest. To address self-interest, a new vision for authentic, deep collaboration is needed. One, as Peter Block would say, chooses service over self-interest.

Authentic, deep collaboration is guided by several intractable axioms or truths.

Axiom #1: Collaboration must be guided by a north star of greater purpose.



The existing Flint community context is one that markets fear, assigns fault, and worships self-interest. This context supports the belief that the future will be improved with new laws, more oversight, and stronger leadership. The recent recall efforts and election is a testament to this context.

Peter Block, in his book Community: The Structure of Belonging, states "The new context that restores community is one of possibility, generosity, and gifts, rather than one of fear, mistakes, and self-interest. Citizens become powerful when they choose to shift the context within which they act in the world. Communities are human systems given form by conversations that build relatedness. The conversations that build relatedness most often occur through associational life, where citizens are unpaid and show up by choice, rather than in large systems where professionals are paid and show up by contractual agreement."

He goes on to say that within this new context we can shift from:

- A place of fear and fault to one of gifts, generosity, and abundance
- A bet on law and oversight to one on social fabric and chosen accountability
- The corporation and systems as central, to associational life as central;
- A focus on leaders to a focus on citizens
- Problems to possibility

This is the north star of authentic, deep collaboration. This is our compass, our greater purpose.

Axiom #2: Work on many levels, scan the environment for the gifts/assets of people

- What we do individually
- What we do organizationally
- What we do neighborhood wise



Authentic collaboration calls for us to work within and across multiple levels. It is not sufficient to focus on only one level. Effectiveness requires multi-level, cultural competent action. For example, according to the World Health Organization efforts to reduce violence must take into account risk factors at four levels:

a) At the individual level, personal history and biological factors influence how individuals behave and their likelihood of becoming a victim or a perpetrator of violence. Among these factors are being a victim of child maltreatment, psychological or personality disorders, alcohol and/or substance abuse, and a history of behaving aggressively or having experienced abuse.

- b) Personal relationships such as those with family, friends, intimate partners and peers may also influence the risks of becoming a victim or perpetrator of violence. For example, a poor relationship with a parent and having violent friends may influence whether a young person engages in or becomes a victim of violence.
- c) Community contexts in which social relationships occur (such as schools, may include the level of unemployment, population density and mobility, and the existence of a local drug or gun trade.
- d) Societal factors influence whether violence is encouraged or inhibited. These include economic and social policies that maintain socioeconomic inequalities between people, the availability of weapons, and social and cultural norms such as those relating to male dominance over females, parental dominance over children, and cultural norms that endorse violence as an acceptable method to resolve conflicts.

Axiom #3: Use existing structures/efforts, don't waste energy and resources if acceptable structures/efforts already exist



We have a habit in Flint of constantly reinventing the wheel. We don't have to do that. Every initiative doesn't have to reinvent every single relationship. Authentic collaboration calls on us to survey our environment to understand who is doing what and to link, leverage, and align those efforts. For example, if we want to bring the wisdom of elders into our efforts, we don't have to create brand new platforms to make that happen. We can initially work with senior centers and churches, existing structures in our community. We can always "add to," but we don't have to start from zero.

Axiom #4: Always create action from our conversations/dialogues

- Use existing meetings to create action
- Harness and combine assets/gifts





Authentic collaboration always creates action from our conversations and dialogues. We waste our resources and time when we engage in conversations that don't lead to action. We have found that Strategic Doing is a highly useful method for moving conversation to action.

What is Strategic Doing?

According to the Agile Strategy Lab at Purdue University (https://www.una.edu/strategicdoing/docs/SDSlideDoc.pdf), "Strategic Doing enables people to form action-oriented collaborations quickly, guide them toward measurable outcomes and make adjustments along the way.

The basics

Nearly everywhere we turn these days, people talk about the importance of collaboration. But how do we design these collaborations? How do we manage them? Strategic Doing provides a simple set of rules to answer these questions. With Strategic Doing, people:

- Link and leverage their assets to create new opportunities
- Convert high-priority opportunities into measurable outcomes
- Define pathfinder projects that move toward these outcomes

Strategic Doing is designed for open, loosely connected networks the common situation in which nobody can tell anyone else what to do.

Managing complexity requires simple rules. We have designed Strategic Doing to be intuitive and concise. In a matter of hours, a loosely organized network of people can generate a sophisticated strategic action plan and begin implementing their ideas."

With Strategic Doing we ask:

- What could we do?
- What should we do?
- What will we do?
- What have we done in the past 30 days, what will we do in the next 30 days?

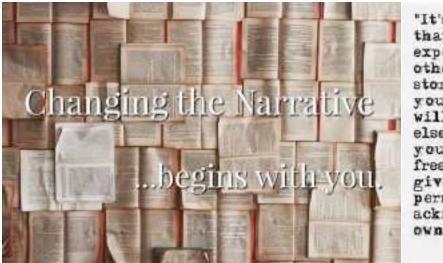
Axiom #5: By intentionally paying attention to our interactions and what is happening around us, collaborative possibilities and opportunities come into view, come into existence. Connect the parts.



We tend to move in the direction of our conversations. If we pay attention to having positive conversations that embrace and explore opportunities, we will work together for a better future. If our conversations are only about problems, we will be stuck in the continued rut of endless negativity that

diminish our community. Authentic collaboration uses opportunities to connect people and their gifts (assets) to create and build community.

Axiom #6: Change the narrative for transformation – our stories are important. Always move to reconcile and heal.



"It's important that we share our experiences with other people. Your story will heal you and your story will heal somebody else. When you tell your story, you free yourself and give other people permission to acknowledge their own story."

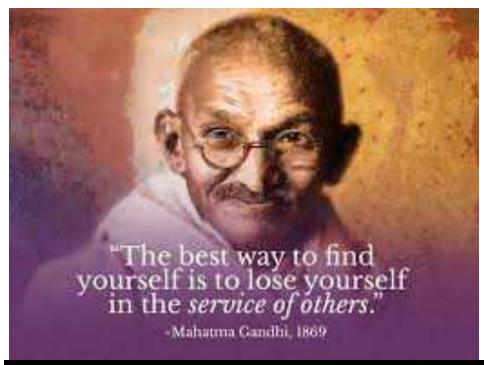
- Iyanla Vanzant

According to New Tactics) https://www.newtactics.org/conversation/change-story-harnessing-power-narrative-social-change):

"People and communities use stories to understand the world and our place in it. These stories are embedded with power - the power to explain and justify the status quo as well as the power to make change imaginable and urgent. A narrative analysis of power encourages us to ask: Which stories define cultural norms? Where did these stories come from? Whose stories were ignored or erased to create these norms? And, most urgently, what new stories can we tell to help create the world we desire?"

Conclusion

Authentic, deep collaboration moves us from a mere practice of collaborating to collaborating as how we are in community and the world. When authentic, deep collaboration is at the core of everything we do, when we use the 6 axioms in everything we do, everything changes. This is when we move from self-interest to service. As it says in Mark 9:35 "And he sat down and called the twelve. And he said to them, "If anyone would be first, he must be last of all and servant of all."





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Prepared by:

Ed Morrison

Purdue Center for Regional Development Antonino Ardilio

Fraunhofer IAO November 20, 2014

A collaboration between
Purdue and Fraunhofer IAO is
pioneering new tools,
frameworks and platforms for
technology and innovation
management

Summary

Universities face a clear challenge: Generate more revenues from their existing assets A Purdue-Fraunhofer team has developed a new model for universities to engage companies and add revenue streams to support research and teaching

The approach applies Fraunhofer principles and frameworks to strengthen the innovation ecosystem surrounding U.S. universities.

 We believe we have a responsibility to build a prosperous, sustainable future for ourselves and future generations. . No individual, organization or place can build that future alone.

 Open, honest, focused and caring collaboration among diverse participants is the path to accomplishing clear, valuable, shared outcomes.

4. We believe in doing, not just talking – and in behavior in alignment with our beliefs.

Strategic Doing Design Team Turkey Run State Park October 2011

Table of Contents

universities. By applying Fraunhofer principles, U.S. universities can generate new revenues by strengthening their innovation ecosystem with more market-This document gives you an overview of collaboration between Purdue and Fraunhofer IAO in developing a new model of corporate engagement for facing initiatives.



University Ecosystems

The Innovation Imperative for Companies

University Supports for Innovating Companies

The Bigger Picture

Our Current Situation

University Ecosystems

Most universities can guide the development of two overlapping ecosystems: one that promotes start-ups and another that supports innovating companies.

Universities are most familiar with their start-up ecosystems. These are initiatives focused on developing spin-out companies from both faculty and students.

Common features of start-up ecosystems include: .

- entrepreneurial training including training in "lean launchpad" approaches;
- business plan and "pitch" competitions; and

Universities have tended to emphasize

largely ignore the revenue potential from their innovation ecosystem.

on their start-up ecosystem and

• incubators or accelerators to house start-up companies.

Innovation ecosystems are less familiar. Here, universities work with existing growth-oriented companies to accelerate their "top line" revenue growth. This growth comes from applying 1) new technologies to existing markets; 2) existing technologies to new markets; and 3) new technologies to new markets.

Assistance can come in the form of product development and prototyping services, innovation and technology management training, and technical assistance.

Faculty at most universities follow incentives that are "inward -facing".

Promotion and tenure policies reward research and publications. They do not generally reward engagement activities,

With engagement activities, faculty build collaborative relationships with industry to speed the flow of resources — money, people, knowledge — to and from the university.

University Ecosystems

Universities operate with two overlapping ecosystems. The start-up ecosystem focuses on new venture formation. The innovation ecosystem focuses on accelerating growth among existing growth-oriented companies. Of the two systems, U.S. universities have paid less attention to the second.

Provides capital and expertise Investor networks Innovation Ecosystem and generates investment **Provides** wealth Companies Innovating Growth **Provides network** and mentoring to start-ups R&D partners **Provides** support and training Provides technology Accelerates new venture investment Recruits and smart people Colleges and universities supplies and smart people Provides ideas, incubators trains smart people Recruits and Start-up firms Skilled talent Source: Ed Morrison smart people Recruits pood Startup Ecosystem

The Innovation Imperative for Companies

Today's markets are increasingly characterized by disruptive technology developments, shorter product life cycles, shifting market boundaries, and continuous fluctuations in product and service offerings. The idea that companies can secure a "sustainable competitive advantage" is quickly disappearing.

Instead, growth and prosperity relies instead on developing reliable protocols to manage the combined processes of technology and market development. To thrive, companies need to ride continuous waves of innovation.

While companies large and small feel the innovation imperative, few have yet mastered the challenges that continuous innovation presents.

University Supports for Innovating Companies

Universities can partially fill revenue streams to support universities can open new faced by growth-oriented the innovation gaps that companies. In doing so, teaching and research.

these networks extend beyond the networks of people. Increasingly, The idea of "open innovation" four walls of the corporation. collaboration among trusted Innovation emerges from

As companies learn to embrace open innovation and collaborate with wider committed universities can seize an networks of partners, prepared and channels of corporate engagement. opportunity. They can open new corporate boundaries.

Wider and deeper corporate engagement depends on how well the university addresses the innovation challenges that companies face. If universities learn to build mutually beneficial relationships, they can generate new resources to support their operations.

Moving in this direction requires a shift in how universities orient.

outward focused. This shift is not an themselves: from inward focused to either/or choice, but a matter of shift in how universities orient balance. Getting the balance right is tricky, and university — will find its own balance college and department within every every university — indeed, every

captures the development of these

networks that extend beyond

perspective, can assist companies in meeting the innovation imperative. Universities, properly oriented to embrace an outward-facing

University Supports for Innovating Companies

Innovation
Knowledge Money
Research

Universities fund their research efforts through government grants. The research system converts money into knowledge. A university's innovation ecosystem converts knowledge into money.

In the drawing on the left, universities have focused on the bottom half of the cycle — converting money into knowledge. The problem, of course, is that this portion of the cycle, funded largely by government grants, is not growing.

By focusing on strengthening the university's innovation ecosystem, the university can convert knowledge into money and grow its research enterprise.

This strategy requires that the university make some key moves. First, it must extend its research activities to an outward-facing, solutions focus.

In technical terms, this move means extending the research activities from Technology Readiness Levels 1-4 (more basic research) to Technology Readiness Levels 5-9 (more applied research).

Second, the must develop new business models to capture the value it is creating with industry partners. Industry, propelled by their own innovation imperative, provide major funding opportunities for universities. But universities must be oriented and structured to capture these resources.

To tap into additional resources, universities must extend their research enterprise and develop new business models.

The Bigger Picture

This challenge of extending the university research enterprise is often expressed as filling a gap. It has become a major focus of national innovation policy in both the U.S. and the U.K.

 High-risk research
 Long time horizon
 Not focused on
 shop floor implementation Basic Research/ Federal Labs NSF Centers, **Universities**, Education **Technology Innovation** Manufacturing technology innovation, maturation, commercialization, insertion 7777 Missing Middle Medium time horizon
 High impact Manufacturing Structural problem requires Incremental improvement
Off the shelf technology
Short time horizon a structural solution **NIST MEP** Practices Industry, Best Technical Innovation

Source: Conrady, C. and Carrick, G., "American Manufacturing Innovation Network"

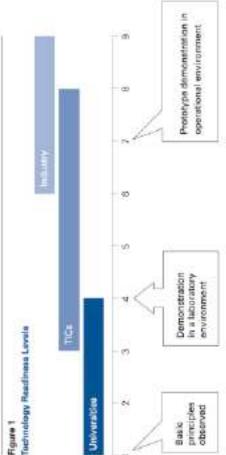
Time to deployment

In both the U.S. and the U.K. policy-makers are developing initiatives to close the gap between existing university research and the growing innovation imperative for industry.

In the U.S., the National Network for Manufacturing Innovation (NNMI) is designed to fill the "missing middle".

In the U.K., the government is implementing a set of Technology Innovation Centres ("Catapult Centres") to fill the gap.

The Purdue-Fraunhofer Team began looking at ways to fill the gap through "bootstrap" initiatives that universities could undertake on their own, without major external funding or large scale investments to start.



Source: Hauser, H., The Current and Future Role of Technology Innovation Centres in the UK (2010).

Background on Fraunhofer

Fraunhofer IAO

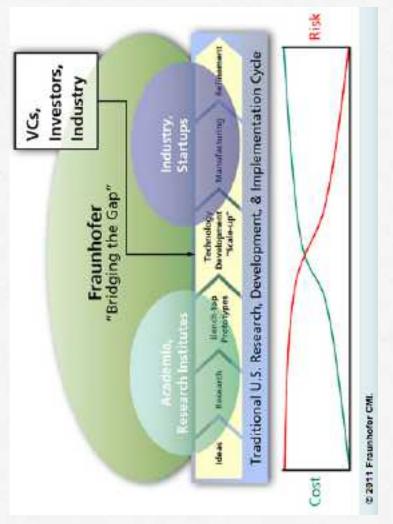
Technology and Innovation Management

Exploiting "smart data"

Why Fraunhofer Mo?

Background on Fraunhofer

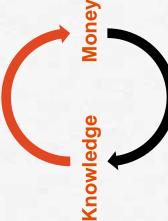
The Fraunhofer business model has enabled the Society's many institutes to grow and prosper by positioning research activities to "fill the gap".



Fraunhofer is the largest applied research organization in Europe and a global leader in working with industry to accelerate innovation. Founded in 1949, the Fraunhofer Society consists of over 66 separate institutes and 22,000 employees.

Background on Fraunhofer

Fraunhofer Focus Innovation TRL 5-9



Research System TRL 1-4 University Focus

institutes and centers, more than Frauhover operates with over 80 22,000 employees, and 4,000+

Key features of the Fraunhofer business model include:

Institutes keep most of what they generate

Institutes work as profit centers: incentive to "run to cash"

- Private sector funding matched with public sector dollars
- Spinoffs by Fraunhofer researchers are encouraged

The Fraunhofer customer base includes:

- Industrial and service companies
- Public sector

The Fraunhofer R&D activities include:

- Application-oriented research based on industry's agenda
- Application-oriented basic research with longer time horizons
- Research for German Defense Ministry

Fraunhofer IAO

Unlike other Fraunhofer institutes, IAO is a "horizontal" institute that spans the work of the other vertical institutes. As a result, a partnership with IAO provides a fast way to connect to the other 60+ institutes and their research assets.



In April 2013, Ed Morrison at the Purdue Center for Regional Development technology management. Unlike most Fraunhofer institutes that specialize n one technology focus area, Fraunhofer IAO explores technology and approached Fraunhofer IAO to explore a partnership in innovation and nnovation management which extends across technology areas.

In other words, Fraunhofer IAO is a "horizontal" institute that provides entry to other vertical institutes.

Technology and Management Innovation

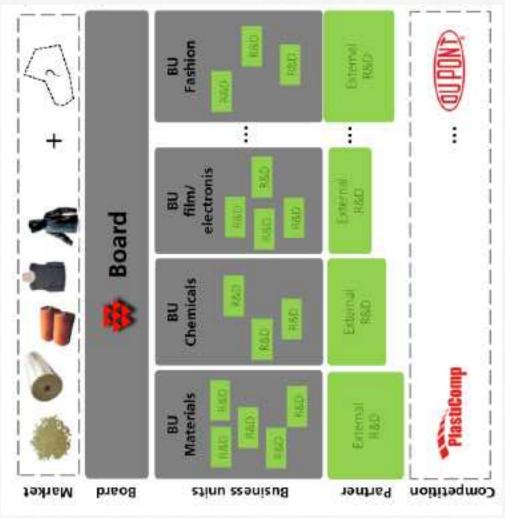
one of the world's largest truck manufacturers. research landscape in autonomous driving for Example: Fraunhofer IAO mapped the

With this mapping, the company could quickly connected these hot spots were to each other, and which research institutes offered the best prospects of partnership for the company. identify technology "hot spots", how

Fraunhofer IAO's Technology and Innovation Management practice focuses on the following key topics:

- Developing and implementing innovation and technology strategies
 - Increasing organizations' capacity for innovation
- Organizing innovation and research and development (R&D) effectively and efficiently using lean processes
- Setting up and supporting technology and innovation networks Identifying, evaluating and exploiting new technologies
 - Intellectual property: IP for innovation
- T support for R&D, technology and innovation management

IAO's New Perspectives



A conventional approach to management sees business units operating in vertical spaces, connected together by operating management and the board.

This perspective limits the sight of the corporation, reduces its responsiveness to change, and limits the corporation's field of

IAO's New Perspectives

Exploiting "Smart Data" for innovation and technology management

Fraunhofer IAO has become a global leader in developing "smart data" to analyze emerging technologies and markets.

Fraunhofer IAO has developed a series of "smart data" platforms to find relationships among researchers, technologies, companies and emerging markets.

These "smart data" platforms — such as MarketExplorer and TechnologyRadar are designed to address specific technology and innovation management challenges facing companies.

Fraunhofer IAO works with companies to use these "smart data" platforms to identify promising market opportunities for existing technologies, to construct technology roadmaps for companies, and to develop research landscapes to dentify potential partners in research and product development.

Integration with Strategic Doing

companies to potential partnerships. Strategic Doing, a new strategy protocol for open, quickly, move them toward measurable outcomes, and make adjustments along the oosely joined networks, enables potential partners to form complex collaborations AO's technology and innovation management platforms point universities and

being used internationally to design and guide complex collaborations. So, for example, undergraduate engineering education by using Strategic Doing with 36 universities. Incubated at the Purdue Center for Regional Development, Strategic Doing is now Purdue is collaborating with Stanford and VentureWell to accelerate innovation in

The Purdue-Fraunhofer team is exploring additional ways in which the "smart data" analytic frameworks and tools developed by IAO can be integrated with Strategic

Where did Strategic Doing come from? What is the Strategic Doing Design Team? Topic Three that could be a clickable link

Topic Four that could be a clickable link

The Purdue-Fraunhofer Model

Where did Strategic Doing come from?

The roots of Strategic Doing can be traced back to Oklahoma City in 1994. There, a group of professionals needed bold, fast action to turn their city around.

Ed Morrison guided a handful of city leaders in a strategy process that focused on "learning by doing". They transformed their city through collaboration and continuous adjustment.

In the late 1990's, the Kentucky Cabinet for Economic Development contracted with Morrison to develop strategic action plans for multiple distressed counties. Over a period of five years, a team of economic developers launched over 22 county strategic action plans. These plans were each designed with a team of six to eight professionals in the space of two days. When the Cabinet reviewed the performance of these plans, they found that 18 of 22 counties made measurable progress.

By the early 2001, Morrison worked with Ernest Andrade in Charleston, South Carolina to design a strategy for the Charleston Digital Corridor. Charleston is now a hot bed of Internet start-up companies.

Morrison took his Strategic Doing work to Purdue in 2005. Purdue deployed the model with a \$15 million federal grant to generate workforce innovations in a region of 14 counties. In four strategic focus areas, Purdue's team launched over 60 different collaborative initiatives, with 80% of these initiatives continuing beyond initial founding.

The Purdue Center for Regional Development continues to incubate this new strategy discipline.

Strategic Doing has evolved over 20 years of field experience in complex environments.

Doing Design Team? What is the Strategic

continued development and deployment of Strategic Doing. The Design Team Twice a year, professionals from around the country convene to discuss the outlines major development goals that the Purdue Center for Regional

> includes professionals committed to the development and

Strategic Doing. deployment of

The Design Team

The Design Team, for example, guided the development of Strategic Doing: improving the curriculum, as they have identified different needs for skill The Game. The Design Team has also taken on the task of testing and development.

Topic Five that could be a clickable link

Copy and Paste these tables to add topics to

each chapter title

Topic Six that could be a clickable link

Topic Two placement

You may delete as many of these as necessary

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Case Study:

The Strategic Doing University Network

The Memorandum of Understanding is designed to encourage the sharing of Strategic Doing training materials and curriculum within the university network.

Organizations affiliated with a college or university join the network by signing Purdue is building an international network of colleges and universities to a Memorandum of Understanding. This MOU encourages the sharing of support the continued development and deployment of Strategic Doing. intellectual property related to Strategic Doing among members of the network. Initial members of the network include Purdue, Michigan State, The University of Akron, the University of Alaska, and the University of Missouri.

For colleges and universities interested in the Strategic Doing Network:

Please contact Ed Morrison at Purdue: edmorrison@purdue.edu

Introduction to Strategic Doing

Strategic Doing: The Game PractitionerTraining

Certification and Faculty

Training Options

Purdue offers a range of training options in Strategic Doing to improve your skills at designing and guiding collaborations.

	Introduction to Strategic D	Strategic Doing: The Game	Strategic Doing: The Game + Briefing	Strategic Doing Table Gu	Practitioner Training	Practitioner Training + Capstone Course	Certification + Purdue Resi
	rategic Doing	Doing: ame	Doing: - Briefing	Table Guide	oner ng	oner kapstone se	due Residency
Face to Face	1 day	3 hours	1 day	1 hour	3 days	3 days + Capstone	3 day Residency at Purdue
	\$275	\$100/player Minimum 20 people	\$275/player Minimum 20 people	Included in a Strategic Doing workshop	\$1,275	\$1,575	\$1,200
Or	5 weeks	×	×	1 hour	×	×	×
Online	\$395	×	×	Included in a workshop	×	×	×

Introduction to Strategic Doing

An introductory workshop in Strategic Doing provides participants with an overview of how strategy gets done in open, loosely connected networks.

The workshop introduces the basic concepts of Strategic Doing and illustrates how others are using the discipline.

The workshop concludes by exploring your "next steps" in developing the skills needed to design and guide collaborations.

After you complete
Introduction to Strategic
Doing, you will be able to
apply these principles to your
professional and personal life.

Strategic Doing: The Game

Strategic Doing: The Game introduces the skills of designing and guiding collaborations through a simulations. Participants gain some valuable insights by focusing on the challenges of transforming the economy of a Midwestern city.

Purdue is developing other versions of the game, and we can work with you to customize a version that meets your needs.

Participants in the game learn that they can develop sophisticated strategic quickly, if they keep their conversation focused on answering strategic questions.

Practitioner Training: 3 day deep dive

Practitioner training is teared for professionals who needs a deeper grounding in the theory and practice of collaboration in open networks.

This 3 day training these plans, as we learn by doing.

With this training, professionals will be able to design and guide collaboration using Strategic Doing workshops.

Certification: Practitioner Training + Capstone Experience

Some professionals want to teach Strategic Doing.

Strategic Doing certification enables professionals to teach Strategic Doing workshops and conduct Strategic Doing: The Game.

The capstone experience includes field work that is supervised by a members of the Strategic Doing faculty. During this fieldwork, professionals learn to design and guide Strategic Doing workshops.

Strategic Doing certification enables professionals to teach Strategic Doing workshops and Strategic Doing: The Game.

Faculty: Certification + Purdue Residency

Certified professionals are eligible to join the Strategic Doing faculty. In order to take that step, the professional participates in a residency at Purdue.

During this experience, the professional develops a plan for contributing to the Strategic Doing curriculum. In addition, the existing faculty provide suggestions for improving presentations and teaching styles.

Strategic Doing faculty design new curriculum, and they lead the development of Strategic Doing in anchor universities.

Copy and Paste these tables to add topics to each chapter title

Topic Two placement

Topic Three that could be a clickable link

Topic Four that could be a clickable link

How You Can Engage

Contact us

For more information on how your organization can partner with Purdue to use Strategic Doing, please contact Peggy Hosea: phosea@purdue.edu

You an also keep up with our work:

- On Facebook
- On Twitter
- On our Strategic Doing web site



Case Study Template Strategic Doing Version 2.0

August 2016

Case Study Title:

Developing an innovation network for Condition-Based Maintenance

Cast Study Subhead (limit 25 words):

Lockheed and the New Jersey Innovation Institute use Strategic Doing to form an innovation network

Summary:

Condition-Based Maintenance is a practice of "just-in –time" maintenance of industrial equipment. For the U.S. Navy, moving to this practice could save millions of taxpayer dollars. Lockheed Corporation and the New Jersey Innovation Institute, seeing an opportunity to accelerate this transformation, formed a network of innovative New Jersey companies, using Strategic Doing.

Challenges:

Condition—Based Maintenance is an easy concept to understand, but a difficult practice to implement. It requires the integration of many different technologies involving sensors, augmented reality, predictive analytics, and machine learning. Lockheed, key contractor to the Navy, has some of these technologies, but not all. At the same time, within New Jersey there are companies that have core capabilities that could be integrated to provide a unique offering to the Navy. The challenge involved identifying these companies with relevant technologies and moving them into a trusted network in which they could innovate and design a solution appropriate to the Navy.

How Strategic Doing Helped:

The New Jersey Innovation Institute (NJII), a spin out from the New Jersey Institute of Technology turned to Purdue University for guidance in implementing Strategic Doing to build this network. Over the course of six months, a team from Purdue and NJII conducted a series of monthly workshops with 20 high technology companies and Lockheed. During the course of these workshops they designed a complex technology roadmap for the implementation of Condition-Based Maintenance in the Navy

Results and Future Plans:

Lockheed and the participating companies integrated their technologies to develop a solution appropriate to the Navy. They leveraged the experience of the smaller companies in predictive maintenance within the automotive and truck sectors; predictive analytics and machine learning in financial services; and augmented reality.

Appendix C-14: New Jersey Innovation Institute

Quote:

Todd Tangert,, Combat Systems Architect at Lockheed Martin Corporation provided guidance to the NJII and Purdue team. Todd summarized his experience:

"The Strategic Doing methodology allows a business to quickly identify an interested ecosystem of local businesses that have a collective interest in and capability to solve a defined customer problem. The process plays to the strengths of the ecosystem and does not bias a solution to what the "prime" has to offer. It instead seeks to leverage what the ecosystem/team has to offer."

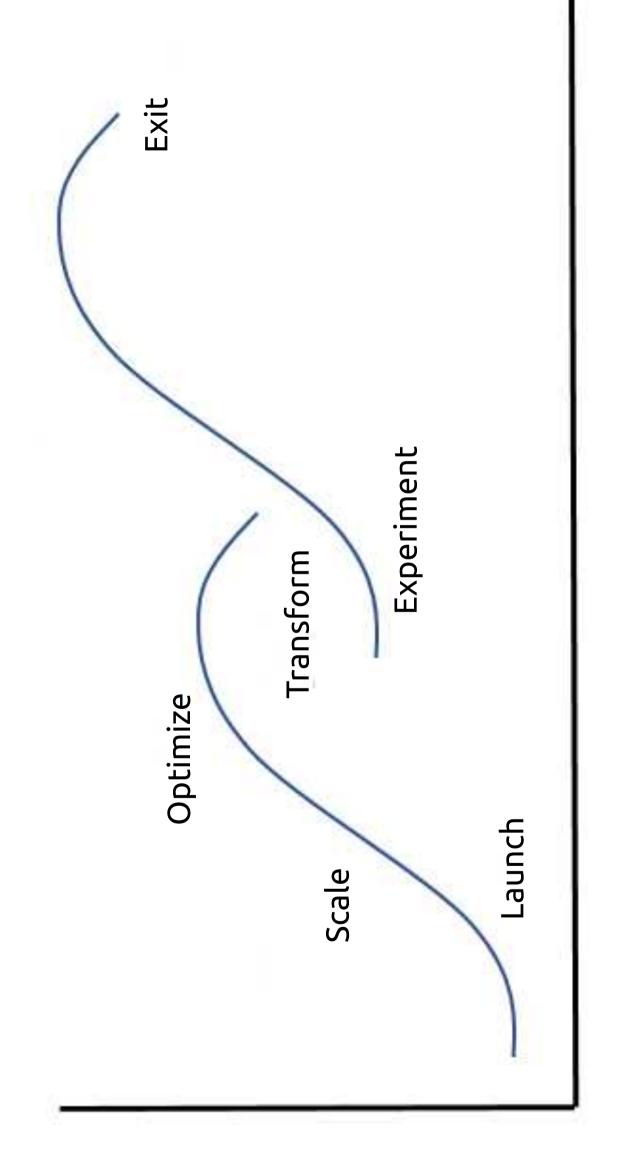
Contact Information:

Mike van Ter Sluis New Jersey Innovation Institute Newark, New Jersey mikevts@njit.edu (973) 596-5800





Strategy is dynamic...the demands of strategy shift as the business context changes





Agility enables companies to jump S-Curves.. But how does company become agile?

Performance

Time



Complex messes with no clear technical fix Companies also face adaptive challenges..





Example: the Navy asked Lockheed to develop a roadmap for deploying predictive maintenance across the destroyer fleet



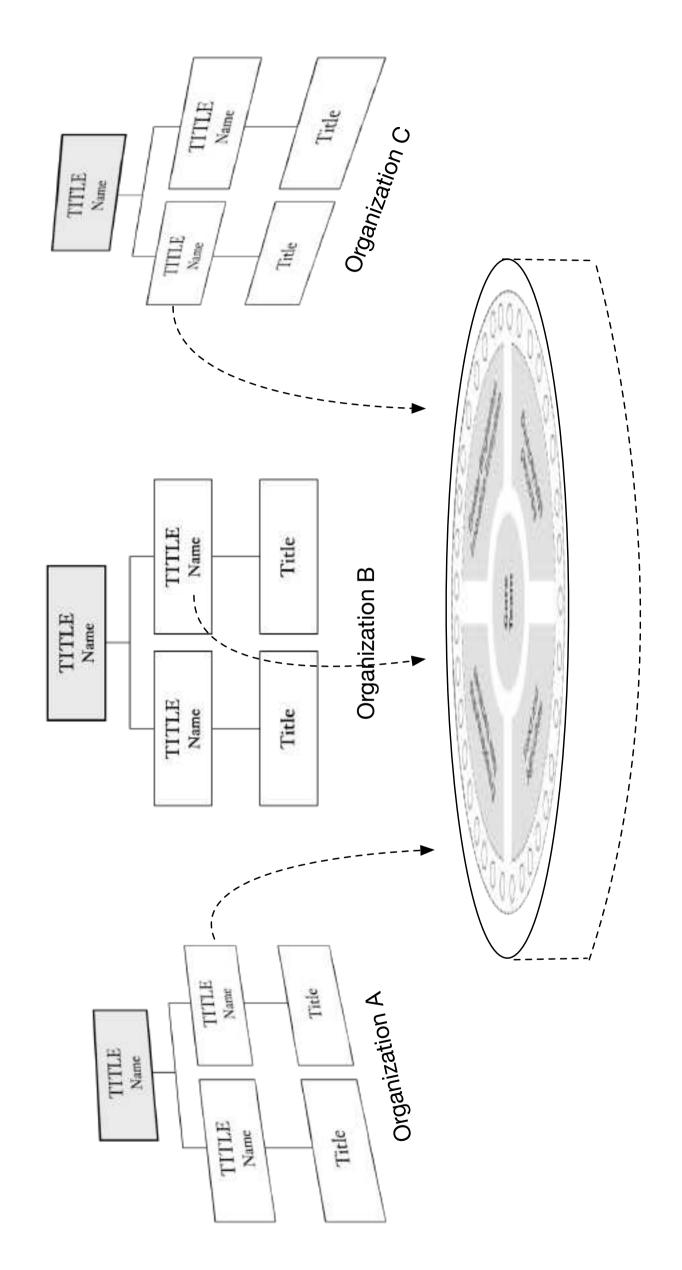


technologies needed to address the challenge.. Problem: Lockheed's Surface Naval Innovation Center did not have access to all the



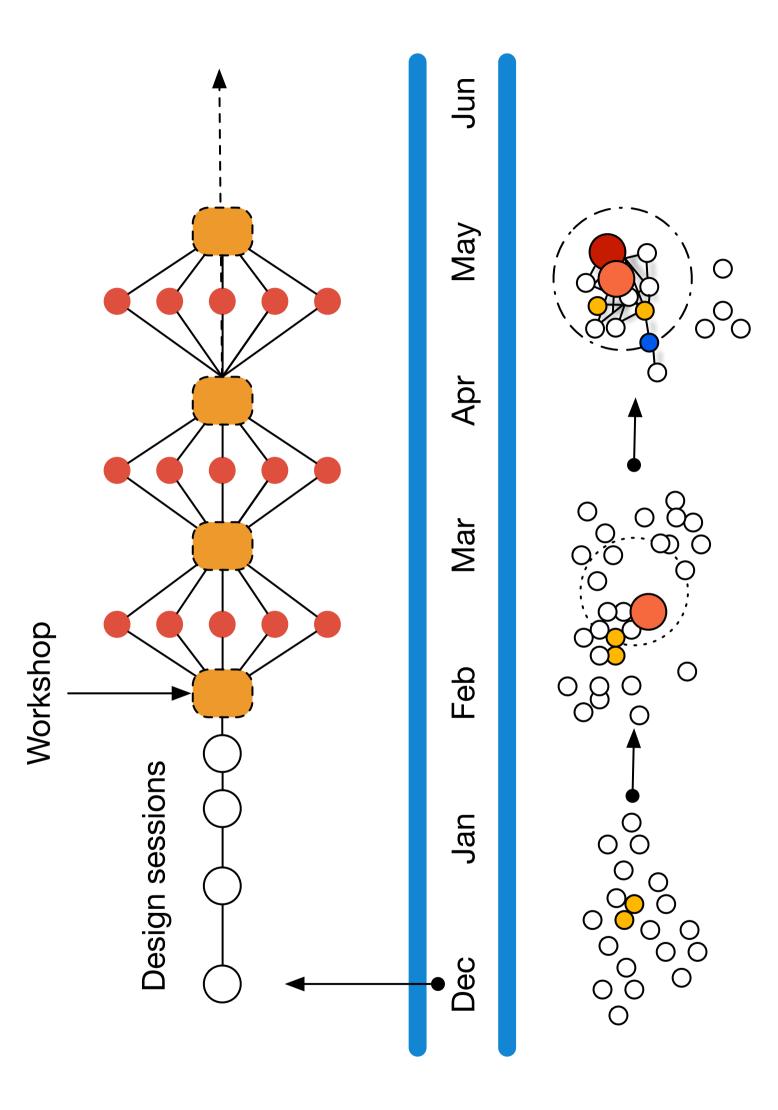


Lockheed could form fast collaborations with We proposed the idea of a platform on which outside companies to solve the problem





We used this drawing to explain to Lockheed executives how a strategy process would unfold





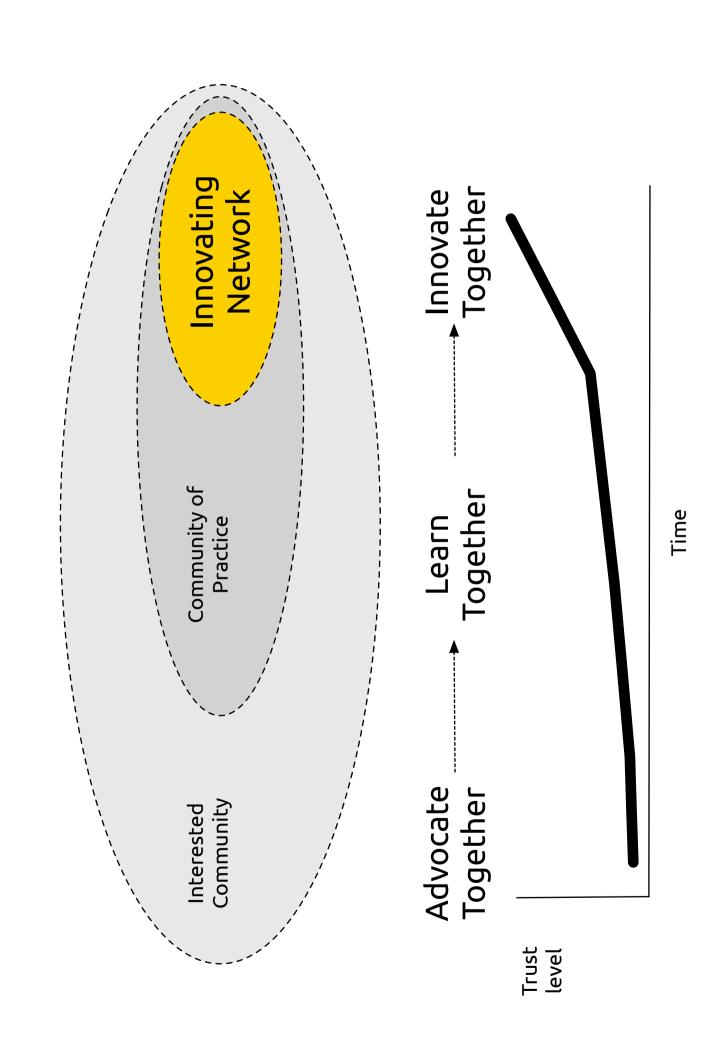
We delivered on our "open innovation" promise by using Strategic Doing to build trust among 20+ companies working on the roadmap





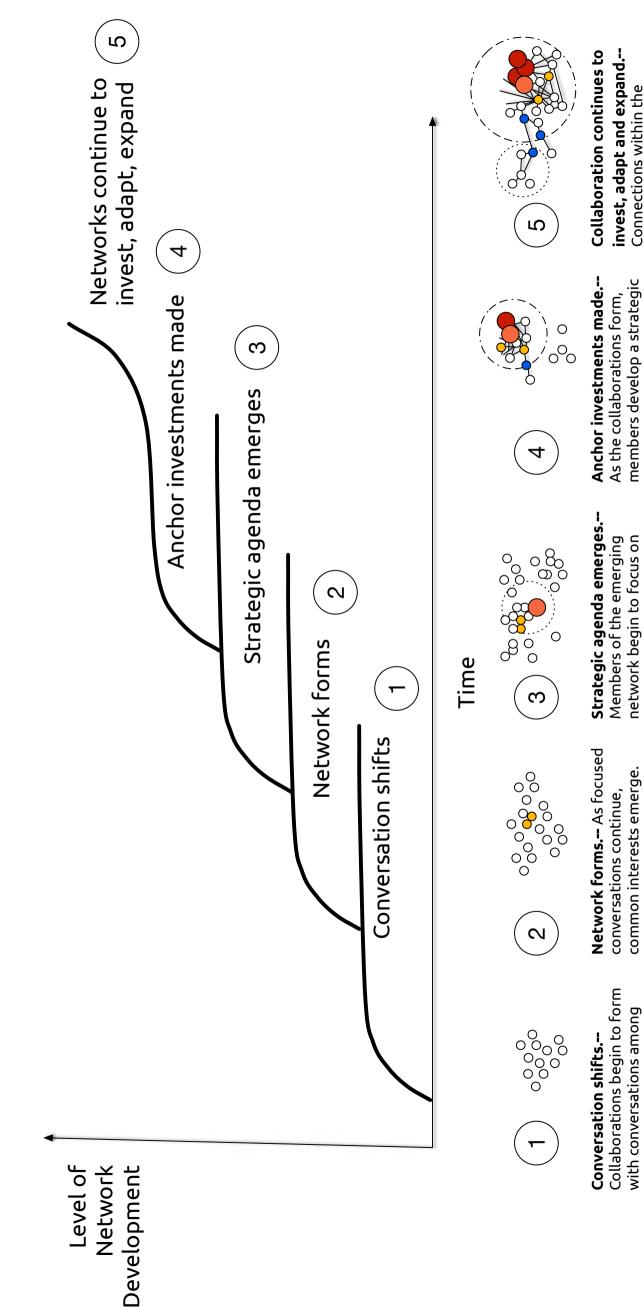


building trust at scale quickly among companies that have never worked together in this way The challenge of open innovation involves



trust at scale by moving companies through a Strategic Doing accelerates the formation of rigorous process





network become more dense

shared investments build out

the collaboration.

and spontaneous. New

investments to strengthen

These opportunities emerge

strategic opportunities.

These shared interests drive

detail. Connections among

firms become stronger.

conversations to deeper

similar "competitive space"

companies that share a

Participants begin testing deas about colabrotion.

as firms "link and leverage"

their assets.

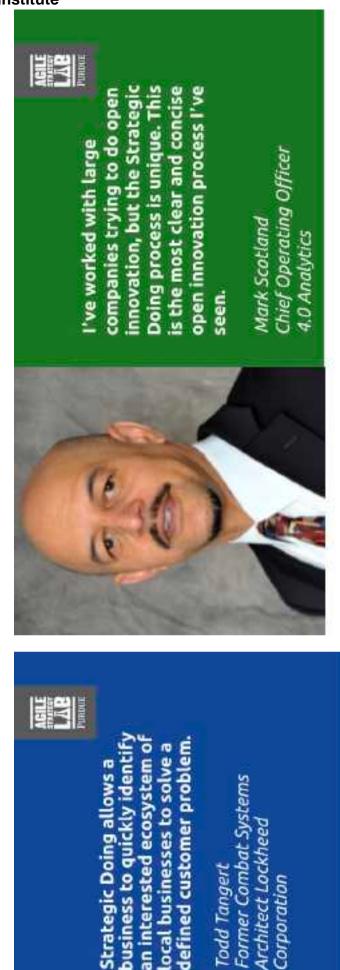
themselves through

collaboration.

agenda: a portfolio of



identifying potential partners. We also provided Strategic Doing solved Lockheed's challenge of a clear path for participants to follow.



Strategic Doing allows a





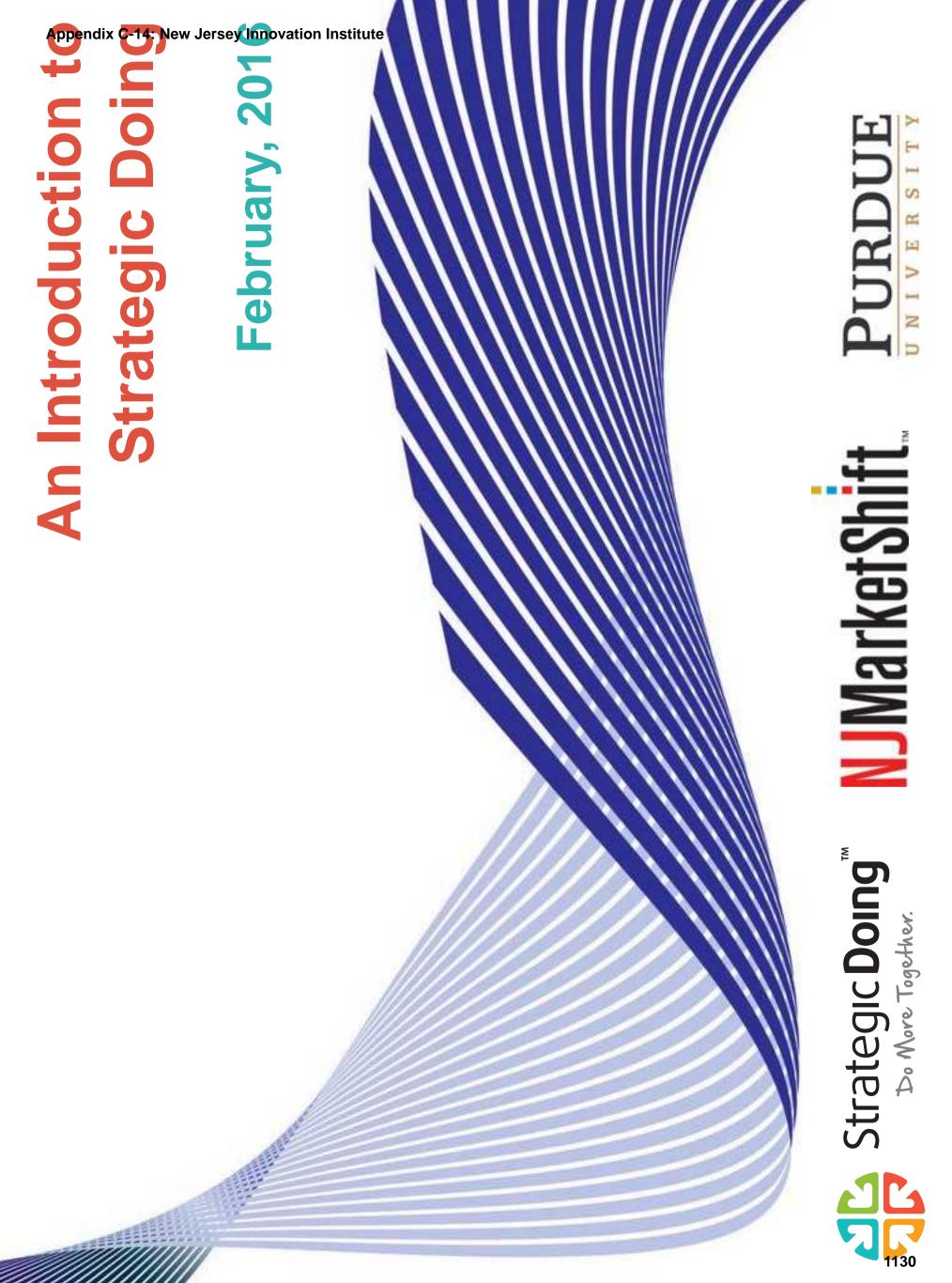


Former Combat Systems

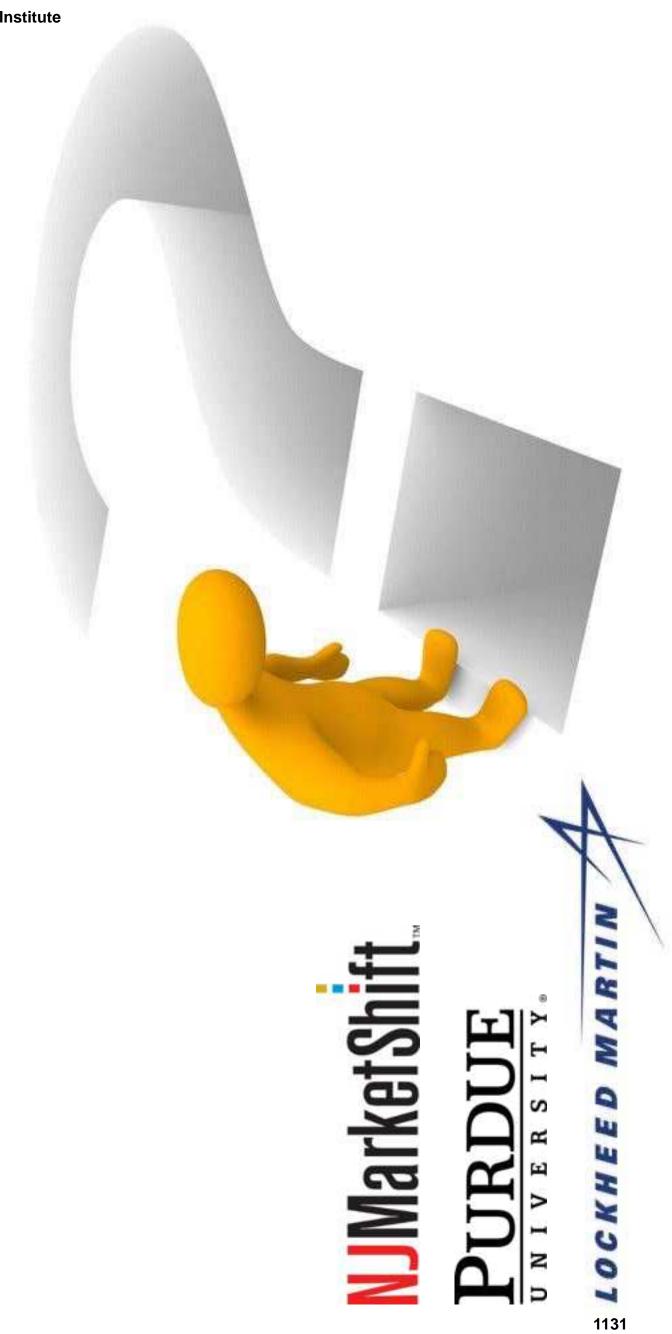
Todd Tangert

Architect Lockheed

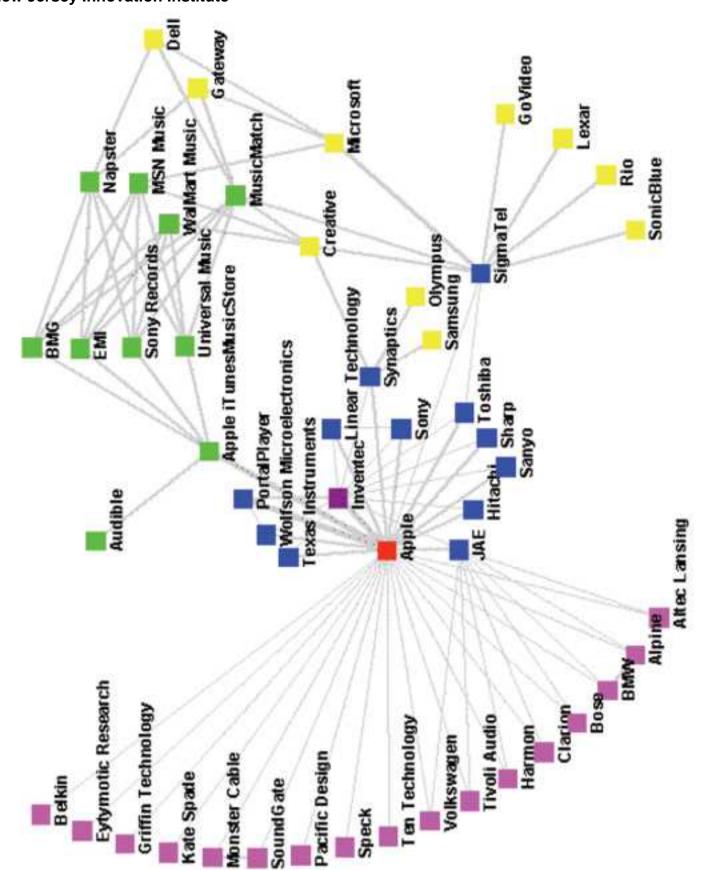




future of Condition-Based Maintenance What would it look like if a network of New Jersey companies designed the for the Navy?



Appendix C-14: New Jersey Innovation Institute





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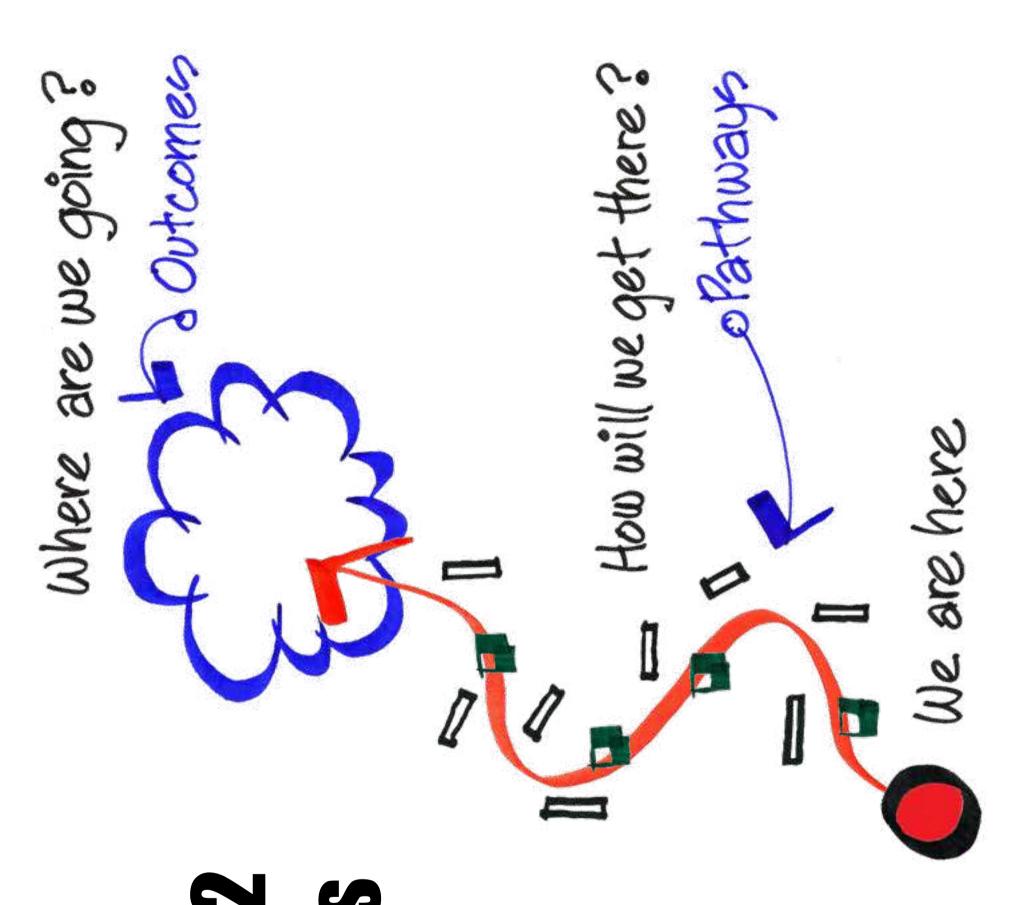
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SUCCESS

From Slow, linear.

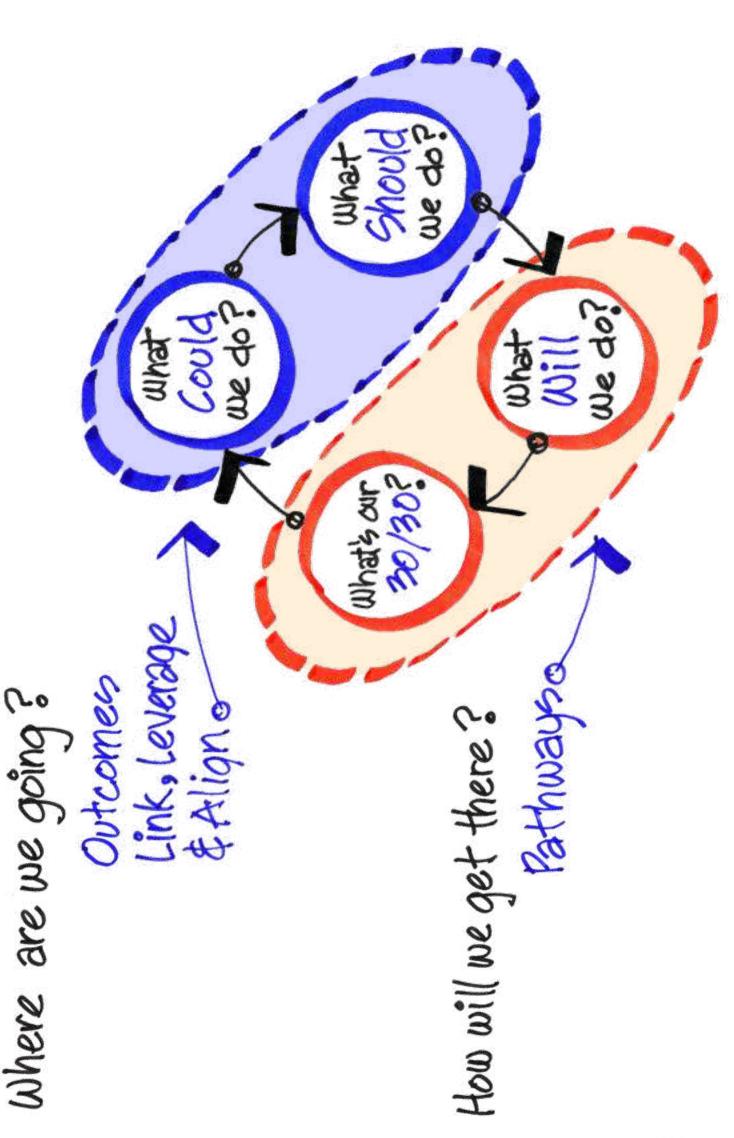
Strategic Doir Strategic Planning

...to fast, agile



Strategy answers 2 questions

questions become 4 Strategic Doing:



Strategy emerges from frequen

leration

Harvard Business Review

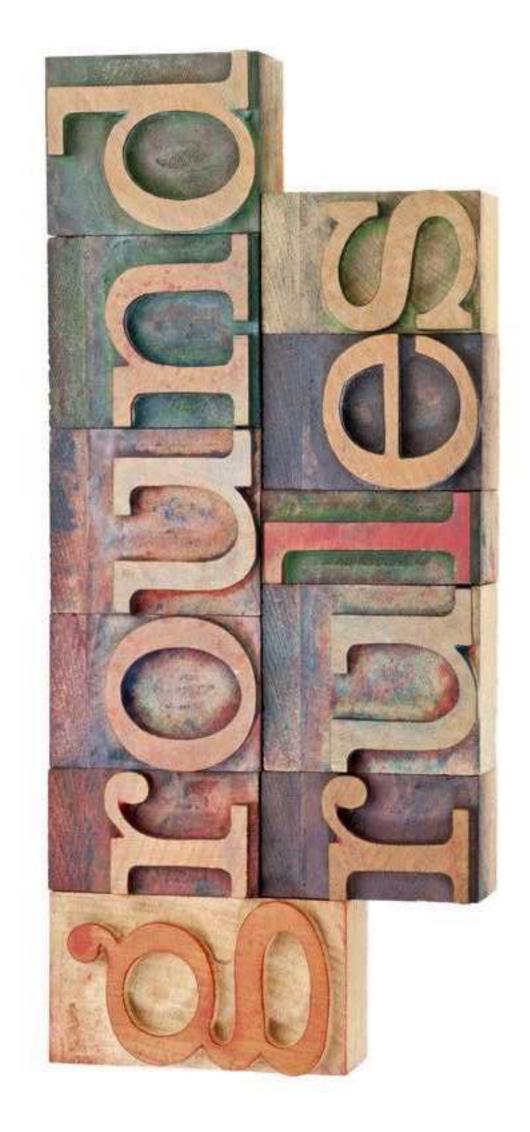




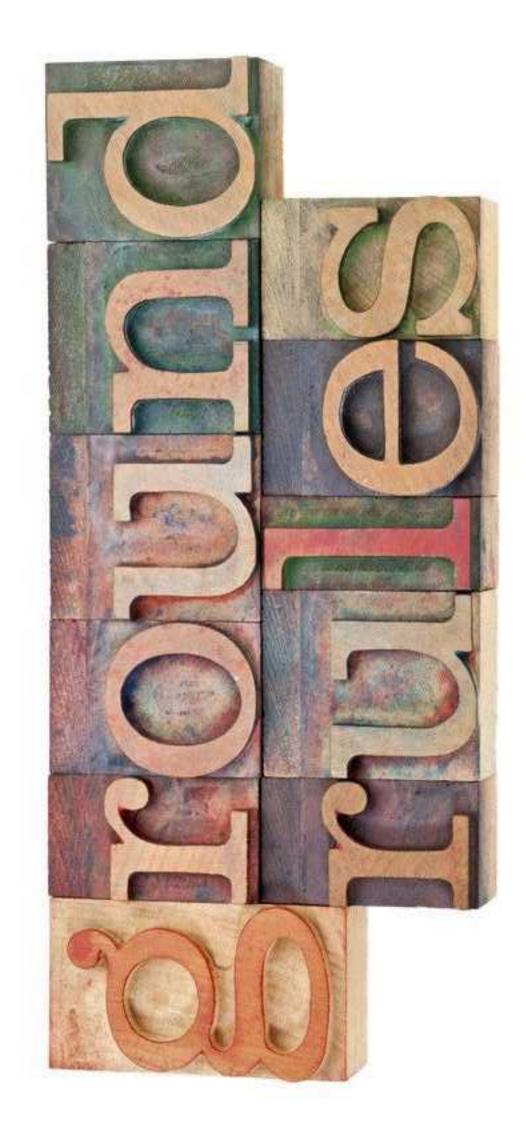




Be brief



you can Share what



Commit to doing

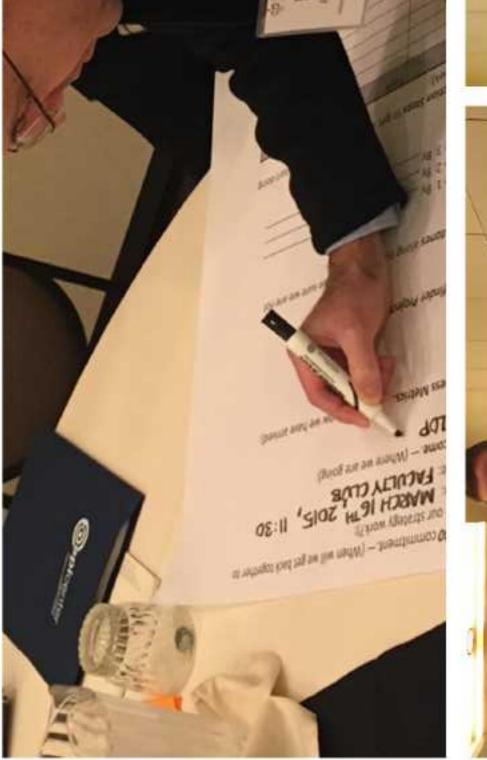


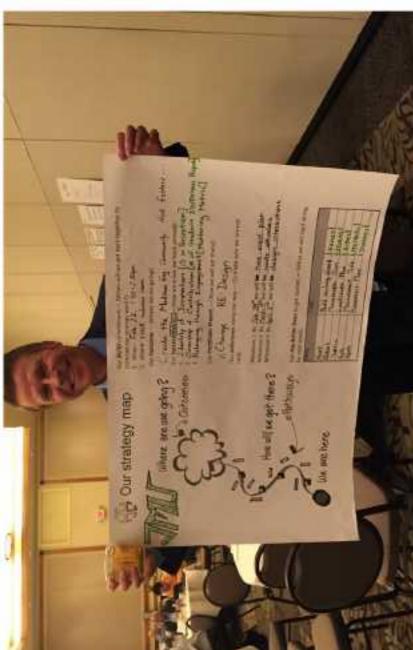












Proceedings of the 2016 Industrial and Systems Engineering Research Conference H. Yang, Z. Kong, and MD Sarder, eds.

Strategic Doing: A Tool for Curricular Evolution

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Abstract

Today's technology companies demand engineering graduates with career-ready skills who can quickly contribute to the enterprise. Preparing these graduates is challenging and adding additional materials to the existing curriculum is viewed with skepticism. In the past two years, the authors have integrated innovation and entrepreneurship into the engineering curriculum with an agile strategy process called Strategic Doing. This process has brought focus to fragmented initiatives, effectively leveraged resources, enhanced engagement, and promoted distributed leadership. Taken together, these efforts have altered the engineering education pathway to innovation. We have built a collaborative ecosystem that transforms the educational experience. Strategic Doing teaches people how to form collaborations quickly, move them toward measurable outcomes and make adjustments along the way. The Strategic Doing process answers two questions: "Where are we going?" and "How will we get there?" Designed specifically for loosely connected networks, it is a new strategy discipline that is lean, agile and fast. In this paper, the authors will discuss how the Strategic Doing process was implemented within a Hispanic Serving Institution to create a networked ecosystem for innovation and entrepreneurship, steps identified to get us there, and progress made to date.

Keywords

Strategic Doing, Innovation, Curricular Change

Introduction

New Mexico State University (NMSU) is a Hispanic Serving Institution, a Land Grant University, and a respected regional leader in engineering education. Similar to many of our peer institutions, our engineering curriculum aligns with that of a traditional engineering education, with experiential learning gained historically through extracurricular and student-organization-based activities. However, the emerging global economy is causing a paradigm shift among such traditional engineering education across the United States and beyond. The implications of a technology-driven global economy for engineering practice are particularly profound. The globalization of markets requires engineers capable of working with and among different cultures and knowledgeable about global markets [1]. The requirements of 21st-century engineering are considerable: engineers must be technically competent, globally sophisticated, culturally aware, innovative and entrepreneurial, and nimble, flexible, and mobile [2]. During the past several years, globalization has led numerous groups, including the National Academies, federal agencies, business organizations, and professional societies to conclude that new paradigms in engineering practice, research, and education are needed to better address the needs of a 21st-century nation in a rapidly changing world [3-7]. Success as an engineer requires a new skill set, above and beyond the traditional basic science and technical

background. Engineers in today's workplace must be effective communicators and team players, with a knack for understanding the non-technical and human factors issues that profoundly affect engineering decisions [8,9].

Recognizing the need to ensure that our graduates remain competitive in the changing workforce, we began to seek out best practices to enhance our undergraduate curriculum and associated offerings while recognizing the uniqueness of our diverse student demographic. We observed what was occurring in engineering programs across the country and recognized a need to offer more powerful learning experiences to our students. In 2013, the College of Engineering at NMSU joined the first cohort ("2014 cohort") of the National Science Foundation-funded Pathways to Innovation program, led jointly by Stanford University and VentureWell. The focus of the Pathways program was to develop and scale best practices for integrating innovation and entrepreneurship into the engineering curriculum at each of the cohort institutions towards formation of 21st-century engineers. Under the auspices of the Pathways program, we created a cross-functional team of engineering faculty and administrators that would participate, champion, and lead the development of our ecosystem. Two of the authors: Pines and Sullivan served as co-leads of this team--both are experienced college administrators and have participated in strategic planning and other program improvement efforts. As we began our participation in the Pathways program, we were cognizant of the many partial successes and failures of projects of this type. With a dubious eye toward such possible outcomes, we took our team of faculty from various engineering disciplines to the first Pathways cohort meeting. At that meeting, we were introduced to the Strategic Doing process by our co-author Morrison as a tool for developing our respective ecosystem, and specifically, to help guide us through the process of integrating emerging innovation and entrepreneurial-minded learning into our engineering education. Each cohort institution was tasked with identifying their respective goals, and subsequently used the Strategic Doing tool to develop strategies for implementation and feedback. As a team, we collectively decided to focus our goal on developing an ecosystem that would integrate two particular strategies: faculty development and institutional change. Our project is now in its third year, and we can speak of some significant successes as a result of using the Strategic Doing process to manage our effort. In this paper, we offer a brief introduction to Strategic Doing, discuss our experiences, and offer some brief conclusions.

Origins of Strategic Doing

Strategic Doing has emerged as an alternative to traditional strategic planning. Our prevailing concepts of strategy in universities have historically been imported from the business community. Initially deployed among large-scale corporations in the 1960's, strategic planning methodologies made their way into the realm of universities in the 1980's [10]. Stripped to its simplest components, a strategy describes where an organization is going and how it will get there. Strategic planning provides a process to answer these questions. Conventional strategic planning methods vary, but they share several features:

- A separation of thinking and doing, in which a small group of top managers designs the plan, and those lower in the organization execute it; in other words, there is a "command and control" structure in place to execute the strategy;
- An assumption of linear movement, in which one step in the process is completed before moving to the next;
- An expectation that the environment in which the plan was designed will remain relatively stable over the longer term planning horizon; and
- A process in which analysis must be completed before decisions are made.

By the mid 1990's significant concerns were emerging in the business world that conventional strategic planning was inadequate to the task [11]. Recognizing that change is constant led to growing dissatisfaction with strategic planning and searches for alternatives [12]. In a university setting in particular, knowledge is the foremost ingredient to create value. This factor alone necessitates a different approach to strategy. Knowledge moves along networks of relationships and increasingly does not respect disciplinary boundaries. Transformative curricular change crosses boundaries within a college of engineering. Strategy in this context is less a formal, rational process and more of an emergent process that must follow a set of simple rules [13]. Strategic Doing responds to these needs as a protocol for developing strategy in open, loosely connected networks. Strategic Doing was originally applied in community and regional development projects, often undertaken within public land grant institutions, to help guide the work (land grant institutions were designed with this kind of public outreach in their original charter). These original efforts led to many successful initiatives [14].

Contrasting Strategic Doing to Strategic Planning

Strategic Doing is a process for groups to come together to address complex problems for which there is no obvious solution. The challenges are inherently complex and changing. In another setting, they might be modeled using a systems dynamics model but solutions would be less likely. Solutions ultimately require the efforts of a number of people – especially when those people are not part of the same operating units, departments, or organizations [15].

Strategic Doing borrows from other systems-oriented intervention strategies. The primary contribution to practice is a shift away from a "deficit" model – that is, a starting point of identifying problems and a lack of resources – to a model rooted in assets (financial, physical or human capital) that can be applied to help achieve a desired outcome. With the realization that no individual has a complete view of a particular landscape, many assets are often unknown to members of the team. Through the Strategic Doing process, assets become inputs to a multi-factor productivity model that includes financial, physical, human and/or social capital. Thus, as a planning team first focuses on identifying their assets, Strategic Doing allows for a collective landscape to execute the respective strategy.

Industrial and systems engineers will quickly note that this process is "agile"—that is, it is designed to accommodate a changing environment in which frequent adjustments or changes might be needed. Agility provides an intuitive feel as one becomes proficient in the process. And, the ability to quickly change direction is appreciated by those used to more structured strategic planning exercises. Furthermore, the incremental steps for frequent review allow for quick pivots when dealing with competing objectives, friction and other well-known project issues.

Contrast the inflexibility of conventional strategic planning. A strategic planning exercise often proceeds in a sequence involving a series of meetings by working groups or task forces. The group picks some set of goals or strategies or programs they think will address those needs, and then develops a detailed implementation plan that directs people (usually not the same people that are in the planning group) to put those strategies into action over a period of time. Then the planning group disbands, its work "done."

The risks of this linear approach are increasingly obvious in a turbulent world. The predictions of the future environment may be wrong, either because conditions change or because initial assumptions were incorrect. Three factors challenge the conventional approach to strategy: 1) the implementers have not been part of the planning process, yet they have critical information to share; 2) as implementation begins, it may become apparent that a particular strategy does not work and thus all of the follow-on work laid out in the plan is impractical or obsolete; and 3) perhaps most critically, a "plan" cannot in and of itself make anyone implement anything – especially if the people who wrote the plan are not the same people who need to implement it.

Strategic Doing approaches the planning/implementation challenge differently. It represents a protocol for managing strategic conversations, conversations that answer the two key questions of strategy: "where are we going" and, "how will we get there?" To answer these two questions, Strategic Doing guides participants toward answering four subsequent questions. The first two define an outcome, a destination. The second define a pathway. The fourth focuses on timely feedback that allows for agile adjustments moving forward.

Table 1: The Strategic Doing Process

Table 1. The Strategic Doing 1 rocess				
What could we do?	What are all the opportunities before us that would			
	build on our current assets?			
What should we do?	Which of those opportunities provides the most value right now (defined as a combination of impact and ease of implementation), and how would we know if we succeeded?			
What will we do?	What small project could those of us currently involved complete that would move us toward that outcome?			
What's our 30/30?	When will we come back together to review what we've learned and done in the past 30 days, and plan for the next 30?			

The Process

Our initial engagement into the Pathways program began with a cohort leadership meeting. As co-leaders of the NMSU team, Pines and Sullivan participated in a workshop that included an in-depth introduction to the Strategic Doing process via an exercise developed by co-author Morrison. The objective of the exercise was to engage participants in a hypothetical situation to illustrate how strategies change over time by incorporating agile feedback. The intended outcome was to overcome perceived opposition to the traditional strategic planning process by pivoting towards the more agile Strategic Doing process.

During the exercise, we were introduced to unique aspects of the Strategic Doing process. Our conversations were bounded by an aspirational framing question that invited participants to design a future that no one can yet see, "What would it look like if our college of engineering used the gift of a downtown building to build our national reputation as an innovator in engineering education?" Our conversations progressed by posing the four strategic questions outlined in Table 1. We recorded our conversations by writing insights and observations on a series of worksheets designed specifically for the Strategic Doing process. The exercise was empowering. As participants, we learned to how to develop a complex collaboration, a sophisticated strategy, in a matter of hours, as opposed to weeks or months. The challenge throughout the exercise was to keep the conversation on track.

A subsequent gathering followed the team leader workshop, where we brought our team of five to a two-and-one-half day workshop with other Pathways institutions. During this gathering, we began developing our respective strategies in earnest. Before convening, we had developed an initial landscape of the assets that aligned with our institutional mission, specifically as they support the education of our uniquely diverse student demographic. We used this landscape to develop a preliminary strategy.

First, we focused on "What could we do to transform our undergraduate engineering experience?" From this, we developed new opportunities by learning to link and leverage our assets in new ways. Next, we turned to the question, "what should we do?" Here, we had to select among our opportunities. We learned to identify our "big easy", the opportunity that we all thought would have a big impact, but was relatively easy to do. We next defined success metrics for our chosen opportunity. In delving deeper to explore how we would measure success, we converted our opportunity into a shared outcome.

Next, we turned our attention to "what will we do?" We defined a "Pathfinder project" with some guideposts or milestones to begin moving us toward our outcome. Within the context of the Pathfinder project, we were asked to define a detailed action plan in which each member of our team made a commitment to move into action. Finally, we agreed on a process of review, our "30/30."

After the workshop, the team leaders participated in a series of monthly video meetings over a six-month period with two to four members from other cohort teams and a Pathways program mentor. Before the call, our team met to review and update our strategy map. We completed new iterations of our strategy on a monthly basis and made adjustments based on feedback.

During monthly video meetings with the other teams, we presented our map and gathered feedback and advice from other participants. As we contemplated expanding our project scope, we relied on the discipline of the Strategic Doing process to evaluate our scope before expanding to other initiatives. Listing the components of our landscape was a significant effort for the team. Our team members were each committed and passionate about our overall goal, thus the discussions were intense. Despite the intensity of these conversations, the landscape tool and our strategy map forced our conversation toward specific measurable outcomes and practical next steps.

In our case, the landscape exercise included courses in which innovation and/or entrepreneurship was taught, offered programs, extracurricular activities, physical spaces, catalysts (institutional-level efforts), and institutional champions. Awareness of these assets resided in the collective knowledge of a networked team. Using the landscape as a starting point, we relied on the Strategic Doing process to leverage, mobilize, and coordinate the various assets to address the challenge under consideration. As a team, we began to execute our strategy quickly and found ourselves "learning by doing." As we gained insights into our work, we built trust among our team and gained champions among our institutional colleagues. Our strategies emerged in a practical and increasingly complex form.

Some results

As a team, the Strategic Doing process helped us to identify a shared vision that would have an immediate as well as long-term impact on student learning. Through a review of our landscape, we found that faculty were interested in adopting pedagogical changes such as flipped classrooms and other active learning methods. Others were interested in pedagogy that blended traditional and active learning styles. In working through the Strategic Doing process, we gravitated toward a need to create active learning classrooms that would allow flexibility in teaching styles as one of our strategies. Thus, the need to remodel several classrooms was deemed imperative to fostering the curricular changes being proposed, thus answering, "how will we get there."

The shared discipline of the Strategic Doing protocol kept our conversations from becoming tangled or inconclusive. We believe that the focus on the "30/30" was key to this success. Figure 1: Strategy Map Revision displays the monthly strategy update for one month. The iterative process resulted in an outcome that was observable and championed by the team. The forward look strategy of the "30/30" was an excellent guide to keep us focused.

Strategy	Map Revision for:				Revision [Date: 30 June 20	
					Current Pathfinder Project: (name) Flexible facilities		
Current Strategic Outcome: (name) Active learning				Milestone	By When		
Characteristic if we succeed Me		Metr	etric for that success		Inventory of Rooms	30-APR	
Innovative courses engaging students		# 0	# of courses				
		Retention Brand Identity			Review best practices	31-MAY	
					Develop baseline	30-JUL	
					Funding sources	30-JUL	
ShortTerm	Action Plan (30-60 days)						
Who	Does What		By When	i	Briefly summarize these talking points for your presentation:		
Team	Develop baseline		30-Jul		We're most comfortable about: Progress to date, university engagement, alumni support		
roum	Develop baseline		00 001	ļΙ	We're least comfortable about: Money, available	e facilities	
Patricia Id Funding Sources							
				1	The group can help us by: Look for collaboration	e efforts	
				Ι.	When and where is your next meeting? 15-Aug Who uploaded meeting notes to Dropbox? NVA Who emailed a summary to everyone? Patricia/Ed Who's filling out the "Strategic Doing Update" for XXXXXX? Ed		

Figure 1: Strategy Map

In our case, the expansion of our ecosystem can be seen in the number of different projects we undertook using the Strategic Doing discipline. Our initial strategy focused on developing flexible working spaces. We moved on to other collaborations including a new course for transfer students, a maker space, and a new design competition. A brief summary of the different collaborations we undertook include:

- Flexible learning spaces—classrooms that allow for a variety of teaching styles;
- New course for transfer students—development of an immersion course using design thinking curriculum;
- Apprentice program for innovation space—transitioned management to student-centric Co-Op experience;
- Assessment of space experience—development of tools for program assessment;
- New maker space—creation of the first engineering maker space at NMSU;
- Design competition—creation of one-day industry-sponsored design challenges; and
- Pop-up workshops—creation of multi-disciplinary non-credit Pop-up workshops to enhance student learning.

During the course of this work we came to experience what we all probably understood: transforming the undergraduate education experience requires multiple, perhaps dozens of initiatives that link, leverage and align our assets across campus. The Strategic Doing process enabled us to multiply our impact by designing, launching and guiding new collaborations quickly but with purpose.

Conclusions

Today, we can report significant success in transforming the undergraduate engineering experience at our university. Our students now benefit from three active learning classrooms. The remodeled classrooms have proven key to curricular evolution. Courses have been retooled, students have become noticeably engaged, faculty have become reinvigorated, and the classrooms have become a gathering spot for brainstorming between faculty and students alike.

Pines, Sullivan, Morrison

Our use of the Strategic Doing process was key to our ability to address the complexity of educational transformation and marshal our resources to design and implement solutions. Through the training we received, we were able quickly to move on a project that would have immediate as well as long-term impact on both faculty and students. The process required us to evaluate the impact of our decisions through measurable outcomes ("where are we going?") and a Pathfinder project with clear milestones and action steps ("How will we get there?"). As such, our work together has positively contributed to changes in our engineering curriculum. Assembling our landscape is an ongoing effort. Our landscape is always shifting, and it requires continuous updating. Yet, with strategic doing this updating has a purpose: it focuses us on "what could we do?" with a growing portfolio of assets. Focusing on these assets is critical—experienced readers will recall how easy it is for teams to focus on what does not exist. These problem-centered conversations too often lead nowhere.

The deeper skills of collaboration developed by strategic doing are transferable through demonstration and practice. We are now working with XX University to explore how we might teach these skills more formally on campus by integrating them to other undergraduate courses, forming new engagements for students and faculty with communities and companies, encouraging faculty to use these skills to expedite the formation of complex research collaborations, and launching executive education workshops. XX University has shown how all these pathways are possible.

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Strategic Doing: A Tool for Curricular Evolution

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Abstract

Today's technology companies demand engineering graduates with career-ready skills who can quickly contribute to the enterprise. Preparing these graduates is challenging and adding additional materials to the existing curriculum is viewed with skepticism. In the past two years, the authors have integrated innovation and entrepreneurship into the engineering curriculum with an agile strategy process called Strategic Doing. This process has brought focus to fragmented initiatives, effectively leveraged resources, enhanced engagement, and promoted distributed leadership. Taken together, these efforts have altered the engineering education pathway to innovation. We have built a collaborative ecosystem that transforms the educational experience. Strategic Doing teaches people how to form collaborations quickly, move them toward measurable outcomes and make adjustments along the way. The Strategic Doing process answers two questions: "Where are we going?" and "How will we get there?" Designed specifically for loosely connected networks, it is a new strategy discipline that is lean, agile and fast. In this paper, the authors will discuss how the Strategic Doing process was implemented within a Hispanic Serving Institution to create a networked ecosystem for innovation and entrepreneurship, steps identified to get us there, and progress made to date.

Keywords

Strategic Doing, Innovation, Curricular Change

Introduction

New Mexico State University (NMSU) is a Hispanic Serving Institution, a Land Grant University, and a respected regional leader in engineering education. Similar to many of our peer institutions, our engineering curriculum aligns with that of a traditional engineering education, with experiential learning gained historically through extracurricular and student-organization-based activities. However, the emerging global economy is causing a paradigm shift among such traditional engineering education across the United States and beyond. The implications of a technology-driven global economy for engineering practice are particularly profound. The globalization of markets requires engineers capable of working with and among different cultures and knowledgeable about global markets [1]. The requirements of 21st-century engineering are considerable: engineers must be technically competent, globally sophisticated, culturally aware, innovative and entrepreneurial, and nimble, flexible, and mobile [2]. During the past several years, globalization has led numerous groups, including the National Academies, federal agencies, business organizations, and professional societies to conclude that new paradigms in engineering practice, research, and education are needed to better address the needs of a 21st-century nation in a rapidly changing world [3-7]. Success as an engineer requires a new skill set, above and beyond the traditional basic science and technical

background. Engineers in today's workplace must be effective communicators and team players, with a knack for understanding the non-technical and human factors issues that profoundly affect engineering decisions [8,9].

Recognizing the need to ensure that our graduates remain competitive in the changing workforce, we began to seek out best practices to enhance our undergraduate curriculum and associated offerings while recognizing the uniqueness of our diverse student demographic. We observed what was occurring in engineering programs across the country and recognized a need to offer more powerful learning experiences to our students. In 2013, the College of Engineering at NMSU joined the first cohort ("2014 cohort") of the National Science Foundation-funded Pathways to Innovation program, led jointly by Stanford University and VentureWell. The focus of the Pathways program was to develop and scale best practices for integrating innovation and entrepreneurship into the engineering curriculum at each of the cohort institutions towards formation of 21st-century engineers. Under the auspices of the Pathways program, we created a cross-functional team of engineering faculty and administrators that would participate, champion, and lead the development of our ecosystem. Two of the authors: Pines and Sullivan served as co-leads of this team--both are experienced college administrators and have participated in strategic planning and other program improvement efforts. As we began our participation in the Pathways program, we were cognizant of the many partial successes and failures of projects of this type. With a dubious eye toward such possible outcomes, we took our team of faculty from various engineering disciplines to the first Pathways cohort meeting. At that meeting, we were introduced to the Strategic Doing process by our co-author Morrison as a tool for developing our respective ecosystem, and specifically, to help guide us through the process of integrating emerging innovation and entrepreneurial-minded learning into our engineering education. Each cohort institution was tasked with identifying their respective goals, and subsequently used the Strategic Doing tool to develop strategies for implementation and feedback. As a team, we collectively decided to focus our goal on developing an ecosystem that would integrate two particular strategies: faculty development and institutional change. Our project is now in its third year, and we can speak of some significant successes as a result of using the Strategic Doing process to manage our effort. In this paper, we offer a brief introduction to Strategic Doing, discuss our experiences, and offer some brief conclusions.

Origins of Strategic Doing

Strategic Doing has emerged as an alternative to traditional strategic planning. Our prevailing concepts of strategy in universities have historically been imported from the business community. Initially deployed among large-scale corporations in the 1960's, strategic planning methodologies made their way into the realm of universities in the 1980's [10]. Stripped to its simplest components, a strategy describes where an organization is going and how it will get there. Strategic planning provides a process to answer these questions. Conventional strategic planning methods vary, but they share several features:

- A separation of thinking and doing, in which a small group of top managers designs the plan, and those lower in the organization execute it; in other words, there is a "command and control" structure in place to execute the strategy;
- An assumption of linear movement, in which one step in the process is completed before moving to the next:
- An expectation that the environment in which the plan was designed will remain relatively stable over the longer term planning horizon; and
- A process in which analysis must be completed before decisions are made.

By the mid 1990's significant concerns were emerging in the business world that conventional strategic planning was inadequate to the task [11]. Recognizing that change is constant led to growing dissatisfaction with strategic planning and searches for alternatives [12]. In a university setting in particular, knowledge is the foremost ingredient to create value. This factor alone necessitates a different approach to strategy. Knowledge moves along networks of relationships and increasingly does not respect disciplinary boundaries. Transformative curricular change crosses boundaries within a college of engineering. Strategy in this context is less a formal, rational process and more of an emergent process that must follow a set of simple rules [13]. Strategic Doing responds to these needs as a protocol for developing strategy in open, loosely connected networks. Strategic Doing was originally applied in community and regional development projects, often undertaken within public land grant institutions, to help guide the work (land grant institutions were designed with this kind of public outreach in their original charter). These original efforts led to many successful initiatives [14].

Contrasting Strategic Doing to Strategic Planning

Strategic Doing is a process for groups to come together to address complex problems for which there is no obvious solution. The challenges are inherently complex and changing. In another setting, they might be modeled using a systems dynamics model but solutions would be less likely. Solutions ultimately require the efforts of a number of people – especially when those people are not part of the same operating units, departments, or organizations [15].

Strategic Doing borrows from other systems-oriented intervention strategies. The primary contribution to practice is a shift away from a "deficit" model – that is, a starting point of identifying problems and a lack of resources – to a model rooted in assets (financial, physical or human capital) that can be applied to help achieve a desired outcome. With the realization that no individual has a complete view of a particular landscape, many assets are often unknown to members of the team. Through the Strategic Doing process, assets become inputs to a multi-factor productivity model that includes financial, physical, human and/or social capital. Thus, as a planning team first focuses on identifying their assets, Strategic Doing allows for a collective landscape to execute the respective strategy.

Industrial and systems engineers will quickly note that this process is "agile"—that is, it is designed to accommodate a changing environment in which frequent adjustments or changes might be needed. Agility provides an intuitive feel as one becomes proficient in the process. And, the ability to quickly change direction is appreciated by those used to more structured strategic planning exercises. Furthermore, the incremental steps for frequent review allow for quick pivots when dealing with competing objectives, friction and other well-known project issues.

Contrast the inflexibility of conventional strategic planning. A strategic planning exercise often proceeds in a sequence involving a series of meetings by working groups or task forces. The group picks some set of goals or strategies or programs they think will address those needs, and then develops a detailed implementation plan that directs people (usually not the same people that are in the planning group) to put those strategies into action over a period of time. Then the planning group disbands, its work "done."

The risks of this linear approach are increasingly obvious in a turbulent world. The predictions of the future environment may be wrong, either because conditions change or because initial assumptions were incorrect. Three factors challenge the conventional approach to strategy: 1) the implementers have not been part of the planning process, yet they have critical information to share; 2) as implementation begins, it may become apparent that a particular strategy does not work and thus all of the follow-on work laid out in the plan is impractical or obsolete; and 3) perhaps most critically, a "plan" cannot in and of itself make anyone implement anything – especially if the people who wrote the plan are not the same people who need to implement it.

Strategic Doing approaches the planning/implementation challenge differently. It represents a protocol for managing strategic conversations, conversations that answer the two key questions of strategy: "where are we going" and, "how will we get there?" To answer these two questions, Strategic Doing guides participants toward answering four subsequent questions. The first two define an outcome, a destination. The second define a pathway. The fourth focuses on timely feedback that allows for agile adjustments moving forward.

Table 1: The Strategic Doing Process

What could we do?	What are all the opportunities before us that would build on our current assets?
What should we do?	Which of those opportunities provides the most value right now (defined as a combination of impact and ease of implementation), and how would we know if we succeeded?
What will we do?	What small project could those of us currently involved complete that would move us toward that outcome?
What's our 30/30?	When will we come back together to review what we've learned and done in the past 30 days, and plan for the next 30?

The Process

Our initial engagement into the Pathways program began with a cohort leadership meeting. As co-leaders of the NMSU team, Pines and Sullivan participated in a workshop that included an in-depth introduction to the Strategic Doing process via an exercise developed by co-author Morrison. The objective of the exercise was to engage participants in a hypothetical situation to illustrate how strategies change over time by incorporating agile feedback. The intended outcome was to overcome perceived opposition to the traditional strategic planning process by pivoting towards the more agile Strategic Doing process.

During the exercise, we were introduced to unique aspects of the Strategic Doing process. Our conversations were bounded by an aspirational framing question that invited participants to design a future that no one can yet see, "What would it look like if our college of engineering used the gift of a downtown building to build our national reputation as an innovator in engineering education?" Our conversations progressed by posing the four strategic questions outlined in Table 1. We recorded our conversations by writing insights and observations on a series of worksheets designed specifically for the Strategic Doing process. The exercise was empowering. As participants, we learned to how to develop a complex collaboration, a sophisticated strategy, in a matter of hours, as opposed to weeks or months. The challenge throughout the exercise was to keep the conversation on track.

A subsequent gathering followed the team leader workshop, where we brought our team of five to a two-and-one-half day workshop with other Pathways institutions. During this gathering, we began developing our respective strategies in earnest. Before convening, we had developed an initial landscape of the assets that aligned with our institutional mission, specifically as they support the education of our uniquely diverse student demographic. We used this landscape to develop a preliminary strategy.

First, we focused on "What could we do to transform our undergraduate engineering experience?" From this, we developed new opportunities by learning to link and leverage our assets in new ways. Next, we turned to the question, "what should we do?" Here, we had to select among our opportunities. We learned to identify our "big easy", the opportunity that we all thought would have a big impact, but was relatively easy to do. We next defined success metrics for our chosen opportunity. In delving deeper to explore how we would measure success, we converted our opportunity into a shared outcome.

Next, we turned our attention to "what will we do?" We defined a "Pathfinder project" with some guideposts or milestones to begin moving us toward our outcome. Within the context of the Pathfinder project, we were asked to define a detailed action plan in which each member of our team made a commitment to move into action. Finally, we agreed on a process of review, our "30/30."

After the workshop, the team leaders participated in a series of monthly video meetings over a six-month period with two to four members from other cohort teams and a Pathways program mentor. Before the call, our team met to review and update our strategy map. We completed new iterations of our strategy on a monthly basis and made adjustments based on feedback.

During monthly video meetings with the other teams, we presented our map and gathered feedback and advice from other participants. As we contemplated expanding our project scope, we relied on the discipline of the Strategic Doing process to evaluate our scope before expanding to other initiatives. Listing the components of our landscape was a significant effort for the team. Our team members were each committed and passionate about our overall goal, thus the discussions were intense. Despite the intensity of these conversations, the landscape tool and our strategy map forced our conversation toward specific measurable outcomes and practical next steps.

In our case, the landscape exercise included courses in which innovation and/or entrepreneurship was taught, offered programs, extracurricular activities, physical spaces, catalysts (institutional-level efforts), and institutional champions. Awareness of these assets resided in the collective knowledge of a networked team. Using the landscape as a starting point, we relied on the Strategic Doing process to leverage, mobilize, and coordinate the various assets to address the challenge under consideration. As a team, we began to execute our strategy quickly and found ourselves "learning by doing." As we gained insights into our work, we built trust among our team and gained champions among our institutional colleagues. Our strategies emerged in a practical and increasingly complex form.

Some results

As a team, the Strategic Doing process helped us to identify a shared vision that would have an immediate as well as long-term impact on student learning. Through a review of our landscape, we found that faculty were interested in adopting pedagogical changes such as flipped classrooms and other active learning methods. Others were interested in pedagogy that blended traditional and active learning styles. In working through the Strategic Doing process, we gravitated toward a need to create active learning classrooms that would allow flexibility in teaching styles as one of our strategies. Thus, the need to remodel several classrooms was deemed imperative to fostering the curricular changes being proposed, thus answering, "how will we get there."

The shared discipline of the Strategic Doing protocol kept our conversations from becoming tangled or inconclusive. We believe that the focus on the "30/30" was key to this success. Figure 1: Strategy Map Revision displays the monthly strategy update for one month. The iterative process resulted in an outcome that was observable and championed by the team. The forward look strategy of the "30/30" was an excellent guide to keep us focused.

Map Revision for:		Revision Date: 30 June 20				
		Current Pathfinder Project: (name) Flexible facilities				
ategic Outcome: (name) Active lea	rning	Milestone	By When			
stic if we succeed	Metr	ic for that success				
un nouron angaging	# 0	facuraca	Inventory of Rooms	30-APR		
students			Review best practices	31-MAY		
		and Identity	Develop baseline	30-JUL		
			Funding sources	30-JUL		
Action Plan (30-60 days)						
Does What		By When	Briefly summarize these talking points for your presentation:			
			We're most comfortable about: Pre engagement, alumni support	ogress to date, university-wide		
Develop baseline		30-Jul	Walta Is and a safe dalah abasah Masasa ana labi at a liida			
atricia Id Funding Sources			We're least comfortable about: Mo	oney, available facilities		
				or collaborative efforts		
			When and where is your next meeting? 15-Aug Who uploaded meeting notes to Dropbox? N/A Who emailed a summary to everyone? Patricia/Ed Who's filling out the "Strategic Doing Update" for XXXXXX			
	ategic Outcome: (name) Active leastic if we succeed we courses engaging S Action Plan (30-60 days) Does What Develop baseline	ategic Outcome: (name) Active learning sticif we succeed Metr ve courses engaging Re Bra Action Plan (30-60 days) Does What Develop baseline	ategic Outcome: (name) Active learning sticif we succeed We courses engaging September 1	Current Pathfinder Project: (name) ategic Outcome: (name) Active learning Milestone		

Figure 1: Strategy Map

In our case, the expansion of our ecosystem can be seen in the number of different projects we undertook using the Strategic Doing discipline. Our initial strategy focused on developing flexible working spaces. We moved on to other collaborations including a new course for transfer students, a maker space, and a new design competition. A brief summary of the different collaborations we undertook include:

- Flexible learning spaces—classrooms that allow for a variety of teaching styles;
- New course for transfer students—development of an immersion course using design thinking curriculum;
- Apprentice program for innovation space—transitioned management to student-centric Co-Op experience;
- Assessment of space experience—development of tools for program assessment;
- New maker space—creation of the first engineering maker space at NMSU;
- Design competition—creation of one-day industry-sponsored design challenges; and
- Pop-up workshops—creation of multi-disciplinary non-credit Pop-up workshops to enhance student learning.

During the course of this work we came to experience what we all probably understood: transforming the undergraduate education experience requires multiple, perhaps dozens of initiatives that link, leverage and align our assets across campus. The Strategic Doing process enabled us to multiply our impact by designing, launching and guiding new collaborations quickly but with purpose.

Conclusions

Today, we can report significant success in transforming the undergraduate engineering experience at our university. Our students now benefit from three active learning classrooms. The remodeled classrooms have proven key to curricular evolution. Courses have been retooled, students have become noticeably engaged, faculty have become reinvigorated, and the classrooms have become a gathering spot for brainstorming between faculty and students alike.

Pines, Sullivan, Morrison

Our use of the Strategic Doing process was key to our ability to address the complexity of educational transformation and marshal our resources to design and implement solutions. Through the training we received, we were able quickly to move on a project that would have immediate as well as long-term impact on both faculty and students. The process required us to evaluate the impact of our decisions through measurable outcomes ("where are we going?") and a Pathfinder project with clear milestones and action steps ("How will we get there?"). As such, our work together has positively contributed to changes in our engineering curriculum. Assembling our landscape is an ongoing effort. Our landscape is always shifting, and it requires continuous updating. Yet, with strategic doing this updating has a purpose: it focuses us on "what could we do?" with a growing portfolio of assets. Focusing on these assets is critical—experienced readers will recall how easy it is for teams to focus on what does not exist. These problem-centered conversations too often lead nowhere.

The deeper skills of collaboration developed by strategic doing are transferable through demonstration and practice. We are now working with XX University to explore how we might teach these skills more formally on campus by integrating them to other undergraduate courses, forming new engagements for students and faculty with communities and companies, encouraging faculty to use these skills to expedite the formation of complex research collaborations, and launching executive education workshops. XX University has shown how all these pathways are possible.

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Award Instrument: Standard Grant

Program Manager: Dana L. Denick

EEC Div Of Engineering Education and Centers

ENG Directorate For Engineering

Start Date: July 1, 2015

End Date: June 30, 2021 (Estimated)

Awarded Amount to Date: \$1,993,490.00

Investigator(s): Anil Bajaj bajaj@ecn.purdue.edu (Principal Investigator)

Elizabeth Briody (Co-Principal Investigator) Edward Berger (Former Co-Principal Investigator) Edward Morrison (Former Co-Principal Investigator)

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NSF Program(s): PFE\RED - Professional Formati,

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Program Element Code(s): 012Y, 1998

ABSTRACT

Higher education institutions strive to improve the opportunities and preparation they give to students, especially in crucial professional skills like communication, creativity, and entrepreneurship. Very often, today's engineering graduates possess exemplary technical skills for analysis and design, but need further development of professional skills. American competitiveness, national security, and leadership in innovation are at stake. This project identifies the academic department as an organization whose alignment with these goals needs to be improved. The modern imperative to add value to a mechanical engineering (ME) education -- by focusing more closely on professional skills -- stimulates critical self-

student outcomes, inspiring changes in curriculum, the student experience, and most importantly the ways that students, staff, and faculty interact with each other. This is significant, because it is not currently known how an organizational model promotes or inhibits development of these professional skills in students. By remaking the organization to one based upon creativity and trust, using modern approaches to manage this change, this project orchestrates revolutionary change in student preparation for engineering careers.

This project engages the tools of engineering education research, ethnography, social network and content analysis, change management, and a new, experimental organization to manifest revolutionary change in how students are prepared for engineering careers. Revolutionary change simply cannot occur until two crucial facets of an academic organization are addressed: emotion and culture. Faculty, students, and staff hold deeply personal, emotionally driven beliefs about what higher education is - and should be. In turn, these beliefs shape the local culture within ME in both positive and negative ways. This project takes a systematic approach to revolutionize the ME department at Purdue by focusing on both engineering education research and culture/change research questions. The effort will answer critical research questions about engineering education and appropriate approaches to achieve professional outcomes at large scale. The vision emphasizes relationships, culture, and communication, along with undeniable technical prowess, as cornerstones of professional skills. The Engineering Dean has provided a strong institutional commitment to the project and its investigating team, which is a unique coalition of experts in engineering education research, change management, and cultural anthropology of technical organizations.

The faculty development plan engages Strategic Doing, a modern approach appropriate for the highly networked (not hierarchical) ME department organization. The connection to professional practice leverages several successful, on-going programs in ME for both domestic and international experiences. Scalability and adaptation are central elements of the faculty development plan, with special emphasis on assessing professional outcomes at scale. Project reliance on research in engineering education is robust, with one of the members of the PI team holding a joint appointment between the ME department and Purdue's School of Engineering Education. The project engages a diverse group of experts in executing the work, and involves a scaling and adaptation plan that allows the revolution blueprint to be adopted and adapted by other interested institutions.

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IUSE:RED: Thought into Action

"No real social change has ever been brought about without a revolution...revolution is but thought carried into action."—Russian political activist Emma Goldman

1. Overview of the Research Questions

The fundamental proposition. Most attempts to reform the core educational practices in traditional engineering departments have failed because these attempts have either been centered on a few enthusiasts who have transformed 1-2 courses, or they have focused on curricula reform without consideration of the underlying culture of the academic unit. The changes are not sustained because they do not take into account of the core beliefs of the faculty, the underlying and usually unstated operating values of the department, its history, and /or the prevailing reward systems, formal and informal. Revolution is therefore not about having the best idea; it is about doing what we know needs to be done.

Our approach. Rather than focus on a specific curricular reform or innovation, we will transform our core culture and create a new working environment. We will shape an ecosystem that embraces innovations in the student experience, especially during the 2nd and 3rd years. We have identified several well-known "target points" that are the primary barriers to the Professional Formation of Engineers (PFE) within Purdue's Mechanical Engineering program: (i) student-faculty relationships in the 2nd and 3rd year experience, and (ii) faculty culture/incentives/rewards and disposition to change, both of which are mediated by the scale of the ME program. These issues encapsulate many of the current challenges facing higher education; moreover, each issue is complex and all are highly coupled. The complexity and coupling are significant problems, because unless each issue is addressed as part of the complex system, it is likely that making improvements in one area will lead to less desirable consequences in another. Here, we use the PFE outcomes (PFEOs) defined by the national mechanical engineering community in the 5XME report (Ulsoy, 2007, detailed later): (i) flexibility and agility, (ii) innovation and creativity to benefit society, (iii) global focus, (iv) teamwork and leadership, and (v) communication skills. Until we tackle these problems in a truly coupled way, we will be unable to achieve the kind of broad-scale shift to improve student PFEOs advocated by the engineering community.

Our vision. In five years, Purdue Mechanical Engineering will be emerging as the global leader in producing engineering graduates, at scale, who set the standard for what it means to be professionally prepared. Our graduates will have exceptional skills in the PFEOs defined above. *We recognize that there are barriers to achieving this outcome within our current culture that must be addressed*, notably student-faculty relationships. *A new organization within ME, the ME Skunkworks (MES)*, will be the seed for departmental revolution, propagating outward from its initial tight core of members. Moreover, the Skunkworks idea will serve as a blueprint for propagation and adaptation at other institutions.

Our research questions. Solving these problems requires two complementary frameworks, integrated via a change strategy that is calibrated for the academic environment. The *engineering education framework* focuses on research-based pedagogies, assessments, and scale for both engineering fundamentals and PFEOs, while the *cultural change framework* considers the faculty, staff, and student cultures within ME and effective practices for cultural change. We will pursue the following two sets of research questions:

Engineering Education Research Questions (EERQs)

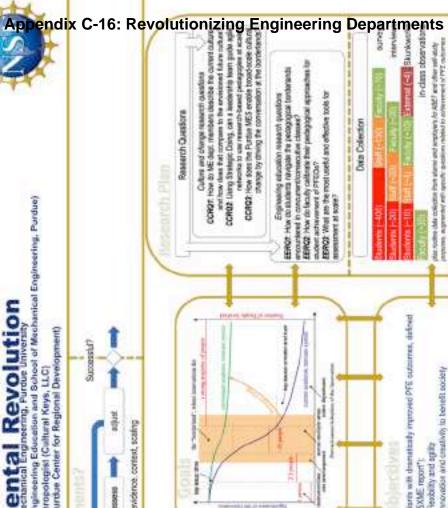
EERQ1. How do students navigate the pedagogical borderland they experience in concurrent or consecutive experiences, and how does their navigation ability affect the achievement of PFEOs? EERQ2. How do faculty navigate the pedagogical borderland, create experiences, and calibrate their pedagogical approaches for student achievement of PFEOs?



An Engineering Education 'Skunkworks' to

Spark Departmental Revolution Probability of Probab

Co-Pt. Ed Berger, Engineering Education Researcher (School of Engineering Education and School of Machanical Engineering, Purdue) Co-Pt Ed Morrison, Change Agent (Purdue Center for Regional Development) Successian Co-Pt: Elizabeth Briody, Anthropologist (Cultural Keys, LLC) Purdue ME Program, key issues; evidence, context, scaling Promising? Purtue MES, kay issues evidence, contact, bookseping



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Appeal Publish: Digestrant of Medianical Supraemy Same, VMM Stubins Serie Charlego (SSC Vinerary of Wiscous-Hilley Ann EERQ3. What are the most useful and effective tools to address the practical challenges associated with revolutionizing engineering education at scale, most importantly assessment tools?

Culture and Change Research Questions (CCRQs)

- CCRQ1. How do ME department members describe and evaluate the current culture, how does that characterization compare to the envisioned future culture, and what are the key obstacles to attaining the ideal future culture?
- CCRQ2. Using Strategic Doing, can a leadership team design and guide the agile networks needed to scale, sustain, and replicate research-based pedagogies that revolutionize PFE outcomes?
- CCRQ3. How does the Purdue ME Skunkworks enable broader-scale cultural change by driving the conversation at the borderlands?

Our team and institutional context. Our interdisciplinary leadership team brings a wide array of expertise to tackle this problem: a transformational leader (PI Bajaj), a trusted cultural translator between ME and engineering education (co-PI Berger), a dedicated change agent (co-PI Morrison), and an anthropologist of technical organizations (co-PI Briody). Purdue reaffirmed its commitment to transforming engineering education through the formation of the School of Engineering Education (ENE) in 2004. The engineering education research capacity of ENE affords our team a unique platform from which to undertake the proposed research. Under the transformation leadership of Dean Leah Jamieson, the College of Engineering at Purdue is growing significantly, creating an excellent opportunity for cultural transformation. Mechanical Engineering continues to be the largest professional school in the College of Engineering, and Purdue ME is the right place, at the right time, to lead this revolution.

2. Institutional Information

Purdue University and ME demographics. Mechanical Engineering at Purdue has 1,376 undergraduate students (and over 550 graduate students), 60+ tenure-track faculty, 18 visiting/research faculty and post-docs, and about 50 full-time staff (Fall 2014 data). The undergraduate student body enrollment is 14.5% female, 27% international, and 97.5% attend full-time. Students matriculate into Mechanical Engineering after completing our First-Year Engineering (FYE) program or as transfer students, and their admission to ME is automatic if their first-year GPA is 2.7 or above (due to capacity issues in ME). Table 1 shows ME enrollment for two recent cohorts and College of Engineering graduation rates, by ethnicity and gender. Table 2 shows faculty information for both the ME department and the university as a whole. Retention rate for students in the FYE program from the 1st to 2nd year is about 88%. Retention rate for ME students from the 2nd to 3nd year exceeds 90%, and from 3nd year to 4th year it approaches 90% (these rates are not available by ethnicity/gender). Only 22 transfer students have entered ME since 2008 (3.2% of all transfer students into engineering during that time period). The 5-year graduation rate for transfer students in the College of Engineering (assuming 2 years at their first institution, 3 years at Purdue) is about 50%. ME-specific data for transfer students (ethnicity, gender, graduation rate) is unavailable.

Table 1. Undergraduate Student Enrollment and Graduate Ra	Table 1. Un	lergraduate Stu	dent Enrollment and	Graduate Rate.
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ME Enroll												
Cohort	Int	H/L	AI	A	AA	PI	W	2+	U	M	\boldsymbol{F}	Total
Fall 2014	376	44	0	84	11	0	800	31	30	1177	199	1,376
Fall 2008	110	17	4	52	12	0	709	18	7	810	119	929
Engineering 5-Year Graduation Rate (percent)**												
Fall 2008	58.9	46.9	30.0	64.5	36.4	30.0	57.9		40.0	56.6	61.3	60.4

<u>Key</u>: Int = international, H/L = Hispanic/Latino, AI = American Indian, A = Asian American, AA = Afr. American, PI = Pacific Islander, W = White, 2+=2 or more, U = Unknown, M = male, F = female ** graduation rate by ethnicity/gender not available for ME; these data are for the CoE as a whole, for students who started their career in engineering and eventually earned an engineering degree

Purdue M	echanical	l Engineer	ring]					
Gender	H/L	AI	A	AA	PI	W	2+	U	Total
Female	1	0	1	1	0	7	0	0	10
Male	1	0	31	0	0	31	0	0	64
Total	2	0	32	1	0	38	0	0	74
Purdue Ur									
Female	20	0	140	30	0	556	9	0	755
Male	55	1	441	38	0	1,129	7	2	1,673
Total	75	1	581	68	0	1,685	16	2	2,428

Table 2. Purdue Faculty, Fall 2014 Headcount (tenure track plus clinical faculty and post-docs).

 \underline{Key} : H/L = Hispanic/Latino, AI = American Indian, A = Asian, AA = African American, PI = Pacific Islander, W = White, 2+=2 or more, U = Unknown

Current ME culture. We reviewed 10 data sources: (i) ME Exit Survey of graduates (2014), (ii) ME Alumni Survey (2013), (iii) ME Employer Survey (2013), (iv) ME ABET Self-Study Report (2013), (v) ME faculty semi-structured interviews (with 11 current ME faculty, October 2014), (vi) ME Forum transcripts (Spring 2013, Fall 2013, Spring 2014)--the ME Forum is a town hall-style meeting of UG students with the Head of the school, (vii) ME sophomore-level course evaluation comments (Spring 2014), (viii) NSSE data for Purdue engineering students (2010), (ix) PACE (Project to Assess Climate in Engineering, Anon., 2014) data for the Purdue College of Engineering, and (x) D grade-F grade-withdrawal (DFW) data for ME sophomore and junior courses. The broad conclusions from each dataset are shown in Table 3. Taken together, these data paint a picture of: (i) graduates strong in engineering fundamentals and with relevant work experience, but (ii) who lag in specific PFE outcomes including communication skills. Moreover, the cultural picture that emerges is paternalistic and faculty-centric, with high variability in pedagogies, student-faculty relationships, and prioritization of teaching/learning. These data inspire the 6 research questions described later.

Strengths and weaknesses of ME's faculty-centric culture. ME's faculty-centric culture rests upon a foundation of individual value creation, as well as policies and rewards systems that incentivize individual achievements. A faculty-centric culture is not entirely a bad thing. The faculty rightly take ownership of the curriculum and its delivery, and uphold high standards of conduct and performance among themselves (via promotion and tenure decisions) and their students (via assessment of learning outcomes). They control faculty hiring decisions and generally take the critical responsibility for the long-term success of the academic unit, and by extension for the University as a whole. But a faculty-centric culture also has its liabilities. First and foremost, a faculty-centric culture is not student-centric. Given their competing set of expectations and priorities, faculty must make excruciating choices about how to spend their time. Often, given the primacy of research productivity, some colleagues prioritize graduate education and research over undergraduate teaching and learning. This is not a secret, and is widely recognized as a great challenge for academia (Olson, 2013). Second, a faculty-centric culture is resistant to change because it is hierarchically quite flat, a networked organization rather than a hierarchical, command-and-control organization. This organizational flatness and the distributed polity of shared governance make change hard, usually interminably long, and incremental.

Faculty development and governance. Faculty development in teaching and learning within ME at Purdue is not required in any formal way, although it is encouraged for both faculty and doctoral students. Purdue's Center for Instructional Excellence (CIE; www.purdue.edu/cie) offers a suite of strong professional development programs around teaching and learning, although uptake on these programs remains tepid. Based upon the semi-structured interviews mentioned in *Table 3*, we conclude that there is a healthy respect for faculty who have engaged in targeted innovation, and praise for their efforts and

results. Nonetheless, there remains no significant peer pressure or expectation among the faculty that those kinds of efforts should be widespread, and as a result they remain isolate achievements.

Table 3. Data sources and broad conclusions about the ME PFE outcomes and culture.

	Data Source	Conclusions						
nent	ME Senior Exit Survey	58% of graduates have a job at graduation; only 16% obtained no work experience while an UG; 40% had an international experience; <i>communication</i> and <i>innovation</i> skills most often cited as deficiencies in their education.						
achievement	ME Alumni Survey	Most often cite <i>communication</i> , <i>innovation</i> , and <i>leadership</i> skills as deficiencies in their education.						
PFE ac	ME Employer Survey	Most often cite <i>communication</i> and <i>innovation</i> skills as deficiencies in undergraduate education of their employees.						
P	ME ABET Self- Study Report	ME graduates generally meet or exceed expectations for all ABET (a)-(k), except (g) an ability to <i>communicate</i> effectively						
1)	ME Faculty Interviews	Strong interest in pedagogical innovations and respect for those who have achieved them; little commitment to prioritize time for pedagogical innovation; widely divergent viewpoints on ME student-faculty culture.						
limate	ME Forum Transcripts	Forum transcripts reveal student-faculty dynamics as hierarchical and paternalistic, rather than partnership-based; students receive, faculty give.						
Department culture and climate	ME Course Eval. Comments	Students generally praise faculty for their expertise and enthusiasm for the subject; student generally want more active learning; student perceptions of climate vary and focus on their sense of being welcomed in ME.						
nent cult	Engineering NSSE Data	Purdue engineers are <i>more disengaged in their faculty relationships</i> than engineering students at peer institutions on NSSE items 1a/l/m/n/o/p/q, 2c, 4a/b, 6d/e/f, 8b (statistically significant differences observed).						
Departi	PACE data	The climate in engineering for women and students with learning disabilities could be improved, and more student engagement with faculty members (both in and out of class) would be beneficial.						
	DFW rate	Varies widely, from less than 10% in some classes to more than 40% in others; strongly influences student morale and perceptions of academic climate.						

Professional formation of students. Purdue ME offers a suite of co-curricular options for students in obtaining both professional and international experiences; on these counts, <u>Purdue ME does reasonably well right now</u>. In a typical ME graduating class, about 70% of students have completed a summer internship, about 20% have completed a co-op (i.e., fall or spring semester) assignment, more than 30% have completed an international experience (some of which are work experiences), and more than 15% completed a service learning experience such as EPICS (engineering.purdue.edu/epics). In addition, a large proportion of students participate in other hands-on projects such as SAE formula or mini-baja teams, Rube Goldberg competitions, or undergraduate research. But, per the data described above, students, alumni, and employers continue to decry a specific set of professional skills as being substandard, including communication skills, innovation, and leadership. We have a huge opportunity to do better here, and it is imperative that we do so via the actions and research explorations described herein.

Prior efforts at innovation in teaching and learning. Purdue engineering is rightly considered a leader in innovation, starting with the formation of the world's first School of Engineering Education more than 10 years ago. Both leadership and educational innovation exist firmly within Purdue's DNA as an institution. Purdue ME faculty have authored or co-authored dozens of textbooks, with widespread national and international adoption, over the past 30 years. New teaching and learning spaces in the ME building's Gatewood Wing break the usual mold of classrooms (fixed vs. movable infrastructure) and

allow for more experiential learning (via a well-staffed and equipped machine shop as well as maker spaces). Curricular innovation is exemplified by the statics-dynamics sequence, which has been entirely overhauled in the past few years largely due to the work of 3 or 4 core faculty who invested significant effort (Venere, 2014). ME has a committed cadre of progressive educators, so this is not an innovation challenge. Because these innovations are generally confined to a small set of student experiences driven by a very small set of faculty, instead of being the de facto way ME is taught at Purdue, this is a diffusion challenge. This proposal addressed the emotional and cultural context of this diffusion process, head on.

3. OUR VISION FOR REVOLUTION: WHAT, WHY PURDUE, AND WHY NOW?

Voices for change. A collection of recent mainstream books (Pink, 2005; Tough, 2012; Wagner, 2008) describe the importance of qualities like grit, perseverance, synthesis, communication, integration, and other complex cognitive skills in today's economy. They also lament the general lack of focus on these traits in public education today. Many of these skills exactly overlap with the PFE outcomes of this research program, and are echoed by the recent spate of engineering education reports from the NAE, the NRC, the ASEE, and others (ASEE, 2009; Duderstadt, 2008; Jamieson & Lohmann, 2012; NAE, 2004, 2005, 2009; NRC, 2010) that focus a similar lens on engineering education. These reports urge the engineering higher education community to transform engineering education today, and enable the professional formation of engineers into the future. These skills also open up new opportunities for engineers as well, outside of traditional industry jobs, for instance in areas of social justice (Riley, 2008), public policy, or global development.

ME-focused initiatives. Two ME-specific reports echo these broad themes. The 5XME report (Ulsoy, 2007) expresses a goal of producing US mechanical engineers that deliver "5 times" the value added to companies as compared to their global peers, by "embracing societal priorities" and promoting innovation, creativity, flexibility, communication skills and the like in our engineering graduates. The 2009 5XME implementation summit (Ulsoy & Wang, 2009) suggested actions and research priorities including both scaling and assessment questions. The ASME Vision 2030 task force surveyed academic faculty, industry supervisors, and early career mechanical engineers, and the survey results clearly demonstrate (A. T. Kirkpatrick et al., 2011; A. Kirkpatrick, 2013) that the three constituents have quite different perceptions about graduates' strength/weaknesses upon graduation, especially in areas of problem solving and communication. Taken together, these ME-specific initiatives amplify the engineering-wide calls for reform and inspire our research questions about scaling and assessment.

Toward a whole new engineer. The Jamieson & Lohmann (2012) report is a blueprint for making these urgent changes in engineering education to improve PFEOs. Their seven recommendations focus on the roles of individuals, institutions, and the broader community. They are: (i) expect career-long professional development for faculty, (ii) expand educational collaborations and partnerships, (iii) make engineering more engaging and relevant for students, (iv) increase/diversify resources for educational innovation, (v) propagate research-based educational practices to the mainstream faculty, (vi) conduct self-assessments within our institutions, and (vii) conduct self-assessments within the engineering education community. Our research program addresses all of these recommendations. However, implementing these recommendations requires abrupt, radical change to our department: "disruption".

An organization cannot disrupt itself. The fabulous recent book A Whole New Engineer (AWNE, Goldberg & Somerville, 2014) expresses an important truism about change in higher education settings: transformative and durable change cannot be done from within—a new organization must be formed. AWNE describes the pioneering work at Olin College and the University of Illinois iFoundry, two new engineering education organizations that simply could not have existed within the usual boundaries of academic cultures. This conclusion is echoed in Disrupting Class (Christianson & Horn, 2008), in which the authors argue that organizations cannot disrupt themselves, and that new a organizational structure with its own culture—is compulsory. Co-PI Briody has drawn a similar conclusion from an

anthropological perspective (Briody & Erickson, 2014). Disrupting an organization is easier said than done, especially in centuries-old academic units (Berger, 2013), and *AWNE* makes the case that the two biggest obstacles to fundamental and durable change are *emotion* and *culture*.

Why Purdue and why now. Purdue's Mechanical Engineering program is uniquely positioned to lead this coming revolution. ME enroll over 18% of all students within our vibrant and large College of Engineering (Office of Institutional Research Assessment and Effectiveness, 2014). ME understands the urgency and tyranny of scale, and lives in an ecosystem at Purdue that enables dramatic change, because:

- <u>Leadership is built into Purdue's DNA.</u> Purdue continues to be a thought leader in research and education, including the establishment of the world's first School of Engineering Education (ENE). ENE continues to lead in engineering education research, collaboration, and practice.
- <u>Purdue understands scale.</u> Revolutions with a durable and significant impact on the professional formation of engineers require scale. Purdue ranks fourth in the nation in ME BS degrees awarded and is one of only 5 schools to award 250+ BSME degrees per year (Yoder, 2013).
- We have powerful administrative advocates. Dean Leah Jamieson is a leading voice in engineering education reform and a serious change agent here at Purdue. Her support of this proposal comes from a position of expertise and authority (see *Supplementary Documentation*).
- Engineering education research is thriving. Purdue's ENE program is driving a conversation with technical disciplines by hiring of experts in discipline-based engineering education research (including co-PI Berger) to lead efforts like this one.
- <u>Faculty hiring plans are a unique opportunity.</u> Between planned growth and expected attrition, the College of Engineering expects to welcome *about 150 new faculty members* (about 1/3 of our total faculty in engineering) over the five-year period 2012-2017. This influx of new junior/mid-career people and ideas will lubricate cultural change.

Purdue understands the value of a student-centric culture. The pioneering Gallup-Purdue (G-P) index (Gallup, 2014), a joint venture examining over 30,000 college graduates, has for the first time quantified the importance of a student-centered orientation for undergraduate studies. The data are clear and unmistakable: in all three dimensions of student outcomes measured (workplace engagement, well-being, and alumni attachment), individual, inspiring and collaborative relationships between students and faculty drive positive outcomes. The outcomes measured in the G-P index—especially the workplace engagement dimension--are proxies for PFE outcomes, and the data clearly demonstrate the central role of student-faculty partnerships in achieving positive outcomes once students enter the workplace. This important study across school type and student demographics leaves no doubt: we must put students first.

4. A THEORY OF CHANGE

The organizational immune system. All organizations have an immune system that attacks change through a combination of personal power dynamics, policies, and business practices (Kegan & Lahey, 2009). In academic organizations, this immune response functions as a low-pass filter on innovation as illustrated in Error! Reference source not found. Only the weakest innovations survive to the department level; as the innovation attempts to spread, time constraints, politics, policies, emotion, and trust create roll-off. We define this roll-off region as the 'borderland'—the interface between the innovators and the department as a whole and the nexus of a cultural clash. In most academic departments, this borderland is controlled faculty who are not innovators, as well as existing policies regarding approval and change. Diffusion across a borderland has been well studied, with Rogers' work among the most well known (Rogers, 2003). When coupled with a theory of change (C. Henderson & Dancy, 2011), as well as the tools of change (Morrison, 2012), we believe control of the borderland can be shifted to the innovators, and the resulting roll-off curve can be shifted from the blue to the green curve, with more significant innovation and participation.

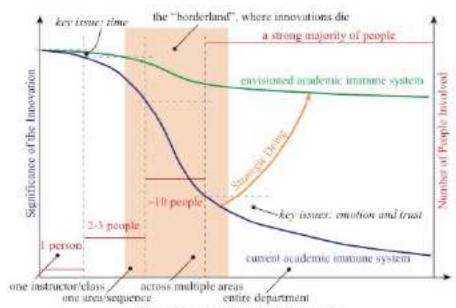


Figure 1. The academic immune system acts as a low-pass filter on the borderland innovation: between the innovators and the broader department is currently controlled by the non-innovators, and only the weakest innovations survive. Emotion and trust are the key issues, and Strategic Doing (see *CCRQ2*) will drive this change.

Pervasiveness/Adoption of the Innovation

Pedagogical borderland: students. An important consequence of slow diffusion is a sharply fragmented student experience across their coursework, which creates a kind of pedagogical borderland for students. A pedagogical borderland is an environment in which students might experience a highly-student-centered, progressive pedagogy in one course, while in the very next class period they experience a traditional lecture-based pedagogy. Students must calibrate their academic approaches to the pedagogy and expectations of each class in order to navigate this borderland. It is unclear whether a more consistent pedagogy and set of expectations would benefit the achievement of learning outcomes, including PFEOs (although we suspect it will, see **EERQ1**). Educational borderland research is sparse and generally focuses on cultural, rather than pedagogical, issues (Camacho & Lord, 2013; Phelan, Davidson, & Cao, 1991); a better understanding of how students negotiate these borders—successfully or not—would be a crucial addition to the literature and is the genesis for one of our research questions.

Pedagogical borderland: faculty. Faculty attempt to navigate this pedagogical borderland as well, but in a different way from students. Lecture-centric faculty operate in an ecosystem in which pedagogies of engagement are celebrated, while pedagogically progressive faculty live in a world in which lecture-based approaches are tolerated. The ways in which these pedagogical differences are navigated have important implications for the departmental culture. Are pedagogical innovations tested, evaluated and adopted? In what ways are faculty trained, and what are the prevailing expectations about faculty adoption of innovations? Right now, the pedagogical borderland is controlled by the department's non-innovators, and research-based pedagogies are not embraced as broadly as they should or could be. Understanding who controls this borderland, and how they navigate it, inspires our EERQ2.

Change processes: Henderson's four-square model. This borderland issue naturally leads to questions about how change occurs in academic organizations. The literature on change in engineering education resoundingly supports the notion of emergent outcomes, developed as part of a democratic process. Henderson's work (Borrego & Henderson, 2014; B. C. Henderson, Finkelstein, & Beach, 2010; C. Henderson & Dancy, 2011) clearly shows that broad-scale change processes in highly-siloed academic organizations require development of a shared vision among the community members. There can be no revolution without deliberate consideration of emotion and trust. This idea is illustrated by Finelli, Daly, & Richardson (2014), Besterfield-Sacre, Cox, Borrego, Beddoes, & Zhu (2014), and Merton, Froyd, Clark, & Richardson (2009) who leverage Henderson's model to explain successful change processes in academic units. Emotion and trust emerge as key regulators of change. Co-PI Briody presents (Briody &

Erickson, 2014) a comparative analysis of change in 3 organizations, and she concludes that 5 ingredients are essential for durable change: collaboration, work practice change, leadership buy-in, structural change, and evidence of benefit. *Our research plan emphasizes each of these issues (see CCRQ1-3)*.

Strategic Doing provides a networked framework for change. Strategic Doing (Morrison, 2012, 2013), pioneered by Purdue's Ed Morrison, advocates change vectors aligned with appreciative processes, open participation among community members, and the gentle guiding hand of leadership. Morrison advocates networks with a "tight core and porous boundaries". The tight core consists of community members with strong bonds of trust, while the porous boundaries allow the flow of new ideas and people into and out of the network. Most importantly, outcomes from a SD process—the goals and the strategy itself—are emergent rather than pre-supposed, consistent with Henderson's model. The SD process focuses conversations among participants that (i) guide them toward actions with clear, measureable outcomes, and (ii) enable adjustments as participants learn by doing through experimentation. Strategic Doing is a specific application of complexity leadership theory (CLT, Uhl-Bien, Marion, & McKelvey, 2007) calibrated for networked, rather than hierarchical, organizations. SD couples Henderson's model for understanding change to a specific set of actions for implementing change in networked organizations.

Strategic Doing is gaining traction in engineering education. The SD model is finding application in academic settings to accelerate the transformation of undergraduate engineering education. *First*, Morrison and a team from Purdue have been working with VentureWell (www.venturewell.org) and the National Center for Engineering Pathways to Innovation at Stanford University (epicenter.standford.edu). Beginning in early 2014, Epicenter partner teams from 12 universities (soon expanding to 36) employed SD to create 12 strategic actions, with VentureWell using SD to evaluate progress of the teams. *Second*, Morrison recently began working with ASEE (Altiero, 2014) on strategic planning using the SD framework. Their first conversation on November 1, 2014 started a process of clarifying their emerging mission, and moving ASEE to a more agile and collaborative organization. *Finally*, the National Academy of Engineering (NAE) invited Morrison and a colleague to document their SD work in an article for the NAE journal *The Bridge*, to appear in 2015. *SD is the subject of CCRO2*.

5. Project Plan, Part 1: Create the Mechanical Engineering Skunkworks (MES)

A Whole New Organization. The central fixture of the proposed work is the formation of the Purdue ME Skunkworks (MES), an agile, experimental organization untethered from the usual departmental constraints of policy, inertia, and history. Progressive in its design and staffed by like-minded risk-takers (faculty, students, staff, and external partners), the Skunkworks will completely remake engineering education within ME at Purdue by changing the dominant educational paradigm from paternalistic to partner-based, from faculty-centric to student-centric. Remember that organizations cannot disrupt themselves (Berger, 2013; Christianson & Horn, 2008), and any revolutionary changes attempted within the existing departmental structure will trigger a fatal immune response. We need this new organization to achieve our vision; without it, our efforts will fail, quickly and painfully.

MES Details. The organizational model for the MES is crucial, as is its relationship to the ME department (the "borderland"; see **Figure 2**). The key features of this new organization are:

- <u>A flat, highly networked structure</u>. We expect a core team of about 8-10 faculty drawn from the 6 areas technical within ME, about 10 students (8 UG/2 G), about 5 staff members, and about 4 external members drawn from our employer and alumni populations. One faculty member and one external person will co-lead the MES, with *all other participants as co-equal partners*.
- A governing principle: put students first. Everything the MES does will be driven by improving the student experience and their achievement of PFE outcomes.

- A culture of assessment: The MES will use the lean launchpad approach (Blank, 2013) of rapid innovation: talk to students, measure what we care about, fail fast, and reinvent constantly based upon the best evidence (either our own data, or evidence from the literature).
- <u>A culture of inclusion and equality</u>: We will intentionally invite people from diverse backgrounds to participate. The literature is incontrovertible in this regard: diverse teams perform better than homogeneous teams.
- A high-trust organization: The inner core of trust among MES partners will be established using Strategic Doing principles such as appreciative inquiry. Cultivating trust across the borderland will be among the most significant and difficult achievements of the MES.

The MES and Purdue ME. We expect the MES to be a cauldron of energy and innovation, with constant circulation of ideas in various phases of lean launchpad development. Per core SD principles, the MES will have a tight core (in blue in Figure 2), with permeable boundaries, and a borderland between the Skunkworks and the rest of the ME department (in orange in Figure 2). Ideas can originate anywhere within this ecosystem, and the lifecycle of an innovation is illustrated by red lines on the figure. Some will succeed to full departmental implementation, while others will eventually die at some point in the lifecycle. primary function of the MES team is to act as cultural translators and champions of innovation as ideas cross the borderland from pilot stage into production. The borderland is at least as important as the Skunkworks, because the borderland is where departmental trust lives. Broad-scale revolution simply will not happen until the innovators control the borderland. Strategic Doing is largely about the borderland (see CCRQ2). The figure also shows how the five key features of the MES listed above map to the research questions we consider here (and detailed in the next section). Clearly the MES allows us to engage those research questions in a structured and systematic way, because it is organized using principles aligned with our vision for our future culture.

MES governance and SD. There are two crucial features of the Skunkworks that will ensure its success. First, the MES partners, especially the faculty involved, must be

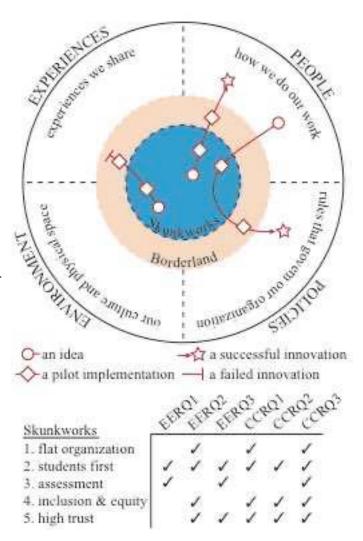


Figure 2. The ME Skunkworks and borderland will mediate the flow of ideas from pilot stage within the MES to production stage in the ME department, via a series of pilot implementations. Skunkworks operation maps cleanly to our research questions.

assured that their efforts will be appropriately considered in matters of recognition, promotion, and tenure. In short, the participants must *feel safe* operating within the MES, and they must *trust* each other and the administration. The bonds of trust among participants will be cultivated using SD principles for

training and routine operation. The administration (PI Bajaj) is committed to demonstrating trust through action and consistency. Second, the experiences developed within the MES must be accepted by the broader ME department to satisfy graduation requirements for students. There are obvious constraints to this—the experience must demonstrate that students have achieved specific learning outcomes, for example—but generally bodies such as the undergraduate curriculum committee in ME must accept MES experiences, rather than clinging to the curriculum as written today. This second issue is entirely a borderland phenomena, and the SD framework will allow MES partners to advocate, proselytize, and ultimately secure approval from the relevant regulatory bodies within ME. Vocal support from PI Bajaj will also be critical here.

6. Project Plan, Part 2: Research Questions, Approaches, and Partnerships

This research program is organized into 6 research question over two areas: (i) engineering education research questions (*EERQs*), (ii) culture and change research questions (*CCRQs*). In each case, we focus on the role of these questions on the PFE outcomes of interest. As we introduce these research questions, the personnel involved and anticipated time frame are shown in parentheses according to the following key: AB = Anil Bajaj, EB = Ed Berger, EM = Ed Morrison, EBr = Elizabeth Briody, ENE ST = Engineering Education PhD student, SMs = Skunkworks members. *In general, AB plays the leadership role of encouraging faculty engagement, continuously reinforcing the value of these efforts, raising the visibility of good works done throughout, and helping the SMs drive the conversation at the borderland.*

Common research methods. Many of our research questions will be answered using data collected using two key methods: semi-structured interview and surveys.

EERQ1. How do students navigate the pedagogical borderland they experience in concurrent or consecutive experiences, and how does their navigation ability affect the achievement of PFEOs?

Working hypothesis: students who experience highly mismatched pedagogies across concurrent (or consecutive) courses lag in achievement of PFEOs and perceive lower quality relationships with faculty.

Introduction. Too often, faculty choose their pedagogies based upon personal preference, their own educational history, and deeply-held, emotionally-driven beliefs, and students must therefore navigate this pedagogical borderland in order to experience academic success. Understanding the role of highly fragmented experiences across concurrent classes will inform future innovations and suggest pathways to improved achievement of PFEs.

Methods. We will answer this research question using a mixed-methods approach:

- <u>Student and faculty learning styles inventory (EB + AB + ENE ST, done annually)</u>. We will use the Solomon-Felder index of learning styles questionnaire (Felder & Spurlin, 2005; Litzinger, Lee, Wise, & Felder, 2007; Soloman & Felder, 2014) to characterize learning preferences of each ME student in the current 2nd year cohort, and *each faculty member* who teaches a 200- or 300-level course. The literature on calibration between learning styles and pedagogical approaches, both their match and their mismatch, is highly relevant and persuasive (Felder & Brent, 2005).
- Pedagogical inventory (EB + AB + ENE ST, done each semester). Via survey instruments and in-person observation, we will characterize ME 200- and 300-level courses, each semester and in each section of each course, according to their use of engaged pedagogies (Smith, Sheppard, Johnson, & Johnson, 2005). This will help us to understand the pedagogical experience of students, and to evaluate shifts in pedagogical practices over time.
- <u>Student longitudinal interviews (EB + ENE ST, twice each semester)</u>. We will identify up to 12 students within each ME cohort and conduct semi-structured interviews with them two times per semester (at approximately week 5 and week 12) from the beginning of their second year until

- they graduate. We seek to understand their perception of the pedagogical models, general climate, and their self-assessment of PFE outcomes.
- Quantitative analysis (EB + ENE ST, model revisited annually). Using the student learning inventory, pedagogical inventory, and student course grades, we will develop a pedagogical mismatch model that examines the role of pedagogies in courses within and across semesters on student academic achievement, especially PFEOs.

Expected Outcomes. We expect to find that pedagogical calibration is indeed an important factor in student academic outcomes, specifically PFEOs. Moreover, via the student interviews, we expect to understand the lived experience of students and their efforts to navigate the pedagogical borderland. *Our results will guide our revolution and improve PFE outcomes* in the 2nd and 3rd year by allowing us to:

- understand pedagogical preferences of our students, and reduce the pedagogical mismatch
- develop advice for students on how to recognize and manage pedagogical border crossings

EERQ2. How do faculty navigate the pedagogical borderland, create experiences, and calibrate their pedagogical approaches for student achievement of PFEOs?

<u>Working hypothesis</u>. Faculty do not, in general, select pedagogies based upon some desired calibration with content and learning outcomes. Instead, faculty choose their pedagogies based upon past experiences, expediency, and their *emotional attachment to a personal idea about how students learn*.

Introduction. The academic immune system allows for only the weakest innovations to achieve departmental adoption (*Figure 1*), and this includes diffusion of pedagogies from the population of innovators to the rest of the department faculty. Understanding the borderland dynamics will shed immense light on the levers of change in typical academic units.

Methods. We will again use a mixed-methods approach to data collection and analysis:

- Faculty interviews (EB + AB + ENE ST, each semester). We will conduct semi-structured interviews with each instructor of a 200- or 300-level ME course at the start of each semester. These interviews serve several purposes. First, we will understand how faculty make pedagogical decisions, and what they perceive to be the trade-offs in those decisions. Second, we will assess their understanding and awareness of research-based pedagogies and assessment strategies. Third, we can track decision making and attitude changes over time. Fourth, we continuously reinforce the idea that research-based pedagogies are mature and important, therefore reinforcing the expectation of change (i.e., engaging faculty in the borderland).
- <u>Faculty surveys</u> (*EB* + *AB* + *ENE ST*, *once per year*). Annually, we will deploy a formal survey asking faculty about research-based pedagogies: (i) their current level of awareness, (ii) their interest in learning more, (iii) their experience in using such pedagogies. We will ask about all manner of pedagogies, including examples such as think-pair-share, use of clickers, etc.
- <u>Data analysis</u> (*EB* + *ENE ST*, *updated annually*). We expect to use both quantitative and qualitative analyses to understand the data collected, and we will develop a model for faculty pedagogical decision making. We will code interview transcripts for themes (insert ref. here from Cambridge handbook) and derive descriptive statistics from the survey questions. The goal is to understand faculty perceived barriers to pedagogical change and identify levers to resolve the borderland conflict. *In our approach, the innovators drive the borderland negotiation*.

Expected Outcomes. We expect to observe a significant pedagogical shift over the course of this project:

- Faculty will be more aware, confident, and enthused about implementing research-based pedagogical strategies and/or developing new experiences for students.
- Pedagogical alignment between students and faculty (per *EERQ1*) will improve.

EERQ3. What are the most useful and effective tools to address the practical challenges associated with revolutionizing engineering education at scale, most importantly assessment tools?

<u>Working hypothesis</u>. A combination of instructor grading, peer grading, and frequent, low-stakes formative feedback (rather than high-stakes, discrete summative feedback) provides the best value for grading at scale, and technology tools can play a key role.

Introduction. Scaling is perhaps the key question, because until we can produce excellent PFE outcomes in graduates at scale, we cannot meet workforce needs. Providing prompt and useful feedback to learners is a central tenet of education (Ambrose, Bridges, DiPietro, Lovett, & Norman, 2010; Bain, 2004); a key challenge arises when we wish to deploy effective, informative, and learner-focused evaluations for more than 700 students in a single course (which Purdue attempts to do today in core sophomore classes such as statics, dynamics, and thermodynamics). Deploying validated and useful assessment strategies at scale simply must form a central component of this effort.

Methods.

Expected Outcomes.

CCRQ1. How do ME department members describe and evaluate the current culture, how does that characterization compare to the envisioned future culture, and what are the key obstacles to attaining the ideal future culture?

<u>Working hypothesis</u>. Members of the ME community (students, faculty, staff) hold highly personal and emotionally-driven views of the culture, many of which challenge the envisioned future culture of ME.

Introduction. Our preliminary data suggests that the ME departmental culture is highly faculty-centric, with all attendant positives and negatives. This research question engages a rigorous ethnographic approach to fully characterize the culture through the eyes of its community members and artifacts: students, faculty, staff, administrators, and the policies and procedures defining the department's work.

Methods—Current Culture (EBr + ENE ST, months 0-18). Primary ethnographic tools of participant observation, interviews, and archival work will be used to construct a thick, rich dataset of cultural information. We will focus on the physical environment, people, relationships, and work of the department. Observations will take place in a wide range of settings and focus on relationships among the department's constituents; settings will include classes and laboratories, faculty meetings, committee meetings, advising sessions, informal spaces, and others. Semi-structured interviews will be conducted with members of these constituent groups, with interview questions and themes grouped around relationships, power, and authority. Archival work will focus on the departmental documentation about hiring (both faculty and staff), departmental decision making, policies/bylaws, and the historical context of power relationships within the department. Taken together, this data will allow us to characterize the current culture and the elements of that culture most highly prized or denigrated by the community.

Methods—Envisioned Culture (EBr + ENE ST, months 37-60). The ethnographic work will be repeated during the last two years of this program to characterize the extent of observable cultural change. The work done in the characterization phase will be critical for the revolution because it will highlight the most cherished, and the most disposable, parts of the ME culture, as well as barriers to systemic innovation and change. The conclusions from the first 18 months will feed into the Strategic Doing planning and implementation, with the final two years of the program reserved for observation and characterization of changes in the culture that are underway during the final years of funding.

Expected Outcomes. We fully expect that the ME departmental culture at the end of the 60 month project period will approach our envisioned culture, but not achieve it, for two reasons. **First**, the envisioning

exercise results in emergent outcomes that we cannot specify before the project begins; this emergent process (Henderson's category IV) will reveal itself via *CCRQ2*. *Second*, cultural change takes time, and fundamental and durable shifts in culture are not likely to take place (and be observable) over just 60 months. However, we do expect to observe the origins of change via abrupt and meaningful shifts in the beliefs, attitudes, and approaches of individuals to their participation in the community. And we expect to have overcome some of the barriers to cultural change identified in the first 18 months of work.

CCRQ2. Using Strategic Doing, can a leadership team design and guide the agile networks needed to scale, sustain, and replicate research-based pedagogies that revolutionize PFE outcomes?

<u>Working hypothesis</u>. Within the large ME department, a small team of faculty, staff, students, and alumni, situated within the ME Skunkworks and trained in Strategic Doing, can both remake the student experience in the 2^{nd} and 3^{rd} year and gradually entrain more ME community members into the effort.

Introduction. Strategic Doing is designed for networked organizations.

Methods—SD Training. Strategic Doing plays two critical roles in this research. First, SD provides the core MES team with a framework for change in individual experiences (a course, a co-curricular experience, or something else that leads to a PFE outcome), a method for envisioning strategic outcomes, and a pathway for implementation. These team members will also proselytize—gently, at first—other members of the ME community and control the conversations at the borderland. Second, the ME department at large (all community members) will be engaged in SD discussions—small at first, but gradually growing—to establish the ideas and vocabulary of SD as a framework for envisioning change. The overarching goal is to have a majority of ME community members actively seek to join the Skunkworks within about 6 years; in essence, the Skunkworks organization and culture will supplant the existing ME organization and culture. A key metric here will be attitudes about and participation in MES activities by non-MES faculty. As part of the faculty interviews described in EERQ1-2,

Methods—SD in Action. Within the Skunkworks, SD will guide the actions of revolutionizing the achievement of PFE outcomes. The core idea is borrowed from entrepreneurs: the "lean launchpad", which quick redesign, rapid iteration, and a *strong evidentiary basis for decision making*.

Expected Outcomes.

CCRQ3. How does the Purdue ME Skunkworks enable broader-scale cultural change by driving the conversation at the borderlands?

Working hypothesis. Because we know that *organizations cannot disrupt themselves* (Christianson & Horn, 2008), the *Strategic Doing core team must exist within a new organizational structure* that is nurturing, empowering, and largely unencumbered by the usual constraints of academic departments.

Introduction. As described in *AWNE* (Goldberg & Somerville, 2014), new organizations like Illinois' iFoundry or Olin College can revolutionize engineering education; we expect the Purdue MES to do the same. This research question probes the way the MES operates, and specifically how it manages the borderlands between itself and the rest of the ME department (*Figure 2*).

Methods—an MES ethnography. Co-PI Briody will deploy the tools of business ethnography to study this new organization. Using essentially identical methods to those used for **CCRQ1**, she will employ participant observation, interviews, and review of archival documents to develop an understanding of the MES, its people, its culture, and how it works toward its mission.

Methods—action at the borderland. Again using participant observations and interviews specifically in borderland settings (faculty meetings, committee meetings, etc.), we will characterize borderland dynamics and examine the ways in which SD facilitates those conversations and drives actions toward innovation rather than toward the status quo. We place special focus on the MES-ME borderland because true revolution will not happen unless the MES wins the battle at the borderland. We have already seen that the borderland between innovation and wide-scale adoption can easily be the place where great innovations go to die (Figure 1). The critical element of managing the borderland will be Strategic Doing. The MES will dominate the conversation at the borderland using the techniques of Strategic Doing by:

• providing a strong evidentiary basis for successful innovations

Expected Outcomes.

7. Project Plan, Part 3: Evaluation and Mentoring Plans

Ethnography as evaluation. The external evaluation of this program takes the form of the three ethnographies proposed: (i) the current ME culture, (ii) the future, revolutionized culture, and (iii) the culture of the MES, as well as the summative evaluation of PFEO achievements. Taken together, the ethnographies will give living, on-going documentation of the program activities, successes, and failures. Our reliance on quantitative and qualitative data, and archival documents—with longitudinal data collection--yields a sweeping view of the revolution, and shifts in culture over time will be the best indicators of success. The PFEO data will reinforce the value of the revolution for student achievements

8. ROADMAP FOR SCALING AND ADAPTATION

Ease of implementation by others. The 'technology' developed in this research—our conceptual frameworks and specific actions--are fully grounded in the literature and leverage emerging techniques for changing networked organizations. We characterize our culture, before and after the revolution, using the tools of ethnography, and the outcomes of the Skunkworks will be evaluated similarly. As such, our 'technology' for cultural revolution is quite direct and very cost effective to implement. While each institution struggles with its own pathologies, the approach we have laid out here is elastic enough to be deployed within virtually any academic department, regardless of size or mission.

Adaptation, part 1: Purdue Foundry. We will certainly publish journal papers and deliver conference presentations, but those efforts alone will be insufficient for propagation of our model. Strategy 1 for broad-scale diffusion is to engage the Purdue Foundry. The Foundry (www.purduefoundry.com) offers accelerator and scale-up services including coaching, mentoring, and commercialization, and we expect to form a start-up company based upon this research work. Using the Foundry's lean launchpad model for funding and commercialization, we expect to begin focusing on technology transfer elements of our work in year 3. We will leverage the Foundry to identify clients; the substantial national enthusiasm for the IUSE:RED solicitation indicates a huge community of parties interested in technologies for change.

Adaptation part 2: I-Corps. The second phase of our diffusion efforts will be an i-Corps program, applied for in year 4 of this work. Consistent with the start-up mentality within the MES, the i-Corps team will examine the commercial landscape for the technologies developed in this RED program. NSF's i-Corps curriculum and program structure seem tailor-made for this program, in the sense that 'customer discovery' is exactly what will be required to push our approach out into other academic departments. This two-part adaptation strategy should inject enough capital into the adaptation program to ensure diffusion of our approach to other academic organizations.

9. MERIT REVIEW CRITERIA

Intellectual merit of the proposed work. This project has exceptional intellectual merit because we meld together important research questions of broad interest to the community with well-crafted plans for departmental revolution locally at Purdue. We expect to answer the key questions about revolution: what happens at the multiple borderlands experienced by students, faculty, and staff within ME at Purdue? Who controls the borderlands? And how can personalities, politics, and policies at the borderlands be shaped toward revolution rather than the status quo? This program is not about a specific pedagogical or curricular innovation; rather, we derive deep intellectual merit from unlocking the cultural barriers to change, regardless of the change being proposed. Finally, our focus on scale—Purdue has scale that few other institutions possess—provides exceptional value to the engineering education community by answering scale-related questions about cultural change in a large department and assessment approaches for a large student body.

Broader impacts of the proposed work. This project creates tremendous broader impact by addressing the fundamental question about academic departments: how do we overcome emotionally-driven, historically-honored beliefs that shape departmental culture, specifically focusing on the borderlands, where trust lives. There is no real debate about what needs to be done (Jamieson & Lohmann, 2012). Yet we still seek a change management plan that respects the peculiarities of academic organizations but allows for true qualitative change to happen. The blueprint we develop here, using the ME Skunkworks and Strategic Doing, unlocks this question by leveraging the best ideas for change in networked organizations and the empowerment associated with creating a new organization, unencumbered by history. Our ethnographic tools will clearly express the cultural imperatives at the borderlands that enable durable change, resulting in a 'technology' that is scalable and adaptable to other institutions. Our plan for scaling and adaptation, using Purdue's Foundry and NSF's i-Corps (detailed below), ensure broad engagement with academic departments motivated to change—and global impact of our program.

Vision. Our *vision* is broad and sweeping. We are not simply proposing broad-scale adoption of a single approach, technology, pedagogy, or program. We are proposing to *entirely remake our organization* via a well-measured process rooted in best practices in change management. Within this change framework, a range of specific curricular, pedagogical, assessment, and programmatic initiatives will *emerge over time*; we are not prescribing these outcomes *a priori*. But by re-shaping our culture to be more open, inclusive, and collaborative (i.e., to be *driven by trust*), we fully expect our vision to be revolutionary, and copied avidly by other academic departments.

PI team. The extraordinary PI team has been assembled strategically to realize our vision. PI Bajaj has already demonstrated himself to be a creative and influential leader (see Supporting Documentation for a letter of support from Purdue's Dean Leah Jamieson). His history of driving pedagogical/curricular innovation while managing faculty rewards within Purdue's system makes him the right leader at the right time for this project. Co-PI Berger's background as a Purdue PhD in Mechanical Engineering, who is now a professor in Engineering Education, places him perfectly as a cultural translator at the borderland (his appointment is 75% in ENE, 25% in ME). He is known and trusted within ME, but brings a strong engineering education research perspective to the ME department. Co-PI Morrison is the prime mover behind Strategic Doing, a pioneering approach to change in networked organizations. His on-going work with other academic organizations (i.e., Stanford) and ASEE establishes him as the right change catalyst for this project. He has enabled and managed change in actual organizations; he is a practitioner of change rather than someone who studies change. Co-PI Briody bring deep expertise and experience in the anthropology of technical organizations, and her ethnographic characterizations of the ME department and the Skunkworks will be the key pieces of information used in the scaling and adaptation plan for other institutions. Without her detailed ethnographic characterization, we simply would not be able to articulate our approach, and propagate it, to other organizations.

Institutional commitment. This project has strong institutional support as illustrated in the attached letters of support. Key among them is the powerful advocacy of our dean, Leah Jamieson, whose track record as a change agent and advocate for engineering education research is unassailable. We also define "institution" rather broadly to include external partners, including our ME external advisory board and other friends of the ME program. See **Supplementary Documentation** for letters of support.

Connection to professional practice.

Faculty and staff development plan. Our faculty and staff development plan has two phases. First, the MES core team will be trained and guided in the Strategic Doing approach. SD will guide all that they do, the initiatives they develop, and most importantly their governance and how they relate to each other. Second, the ME department more broadly will be engaged in the SD concept, using the MES team as strong advocates for adoption of SD practices. This is, of course, about developing new skills and attitudes within the faculty and staff—say, a new pedagogical or assessment approach. But in our project, faculty and staff 'development' is really about revolutionizing the culture: about teaching faculty and staff new ways of viewing and managing their relationships with each other, ways of doing their work, and ways of engaging with our students. This is qualitatively different from the usual kinds of faculty development described in the literature, and much more powerful in terms of enacting durable change.

Success and scalability. The results of this project will be self-sustained culturally, educationally, and financially. Cultures change in one of two ways: (i) via evolutionary processes over a long time period, or (ii) due to abrupt interventions that suddenly shift the community's views, priorities, and actions. This project is clearly of the second variety, but the danger is that after transformation, the 'old' culture creeps back into the ME department. Culturally, we expect to change the polity (and the on-going change in demographics via faculty hiring) of the department to leverage the fact that we are a highly networked organization of high-achieving individuals, using Strategic Doing. By building SD principles into the new operational model for the department, permeating faculty meetings, committee work, and policies/workflows (especially hiring practices), the opportunity for backpedaling will be minimized. Educationally, the new environment of aggressive experimentation and thorough assessment will be sustained by continued strong connections to engineering education (via the co-PI and others) as well as clear demonstration of the rewards and career advancement associated with educational innovations. Financially, the ideas proposed here require time and commitment, but modest financial resources. We are not building a new educational program requiring substantial fixed infrastructure, staff, raw materials, complicated external partnerships, etc. This project is not about 'things', it is about relationships, emotion, and trust—all of which require time but modest financial resources.

Connection to research on engineering education. The EERQs and CCRQs are of general interest to the engineering education community, especially our question about scaling of assessment practices. Our proposal is clearly rooted in the literature on change, acknowledges the vast body of work on effective engineering education practices, and will substantially extend our understanding of how to achieve these critical PFE outcomes. Having co-PI Berger, an ME PhD turned engineering education researcher, on the project team clearly signals the importance of engineering education research to this project, and it also enables cultural translation at the borderland.

Scaling and adaptation. This project has been carefully designed so that our outcomes can be replicated, at scale, at other institutions. The cultural characterization in this work, including issues of emotion and trust, is the critical element to enable transferability from our institution to others. Obviously cultural issues and barriers vary from one institution to the next. Strategic Doing respects these differences by using a networked framework for change in which the outcomes are emergent, rather than pre-supposed. As such, SD is elastic enough to respect existing cultures and the financial/environmental realities prevailing at an institution, yet specific enough to allow rapid changes in culture, priorities, and attitudes.

Our MES blueprint for creating a new organization within an existing one will be invaluable to other adopters of our approach. As a practical matter, our research question about *scaling of assessment practices* will add immediate value to other institutions struggling with learning outcome evaluation.

10. RESULTS FROM PRIOR NSF SUPPORT

1. NSF-1452258-CMMI (\$15,000; 9/14-8/15); PI: Zavattieri, co-PI: Bajaj

A Proposal for Partial Support of Organizing the 51st SES Annual Technical Meeting
Intellectual Merit: The 2014 SES Annual Technical Conference, held at Purdue University, West
Lafayette, IN, October 1-3, consisted of five tracks and the tracks were further organized into organized into 38 symposia. The SES conferences promote the development and strengthening of the interfaces between various disciplines in engineering, sciences, and mathematics. More than 500 registrants participated in the conference, and more that 35 student posters were presented in the poster competition.

Broader Impact: Consistent with the SES mission, the 51st SES Annual Technical Meeting actively sought participation of groups underrepresented in science and engineering. All students participating in poster session also presented their work in regular sessions as well. The funds partially supported registration and travel of students participating in poster competition.

<u>Publications:</u> Proceedings of the conference available at: http://docs.lib.purdue.edu/ses2014/ Products and availability: conference proceedings are freely available at the site above.

2. NSF-1257333-SES (\$148,047; 8/1/13-7/31/15); PI: Johnson, co-PI: Berger, Carse

A Study of Networked Infrastructures that Supply Water for Both Shipping and Municipal Use Intellectual Merit: This work merges expertise from engineering (Berger), STS (Johnson), and anthropology (Carse) in the study of networked infrastructures, using the Panama Canal as a model system. The multi-modal perspective afforded by this engineering-STS-anthropology collaboration elevates key issues that converge on STS perspectives of development, social justice, and both historical and modern views of the role of infrastructure and its maintenance. The Canal Zone is a cultural borderland where values and ethics merge with engineering, public policy, and nationalism in both self-reinforcing and destructive ways.

<u>Broader Impact</u>: This work represents a unique collaboration among experts in three different disciplines, and the resulting products will shed new light, presented in a new way, on the Canal as a modern infrastructure system. We use the vocabulary of all three disciplines to present a highly-integrated view of the Canal, its history, and its role as a national identity symbol (for Panama) and global transit route. Publications:

- Carse, A., Beyond the Big Ditch: Politics, Ecology, and Infrastructure at the Panama Canal, Cambridge:MIT Press, 2014. This book was completed with partial support of this grant.
- Carse, A., Johnson, D., and Berger, E., "Design, Actor-Network Theory, and the Panama Canal", in preparation for submission Spring 2015.

<u>Products and availability</u>: Carse's book is available via Amazon, and future publications will appear in journal and conference proceedings.

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ME Staff Retreat – 2019

Beck Agricultural Center, 4550 U.S. Highway 52 West, West Lafayette, IN 47906 (765) 583-0590 12:00 – 4:00 pm, Wednesday, August 14, 2019

Strategic Doing Team Outcomes:

1. **Facilities/Space** – Imagine all of the physical spaces in ME enabled for staff, faculty, and students to feel more engaged, productive, and connected. What would that look like?

Ed Morrison

Student Listen-Ins: These sessions would be small: 5 to 10 students for each group with a targeted set of questions over a short period of time: something like 15 minutes. The sessions could run up to 45 minutes. The purpose would be to identify opportunities to improve the use of physical spaces in ME from the student perspective.

2. **Events** – Imagine if ME events would be the highlight of the school year for all stakeholders, including students, faculty, staff and alumni. What would a successful event look like in ME?

Kristin Deckard Dawson

Evaluate all ME events starting with events traditionally held in the Spring. Use a shared events calendar (a prototype exists) across the school to coordinate & communicate events.

3. **Fundraising & Alumni/Industry Relations** – What would it look like if alumni & industry engagement opportunities with Purdue ME were wildly popular and directly linked to increased giving? **Chad Molter/Kyle Rice**

Take a holistic approach (across undergrad, grad, development, & research labs) to campus visits by alumni/industry. Plan multiple events throughout the day to expand the engagement of alumni/industry with ME including guest lectures, meeting with department head, meeting with development, tours/demonstrations at the research labs, lunch with student organizations, etc. Work collaboratively across departments to plan and implement these visits.

4. Student Success – What if every Purdue ME student left as a balanced, healthy, capable problem solver and as a graduate widely regarded to be exceptionally prepared to achieve future success?
Beth Hess

Host a food pantry and a personal care pantry within ME facilities (in the ME building, Herrick, and Zucrow). The personal care pantries would be located in restrooms and would be available year-round. The food pantry would be offered the last couple of weeks of the semester. Pantries would be stocked by faculty and staff donations.

5. Culture, Retention, Connectivity – What would it look like if the PurdueME culture was collaborative, inspirational, and empowering for students, staff, faculty, and alumni? **Julia King**

Engagement activities/community building/events funded by grant dollars that leverage our team's collective cultural knowledge. We agreed following the report outs that our Big Easy needs further refinement and clarification.

6. **Cross Discipline Collaborations** – What would it look like if ME faculty, staff, and alumni leveraged each other's strengths to create a comprehensive learning environment that provide all students with technical and professional skills that equip them to make an incredible impact on our world?

Todd Nelson

Resource awareness for students (machine shop/e-shop etc.). This includes a database of knowledge/experience/strengths/practical skills within the school to be used to connect students to staff & faculty.

7. **Communications** – Imagine if we never need a meeting to share information, but always had key information readily available, in every situation. What would that look like?

Brad Beach/Jared Pike

A stronger ME narrative of transformation. Expanded use of video stories to tell student and faculty stories in short snips. Use these videos to tell the coherent story of the transformation in ME: more of a community, less of a hierarchy.

Memorandum

TO: Anil Bajaj, Ed Berger

FROM: Ed Morrison

SUBJECT: RED Grant Progress Report

DATE: September 21, 2019

This memorandum outlines the Strategic Doing process that is currently underway in the school of mechanical engineering. After the Summary, the memorandum falls into four parts:

- 1. Applying the Strategic Doing Process
- 2. Strategic Doing Workshops: August 14 and 29
- 3. Status of the Teams
- 4. Recommendations for moving forward
- 5. Brief summary on launch of one unit course

Throughout the memorandum, we capture lessons learned. Four of the 7 teams completed a strategic action plan for their collaboration. The Appendix includes their action plans.

Summary

- In August, we ran an experiment to understand whether staff could develop collaborations
 to improve the learning experiences of students. The experiment followed the protocols of
 Strategic Doing, a discipline to form collaborations in open, loosely connected networks.
- The experiment organized teams aligned with the head's strategy for transforming the school into more of a community among faculty, staff, students, alumni and industry partners.
- The results so far are promising. ME staff teams can self-organize to improve the out-of-class learning experiences for students. Five teams are making clear progress: student success, facilities, culture, events and communications. Two teams are struggling: collaboration and fundraising. These teams will need to be re-organized or dropped for the time being.
- To sustain these teams, we will need to align small incentives to support their work. In addition, the effort needs to be reframed to focus on the innovative potential of staff collaboration. This will require a more focused communication plan directed at the staff.
- We should also consider creating an Opportunity Fund and Pitch Competition to encourage and sustain these initiatives.

I. Applying the Strategic Doing Process

ORIENTATION TO STRATEGIC DOING.-- Strategic Doing is a protocol for forming complex collaborations quickly, moving them toward measurable outcomes, and making adjustments along the way. The discipline represents a core theory of change embedded in the RED grant. The grant proposes to improve student outcomes by stimulating innovation through collaboration using the Strategic Doing discipline.

The discipline is based on the insight that complex collaborations emerge from conversations with an underlying structure and trajectory. The key elements of Strategic Doing are as follows:

- Effective collaborations need a strategy. In this context, a strategy is defined rigorously as answering two questions: Where we going? and How will we get there?
- To answer these two questions, we design a strategic conversation to answer four questions: What could we do? What should we do? What will we do? and When will we get back together to learn what's working? (Or, What's our 30/30?)
- Designing and guiding a strategic conversations to answer these four questions, requires 10 skills.

These ten skills guide the ten steps of the protocol. These steps are as follows:

- 1. Creating and maintaining a safe space for deep, focused, strategic conversations
- 2. Framing a strategic conversation by designing an appreciative question
- 3. Uncovering hidden assets in the emerging network that address the framing question
- 4. Linking and leveraging assets to create new opportunities with shared value
- 5. Ranking opportunities to find at least one "Big Easy": impactful ideas that are relatively easy to do
- 6. Converting a "Big Easy" into an outcome with multiple, measurable characteristics
- 7. Defining at least one Pathfinder Project with clear milestones that moves toward the outcome
- 8. Drafting a short-term action plan that gives everyone at least one task to complete
- 9. Designing a simple process to strengthen accountability, evaluate progress, and make adjustments
- 10. Nudging and promoting collaboration continuously

DESIGNING A STRATEGIC CONVERSATION. — A strategic conversation is a complex adaptive system that is bounded. This boundary consists of two parts: a simple rule of civility and framing question. The rule of civility enables complex thinking to take place among the participants. The framing question presents a hypothesis for participants to explore during their conversation.

Within a workshop, Strategic Doing can be distilled and presented as a protocol of ten steps. Each of these steps represents a separate skill that leaders need to develop to improve their ability to design and guide complex collaborations.

THE INNOVATION POTENTIAL OF THE ME STAFF.-- Large portions of the student time In the School of mechanical engineering takes place outside of class. Most of this time is not programmed by faculty. Potentially, the learning experience of students can be improved through better design of the out-of-class experience. In addition, staff has influence over the physical spaces in which

learning takes place within ME. In sum, the staff has a potential role to play in coming up with innovations to improve the student learning experience.

To test this hypothesis, we designed a Strategic Doing workshop for the staff on August 14. We organized staff members and to seven teams. Each team developed opportunities for collaboration within the scope of their activities. The teams are focused on key characteristics of the school that the head would like to transform.

Two weeks later, on August 29, we held an additional workshop to define "pathfinder projects" to move forward toward these outcomes. Four of the seven teams participated in the second workshop.

ORGANIZING TEAMS AND TABLE GUIDES.-- Julia King took the lead in organizing the teams in the lining the subject matter of each team to the strategic agenda presented by the new head of school. Julia defined the following focus areas. She then recruited members of the staff to lead each team as a table guide. The discipline requires an experienced guide to keep the conversation on course.

- Team 1: Facilities: Ed Morrison
- Team 2: Events: Kristin Deckard Dawson
- Team 3: Fundraising: Chad Molter
- Team 4: Student success: Beth Hess
- Team 5: Culture: Julia King
- Team 6: Collaboration: Todd Nelson
- Team 7: Communication: Brad Beach

TRAINING TABLE GUIDES.-- Ed Morrison conducted a one hour training for the table guides. The training walked through the Strategic Doing process and the workshop exercises. To record information that is generated as the conversation takes place, each team has a Strategic Doing action pack of timed exercises. The table guides are responsible for guiding their team to answer the questions in the action pack.

LESSON LEARNED: take a training needs to be more focused on the actual completion of the strategic action pack. Without a completed strategic action pack, it is impossible to reconstruct what took place at the table during the workshop. In addition, table guide training needs to include the process by which the Strategic Doing action pack is converted into the initial version of a strategic action plan. Only three of the seven groups completed satisfactory strategic action plans to report on the outcome of their workshop.

DRAFTING FRAMING QUESTIONS.-- Strategic conversations following the Strategic Doing protocol start by framing questions that lead to new opportunities. The central role of framing questions is grounded in cognitive psychology. After a brief review of the role framing questions play in the Strategic Doing process, Julia asked each table guide to develop their own framing question. During their training, The table guides discussed their framing questions and refined them.

DESIGNING THE INITIAL WORKSHOP. — Given time constraints of the August retreat, we designed the initial workshop to create an opportunity for each team (answering the first question of strategy: where are we going?) We presented the next step – defining a Pathfinder Project – as optional.

Julia created the date and time for a second workshop for those teams interested in completing the Strategic Doing process.

Julia recruited two or three members to each of the seven teams. By assigning some members to the table, she insured that critical expertise was available to the team. So for example, she ensured that the faculty head of facilities participated in the team considering the school's facilities and that the staff responsible for marketing participated in the communications team.

KNOWLEDGE KEEPERS AND STRATEGIC DOING ACTION PACKS.-- During a strategic conversation, participants are generating knowledge and learning about hidden assets and how they might combine to create new value for ME students, staff and faculty. Unless this knowledge and learning is captured in some way, the conversation quickly dissolves after the workshop.

Scholars refer to this process as dialogic organizational development (Busche & Marshak, 2014). In Strategic Doing process, participants capture knowledge as it is being generated. The Table Guide appoints a Knowledge Keeper who is charged with the responsibility of distilling knowledge that emerges form the conversation. The Knowledge Keeper uses a Strategic Doing Action Pack to gather the knowledge.

II. The Strategic Doing Workshops: August 14 and 29

CONDUCTING THE AUGUST 14 WORKSHOP.-- During the August 14 workshop, the seven teams walked through the first five steps of the Strategic Doing protocol. The table guide quickly introduced the process, recruited a knowledge keeper and completed the first two steps of the process – setting ground rules for a focused conversation and setting a focus and boundary for the conversation with a framing question for each team

The teams then began by uncovering hidden assets that could help them to lead he team to a solution to the framing question. (There is no single solution to a complex challenge; there are many possible solutions.) The table guides next began the process of linking and leveraging assets to define new opportunities: What the team could do.

The final step in the workshop for each team involved evaluating their opportunities to select one on which to focus. Table guides walked the team through a simple process to balance two dimensions: potential impact and ease of implementation.

The workshop ended with each team coming up with an opportunity that they could then explore in an August 29 workshop. That workshop is already scheduled for August 29. In concluding the workshop, Julia invited teams that were interested in moving forward to the August 29 workshop. We expected 3 or 4 teams would be interested in continuing their work beyond the initial workshop. All 7 teams elected to move forward.

LESSON LEARNED: in reviewing the strategic action packs compiled by the teams, it is clear that we did not emphasize enough the importance of the role of knowledge keeper. As teams are exploring into finding their strategies, they are generating knowledge about hidden networks. This knowledge is extremely valuable, but it disappears unless it is captured. The role of the knowledge keep her in the Strategic Doing process is critical to creating this artifact. In the future, We need to spend more time with our table guides in emphasizing the role of the knowledge keeper.

LESSON LEARNED: As this workshop was designed as an experiment, we only designed the process through the first 6 steps of Strategic Doing. We set the second workshop up prior to the August 14 workshop. As we will see, attendance at the August 29 workshop was spotty. It would be far better to encourage the teams to set their own next steps, due to the problems of scheduling.

LESSON LEARNED: We probably did not do enough to set the context of the workshop. Most people perceive the workshop as a one time event connected to the faculty retreat. Although attendance was good at the staff retreat -- 44 out of about 60 members of the staff attended -- we did not provide enough context. Many of the staff did not understanding that we were experimenting with a new innovation process within ME.

August 29 workshop: Four of the 7 teams had adequate participation to advance their work in the August 29 workshop. This workshop, scheduled for two hours, took the teams through the remaining steps of the Strategic Doing process. The August 14 workshop established an outcome for the team. The August 29 workshop was designed to enable teams to develop a Pathfinder Project.

LESSON LEARNED: Coming out of the retreat workshop on August 14, teams should have scheduled their own follow-up workshop. However, because the table guides have minimal Strategic Doing training, this more flexible approach might have posed complications. Working through this kind of scheduling with 7 teams creates complications, as we will see below.

TEAM ACTIVITY AFTER THE AUGUST 29 WORKSHOP: Several of the teams have continued to move forward with their own pathfinder projects. They are coordinating their activities through email. This creates problems both within and across teams. We need to develop a new approach to managing the complexities of multiple teams operating on their own projects. We have began exploring different ways to improve communication across the teams.

LESSON LEARNED: THE NEED FOR COLLABORATION INFRASTRUCTURE. – We are learning that complex collaborations within a high pressure organization requires a simple, lean communications infrastructure. Maintaining communication both within and among teams has become a critical challenge. There are a lot of complex details to manage,

We are slowly beginning to build out a collaboration infrastructure within ME. It has several different components. Initially, the core is the internal staff email. We can use the staff e-mail list to make announcements to all ME staff. Second, we have organized activity across the teams with a web-based platform called AirTable (Link). Finally, we are integrating our work slowly into the established internal communications networks within the school. These include video screen announcements. We are cautious here, because a lot of information is currently flowing through this channel.

ENGAGING STUDENTS.-- Integrating students into the teams will become increasingly important. Team number one facilities, invited a team student team leader into the working of the team for the August 29 workshop. The other teams that are interested in moving forward are also beginning to expand their membership to include students.

III. Status of the Teams: Outcomes and Pathfinders

1. Facilities/Space

TEAM LEADS: Ed Morrison, Mike Logan, Peter Meckl

FRAMING QUESTION: Imagine all of the physical spaces in ME enabled for staff, faculty, and students to feel more engaged, productive, and connected. What would that look like?

OUTCOME: A new discipline of "Student Listen-Ins": These sessions would be small: 5 to 10 students for each group with a targeted set of questions over a short period of time: something like 15 minutes. The sessions could run up to 45 minutes. The purpose would be to identify opportunities to improve the use of physical spaces in ME from the student perspective.

PATHFINDER PROJECT: Conduct pilots to engage students in "listen-in" session during week of Sep 23.

2. Events -

TEAM LEAD: Kristin Deckard Dawson

FRAMING QUESTION: Imagine if ME events would be the highlight of the school year for all stakeholders, including students, faculty, staff and alumni. What would a successful event look like in ME?

OUTCOME: Evaluate all ME events starting with events traditionally held in the Spring. Use a shared events calendar (a prototype exists) across the school to coordinate & communicate events.

PATHFINDER PROJECT: Develop events calendar for second semester to communicate more effectively to students and engage them more fully

3. Fundraising & Alumni/Industry Relations -

TEAM LEADS: Chad Molter/Kyle Rice

FRAMING QUESTION: What would it look like if alumni & industry engagement opportunities with Purdue ME were wildly popular and directly linked to increased giving? Chad Molter/Kyle Rice

OUTCOME: Take a holistic approach (across undergrad, grad, development, & research labs) to campus visits by alumni/industry. Plan multiple events throughout the day to expand the engagement of alumni/industry with ME including guest lectures, meeting with department head, meeting with development, tours/demonstrations at the research labs, lunch with student organizations, etc. Work collaboratively across departments to plan and implement these visits.

PATHFINDER PROJECT: None.

4. Student Success -

TEAM LEAD: Beth Hess

FRAMING QUESTION: What if every Purdue ME student left as a balanced, healthy, capable problem solver and as a graduate widely regarded to be exceptionally prepared to achieve future success?

OUTCOME: Host a food pantry and a personal care pantry within ME facilities (in the ME building, Herrick, and Zucrow). The personal care pantries would be located in restrooms and would be available year-round. The food pantry would be offered the last couple of weeks of the semester. Pantries would be stocked by faculty and staff donations.

Pathfinder Project: Develop budget and funding options for an ME Student Pantry designed to reduce financial stress on students during finals at the end of the semester

5. Culture, Retention, Connectivity -

TEAM LEAD: Julia King

FRAMING QUESTION: What would it look like if the PurdueME culture was collaborative, inspirational, and empowering for students, staff, faculty, and alumni?

OUTCOME: Engagement activities/community building/events funded by grant dollars that leverage our team's collective cultural knowledge. We agreed following the report outs that our Big Easy needs further refinement and clarification.

PATHFINDER PROJECT: Design and experiment with a series of carefully programmed events starting this semester that can engage students, staff and faculty.

6. Cross Discipline Collaborations -

TEAM LEAD: Todd Nelson

FRAMING QUESTION: What would it look like if ME faculty, staff, and alumni leveraged each other's strengths to create a comprehensive learning environment that provide all students with technical and professional skills that equip them to make an incredible impact on our world?

OUTCOME: Resource awareness for students (machine shop/e-shop etc.). This includes a database of knowledge/experience/strengths/practical skills within the school to be used to connect students to staff & faculty.

PATHFINDER PROJECT: None

7. Communications -

TEAM LEADS: Brad Beach/Jared Pike

FRAMING QUESTION: Imagine if we never need a meeting to share information, but always had key information readily available, in every situation. What would that look like? A stronger ME narrative of transformation. Expanded use of video stories to tell student and faculty stories in short snips. Use these videos to tell the coherent story of the transformation in ME: more of a community, less of a hierarchy.

PATHFINDER PROJECT: Develop a portfolio of model videos that engage and educate students

PATHFINDER PROJECT: Design a communications strategy across staff to promote the theme that staff can be innovators within ME to improve the student experience

IV. Recommendations

To sustain this process, we will need additional resources of two types:

- 1. **PROVIDE STAFF INCENTIVES TO PARTICIPATE IN THE PROCESS.** This step is as simple as providing lunches for each of the teams, as they gather for their 30 day check-ins. Approximate amount of funding required: \$980 (7 teams X 5 team members average X \$7 per lunch X 4 meetings per semester)
- 2. CREATE A COLLABORATION OPPORTUNITY FUND AND PITCH COMPETITION.— One way to provide incentives to support individual initiatives involves creating an Opportunity Fund along with a "pitch competition". Staff could regularly pitch their ideas for initiatives, and the head of school could invite students, staff, faculty and alumni to judge a pitch competition. The criteria for successful initiatives would be clearly outlined to include:
 - a. Student impact: How is the initiative improving student outcomes;
 - b. Collaborative engagement: How does the initiative engage students, faculty, staff and alumni?
 - c. Scalability and Sustainability: How will the initiative grow and be sustainable?

V. One Unit Class Launch

At the request of the Provost, we developed a one unit online class in the <u>science and practice of complex collaboration</u> ENGR 39600. This class introduces students do the simple rules of designing and guiding conversations that lead to complex collaborations.

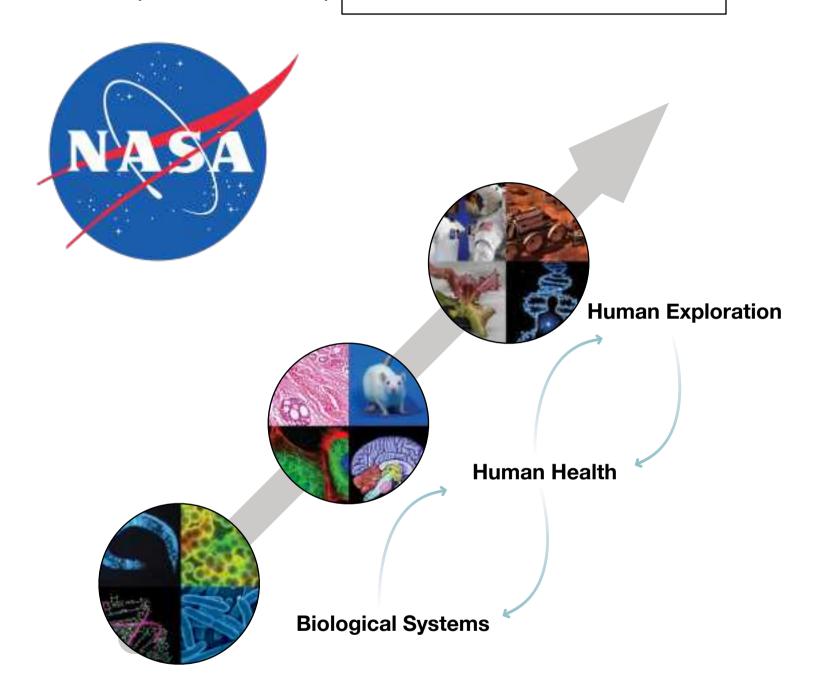
We are publicizing this course to all ME undergraduates. Jim Jones has has arranged to promote the course through the undergraduate blog as a Free Elective.

REFERENCE

• Bushe, G. R., & Marshak, R. J. (2014). Dialogic organization development. *The NTL handbook of organization development and change*, 193-211.

Appendix C-17: National Aeronautics and Space Administration

Your Name (Block Letters Please):



Imagine Space Biology and HRP have an exemplary reputation for collaborating to identify and answer significant life science questions that translate to proven countermeasures for human exploration by programmatic design. What collaborations would you map out for the life of the ISS?

Table of Contents

Topic	Page	Comment
Agenda	2	en.
Welcome and Introductions	3	Identify people with whom you'd like to connect
Space Biology Discussion	4	Generate collaboration hypotheses
HRP Discussion	5	Generate collaboration hypotheses
Introduction to Strategic Doing	6	Simple rules of complex collaboration
Preliminary Collaboration Scenarios	7-10	Identify promising collaborations
Program Scientists and Managers I Process Map	11	Develop a process map
Element and Project Scientists Collaboration Characteristics	12-13	Characterize the potential collaborations
Element and Project Scientists Roadmapping Worksheet	14	Map the potential collaborations, version 1
Element and Project Scientists Roadmapping Summary	15	Map the potential collaborations, version 2
Element and Project Scientists Additional Questions	16	Additional questions to consider



Day 1

Time	Topic(s)	Approach	Lead
9:00 am	Welcome and Introductions Use Org Overview to introduce the key players in attendance Discussion of Decadal Plan by Space Biology Discussion of Path to Risk Reduction (PRR) by HRP	Presentation	Rayl/Tomko, Paloski
9:30 am	Setting the stage: Programmatics * What do SB & HRP look tike in the future and beyond ISS? What do we need to think about now? * What do you see as our common goals and areas of alignment (introduce the LSRCT interest matrix/TRR)? * Why we are here today.	Fireside Chat	Rayl./Tomko, Paloski
10:00 am	SB Discussions; Overview of work being done and discussion of the following areas: 1. Gravity as a Continuum 2. Plant Biology 3. Cell and Molecular Biology 4. Animal Biology - Vetebrate & Non-Vertebrate 5. Microbial Research 6. Radiation & Systems Biology Research	3, 20-minute round-table discussion sessions	Frances Donovan Howard Levine Eduardo Almeida Ruth Globus & April Ronca David Smith Marianne Sowa & Sylvain Costes
11:00 am	HRP Discussions: Overview of work being done and discussion of the following areas: 1. ISS Medical Projects 2. Space Radiation 3. Human Health Countermeasures 4. Exploration Medical Capabilities 5. Human Factors and Behavioral Performance 6. Translation by design	3, 20-minute round-table discussion sessions	1. Steven Platts 2. Honglu Wu 3. Peter Norsk 4. TBD 5. Tom Williams 6. Josh Alwood & April Ronca
12:00 pm	Lunch		
1:00 pm	Intro to Strategic Doing Framing Question: Imagine Space Biology and HRP have an exemplary reputation for collaborating to identify and answer significant life science questions that enable human exploration by programmatic design. What collaborations would you map out for the life of the ISS?	Presentation	Ed Morrison
1:30 pm	Strategic Sprint #1: Given the LSRCT interest Matrix and the TRR generated by Josh Alwood and April Ronca, what areas of collaboration could integrate the Space Biology questions with the HRP knowledge gaps/risks? Goal: Each table identify 5 or more collaboration scenarios Report Out: 1. What is the collaboration scenario (i.e. topic or question)? 2. What is the rationale for the collaboration? 3. What SB question(s) does it address? 4. What HRP gap/risk does it address? 5. Is the collaboration complimentary or a direct alignment? (Complementary - maximizes opportunity by addressing different questions that don't impact each other in a single investigation; Direct Alignment - both HRP and SB are looking for an integrated approach to answer the same question)	Round table discussions	Table guides
3:00 pm	Report out on large maps	Round table presentations	Table guides or representatives
3:30 pm	Wrap up & prep for next day		Ed Morrison
5:00 pm	Dinner	Campo di Bocce	Everyone

Day 2

Time	Topic(s)	Approach	Lead
:00 am	Setting the Stage: Programmatic Continued • What opportunities do our common goals create? • How can these common goals be leveraged to buy down risk and achieve decadel priorities? To accomplish the agency's vision? • What are the near-term research plans?	Fireside Chat on Stage/ Presentation	Rayl and Fogarty/Vega
:30 am		Round table	Table guides
	1. Program Scientists and Managers - What would a process for engaging in collaborations and making decisions look like? Goal: Agree to the rules of engagement for collaborations and decision making Factors to consider: Lessons learned from previous collaborations and decisions Science Progress Science Priorities Available budget Note: A draft proposed process will be provided as a starting point. 2. Element and Project Scientists - Given the collaborations identified yestenday in conjunction with the existing research plans and priorities, what collaboration scenarios should begin in the neartarm (-2 years), mid-term (2-4 years), and long-term (-4 years) timeframes? Goal: Generate an implementation plan that takes the factors below into account. Factors to consider: Research Complexity What is the anticipated timeframe to address the question? (i.e. are we close to an answer?) How much knowledge do we already have in this area? implementation Should this be performed in flight or on the ground? Does an analog or the flight hardware needed already exist? How long should it take to complete this work? Is its crew time required? Budget High [>S1, SN), medium (S500K - S1, SN), or low budget (-\$500K)	3 or 4 tables 8-9 or 6-7 collaborations evaluated per table	
1:30 m	Feedback loop #1 (scientists -> program managers)	Round table presentations	Table guides or representatives
2:00 m	Lunch		
:00 pm	Feedback loop #2 (program managers -> scientists)	Round table presentations	Table guides or representatives
:30 pm	Strategic Sprint #26 or #3: 2b - refine and further develop approach based on feedback OR 3 - How can research products expected by SB and HRP be tracked effectively so they may be used to identify benefits for both arganizations? 4 - What science emphases should be considered by Space Biology to enable HRP to more quickly address risks?	Round table discussions	Table guides
:30 pm	Report out	Round table presentations	Table guides or representatives
:00 pm	Debrief & Forward Plans With Notional Schedule	Guided discussion	Ed Morrison
- 200	Closing		Rayl/Tomko, Paloski

1193

		1	Attending	
			Workshop	
Name	Drawam	Comton	-	Notes
	Program			Notes
April Ronca	SB/HRP	ARC	Y	
Chris Maese	HRP	ARC	Y	
David Smith	SB/HRP	ARC	Y	
Diana Ly	SB	ARC	Y	
Eduardo Almeida	SB/HRP	ARC	Y	
Elizabeth Keller	SB	ARC	Y	
Elizabeth Taylor	SB	ARC	Y	
Frances Donovan	SB	ARC	Y	
Joshua Alwood	SB/HRP	ARC	Υ	
Kevin Sato	SB	ARC	Υ	
Linda Timucin	SB	ARC	Υ	
Marianne Sowa	N/A	ARC	Y	
Ruth Globus	SB/HRP	ARC	Y	
Sharmila Battacharya	SB/HRP	ARC	N	
Sidney Sun	N/A	ARC	Υ	
Sylvain Costes	SB/HRP	ARC	Υ	
Anthony Hickey	SB	HQ	N	
Bruce Hather	HRP	HQ		
David Tomko	SB	HQ	Υ	
Nicole Rayl	SB	HQ	Υ	
Steve Davidson	HRP	HQ		
Barbara Corbin	HRP	JSC	Y	Intro and end only
Bill Paloski	HRP	JSC	Y	Intro and end only
Graham Scott	HRP	JSC	N	
Honglu Wu	HRP	JSC	Y	
Jennifer Fogarty	HRP	JSC	Y	
John Charles	HRP	JSC	N	
Letty Vega	HRP	JSC	Y	
Peter Norsk	HRP	JSC	Y	
Steve Platts	HRP	JSC	Y	
Tom Wiliams	HRP	JSC	Y	
Charlie Quincy	SB	KSC	Y	
Deborah Hahn	SB	KSC	Y	
Gioia Massa	SB	KSC	N	
Howard Levine	SB	KSC	Y	
	SB	KSC	Y	
Ye Zhang	OB	NOC	Y	

Notes

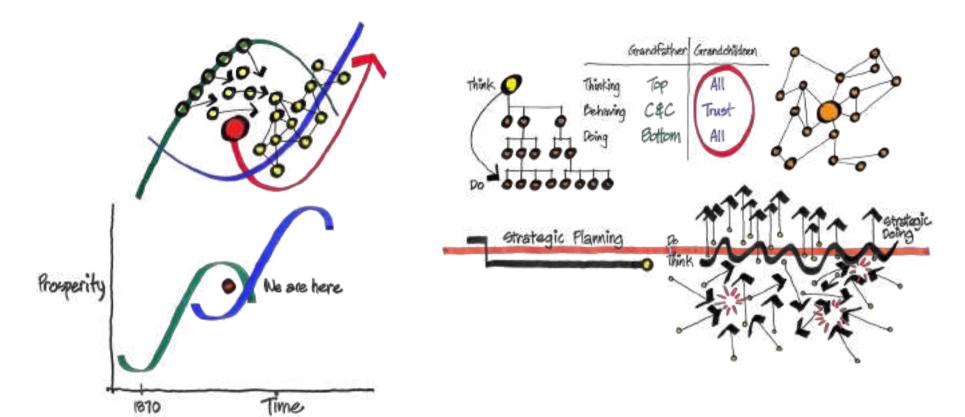
What do SB & HRP look like in the future and beyond ISS? What do we need to think about now? What do you see as our common goals and areas of alignment? Why we are here today? What outcomes would you like to see?

Time Block 1	Time Block 2	Time Block 3
Notes	Notes	Notes
Hypotheses about Collaborations	Hypotheses about Collaborations	Hypotheses about Collaborations

Time Block 1	Time Block 2	Time Block 3
Notes	Notes	Notes
Hypotheses about Collaborations	Hypotheses about Collaborations	Hypotheses about Collaborations

6

Introduction to Strategic Doing



Where are we going?

Strategic Doing / Cycle

What Could we do?

What Should we do?

What What we do?

What What we do?

What Should we do?

What we do?

Imagine Space Biology and HRP have an exemplary reputation for collaborating to identify and answer significant life science questions that translate to proven countermeasures for human exploration by programmatic design. What collaborations would you map out for the life of the ISS?

Notes		

Preliminary Scenario

1. What is the collaboration scenario (i.e. topic or question)?
2. What is the rationale for the collaboration?
3. What SB question(s) does it address?
4. What HRP gap/risk does it address?
5. Is the collaboration complimentary or a direct alignment?
Name your Scenario: Now put the name on a Post-It note.

Imagine Space Biology and HRP have an exemplary reputation for collaborating to identify and answer significant life science questions that translate to proven countermeasures for human exploration by programmatic design. What collaborations would you map out for the life of the ISS?

Preliminary Scenario

1. What is the collaboration scenario (i.e. topic or question)?
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4. What HRP gap/risk does it address?
5. Is the collaboration complimentary or a direct alignment?
Name your Scenario: Now put the name on a Post-It note.

Team Scenario 1

1. What is the collaboration scenario (i.e. topic or question)?
2. What is the rationale for the collaboration?
3. What SB question(s) does it address?
4. What HRP gap/risk does it address?
5. Is the collaboration complimentary or a direct alignment?
Name your Scenario:

Imagine Space Biology and HRP have an exemplary reputation for collaborating to identify and answer significant life science questions that translate to proven countermeasures for human exploration by programmatic design. What collaborations would you map out for the life of the ISS?

Team Scenario 2

1. What is the collaboration scenario (i.e. topic or question)?
2. What is the rationale for the collaboration?
3. What SB question(s) does it address?
4. What HRP gap/risk does it address?
5. Is the collaboration complimentary or a direct alignment?
Name your Scenario:

Team Scenario 3

1. What is the collaboration scenario (i.e. topic or question)?
2. What is the rationale for the collaboration?
3. What SB question(s) does it address?
4. What HRP gap/risk does it address?
5. Is the collaboration complimentary or a direct alignment?
Name your Scenario:

Imagine Space Biology and HRP have an exemplary reputation for collaborating to identify and answer significant life science questions that translate to proven countermeasures for human exploration by programmatic design. What collaborations would you map out for the life of the ISS?

Team Scenario 4

1. What is the collaboration scenario (i.e. topic or question)?
2. What is the rationale for the collaboration?
3. What SB question(s) does it address?
4. What HRP gap/risk does it address?
5. Is the collaboration complimentary or a direct alignment?
Name your Scenario:

you map out for the life of the ISS?

Team Scenario 5	Team	Scen	ario	5
------------------------	-------------	------	------	---

1. What is the collaboration scenario (i.e. topic or question)?
2. What is the rationale for the collaboration?
3. What SB question(s) does it address?
4. What HRP gap/risk does it address?
5. Is the collaboration complimentary or a direct alignment?
Name your Scenario:

exploration by programmatic design. What collaborations would

11

Program Scientists and Managers

What would a process for engaging in collaborations and making decisions look like?

Outcome: Agree to the rules of engagement for collaborations and decision making

Factors to consider:

- Lessons learned from previous collaborations and decisions
- Science Progress
- Science Priorities
- Available budget

Key Rules of Enga	agement:		

Notes on a Process Map:	

lement and Project	Scientists Scientists	COLLABORATION						
		1	2	3	4	5	6	7
Notes	Name and Brief Description of the Collaboration							
	RESEARCH COMPLEXITY							
	What is the anticipated timeframe to address the question? (i.e. are we close to an answer?)							
	How much knowledge do we already have in this area?							
	IMPLEMENTATION							
	Should this be performed in flight or on the ground?							
	Does an analog or the flight hardware needed already exist?							
	How long should it take to complete this work?							
	Is ISS crew time required?							
	BUDGET							
	High (>\$1.5 M) Medium (\$500K-\$1.5 M) Low (<\$500K)							

lement and Project	Scientists	COLLABORATION				13		
		1	2	3	4	5	6	7
Notes	Name and Brief Description of the Collaboration							
	RESEARCH COMPLEXITY							
	What is the anticipated timeframe to address the question? (i.e. are we close to an answer?)							
	How much knowledge do we already have in this area?							
	IMPLEMENTATION							
	Should this be performed in flight or on the ground?							
Does an analog or the flight hardware needed already exist? How long should it take to complete this work?	Does an analog or the flight hardware needed							
	Is ISS crew time required?							
	BUDGET							
	High (>\$1.5 M) Medium (\$500K-\$1.5 M) Low (<\$500K)							

Given the collaborations identified yesterday in conjunction with the existing research plans and priorities, what collaboration scenarios should begin in the near-term (<2 years), mid-term (2-4 years), and long-term (>4 years) timeframes?

Goal: Generate an implementation plan that takes the factors below into account.

Factors to consider:

Research Complexity

- ï What is the anticipated timeframe to address the question? (i.e. are we close to an answer?)
- ï How much knowledge do we already have in this area?

Implementation

- ï Should this be performed in flight or on the ground?
- ï Does an analog or the flight hardware needed already exist?
- i How long should it take to complete this work?
- ï Is ISS crew time required?

Budget High (>\$1.5M), medium (\$500K - \$1.5M), or low budget (<\$500K)

Near Term Collaborations <2 years

Mid Term Collaborations 2-4 years

Long Term Collaborations >4 years

Near Term Collaborations <2 years

Mid Term Collaborations 2-4 years

Long Term Collaborations >4 years

How can research products expected by SB and HRP be tracked effectively so they may be used to identify benefits for both organizations?

What science emphases should be considered by Space Biology to enable HRP to more quickly address risks?

NASA Space Biology – Output from 2/27-28/17 Retreat

"Blue" Tables (Led by Ed)

Question 1:

Imagine that Space Biology has developed an exemplary reputation within NASA and the international science community for enabling exploration, pioneering scientific discovery, and building value added collaborative partnerships to answer the significant questions put before us. What would that look like? Consider the array of current research:

- Microbiology
- Cell and molecular biology
- Plant biology
- Animal biology
- Developmental, reproductive and evolutionary biology
- GeneLab as a tool for disseminating and utilizing Space Biology data

Assets that could potentially be linked/leveraged:

- Howard:
 - o American Society for Gravitational and Space Research
 - o NASA Space Biology and Physical Science leadership and scientists on the board
 - o Astronaut Crew Office
 - Scientists on the advisory committees
 - o National Academy Committees
 - o PR value of vegetables on the International Space Station
- David:
 - o Advisory committees
 - o National Academy
 - HRP and Science leadership
 - o lobbying by the Employee Union
 - History of NIH/Space Biology collaboration: NASA NIH Memorandum of Understanding
 - o Need to lift up the history of the NIH/Space Biology collaboration
- Kevin:

- o co-location of programs and divisions at headquarters
- o and physical sciences and space biology in same programs
- o strong linkage between KSC and HRC biological sciences
- o Program scientist link with HRP leadership
- o strong links between JSC, KSC, and ARC biological sciences
- Working relationship with CASIS
- o ARC Space Biology working closely with a RC engineering divisions
- o strong public interest in NASA and space exploration
- o strong interest in K-12/college in NASA
- Ed:
 - o Capitol Hill experience
- Diana
 - o business and marketing strategy skills
 - o Silicon Valley network
 - o connection to the younger generation

Top strategic opportunities identified:

- Stronger opportunities with young people, such as:
 - o Expand internships with commercial partners
 - o Scholarships for space biology for undergraduates and graduate students
 - o Augment the NASA Post doctoral program
 - o Reinstate the NASA GSRP
 - o Outreach to professional associations
- Leverage existing partnerships with NIH
- Advance networks in Silicon Valley
- Establish a policy network
 - o Scoring:
 - Young people: 24/28/52
 - NIH: 26/19/45
 - Silicon Valley Network: 19/22/41
 - Policy Network: 28/18/46

After some discussion the team focused on the Policy Network as the "Big Easy," with these characteristics of success:

- Language in the authorization and appropriations bills that provide line item funding stability and growth for Space Biology
 - o success metric: line item appropriation

- Expansion of productivity and science beyond Low Earth Orbit
 - o success metric: number of projects, amount of money
- Expanded collaboration/growing network of people capable of influencing policy decisions
 - o success metric: number of people engaged in the policy network

The Pathfinder Project: develop a policy brief for Space Biology

Guideposts:

- All team members will provide Ed with bullet points by March 3
- it will provide a draft policy brief to the group in the group will comment by March 12
- We will have a draft policy brief by March 20 in time for the next workshop

First action plan:

Provide bullet points on	alli	3/3
what key point should be		
included in a policy brief to		
structure the argument in		
support of Space Biology		
First draft policy brief v. 0.1	Ed	3/10
Comments on the policy	All	3/12
brief draft v. 0.1		
Compile another draft of the	Ed	3/14
policy brief v.0.2		
Submitted to all for review	Ed	3/14
and comment on v 0.2		
Comments back	All	3/16
Draft of v 0.3 complete	Ed	3/20

Question 2:

Now shift your focus to the nexus between Space Biology and medicine. Imagine that Space Biology is a recognized source for stimulating new research. Our strategic partnerships and collaboration drive research work that is translational by design while maximizing the government's return on investment. What does that look like?

Assets that could be linked and leveraged:

Howard

- o Rodent research (IACUC)
- ARC partnerships with animal care facilities: Silicon Valley Commercial customers: Kind of a core lab for these companies
- Rodent Studies in micro gravity useful for...
 - Muscle
 - Bone loss
 - Immune system deficiency studies
- o Russian collaborations with rodent BION(?) studies
- o JAXA collaboration with NASA for rodent studies with centrifuge hardware
- o CASIS is dependent on Ames and KSU for their rodent studies
- o ASGSR

Elizabeth

- o boundary spanner
- o ISS relationships and connections
- o CASIS connections
- o Commercial connections
- o IPs relationship

Diana

- o CASIS connections: Commercial relationships
- o Silicon Valley Connections
- o Commercial Collaborations: Biotech Pharma (proximity)

David

- o HRP's translational roadmap (identifies current applicable research)
- o NIH MOU
- o International Partners
- o CASIS (would like to see improved relationships)
- o National Academy Committee

Angel

- o HRP reports through SLPSRA (Craig)
- o HQ connections to other programs

Top strategic opportunities identified:

- HRP joint research solicitations: Use of SB research to inform HRP
- NIH and other independent agencies joint research solicitations: integration of research programs, e.g., aging; non-space station vehicles
- Advocacy: Advisory Committee NAC lobbying, framing arguments to promote SB's role; language in authorization and appropriation legislation

- CASIS access to space to perform research
- Scoring:

o HRP/SB: 22/24/46

SB/NIH/agencies: 28/15/43SB/Advocacy NAC: 19/16/35

o SB/CASIS: 17/15/32

The first opportunity – SB/HRP collaboration -- was identified as the Big Easy. Characteristics of success:

- More joint research
 - o success metric: number of joint proposals
- SB is integral to HRP needs
 - o Success metric: a formal "customer" agreement
- More effective joint advocacy
 - o Additional resources: money; crew time; access to space

The Pathfinder Project: Draft a white paper on SB/HRP collaboration opportunities

Guideposts:

- Get comments to Ed-3/3
- Draft an alpha -3/12
- Develop discussion draft for next workshop 3/20

First action plan:

Bullet points to Ed	David, Howard, Elizabeth,	3/3
	Diana, Angel	
Draft outline for white paper	Ed	3/12
Comments	David, Howard, Elizabeth,	3/15
	Diana	
Draft alpha version	Ed	3/20

Question 3:

Imagine Space Biology has a clear prioritization approach that guides strategic planning and tactical decision making within an environment of constrained resources. The approach incorporates the input we get from our stakeholders, including NASA colleagues, the NRC,

and Congress, and we can communicate to those stakeholders how we have made these decisions. What would that look like?

Assets that could be linked and leveraged:

- Diana
 - o risk-based prioritization, risk based analysis
 - o Tier 2 model for scoring – relation to exploration
 - o alternative platforms assessment
- Nikki
 - o peer-reviewed scheduling
 - o HRP Tier 2
- David
 - advocacy reports
 - o published papers
 - o direction from Congress
 - o institutional knowledge
- Ed
- o scoring matrix
- Angel
 - o people around this table
 - o Gene lab database
 - o staff and facilities of the centers
 - o SMT's TCAT and other activities like that
- Charlie
 - o resource-based prioritization and decision-making
 - o leverage on different technical skill sets

Top strategic opportunities identified:

- Develop a pilot to understand better Human Exploration and Operations Missions Directorate needs
- Develop a pilot to develop a protocol for Space Technology Mission Directorate collaboration with partners
- Use an NIH model to develop a partnering pilot working with entities such as Sloan HRP, NSF, NIH --
- Develop an Alternative Platform pilot

The second and third opportunity were combined as the "Big Easy": A prioritization protocol that can be explained and replicated to align Space Biology and its partners to the Space Technology Mission Directorate

Characteristics of success:

- A replicable protocol for prioritization
- Transparent
- Explainable

The Pathfinder Project: build a prototype

Guideposts:

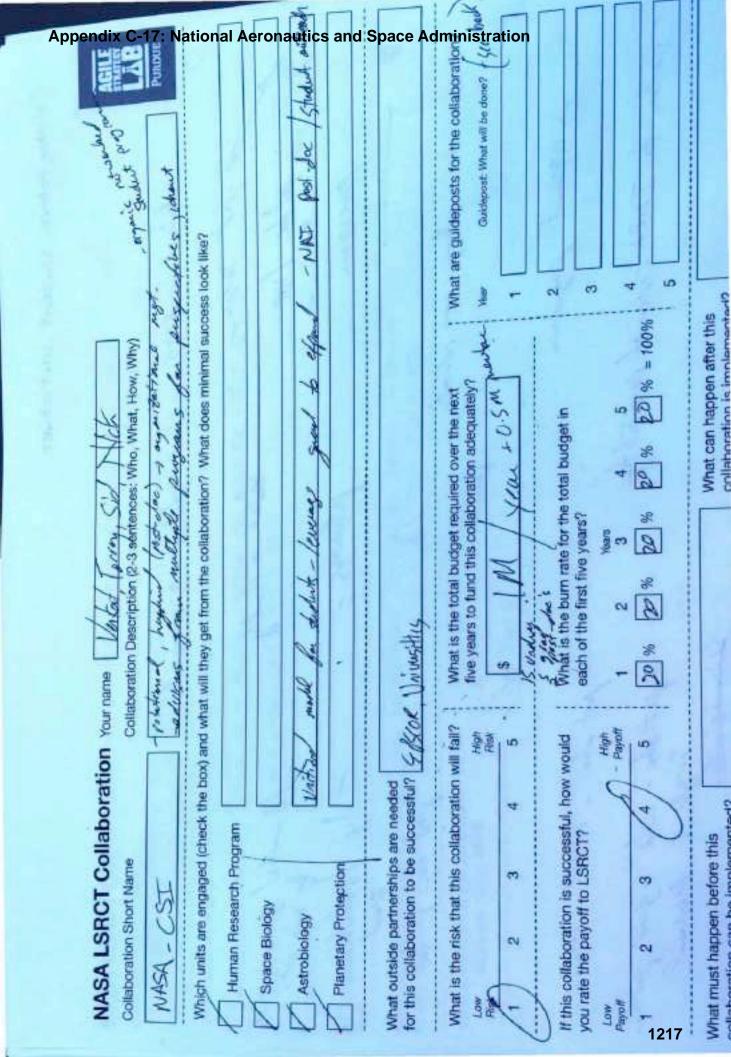
- David and Nikki will work from the basis of the Space Biology Science Plan to develop an initial prioritization of activities within the plan 3/31
- Internal review completed 5/31
- Prototype completed 6/1

First action plan:

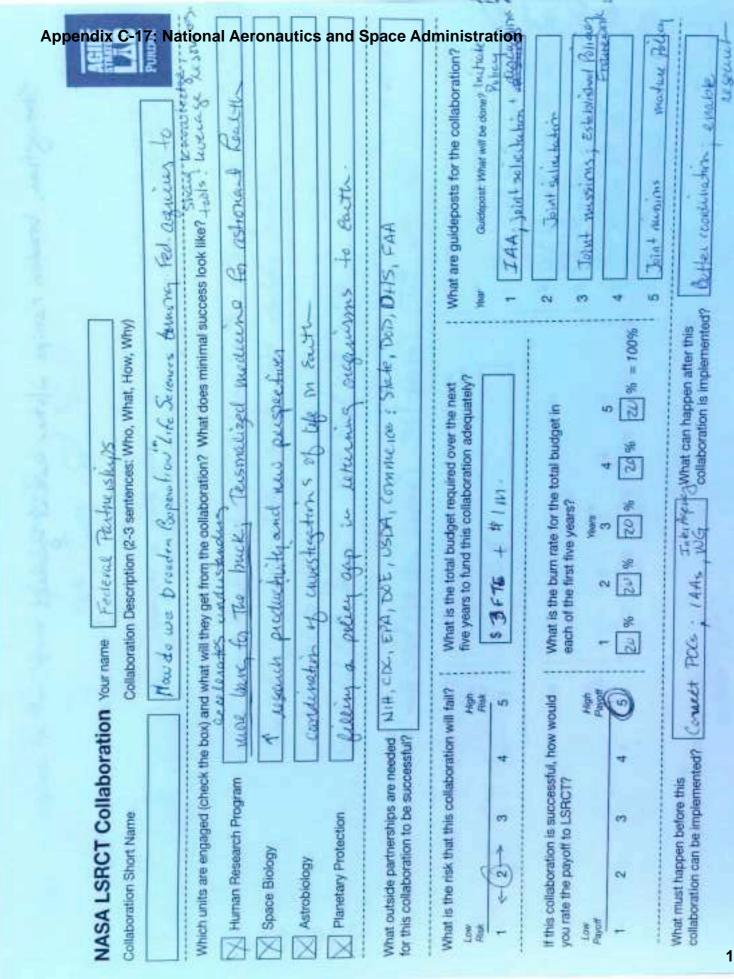
Review SB Science Plan to	David and Nicki	
discuss prioritization		

30/30: not yet identified

Radiction Path ways model - EPA



NASA LSRCT Collaboration Your name Collaboration Descention Short Name Collaboration Short Name Collaboration Short Name Collaboration Descention Short Name (Check the box) and what will they ge Which units are engaged (check the box) and what will they ge I which units are engaged (check the box) and what will they ge I which units are engaged (check the box) and what will they ge I what outside partnerships are needed I what call heaven outside partnerships are needed I what is the risk that this collaboration to be successful? What is the risk that this collaboration will fail? What is the years frow the payoff to LSRCT? If this collaboration is successful, how would what is the years frow the payoff to LSRCT? Low From From From From From From From From
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Standar, broader renige what partnerships do are have and suppressing the land of the have and single with the single with the sold of the control of the co GP4) Identify & act you connections win the team to get the tit needed GPS) Develop plan(s) to comptance get missing relationships #GPS) Build a comm tree to solicit this kind of input Strengthan, broaden riships when tederal agencies to TBD

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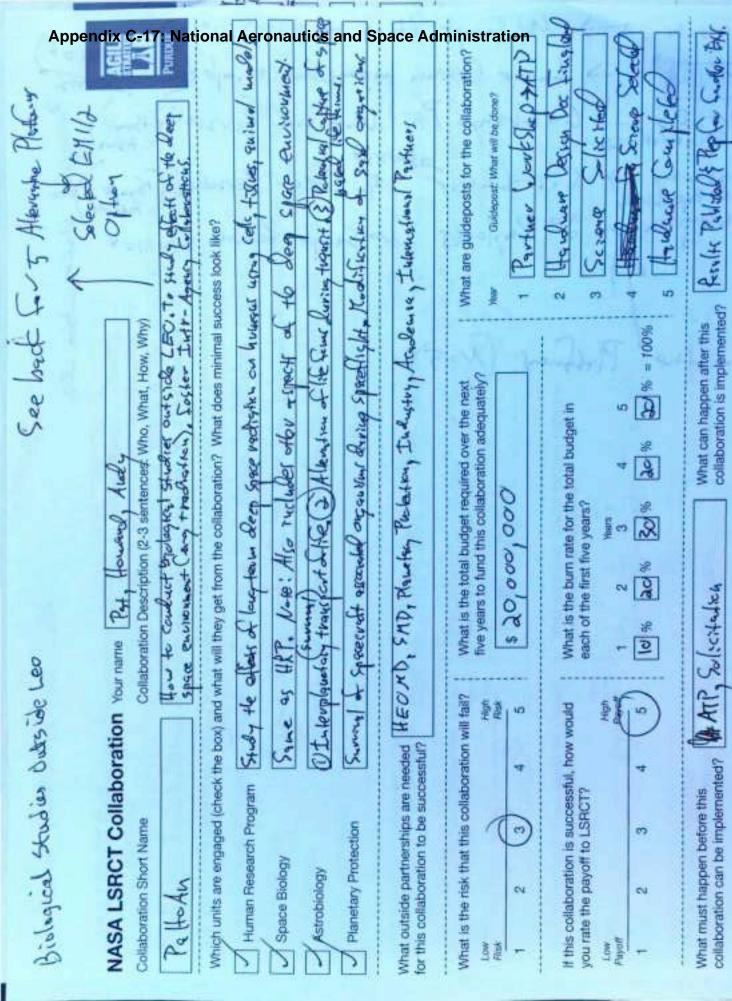
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Appendix C-17: National Aeronautics and Space Administration Collabo notive shudent initiatives

Appendix C-17: National Aeronautics and Space Administration -) MW 18 fonce the

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DIAPPENDIX C-17: National Aeronautics and Space Administration

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Appendix C-18: NIST



Lab to Market Kickoff Discussion

Thursday, July 23, 2015 3:00 p.m. Conference Call

	NIST Directive
ı	

- 1. Overview of Initiative
- 2. Timeline
- 3. Review Workshop Design Monday, August 31, 2015 in DC at APLU HQ
 - a. Clarify the desired outcome. Are we working with 3 buckets of potential action items?
 - i. Increase Collaboration among the Parties, e.g., more action-oriented workshops
 - ii. Rule changes or rule interpretations that NIST could do
 - iii. Recommendations for statutory changes
 - 4. Between today and Friday August 14, 2015, list 10 different opportunities to make these changes
 - i. Assemble portfolio of potential initiatives, use Workshop to move high priority initiatives into action.
 - ii. Purdue Team will interview at least 10 other people not on this call for input
 - iii. The Purpose of the Workshop is to determine direction, accountability, and Strategic Plan to provide a report to NIST that can be transmitted to the White House for action.
 - 5. Do we have everyone identified that needs to be involved with the workshop? Do we have balanced representation? If not, how to we move toward balance?

Act	tio	n I	Ite	ms	

■ NEXT M	IEETING
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Background Paper
Lab to Market Workshop
Commercialization of Federally Funded Research by Universities
Washington, D.C.
November 2015

Duane Dunlap: ddunlap@purdue.edu Scott Hutcheson: hutcheson@purdue.edu Ed Morrison: edmorrison@purdue.edu

Introduction

Commercialization of federally funded research at universities faces a bewildering array of obstacles. The reason: innovation — the translation of knowledge into value (or money) — emerges from continuous knowledge flows. Unfortunately, these knowledge flows can be easily blocked in multiple ways.

Taken together, these knowledge flows form an "ecosystem", networks embedded in other networks, that support and accelerate commercialization. From the perspective of an ecosystem, we can reframe our challenge. Accelerating commercialization involves improving the productivity of start-up and innovation ecosystems that both surround universities and are fueled by federal research.

From this perspective, we are not trying to fix old systems that were never intended to work together. We are not "removing barriers". Rather, we are designing new, more productive networks of collaboration.

This series of three workshops start us down a new pathway. We are reframing the challenge by focusing on three categories of solutions to strengthen start-up and innovation ecosystems:

Page 1

- Collaborative solutions that can be initiated immediately;
- Administrative solutions that can be designed by federal agencies;
- Legislative solutions that require Congressional action.

A library of reports is available <u>here</u>. Three types of material are included in the library: policy reports, congressional hearings, and research papers.

Where we stand: The purpose of our workshops

Researchers have documented the many obstacles to commercializing university-based research. These include insufficient faculty time, weak faculty incentives, the absence of a commercialization infrastructure within or adjacent to the university, restrictive regulations and policies, lack of commercialization skills and entrepreneurial thinking among the faculty, and weak interactions with industry representatives. (See, for example, Vanderford, et.al., 2013).

Congress and federal agencies cannot fix these problems with new directives. Major increases in federal funding are equally unlikely. Yet, they can be partners in designing "what's next", in rethinking their role within the ecosystems surrounding universities. In short, they can take important steps to Improve the productivity of commercialization.

Moving in this direction requires a new mindset from all actors in the ecosystem. The linear model of technology transfer is inadequate to capture the complexities of an ecosystem (Bradley, et. al., 2013) Knowledge from university to industry flows through social networks (Ostergaard, 2009). That's why understanding how to design and guide the knowledge flows through ecosystems and clusters becomes important to understand.

Federal agencies are already moving in this direction. In 2010, the National Science Foundation's Directorate for Engineering issued an important white paper on the role the NSF plays in innovation ecosystems. NSF has

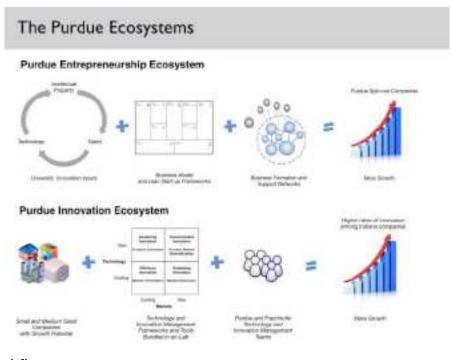
Page 2

subsequently funded like like Engineering Research Centers to stimulate the formation of these ecosystems. Other agencies are moving in a similar direction. Cluster-based initiatives by the Economic Development Administration and the Small Business Administration focus on designing networks of collaboration. NIH has funded three Research Evaluation and Commercialization Hub sites to accelerate commercialization and technology transfer in the life sciences and biomedical technology.

The purpose of this workshop is to identify opportunities to continue improving the performance of start-up and innovation ecosystems surrounding universities that are conducting federally funded research. By improving the productivity of these ecosystems, we will be promoting commercialization and technology transfer.

Defining Start-up and Innovation Ecosystems

For the past two years,
Purdue has been working
with Fraunhofer IAO,
based in Stuttgart, to
understand how to
strengthen ecosystems
surrounding universities
by following "marketfacing" principles of
design. Universities
operate with two
overlapping ecosystems,
one focused on
generating start-ups and
the other focused on



innovation among established firms.

Page 3

Innovation Ecosystem Investor Networks Provide capital Provide an estment and expertse generated wealth Accelerate new venture investment Provide networks and mentors Innovative Provide Start-up Research R&D. Growth partners Infrastructure Firms Companies Provide Provide ideas technology, support and incubators, and at Train and recruit amost people areast people training

necruit and

ruggly among

people

Start Up

Economy

Source: Ed Mornson, Dale Wunderlich

We can capture the nature of these ecosystems as a series of flows:

Moving from Problems and Barriers to Platforms and Solution Sets

Skilled

Talent Pool

In our work with Fraunhofer, we are exploring how to design new collaboration platforms for universities following Fraunhofer's market-facing principles. With our partners at New Jersey Institute of Technology, we are beginning to pilot these approaches with the New Jersey Innovation Institute.

Recruit and

aucusty amart.

people

Growth

Economy

Page 4

At the same time, we are using this approach to explore how we can transform engineering education within the university to strengthen innovation and entrepreneurship. We are engaged in two NSF funded initiatives: Pathways to Innovation, managed by Stanford University and VentureWell, and Revolutionizing Engineering Departments.

Based on our experience in designing guiding new networks, collaborations and clusters, we see three focus areas or "solution sets" emerging from this work. We can strengthen the ecosystems surrounding universities in three ways:

Collaboration solutions. – Three types of collaborations are emerging: collaborations within the university; collaborations between the university and industry; and collaborations among federal agencies.

- Within the university new solutions are emerging to expand incentives for commercialization activity among faculty and students. The NSF funds an initiative led by Stanford University and VentureWell provides an insight into how universities are creating new collaborations to stimulate innovation and entrepreneurship in undergraduate engineering programs.
- Collaborations between the university and industry arise in a number of different ways. They can be led by industry, such as GlaxoSmithKline's Discovery Partnerships with Academia; designed by universities, such as the Deshpande Center for Innovation at MIT; or stimulated formally or informally by federal agencies, such as the workshops conducted under the sponsorship of the National Nanotechnology Initiative.
- Collaborations among federal agencies are most clearly expressed in joint funding proposals to stimulate start-ups and innovation.

Administrative solutions.— Federal agencies can take a wide range of actions within current statutory frameworks. These actions span from regulatory interpretations and guidance letters to rule makings and executive orders.

Legislative solutions. — Congressional authorization and appropriations can create new collaborative initiatives, such as those found in the America COMPETES Act, and the Workforce Investment and Opportunities Act.

Outcomes from the August and October Workshops

The August 31 workshop explored whether this framing of the "commercialization challenge" makes sense to participants. It did, and we produced an initial version of a strategic action plan to strengthen innovation ecosystems around universities. We identified three initiatives on which to focus:

- A "phase zero" initiative for SBIR grants that would be piloted at NSF for diffusion across federal agencies;
- 2. An initiative to connect innovating universities to federal agencies in a more stable and focused collaboration network;
- 3. Developing a pilot collaboration to facilitate the "hand-off" of emerging companies among potential federal funding partners.

The August workshop produced an "alpha version" of a strategic action plan. We used a follow-up workshop in October to strengthen and clarify these initiatives and produce a "beta plan". A workshop in January wil continue to develop and move these initiatives forward.

Conclusion: A New Model of Collaboration

Using an agile strategy discipline incubated at Purdue, called Strategic Doing, we have demonstrated how an open, loosely joined network of federal agencies and university partners can generate strategic action plans quickly.

By moving these action plans forward in short 30 day to 60 day "time buckets", we believe participants can make meaningful progress in strengthening the innovation ecosystems surrounding universities. We will complete this pilot by the end of January and submit a report. Based on the progress we have already made, we will recommend expansion of this pilot.

Workshop on Barriers to Commercial Development of Federally
Funded Research at Universities
August 31, 2015
8:30 AM to 3:30 PM
APLU: Washington, D.C.

This workshop focuses on removing the barriers to the commercialization of federally funded research at universities. It is an outgrowth of the White House's Lab to Market (L2M) initiative.

Participants from universities, university interest groups (e.g., APLU, COGR, AUTM, AAU), and federal agencies will focus on identifying barriers and developing a strategic action plan to begin moving past them.

These barriers fall under three categories relevant to the Federal agencies:

- 1) Barriers that can be overcome through more extensive collaboration among Federal agencies and funding partners;
- 2) Barriers that can be overcome through administrative actions, such as regulatory interpretations, rule makings, executive orders, or similar other administrative actions; and
- 3) Barriers that can best be overcome through Congressional action.

Following a principle of "doing the doable", the workshop will develop an inventory of barriers, rank them, and then focus on the barriers that can be most easily overcome. To assess progress, the workshop will reconvene in late October in Washington.

For more information, please contact Duane Dunlap at Purdue University: ddunlap@purdue.edu.

Lab to Market Table 1

Strategic Action Plan – Alpha Version

Our Team

Member	Organization	Email
Jessica Seboek	Association of American Universities	jessica.sebeok@aau.edu
Scott Hutcheson	Purdue University	hutcheson@purdue.edu
Tim Franklin	NJII/NJIT	franklin@njit.edu
Toby Smith	Association of American Universities	toby_smith@aau.edu
Paul Zielinski	NIST	paul.zielinski@nist.gov
Rick Huebsch	University of Minnesota	rhuebsch@umn.edu
Barry Johnson	University of Virginia/NSF	<u>bwjohnso@nsf.gov</u>

Our Strategic Opportunity

Design a "Phase Zero" (may not actually be called that) program as a first step in the SBIR/STTR program.

Our Strategic Outcome

All of the SBIR/STTR-issuing agencies offer a Phase Zero program open to both small businesses and university faculty.

Our Characteristics of Success and Success Metrics

Characteristic	Metric
1. Will result in better proposals	# number of proposals recommended for
	funding
2. Private investment in those that make	# of companies that get private investment
it through Phase 1	
3. Broader pool of applicants	# of first-time applicants

Our Guideposts

Guidepost	Date
2-3 page white paper drafted	November 1, 2015
SBA buy-in	May 1, 2016
Solicitation written	July 1, 2016
Solicitation published	September 1, 2016
First round issues with new option	December 1, 2016

Our Pathfinder Project

SBA will adopt new guidelines to allow for this new program and pilot with NSF.

Action Plan for the Next 30 Days

Member	Task	Date
Toby	Send Barry white paper written by Christie Holly (sp?)	Sept 1
Scott	Draft strategic action plan and send to group	Sept 4
Barry	Draft 2-paragaph summary of our white paper	Sept 9
Tim	Review white paper and provide feedback	Sept 23

Appendix C-18: NIST

Member	Task	Date
Rick	Speak with two research deans of faculty members and solicit	Sept 23
	their input, summarize and send to group	
Paul	Provide feedback on early draft	Sept 23
Jessica & Toby	Provide feedback on early draft	Sept 23
Scott	Draft use case	Sept 23

Details of Our 30/30 Meeting

We will meet together via conference call on Thursday, September 24, 2015 from 9-10am. The information for the call is:

Conf. Call #: 712-775-7031 Participant Code: 296-292

Lab to Market Workshop | Table 2 Strategic Action Plan (alpha version)

APLU, Washington, DC August 30, 2015

Table Guide: Ed Morrison

Knowledge Keeper: Janet Holston

Team Members

Nicole	Kuehl	nicole.kuehl@NIST.gov
Janet	Holston	janet.holston@ASU.edu
Jetta	Wong	jetta.wong@HQ.DOE.gov
Jim	Woodell	jwoodell@APLU.org
Duane	Dunlap	ddunlap@Purdue.edu
Ed	Morrison	edmorrison@purdue.edu

Our "Big Easy" Opportunity

Convene IEP universities as a network with federal agencies for data sharing and creating mutual benefit.

Comment: To what extent should our opportunity also connect with the business community through the Council on Competitiveness that Jim Woodell has underway? A memorandum of understanding has been under negotiation for some time. This memorandum could also provide some guidance as we move forward. Jim is suggested that he will connect with the Council to see if the Council would have no objection to sharing the draft memorandum with our team.

Our Outcome

A growing collaborative network of representatives from IEP universities and federal agencies that addresses mutually defined innovation challenges. The network will produce: 1) emerging principles of practice; and 2) ongoing reports and data from promising practices.

Comment: The principles of practice will help universities design collaborative initiatives and help federal agencies design effective policies to promote innovation.

Characteristics of Our Outcome

Characteristic	Metrics
A mechanism for ongoing reporting toward growing the network of stronger IEP institutions	Number of participants; quality of the participation
Participants in the network are actively using principles of practice	Number of principles of practice generated; number of new principles adopted for use by members of the network
Growing participation in the network by agency and institutional members	Number of participants and the diversity of their representation across IEP universities and agencies
A network that generates collaboration between federal agencies and universities	Number of new collaborations generated

Pathfinder Project and Guideposts

Create a design prospectus for convening IEP universities and federal agencies into an economic growth network

Gidepost	By when
Outline of a draft has been circulated and reviewed	October 14
First Draft completed	October 29
Second Draft completed	December 1

Action Plan

Person	will	By When
Janet and Ed	draft outline and send to review	October 14
Entire team	review outline	October 16
Janet and Ed	complete first draft	October 29

30/30 Review Meeting

Date	October 2	Communication
Time	12 PM	Duane will send out conference number: 1 – 866 – 899 – 5146
Place	conference call	Tiumber: 1 – 600 – 699 – 5146

Lab to Market Table 3

Strategic Action Plan – Alpha Version

Our Team

Member	Organization	Email
Bob Hardy	Council on Governmental Relations	rhardy@cogr.edu
Fred Reinhart	AUTM/UMass	fred@research.umass.edu
Courtney Silverthorn	NIST	courtney.silverthorn@nist.gov
Ann Hammersla	(NIH) National Institutes of Health	hammerslaa@mail.nih.gov
Donald Sebastian	New Jersey Innovation Institute	donald.sebastian@njit.edu
Ryan Umstattd	Advanced Research Projects Agency-	ryan.umstattd@hq.doe.gov
	Energy (ARPA-E)	
Liz Nilsen	Venture Well	Inilsen@venturewell.org

Our Strategic Opportunity

Funding Alignment -

Reorganization of funding from agencies resulting in a continuum of mechanisms to provide support all the way to full commercialization.

Our Strategic Outcome

Potential ventures would receive assistance navigating within and among the multiple federal agencies and funding opportunities by the creation of a continuum of funding paths from initial proof of concept through commercialization. A "migration manager" kind of role would offer that support.

Our Characteristics of Success and Success Metrics

Characteristic (samples)	Metric
Specifics have been reconstructed fro	m various notes – confirmed on follow up call
1. Individuals developing ventures value	Survey of individuals receiving support
the support received.	
2. The simplified funding path continuum	# of agencies included in the continuum
represents multiple agencies.	
3. Support through the continuum /	# of ventures supported
migration manager is readily available.	

Our Guideposts

Guidepost	Date
Specifics have been reconstructed from various note -	- confirmed on follow up call
Build the working team through	
recommendations	
Convene the team to initiate discussion and	
fully develop the working idea	
Develop a working document for review	
Determine to whom recommendations should	
be made and provide as appropriate	

Our Pathfinder Project

Establish a working group with the right people at the table.

Action Plan for the Next 30 Days

Member	Task	Date
All	Vet the concept with peers at respective organizations	
All	Determine recommendations for team members	
	Develop talking points of the current situation and proposed solution	

Details of Our 30/30 Meeting

We will meet together via conference call on Thursday, September 24, 2015 from 2-2:30 pm. The information for the call will be provided by NIST.

Welcome to our experiment



Table 2

Our "Big Easy" Opportunity

Convene IEP universities as a network with federal agencies for data sharing and creating mutual benefit.

Our Outcome

that addresses mutually defined innovation challenges. The network will produce: 1) emerging A growing collaborative network of representatives from IEP universities and federal agencies principles of practice; and 2) ongoing reports and data from promising practices.

Table 3

Our Strategic Opportunity

Funding Alignment -

Reorganization of funding from agencies resulting in a continuum of mechanisms to provide support all the way to full commercialization.

Our Strategic Outcome

agencies and funding opportunities by the creation of a continuum of funding paths from initial Potential ventures would receive assistance navigating within and among the multiple federal proof of concept through commercialization. A "migration manager" kind of role would offer that support.

Increase the economic impact of federally-funded research and development by accelerating and improving the transfer of new technologies from the laboratory to the commercial marketplace. Assets e-mail Outcome from the August Workshop: Washington, October 30, 2015 Strategic Doing Workshop Name **Purdue University**

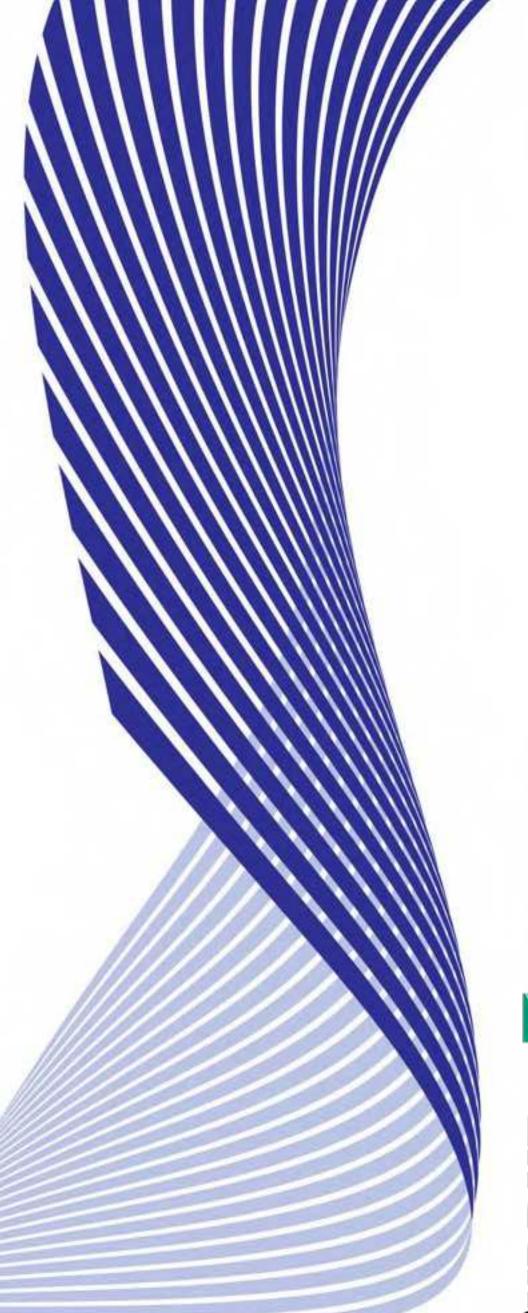
Review progress since the August workshop. Review any materials prepar pursue? What changes or modifications should we make to our outcome?	eview any materials pre we make to our outcom	pared after the workshie?	progress since the August workshop. Review any materials prepared after the workshop. Does our outcome still make sense to post changes or modifications should we make to our outcome?
			NIST
Define the success metrics for our outcome:			
Outcome Characteristics			Success metrics
Define a Pathfinder Project with guideposts for the next 60 to 90 days:	he next 60 to 90 days:		
Pathfinder Project:		Guideposts	osts
	By this date.	ate	We will do
Define an action plan for the next 60 to 90 days:			
Who Will do what		Who	Will do what

Re Imagine

Improving the productivity of federally funded university research







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also like to thank Jim Woodell of the Association of Public and Land-grant Universities (APLU) for his continuing point Paul and Courtney in our direction. Finally, we would like to express our appreciations to the participants and Technology (NIST) for their flexibility and their willingness to experiment with a new approach. We would The authors would like to thank Paul Zielinski and Courtney Silverthorn of the National Institute for Standards support of these new approaches to defining the university's role in today's economy. Jim took the initiative to for the time they invested in our workshops. The participants are listed in the Appendix.

Introduction

This report presents the story of an experiment. Sometimes we can address the challenges in front of us more effectively if we reframe the problem. That's the case with trying to figure out new ways to make federal investments in research more productive.

While it was never explicitly presented to us in this fashion, the challenge of "removing the barriers to commercialization" to federally funded research on university campuses implies a sixty year old model of commercialization that limits our thinking. Ever since Vannevar Bush set the post war direction of federal research, federal policy has followed a logical, linear model of commercialization. To improve the productivity of federal investment, simply identify and remove the barriers.

Indeed, the deceptively simple term "technology transfer" implies a hand-off, a linear flow.

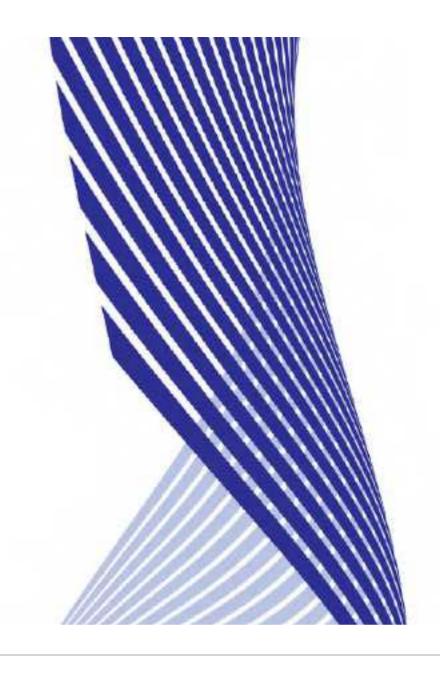
But what if the process of innovation -- moving new ideas into the marketplace to create and capture value -- is not linear? What if it is more like a complex adaptive system? An ecosystem? A network of networks? How do we think of the challenge in this way? What if we focus on strengthening the start-up and innovation ecosystems surrounding universities that receive federal research dollars? Does reframing the challenge open up the "solution space"? Does it change how the actors in these systems think and behave? Does it lead to new, more productive collaborations? More flexible, higher leverage policies? Does this new perspective place us on the doorstep of what's next?

We believe it does. This report represents a small step in that direction.

Ed Morrison Scott Hutcheson Duane Dunlap Purdue Agile Strategy Lab Antonino Ardilio Joachim Warschat Fraunhofer IAO

CHAPTER 1

Setting the Stage



Design thinking teaches important lessons, but none are more important than this one: how we think about a problem defines the boundaries we impose on the solutions we consider.

Bernard Roth, a founding luminary of Stanford's design

SECTION 1

Asking the Right Question

EXPANDING OUR "SOLUTION SPACE"

- In mathematical optimization, a solution space refers to a set of all possible points that satisfy a problem's constraints.
- 2. The emerging discipline of design thinking has adopted the term. Design thinking focuses on generating solutions. The emphasis is on designing experiments to explore a solution space. Little time is spent on defining the problem.
- 3. Most important, the solution space can be expanded by reframing the problem.
- 4. "Overcoming barriers to commercialization" is probably too narrow a definition of the problem and limits our thinking of what is possible.

school, illustrates the value of asking the right question with a story. Some years ago, a student team went to Nepal to improve the performance of incubators for premature infants. After doing some field research, they reframed to their problem by changing their point of view. The problem was not the incubators, the problem was how to keep babies warm long enough for them to survive. With this altered perspective, the students developed a solution that sold for 1% of the price of a conventional incubator. The core message is simple and powerful. Reframing the problem, changing our point of view, helps us to find more creative and productive solutions.

This lesson is crucial as we consider how to improve the productivity – the returns to the public – from federal investments in research performed on university campuses. As we shall see, in the 35 years or so that this issue has circulated among policy circles in Washington, the predominant framing of the problem is been to "eliminate the barriers" to commercialization.

This report argues that more needs to be done to shift our perspective from "barriers" to an emerging language of "innovation ecosystems". Our framing question moves from "How do we eliminate barriers to commercialization?" to "How to we work together to strengthen innovation ecosystems?" By making this shift, we open a wider range of solutions available to

To demonstrate the value of this shift in perspective, we've conducted three workshops in Washington focused on strengthening the innovation ecosystems surrounding universities that conduct federally funded research. Our report is divided as follows:

- The balance of this chapter provides an overview of how academic research and policy formulation has moved from a linear model of commercialization to an emerging model of "innovation ecosystems".
- Chapter 2 explores how a small team at Purdue University has been exploring this new perspective over the past decade and has begun to implement new promising methodologies to design and guide the complex collaborations needed to strengthen "innovation ecosystems". We introduce our collaboration with Fraunhofer and their innovation and technology management solutions that we are piloting with our partners at the New Jersey Institute of Technology.
- Chapter 3 demonstrates how we designed three workshops to apply these approaches in order to build stronger connections among universities and federal agencies. We demonstrate this framework with three potentially productive collaborations.
- Chapter 4 explores how this approach could be scaled through more low-cost experiments.



SECTION 2

Moving from Barriers to Ecosystems

NEW MODELS OF INNOVATION

- 1. The notion of commercialization barriers is inherently tied to a linear model of commercialization that is an inadequate description of the innovation process.
- 2. An alternative, emerging model sees innovation as the product of networks and collaboration. Multiple actors work together to explore innovations and experiment in new ways.
- 3. Creating new products and services is an iterative process of experimenting and prototyping in real world settings.
- 4. The resources required for successful innovation are rarely housed within a single entity. Rather, a network of actors -- embedded in an ecosystem -- drive the innovation process.

We begin our history with the passage of the Bayh-Dole Act in 1980. In the late 1970s, amidst growing concerns about stagflation and the global competitiveness of the US economy, Congress began looking at how to accelerate innovation from federally funded research. In 1980, Congress enacted the Patent Policy Act of 1980, also known as the Bayh-Dole Act. By changing the patent rules, Congress hoped to increase the synergies between universities and business.

The Bayh-Dole enabled a linear model of technology transfer that moves roughly as follows:

- A university scientist makes a discovery;
- Scientist discloses the invention to the university's technology transfer office (TTO)
- The TTO evaluates the invention and decides whether or not the patent
- The TTO files a patent application
- The TTO markets the technology to firms and entrepreneurs
- The TTO signs an agreement to license or acquire an equity stake in a spinoff company

Bayh-Dole, although helpful, was not enough. By the mid-1980's a growing turbulence in the global economy pushed the business community advocate for a more focused approach in strengthening the nation's competitiveness. The rise of China, the demise of the Soviet Union, and the emergence of India, Stanford's Center for Integrated Sys-

tems (CIS) as an exemplar.

as well as lingering pressure from competitors in Europe and Japan all contributed to a sense of urgency. The President's Commission on Industrial Competitiveness outlined the nation's declining competitive position and argued that our weakness in commercializing new technology contributed significantly to the problem.

In an article written three years after the commission report, the chairman, John
Young, former CEO of
Hewlett-Packard, explained:

"Technology is one area where the United States has a competitive advantage. In fact, as a nation, it is probably our greatest advantage... Yet, the competitiveness of US industry is seriously handicapped by shortcomings in our ability to commercialize tech-

both the products in the manufacturing processes that today's markets demand." He went on to cite the loss of US position in semiconductors, videocassette recorders, compact disc players, and other consumer electronics. Young began reframing the challenge as involving a wide array of actors. He cited

"CIS represents a special partnership that joins together private industry, academia and government in an Americanized version of the cooperative spirit that is given Japanese industry and international edge. This arrangement is mutually beneficial because it promotes the collaboration between aca-

demic and industrial communi-

ties and the basic research

needed to keep the United

States in the forefront of tech-

nology."

Young's work began the process of expanding our understanding of commercialization. The perspective gained even more traction with the publication in 1990 of Michael Porter's Competitive Advantage of Nations. As he summarized his book in a companion article in the Harvard Business Review, Porter explained how national competitiveness is grounded in company comission.

nologies to develop

petitiveness. He proposed to that understanding company competitiveness required analyzing a model of five factors. It was an important effort to explain that national prosperity was rooted in a complex system of interrelationships. By managing these factors intentionally, countries can give rise to "clusters" of internationally competitive industries.

By the mid-1990's the landscape was clearly shifting. In an important report, the Office of Technology Assessment declared that the debate on commercialization "has been hampered By an incomplete understanding of the ways in which firms develop and market new products, processes, and services in the barriers that be must overcome in the process."

The report described the linear model of innovation and commercialization, but called it "an inadequate description of the innovation process." The traditional model only describes one pathway to innovation and "reinforces the notion that government should restrict

its role to the support of basic research."

At the same time, a number of academics began contributing to our understanding by proposing different frameworks that might help us understand the complex nature of innovation within regional economies. While Porter focused on clusters, Leydesdorff and Etzkowitz proposed the idea of a "triple helix" of universities, govern-

The linear model of commercialization is "an inadequate description of the innovation process."

Office of Technology Assessment

ment and business. Cooke, building off work done by Freeman in national innovation systems, proposed the framework of "regional innovation systems". Saxenian, comparing the economic performance of Silicon Valley with Boston's Route 128, saw the importance of networks in explaining regional competitiveness.

was fundamentally different than tradirules. In 2002, an important line of re-These researchers provided the foundational approaches. They suggested that vided a useful metaphor for mobilizing tion". In 2005, Seely Brown and Hagel commercialization and innovation. In tion for what has followed. In the past connected networks that characterize tion of social network analysis and innovation. In 2003, Chesbrough introtangible and intangible assets needed signing and guiding the open, loosely search opened to explore the connecfifteen years, additional research has works emerge from following simple successful strategies in dynamic net-2001, Eisenhardt and Sull suggested explored practical approaches to desuggested that "pull platforms" prothat strategy in a world of networks duced his concept of "open innovafor innovation. By 2010, the National Science Foundation's Directorate of Engineering suggested a new policy framework focused on strengthening "innovation ecosystems". The white paper bluntly states,

"The linear model is an oversimplification of the innovation process, and it misses many of the nuances involved in the non-linear, real life process."

This paper serves as a useful bridge between academics, focused on fashioning theoretical tools to guide policy, and policy makers seeking to improve the productivity of federal research.

In 2013, the White House convened the Lab to Market Summit. The expert panel following the sum-

mit reiterated the challenge voiced by John Young in 1988: "[I]f the U.S. is to remain globally competitive in the 21st century, it must accelerate the translation of federally funded R&D into commercial outcomes that create economic and public value, thus maximizing the return on the public dollars invested."

Framing the problem differently shifts our approach

Opportunity focused	Adaptive systems	systems	nalysis	ge points	stworks	t's next
Opport	Adaptiv	Dynamic systems	Inductive analysis	Look for leverage points	Engage the networks	Designing what's next
Problem focused	Mechanistic systems	Static systems	Deductive analysis	Look for bottlenecks	Find the experts	Fixing the problem

The question, of course, is "How?"

There are no set answers, only experiments on which to build. The federal government has been experimenting with different policy approaches, from the multi-agency i6 Challenge to the National Innovation Corps (I-Corps), the NIH Research Evaluation and Commercialization Hub (REACH) program,

the National Incubator Initiative for Clean Energy, and the National Network for Manufacturing Innovation (NNMI). APLU has launched its Innovation and Economic Prosperity (IEP) initiative to recognize the strategies undertaken by universities to design and guide the networks needed to accelerate innovation.

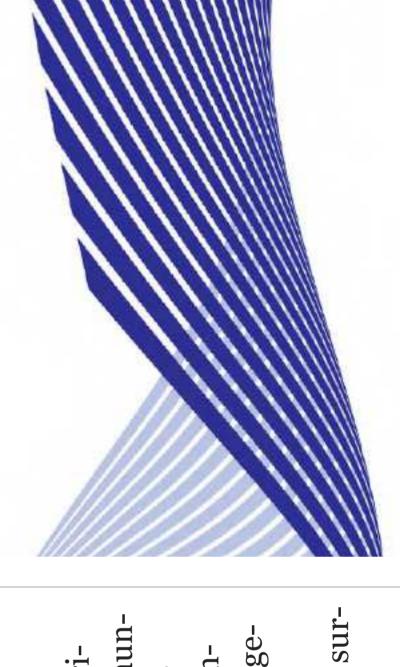
The IEP program demonstrates that universities are experi-

menting in a wide range of activities and collaborative investments to build both the start up and innovation ecosystems surrounding their campuses.

These experiments are teaching us how to design the networks and platforms leading to a more productive investment of federal research funding.

CHAPTER 2

Taking on the How



We now take you inside another experiment. In August 2013, Purdue and Fraunhofer IAO began a collaboration to explore this question: How could we combine our innovation, technology management and strategy frameworks to strengthen the innovation ecosystems surrounding U.S. universities?

SECTION 1

Open Innovation and Agile Strategy

WHAT IS AGILE STRATEGY?

- 1. Strategy enables investors to deploy scarce resources in productive ways.
- 2. Designing strategy in an ecosystem cannot follow conventional strategic planning methods. Traditional approaches were designed for hierarchical, command-and-control organizations. Ecosystems, by contrast, are open, loosely connected networks embedded in other networks. In an ecosystem, no one can tell anyone else what to do.
- 3. Strategy in open networks is inherently complex. To design effective strategies, actors must follow a collective discipline of simple rules.
- 4. As participants follow these rules, complex strategies emerge from continuous experimentation and adaptation.

One of the biggest challenges of moving from a linear to a network-based model of innovation involves figuring out a new approach to strategy. An effective strategy consists of two components: a destination ("Where we going?") and a pathway ("How we get there?"). With conventional hierarchical organizations, the responsibility of developing a strategy falls to top management. In an ecosystem, the design of strategy is not so clear.

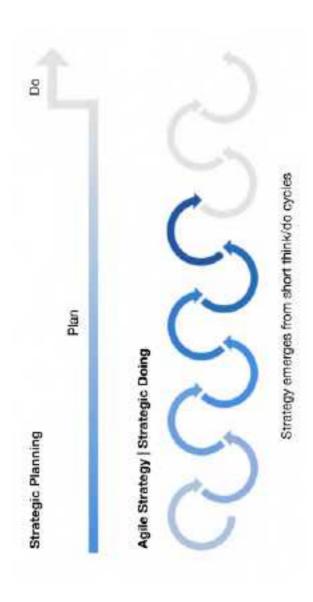
Meeting this challenge is crucial, if we hope to design and guide an ecosystem intentionally. If we have no replicable, scalable and sustainable approach to strategy, then we must leave the formation and operation of ecosystems to serendipity.

Seen from the perspective of the business firm, the challenge of innovating within an ecosystem involves managing the process of open innovation. The term, coined in 2003 by Henry Chesbrough, describes how a firm identifies, links and leverages resources outside the firm to accelerate the innovation. Within large firms, managing this process is challenging, and there is no established process for doing so.

For nearly a decade, a small group of practitioners and researchers at Purdue University have been experimenting with a new approach to strategy, an approach that is directly applicable to open innovation and innovation ecosystems. Designed specifically for open, loosely connected networks, this approach manages the inherent complexities of ecosystem design with a set of simple rules. These rules guide participants

to shared, measurable outcomes and enable them to make frequent adjustments along the way, as they learn by doing.

This discipline, called Strategic Doing, focuses participants on deep conversations framed by engaging, strategic question about what they could do together. Participants begin to explore this question by connecting their assets and defining



new opportunities. They then go through a clear, concise process of establishing priorities. They identify opportunities that both have a big potential impact and are relatively easy to do. To set these priorities they fall back on a valuable, often neglected resource: their strategic intuition.

With one opportunity on which to focus they drive their conversation deeper to explore what a successful outcome might look like and how they would measure their success. Once they have an outcome, they next turn their attention to establishing a project that can move them toward that outcome.

They mark their path forward and established commitments to move their ideas and action. Finally, they establish a time

to meet so they can review their

can review their progress and decide on next steps.

trying to do open innovation, but the

"I've worked with large companies

This conversation takes a relatively short time to complete, a matter of hours. As participants answer these questions they generate all they generate all they need for a

Strategic Doing process is unique.
This is the most clear an concise
open innovation process I've seen."
Mark Scotland

A company participating in an open innovation network with Lockheed to develop Condition-Based Maintenance innovations for the Navy

strategy to begin implementing. By following this protocol of collaboration, partners can quickly begin building trust by working toward a shared outcome.

With this process in place, universities can design and guide the development of innovating networks capable of speeding resources to the most promising ideas. To begin developing the ecosystems needed to speed commercialization of federally funded research, we have borrowed an important emerging idea from business strategy and product development: the concept of platforms. Universities need to design and develop their own platforms on which ecosystems can form.

SECTION 2

Platforms and Ecosystems

WHY PLATFORMS?

- Beginning in the 1990's, as business strategy
 began to shift toward networks and
 ecosystems, the concept of platforms emerged.
- 2. A platform enables a business to "orchestrate" collaborations and networks that create value for markets.
- 3. So, for example, Apple created a platform for music sales with iTunes, Amazon created a platform for books and publishing, and Intel created a platform to accelerate the development of the personal computer.
- 4. Following a similar approach, universities and national labs can design platforms that will speed the commercial development of federally funded research.

In the business world, the idea of platforms first emerged in product development in the 1980's. Companies assembled foundation of components around which they developed multiple products. So, for example, auto companies like Toyota would develop a series of models on the same platform of shared components. Similarly, Microsoft developed its Office suite using a shared set of components for file sharing, text processing, and graphics.

As the concept of business ecosystems developed in the 1990's, however, the term platform took on a different meaning. Companies began designing platforms in order to engage partners and customers in new networks. In other words, their business strategy focused on designing and guiding their own business ecosystems using a platform business model. Apple disrupted the music industry by creating a new platform, iTunes, which enabled consumers to download single music tracks and develop their own playlists. By designing the platform and setting the rules of operation, a company can orchestrate the networks that form on the platform. In this way, a business ecosystem emerges that provides a competitive advantage to the platform owner.

Universities can use the same approach to design and guide two overlapping ecosystems to accelerate the commercialization of federally funded research. The first ecosystem focuses on startup companies. Here, faculty and students leverage university intellectual property from federally funded research to create spinoff companies. The second ecosystem involves accelerating innovation among existing companies.

Economy Growth Companies Innovative Growth A university's ecosystems Rezult and supply firmed people Support and Fraining Provide SAD Provide partners Tools and technik sawit people Infrastructure Proude networks and mentors Networks Research Investor Skilled Talent Pool Accelerate new venture investrial Provide Valors incubators and smart people Source: Ed Marrison, Dale Wunderlich Regultand supply serget poople Provide capital and expertise Start-up Firms Economy Start Up

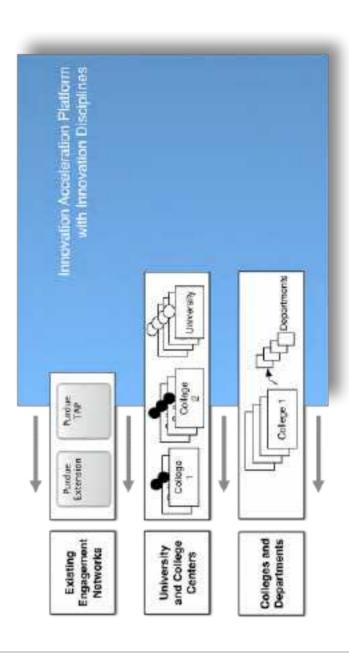
In the United States, a great deal of attention focuses on accelerating the rate of university startups and spinoff companies. In Germany, by contrast, much more attention is paid to accelerating innovation among existing companies, small and

Universities pursuing federally funded research can do both, but each requires a different strategy and a different set of networks. Equally important, the assets around which networks form vary from university to university. Each set of university ecosystems will be different.

Meeting the challenge of designing and guiding these ecosystems -- with universities as a orchestrator or "platform owner"

-- is not easy. Universities are organized around academic departments that often block cross disciplinary collaborations. Faculty are not easily rewarded for devoting time and resources to innovation. The lack of faculty incentives to innovate represents a common "obstacle" often cited but difficult to address.

The Purdue Agile Strategy Lab is addressing this challenge by developing "platforms" on which faculty are attracted to collaborate. The platforms are "open" to participation by faculty, students and outside organizations, including companies.



These platforms "slide underneath" existing organizational structures and do not disrupt existing power relationships. As a result, they are unlikely to provoke an "immune response" from power players within the existing organizations. Each platform provides a safe place where "networks of the willing" can form to explore innovation opportunities. By becoming a

celerate the developuniversities can acplatform designer, up and innovation ment of both start ecosystems.

TITLE

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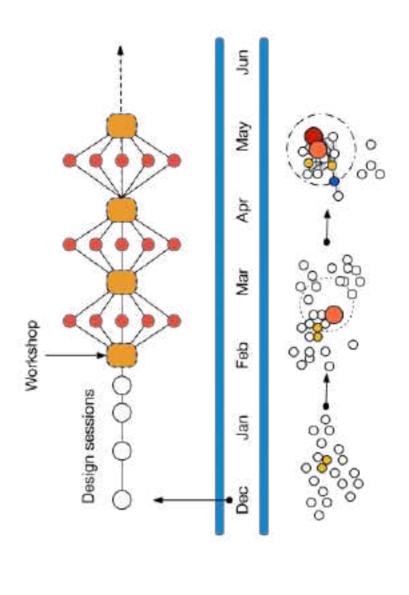
Fraunhofer IAO over has been working on In the past year, the the past three years. rated with the New this approach with team has collabo-The Purdue team

H Company A TITLE New N Tak

heed Martin to address the challenge of Condition Based Maincertain indicators show that performance is degrading or a failtenance (CBM) with the Navy. (CBM represents a strategy in Jersey Innovation Institute to design innovation platforms to address particular opportunities, including developing an innovation network of smaller companies working with Lockwhich maintenance is performed on heavy equipment when ure is imminent.)

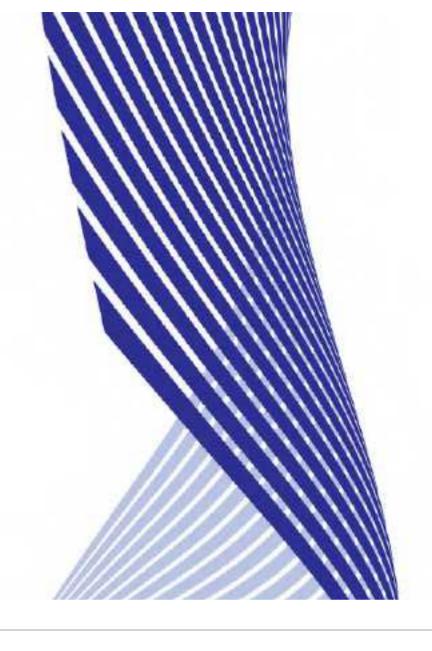
The university uses its convening power and the discipline of experiments to test these hypotheses. The formation of these the process. Participants learn that by linking and leveraging agile strategy to form networks quickly, generate hypotheses about how value could be created collaboratively, and design networks takes time, but an agile strategy discipline speeds

their assets, they can generstrategy workshops, a new ate new opportunities. In nies in sensors, data ana-Through a series of agile predictive analytics, and promising set of compalytics, machine learning, Purdue-NJII team used formed on the platform this process uncover a the case of CBM, the innovation network augmented reality. within six months. THE Company C



CHAPTER 3

A Lab to Market Experiment



What would it look like if we introduce these concepts of platforms, innovation networks and ecosystems to the ongoing Lab to Market initiative in Washington? We launched an experiment to find out.

In 2015, representatives from NIST approached Purdue about conducting a workshop on the barriers to commercialization of federally funded research by universities. The Purdue team instead proposed an alternative of three workshops designed as an experiment. The purpose is to explore how we could develop practical initiatives to strengthen the innovation ecosystem surrounding universities conducting federal research. So the question guiding the design of these workshops was as fol-

Could we design a series of workshops that generated practical initiatives to strengthen university start-up and innovation ecosystems?

To test this idea, we conducted a series of three workshops in August 2015, October 2015, and February 2016. We began with the premise that there are three types of solutions that could strengthen these innovation ecosystems:

- Collaborative solutions These consist of three types of collaboration: collaborations within universities, such as multidisciplinary research teams tackling grand challenges; collaborations between university and industry; and collaborations among federal agencies.
- Administrative solutions These are actions by federal
 agencies that can speed collaboration by increasing the flexibility and flow of information and funding within innovation
 ecosystems;

• Legislative solutions — These are Congressional authorizations of appropriations specifically designed to support collaborations within innovation ecosystems.

In the August workshop, 20 participants convened to explore solutions that they could generate. We arbitrarily divided into three teams. Using the Strategic Doing process, each team quickly generated an inventory of potential solutions that could be launched by the participants from the assets within their networks. In the October and February workshops, the teams continued to refine their work.

The three initiatives they developed include:

- Connect network of IEP universities with the Federal Lab
 Consortium to form opportunities for new collaborations
 to form.
- 2. Pilot an SBIR Phase o initiative to bridge the gap between federal research funding and Phase 1 SBIRs.
- 3. Promote funding alignment with NIST's Washington-based innovation fellows initiative to serve as "innovation guides". They would develop tools and methods to navigate among different federal programs to support technology-based start-ups and early stage high growth firms. They would also advise federal program managers on how to make their initiatives more open, flexible, transparent and collaborative.

The process demonstrated that with short bursts of time, teams of professionals from universities, university associations, and government agencies could do complex thinking in a new way.

In the course of three four hour workshops, the teams developed creative, sophisticated ideas for productive collaborations, set priorities among these opportunities, and began implementing an action plan to develop their top priority.

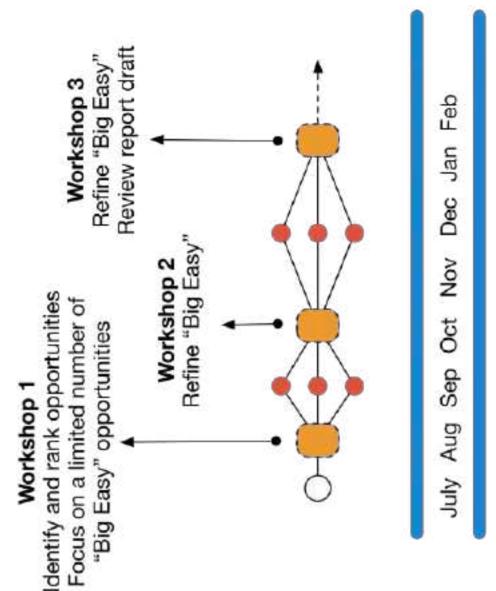
A deeper dive into the process

Let's take a deeper look into the opportunities that emerged from the first workshop.

On August 31, 2015 a diverse group of twenty participants gathered at the office of the Association of Public and Land Grant Universities (APLU) in Washington D.C. The participants completed an agile strategy workshop, guided by a team from Purdue University. The first step in this process involves identifying opportunities for linking and leveraging assets among the participants. Opportunities emerge when participants link these assets across their networks.

Working on three teams, the participants identified 29 potential solutions including 13 that could likely be accomplished through administrative action [A], 12 that could be implemented through focused collaboration [C], and four that would require legislative action [L]. Each of the three teams selected one of their solutions to begin developing. They designed a Strategic Action Plan to begin moving forward. Each

team ranked their opportunities along two dimensions: impact and ease of implementation. On a five point scale, they ranked the potential impact of each opportunity (1=low; 5=high). Next, they ranked the ease of implementation for each opportunity (1=low; 5=high). In this way, each team decided on their "Big Easy", the opportunity that had a relatively high impact, but that was also relatively easy to do. In subsequent workshops, the teams continued to develop their Big Fasy.



A more detailed assessment of each team's activity follows. For each team, their opportunities are outlined, along with their scoring in terms of impact and ease of implementation.

Team One: Opportunities Identified

Business Intelligence Web Platform

Create a business intelligence web platform that can assist in finding technologies and markets, doing market analysis, and regional economic development analytics. [A] Impact: 5, Ease: 3

Industry-Inspired I/UCRC

Assure that Industry/University Cooperative Research Centers are truly industry inspired so that fundamental research is motivated by industry-relevant problems. [A] Impact: 4, Ease: 3

SBIR Phase Zero Program*

Design a "Phase Zero" (may not actually be called that) program as a first step in the SBIR/STTR program. The program could fund teams to go through an I-Corps-like experience as a first step in the SBIR/STTR process. This could result in better Phase 1 proposals. [A] Impact: 4, Ease: 4

Venture Capital Community Integration

Form a consortium of public and private funding entities that includes, not just inter-agency grants, but also inter-governmental and private sector funding that includes the venture capital community. This would be a hybrid of federal grant and sponsored research. [C] Impact: 4, Ease: 4

Cluster-Based Collaborative Network

Design a cluster-based collaborative network that goes beyond a firm-by-firm approach. [C] Impact: 4, Ease: 4

Innovation Academy

Develop an Innovation Academy program that designs and offers short courses, workshops, etc. on innovation and enterprise development. [A] Impact: 3, Ease: 5

Clear & Transparent University Policies on Tech Transfer Goals & Objectives Establish and clearly state what the goals and policies are for the university as it relates to tech transfer/communications (i.e., have a clear tech transfer policy). Often times the objectives of the university, as they relate to tech transfer, are unclear and difficult, depending who you talk to. [A] Impact: 5, Ease: 4 Systematic Collaboration Among Federal Relations Officers, University Innovators, and Higher Education Associations Foster greater collaboration among federal relations officers, university innovators, and higher education associations. Federal relations officers can help educate innovators about regulatory and legislative trends – and more importantly, the innovators can convey obstacles to Washington, DC for advocacy and action. [C] Impact: 3, Ease: 4

Industry-Funded Basic Research

Develop university/industry partnerships to support basic research that is of value to industry. [C] Impact: 5, Ease: 2

Statewide/Regional Buffer Organizations

Create statewide or regional buffer organizations with missions focused exclusively on holistic economic development and technology transfer and with a board made up of government, industry, and research institutions. [L] Impact 4, Ease 4

Multi-Agency Proof of Concept Research Funding Program Establish a multi-agency approach to supporting early proof of concept research at universities to help support the innovation gap that often exists, preventing ideas from being successful

and advancing in the marketplace. [A] Impact: 4, Ease: 2

I-Corps at State Level

Develop a state-level version of I-Corps to engage beyond NSF-funded PIs. Would likely require both state and federal legislative action. [L] Impact: 3, Ease: 2

Federal Agency Navigation Tool

Develop a tool that serves as a concierge or guidance counselor-like service to help navigate the funding, programs, tools, and personnel from the various federal agencies. This could result in more unification among funding agencies and

the ability to refer between agencies. [A] Impact: 3, Ease: 3

Industrial IGERT Training Program for Grad Students Develop an NSF/NIH training/ internship program for grad students that provides them with multidisciplinary research experiences working with industry problems. This could result in broader grad training and culture change. [A] Impact: 3, Ease:3

Catalogue of University Programs

Develop a sharable catalogue of university tools of bite-size program and tools they have implemented about which

they would be willing to take questions from other university colleagues. This would be one-page data sheets rather than large slide decks and longer documents. [C] Impact: 2, Ease 4

Team Two: Opportunities Identified

Innovation Campaign

Launch an innovation campaign to create better understanding of innovation and the role universities play. Looking forward, connect innovation to the Grand Challenges that we face in food, energy, water, climate change, and so on. Looking retrospectively, tell the backstory of important innovations that we use today. [C] Impact: 4, Ease: 3

More Flexible DOE Funding

Provide more federal funding flexibility for DOE. In the 2011/2012 appropriations cycle, Congress placed new restrictions on how funds could be appropriated. These restrictions reduce the ability of DOE to experiment and adapt to new innovation opportunities as they occur. They impose significant lag times in budgeting. DOE is not working in real time. [L] Impact: 5, Ease: 2

Network of Networks

Convene a team to design a "network of networks" of organizations involved in university-based innovation and economic growth. They would include university associations (APLU, ASCU), professional associations (AUTM, UEDA, ASEE) and others. This network of network will probably need a full time staff, and it could provide a more coherent way to align promotion and advocacy. (Example: A green network of organization and advocacy.

tions involved in sustainability; this idea contributed by Jetta). [C] Impact: 4, Ease: 3

Innovation and Economic Prosperity (IEP) Network with Federal Partners* APLU has organized network of leading edge universities involved in economic growth (IEP universities). The network, in its third year, includes 48 universities. The mutual advantage of connecting IEP with federal agencies: 1) IEP universities have a broader network of federal professionals with whom to interact; and 2) federal professionals have a network that can use when they are seeking policy guidance. [C] Impact: 3, Ease: 5

Model IP Policies

Develop model IP policies, using an emerging compilation of innovative IP policies that APLU is compiling. Connect this work with AUTM. [C] Impact: 2.5, Ease: 5

Team Three: Opportunities Identified

UIDP Participation*

Increase the participation of government agencies in the University Industry Demonstration Partnership. [C] Impact: 5, Ease 5.

Funding Alignment

Reorganization of funding from agencies so there is a continuum of mechanisms to provide support all the way to full commercialization. [A] Impact: 5, Ease: 3.

Dedicated Funding

Create new funding mechanisms for dedicated entities to connect research to innovation. Could be interagency funding. [L] Impact: 5, Ease: 2

Consistent External Messaging Create consistent messaging to the public about the value connecting better research and industry to better respond to public skepticism. [A] Impact: 3, Ease: 3.

Internal Messaging

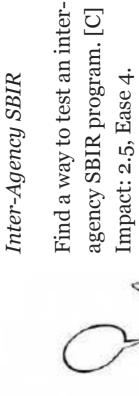
Create internal messaging about the value

to of the connections between better research and industry to respond to skepticism. [A] Impact: 4, Ease: 3

Conflict of Interest Model

Create a model for conflict of interest between industry and university. COGR, APLU, and AAU to could take the lead. [C]

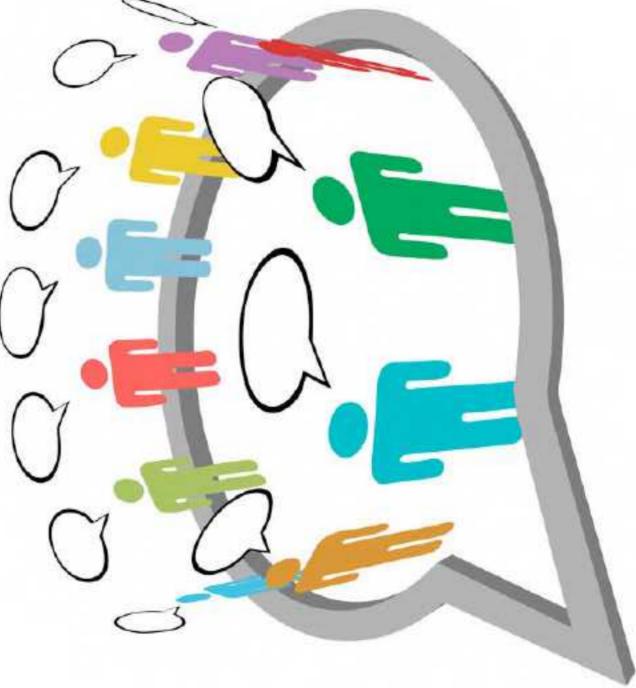
Impact: 3, Ease 1.

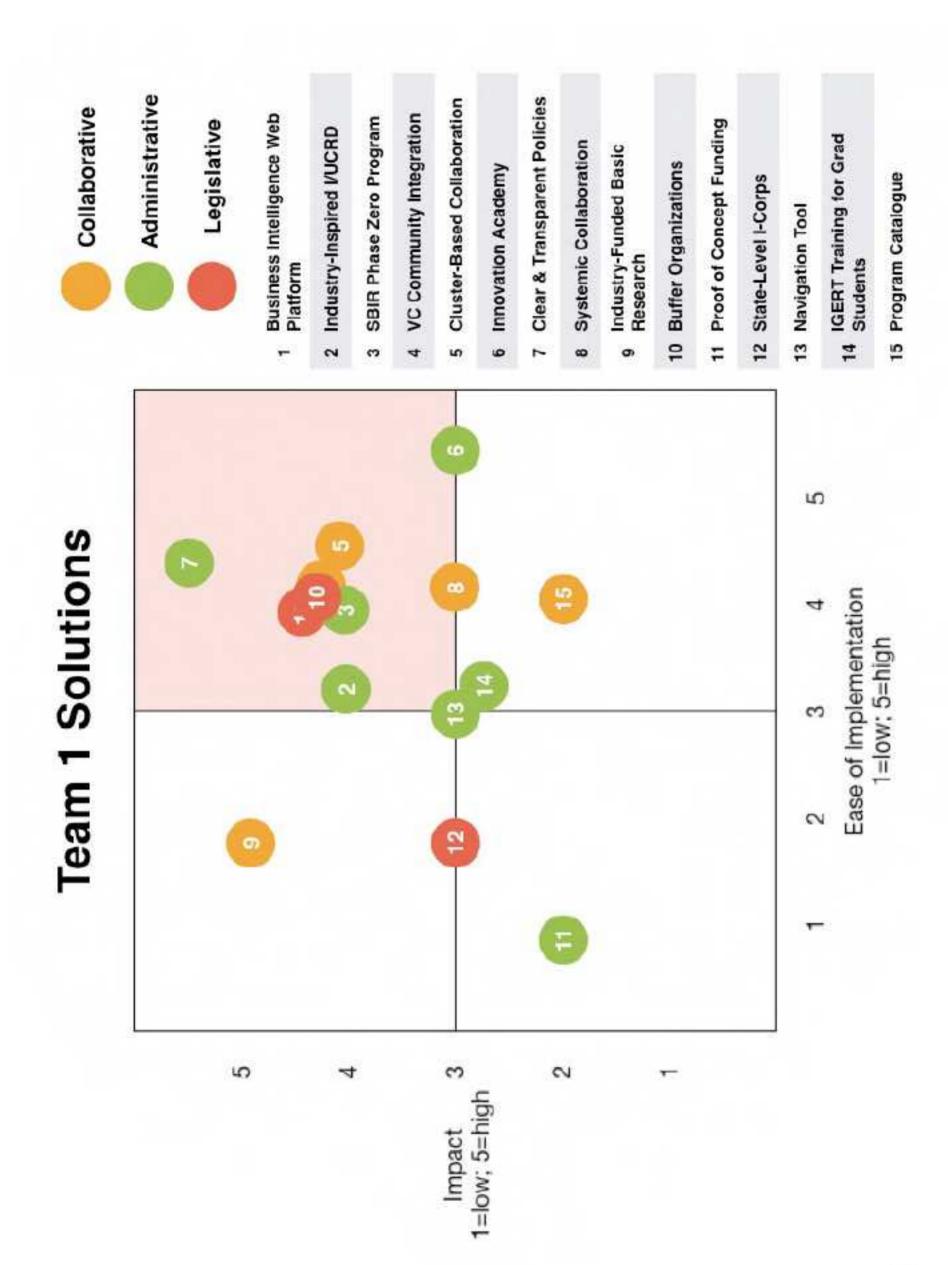


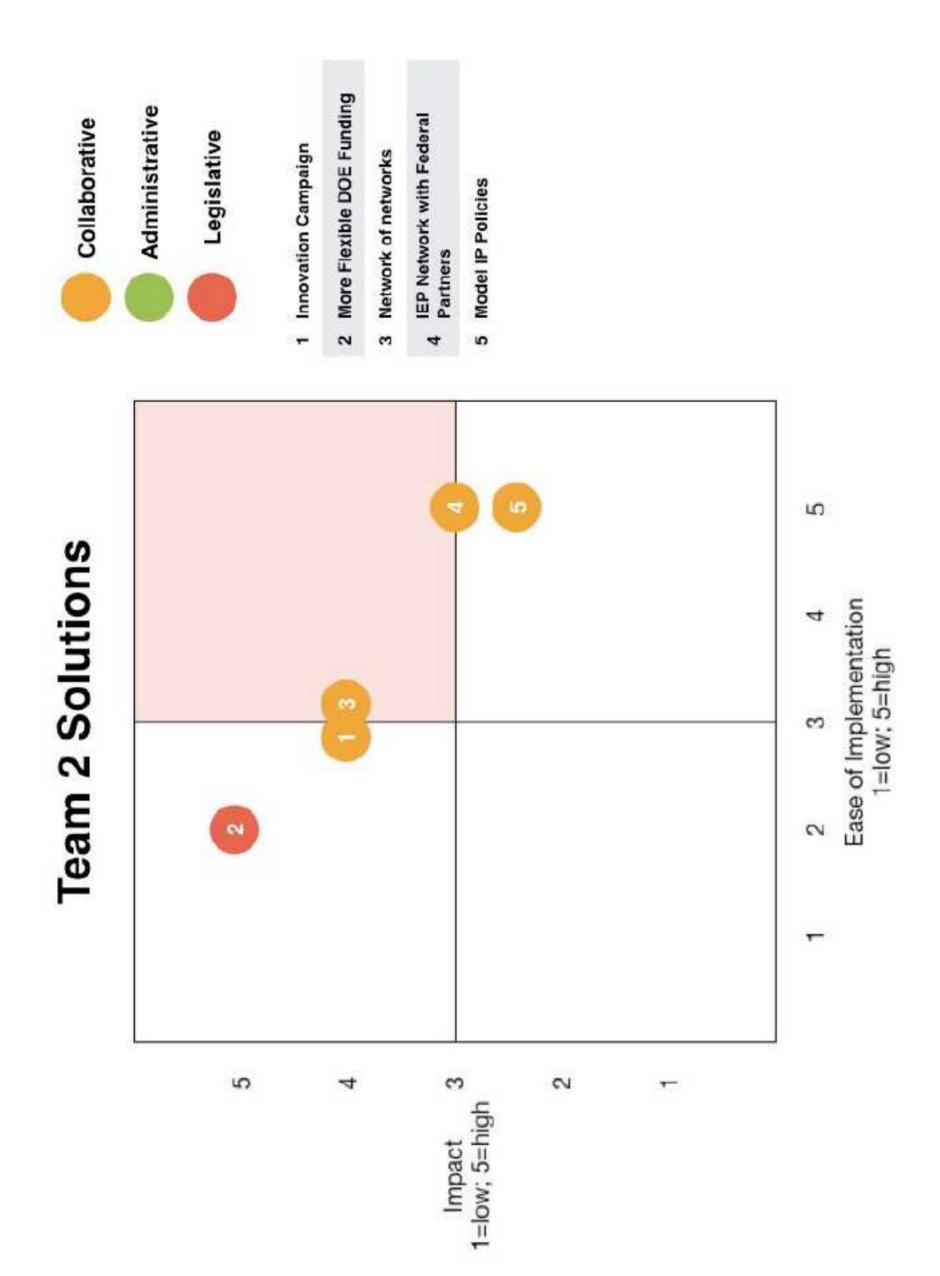
Expansion of Entrepreneur in Residence Expand the role of the Entrepreneurship in Residence program to take advantage of cross-agency possibilities. [A] Impact: 2, Ease: 5.

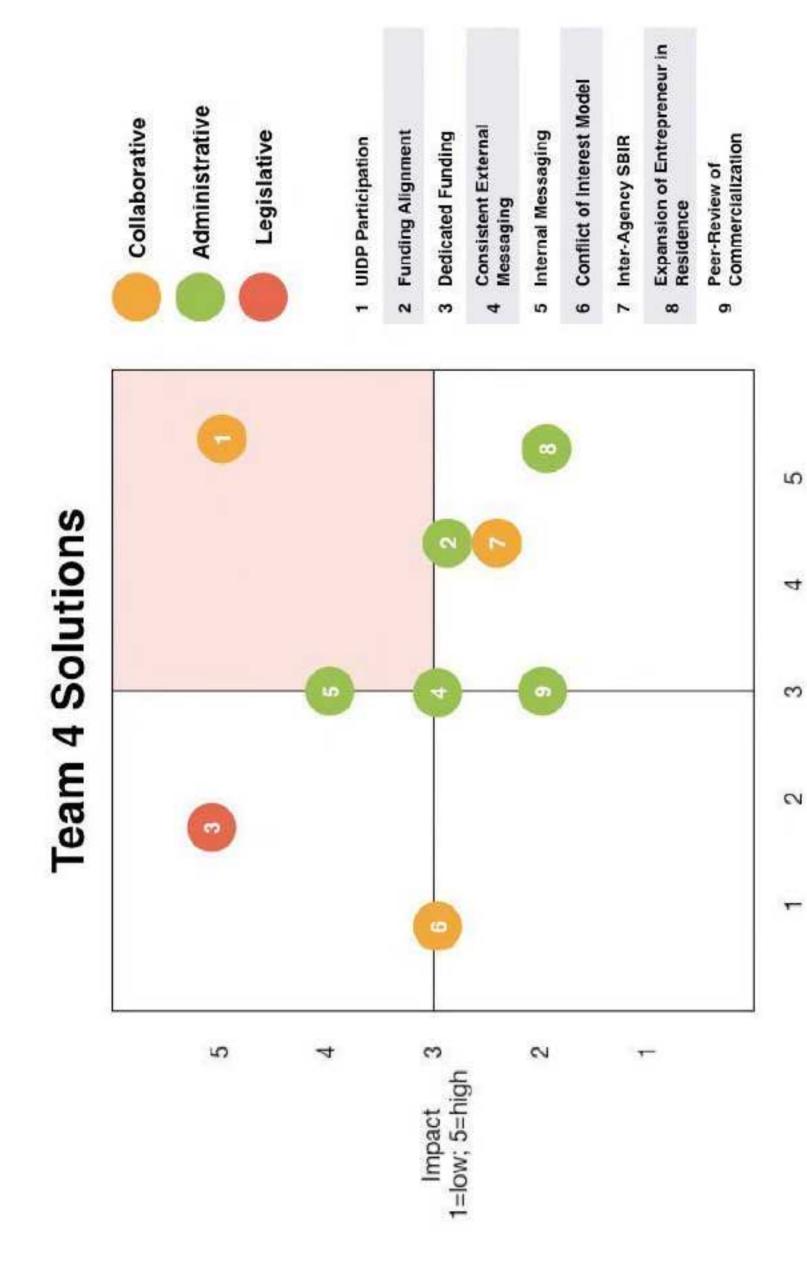
Peer-Review of Commer-cialization

Build into the peer-review process the consideration of commercialization factors (not just SBIR). [A] Impact: 2, Ease: 3.









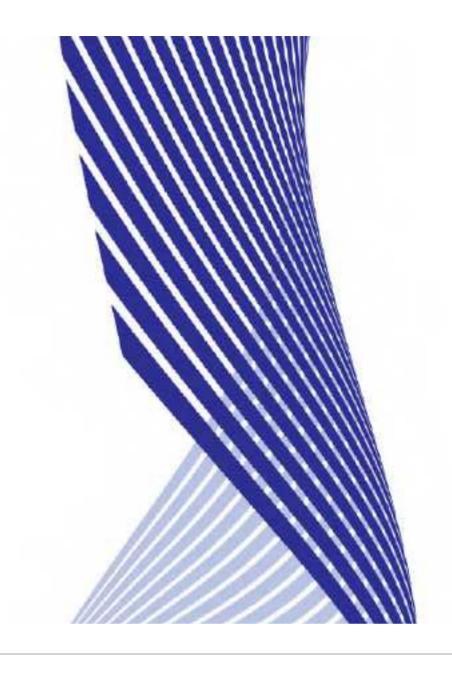
Ease of Implementation

1=low; 5=high

CHAPTER 4

Insights and Next Steps

We started with a simple idea. Rather than convene another workshop on "barriers to commercialization" why not reframe the challenge and introduce some new approaches to designing and guiding platforms, innovation networks, and university ecosystems? This approach generated some useful insights and practical initiatives. The next step involves following up on this work and designing a more ambitious set of experiments.



Here are some insights that emerge from this process.

- University-based ecosystems will be improved through multiple, practical collaborations. A relatively small group of participants generated a large number of practical initiatives that could strengthen the collaborations and speed the flow of resources into innovation. Many of these ideas can be implemented now, in the short term.
- Despite a challenging political and budget environment, there are important, practical steps that can be taken to improve the productivity of federal investment in research and development. Federal agencies and their university partners can design and implement these collaborations themselves, since they draw on assets within their own networks.
- In order to move in this direction, the participants need a common strategic framework, a simple set of rules to design and guide their collaborations. The workshops demonstrated that participants who had never worked together before could learn the simple rules needed to design and guide complex strategies in an open, loosely connected network.
- "doing the doable". As we focus on some relatively big ideas that are relatively easy to do, important "network effects" improve our productivity. First, our networks grow. As they do, we gain access to more resources. We meet new people, and we uncover new assets. Second, focusing on "doing the doable" accelerates our learning. We figure out what works to improve the performance of complex systems. Finally, as

we collectively work together, trust builds. Stronger bonds of trust lead to more effective networks. Our collective skills improve. We can do more complex work together faster.

one beginning and guiding new collaborations to strengthen university innovation ecosystems is likely to be a high leverage investment for the federal government. Convening agile strategy workshops is not expensive. It requires a new approach in our thinking, a new set of collective skills that we can improve through practice, and a disciplined commitment of short bursts of time.

A team from Purdue and Fraunhofer IAO have been building this "innovation ecosystem" approach for the past three years. The team is now collaborating with New Jersey Institute of Technology to pilot this approach in its NJMarketShift initiative, funded by the Department of Defense.

Here are some practical next steps to consider.

- 1. Design a Lab to Market process that builds on the ideas generated from this three workshop pilot. NIST and its university partners could build on the work that has been started. This process would lead to regular workshops in Washington at a time when university representatives are in the city to attend other events.
- 2. Design a series of agile strategy workshops in one Federal Lab Consortium region over the next six months. If results are promising, the process can be replicated and scaled to other regions. Federal research labs and re-

search universities, even those within the same U.S. region, function largely as independent actors rather than as interconnected components within a regional innovation ecosystem. Significant inventories of new technologies exist within the walls of each of these institutions; but currently there is no methodology for regional innovation. There is no systematic, replicable approach to explore how these individual technologies might be linked and leveraged to focus on specific market opportunities and grand challenges.

3. Learn more about the Purdue-Fraunhofer approach to designing and guiding innovation ecosystems in New Jersey. The Purdue Agile Strategy Lab and Fraunhofer IAO have been building this "innovation ecosystem" approach for the past three years. The team is now collaborating with New Jersey Institute of Technology the pilot this approach in its NJMarketShift initia-

tive, funded by the Department of Defense.

4. Conduct training in agile strategy disciplines for professionals in federal agencies. Moving toward the perspective of innovation ecosystems calls on professionals in federal agencies to develop a deeper set of skills to collaborate. These skills can be taught, and the process of teaching is scalable across

an agency. (In a different context, a small team from the DC Department of Employment Services is transforming that agency by teaching Strategic Doing. In months, they have trained 700 employees and launched collaborative initiatives to improve performance in five focus areas.)

Innovation is a discipline, and networks can speed the flow of resources to start-up and innovating companies. These networks can be intentionally designed and guided. But before this approach can be replicated on a broader scale, federal agencies, universities and federal labs will need to substitute old thinking about "barriers" and begin learning how to link and leverage their assets to build new networks. They will need to learn and practice the deeper, collective skills of collaboration.

The good news is that moving down this path is relatively easy and low cost. Importantly, because we are dealing with com-



APPENDIX

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APPENDIX

Participants

The participants in the workshops included:

- · Joseph Allen, Allen Associates
- Amanda Arnold, Arizona State University
- Dorn Carranza, VentureWell
- Duane Dunlap, Purdue University
- Tim Franklin, New Jersey Innovation Institute
- Ann Hammersla, NIH
- Bob Hardy, Council on Government Relations
- · Janet Holston, Arizona State University
- · Rick Huebsch, University of Minnesota
- Scott Hutcheson, Purdue University

- Barry Johnson, National Science Foundation
 - Nicole Kuehl, NIST
- · Wiley Larsen, Arizona State University
- Ed Morrison, Purdue University
- Liz Nilsen, Purdue University
- Kate O'Mara, NIST
- Diane Palmintera, Innovation Associates
- · Angela Phillips Diaz, University of California, San Diego
- Doug Rand, OSTP
- Rebecca Ranich, Quester Corporation
- Fred Rheinhart, AUTM & University of Massachusetts-Amherst
- Carmel Ruffolo, Marquette University
- Don Sebastian, New Jersey Innovation Institute
- Jessica Sebeok, Association of American Universities
- Courtney Silverthorn, NIST
- · Toby Smith, Association of American Universities
- Tony Stanco, National Council of Entrepreneurial Tech Transfer

- Ryan Umstattd, Advanced Research Projects Agency-Energy
- Phil Wellerstein, VentureWell
- Dave Winwood, Pennington Biomedical Research Center
- Jetta Wong, Department of Energy
- Jim Woodell, APLU
- Marc Wynne, OSTP
- Paul Zielinski, NIST

Appendix C-18: NIST





reparing a Phase I Small Business Innovation Research (SBIR) or Small Business Technology Transfer (STTR) proposal can be a formidable task, especially if this is your first attempt. There are many steps involved, as well as potential obstacles that require successful navigation. These include: starting the preparation process early enough; navigating the numerous registrations; developing a commercialization strategy; assembling a winning team with both technical and business expertise; understanding how to develop the required budget; and translating an innovative solution into a compelling work plan.



PHASE 0 ASSISTANCE

To overcome these obstacles, small businesses often need one or more forms of assistance to help prepare their first Phase I SBIR or STTR proposal. Assistance at this pre-proposal stage is most commonly referred to as Phase 0. Phase 0 assistance can take several forms and is offered by various organizations

at the state level. Services vary widely from state to state but most commonly include: grant writing services; purchasing market research reports; assistance with identifying potential partners; and budget preparation and proposal review.

FUNDING & SERVICE SUPPORT

Some Phase 0 programs provide support in the form of preapproved funds to reimburse expenses incurred by the small business in preparation of a federal Phase I SBIR/STTR proposal. Eligible expenses often include hiring grant writers, subject matter experts (SMEs), other consultants, or purchasing market research reports. You must apply for these funds before incurring the expenses. To find out more about these opportunities, contact the relevant organization directly to determine eligibility and the timeframe for the award.

State organizations also provide business services in addition to or instead of funds. These services may include personalized counseling, aid in identifying relevant federal granting agencies and topics, assistance with registration, review of the proposal,





Organizations that offer SBIR/STTR information and assistance include SBDCs, Departments' of Economic Development, PTACs, and universities.

technical review of the innovation, market intelligence, cost proposal and budget assistance, commercialization assistance, assistance with identifying strategic partners, and coaching on licensing and IP issues. The level and combination of services is varied depending on the organization.

ORGANIZATIONS OFFERING SBIR/STTR ASSISTANCE

At last count, 23 states had a formal Phase 0 program. A list of these organizations is included in the Links Tool section of this tutorial. In addition to Phase 0 assistance, most states offer other kinds of information and guidance regarding the SBIR and STTR programs. These organizations include Small Business Development Centers (SBDCs), Departments of Economic Development, Procurement Technical Assistance Centers (PTACs), and universities. For universities, the relevant department can be the Technology Transfer Office, the Research and Economic Development Office, an incubator, or an innovation center. The purpose of this brief course is to introduce you to this network, so that you can determine how to find and leverage the services of a local organization in your area.

DETERMINING WHAT TYPE OF SERVICES ONE NEEDS

However, before deciding which organization to approach for assistance, it is important that you determine what kind of assistance you need. Are you looking for someone to review your business plan or SBIR proposal? Are you looking for a coach to guide you through the process of starting or growing a business? Do you need technical assistance from SMEs? Perhaps further training is required to improve your understanding of government accounting, federal contracts and procurement. You might be looking for a loan or line of credit to bridge a gap or hire an expert.

Once you've determined the types of services you need to start and grow your small business, look for a local organization that can provide the assistance needed. There are a number of URLs in the Links Tool section associated with this tutorial to get you started. We will start with a quick introduction to the network of SBDCs.

SMALL BUSINESS DEVELOPMENT CENTERS

The U.S. Small Business Administration (SBA) designates and supports a nationwide network of SBDCs and Small Business Technology Development Centers (SBTDCs). SBDCs are one of the nation's largest small business assistance programs in the federal government. There are 63 lead SBDCs covering every state and region of the country. Some lead centers cover the entire state, while others are assigned to regions within a state. These lead centers take the responsibility of subcontracting with specific service providers to provide no-cost technical assistance and low-cost training to small businesses within their regions. Dozens of these host networks branch out to more than 900 service delivery points throughout the U.S. and its territories. SBDCs are typically located within universities, community colleges, or longstanding economic development agencies with experience in small business development services. You can easily find an SBDC office near you.

Advisors at the SBDCs and SBTDCs provide entrepreneurs and small business owners a variety of business and technology consulting, training services, and workshops including topics such as: business plan development; manufacturing assistance; financial packaging and lending assistance; pre-venture planning; and many others.

Anyone interested in starting a small business or improving or expanding its services, is eligible for assistance. The SBDCs make special efforts to reach minority members of socially and economically disadvantaged groups, as well as veterans, women, and the disabled. For more information on these efforts please consult SBA's website directly.

Shoals Shift Testimonials

Caitlin Holland, President, Shoals Chamber of Commerce: "The Shoals area is already benefitting from The *Shoals Shift* Movement by heightened interest in establishing new businesses. The Chamber strongly embraces this entrepreneurial and innovative initiative."

Dr. Ken Kitts, President, University of North Alabama: "It is exciting to see our students engaged with business leaders and mentors in the many *Shoals Shift* project initiatives. This project continues to expand the ways in which UNA impacts the economic wealth of the region."

Mary Marshall VanSant, Director of Continuing Education, University of North Alabama: "The Idea Audition has offered people the opportunity to showcase their ideas in a creative and fun environment. It is exciting to see several of the participants launching their own companies and watching their success."

Dr. Doug Barrett, Director, Institute for Innovation and Economic Development: "The *Shoals Shift* project gives our students opportunities to experience real-world learning opportunities that can result in starting their own companies. All of the hundreds of students who participated have added to their future skill-sets as well strengthening their resumes."

Kristin Husainy, COO / Managing Partner, Sycamore Physician Contracting: "I am so grateful for UNA and the programming provided through the *Shoals Shift* initiatives. Participating in Shoals Idea Audition and Shoals Alabama Launchpad has provided the training and opportunities we needed to compete for funding and accelerate the growth of our new business."

Angela Wier, Vice President, Economic Development Partnership of Alabama: "There is a special collaboration going on in the Shoals. The culture of entrepreneurship was why we were so excited when this area signed up first for the regional Alabama Launchpad program."

Giles McDaniel, Executive Director, Shoals Entrepreneurial Center: "Watching the community embrace the *Shoals Shift* movement as a catalyst for Economic Development has made me proud of the role the Shoals Entrepreneurial Center has played in its inception. The collaboration with UNA and the Shoals Chamber of Commerce is successfully building a platform for the community to compete in a digital world."

Nancy Sanford, Director, Florence Lauderdale Public Library: "As a lifelong Shoals resident, I have witnessed the transformative powers that the *Shoals Shift* movement has offered to our area. The Collaboratory at the Library is pleased to be a part of this exciting initiative."

Wes Wages, Armosa Studios: "Shoals Shift has been an encouraging movement for our business that pushes us to new levels in digital technology."

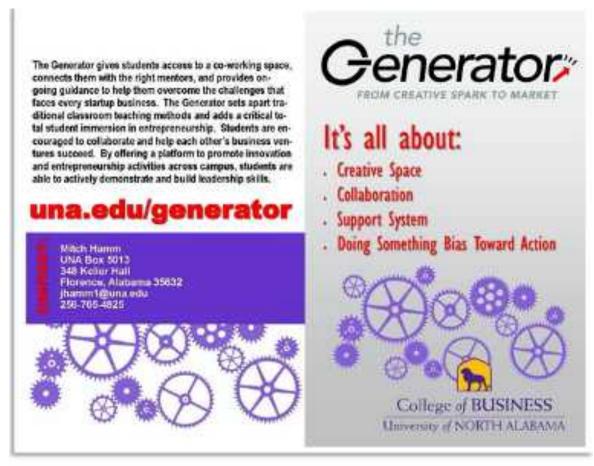
Dr. Gregory Carnes, Dean, College of Business, University of North Alabama: "Our job as educators is to offer opportunities for students to explore their interests, engage their imaginations, and learn how they can contribute to our community and broader society. As the *Shoals Shift* partnership has gained steam, we've had to push ourselves to keep pace with student demand. We're finding out how innovative a college of business can be and

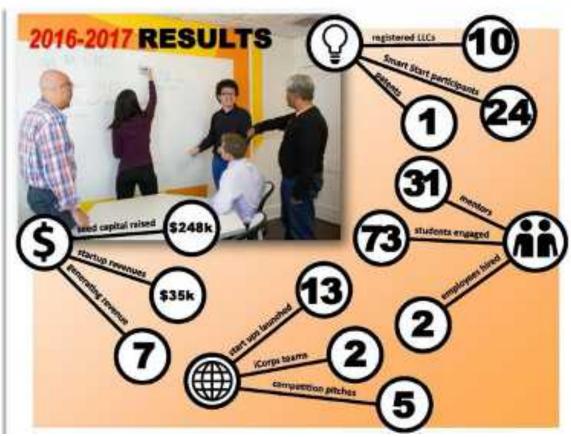
Appendix C-19: Shoals Shift

what that looks like in the 21st Century. It's been an exciting experiment thus far, and we're all looking forward to what we can become."









UNIVERSITY OF NORTH ALABAMA COLLEGE OF BUSINESS **NEWSLETTER** | MARCH 2017



Dr. Greg Carnes, Dean Raburn Eminent Scholar of Accounting

COB WINS UEDA AWARD FOR INNOVATION AND TALENT

of Business keeps racking up the acco- ics and Finance at UNA, Dr. Doug Barrett, lades, with the most recent being a Uni- said the award speaks to the magnitude versity Economic Development Associa- of the collaborative innovation and ecotion (UEDA) 2016 Award of Excellence nomic development efforts taking place for Innovation and Talent.

UNA's Shoals Shift, developed in the Col- The UEDA awards are designed to help lege of Business, beat out a record num- accelerate these programs by recognizber of applicants for the top spot at the ing cutting edge initiatives, and to pro-UEDA's Annual Summit, which took mote their adoption by other universiplace Oct. 16-19, in Roanoke, Virgin- ties and communities. Program categoia. Award recipients were selected by a ries include: Innovation, Talent, and panel of peers consisting of university Place, as well as the intersections of and economic development profession- these three categories. als.

The University of North Alabama College The Chair of the Department of Economin the Shoals.



POWERED BY ENGINEERING

FEBRUARY 23, 24, AND 25, 2018



THE COMMONS



SMART START WEEKEND is a 72-hour learn-by-doing campus workshop that teaches entrepreneurial skills to students in an extreme hands-on environment. The idea is simple: start a company over the course of three days.

INFORMATION & REGISTRATION:

www.una.edu/smartstartweekend

PARTIALLY FUNDED BY A GRANT FROM THE APPALACHIAN REGIONAL COMMISSION













Strategic Doing Certification Course

University of North Alabama April 18, 19, & 20, 2018 Florence, AL

Take part in three days of engaged learning and join an active, national network of Strategic Doing practitioners

This course will help you design and implement agile strategies using Strategic Doing—an adaptable process that uses lean principles to rapidly build complex collaborations and leverage them to move toward measurable outcomes.

Expand your ability to lead collaborations

- explain this new approach to strange
- discover what works and expand upon it
- design and lead Strategic Doing workshops
- create and guide sophisticated collaborations
- find new opportunities and quickly take action.
- lead strategies without "command and control"

You can take this coorse as standalone endeavor or as a stepping stone toward certification. Certification in Strangic Duing insulves classroom inseraction as well as field work with coaching from Strategic Duing faculty.



The cost for the two options is:

- Practitioner Training Certification: \$1575
- Practitioner Training: \$1275

For more information, contact:

Janyce Fadden Mary-Marshall VanSant fladden@una.edu mmvansant@una.edu (256) 765-4413 (256) 765-4184 https://www.una.edu/atrategicdoing/

Strategic Doing 301: Leading Complex Collaborations

April 18 (6 h 100 pm - April 20 (6 x 2 100 pm

Appendix C-20: Kauffman Foundation

August 25, 2020

Sorenson Impact Foundation 2755 E Cottonwood Pkwy, Suite 500 Salt Lake City, UT 8412

Andy Stoll
Ewing Marion Kauffman Foundation
4801 Rockhill Road
Kansas City, MO 64110
astoll@kauffman.org

To Whom It May Concern:

I am writing this letter of support for Ed Morrison and the Agile Strategy Lab at the University of Northern Alabama for their application to the Equitable & Resilient Recovery Grant Program.

Ed and his team have worked closely with the Ecosystem Development team here at the Kauffman Foundation over the last year to help train and guide us in the use of Strategic Doing. We've used those new skills within a few programs we are implementing to build more robust and inclusive entrepreneurial ecosystems.

Our Ecosystem Development strategy is focused on accelerating entrepreneurial ecosystem building as a key aspect of economic, community and entrepreneurial development in the 21st century. Like you, we deeply believe that this emerging practice must center on the values of diversity, equity and inclusion, if we are to build a more just, inclusive and vibrant economy, where all citizens are able to thrive.

I have spent the last 15 years of my career — including four years at the Kauffman Foundation — exploring and trying to better understand how we build more inclusive entrepreneurial ecosystems that can unlock local entrepreneurial talent in all people. The Strategic Doing methodology is so far the most clearly articulated ecosystem building process that I have found to date. The most important aspect it addresses is the need for complex collaboration across an entire community in order to increase entrepreneurial starts and successes. Ecosystem building can not be done without many players in the system working together in new and collaborative ways. Ed and his team have spent more than a decade now developing a curriculum to teach that process, and have refined it over the years to make it even more effective.

In addition to the Strategic Doing methodology, I have reviewed the Agile's Strategy Lab's framework that outlines the key elements of an entrepreneurial ecosystem and a process to better understand where interventions are needed to fortify and strengthen that system. I must say, I am impressed by its simplicity yet how it also captures many complex and nuanced aspects of how communities work and what factors and interventions fuel ecosystem development. After working alongside Ed over the last

Appendix C-20: Kauffman Foundation

year, it is clear to me that his thinking on entrepreneurial ecosystem building has been forged from decades of direct work in communities, which has allowed him to develop a near sixth sense and wisdom on what needs to be done and how.

The Agile Strategy Lab's Strategic Doing methodology combined with their frameworks on entrepreneurial ecosystem development make them one of the leading pioneers in the emerging practice of entrepreneurial ecosystem building. I believe ecosystem building, done with diversity, equity and inclusion as core value #1, is the best opportunity and most effective way to empower entrepreneurs in underserved and underrepresented communities at scale.

The Agile Strategy Lab's methodologies and approaches, combined with the right on the ground leaders in your targeted communities, have high potential for high impact towards the outcomes you've outlined for this grant program.

For those reasons and more, I am happy to provide this letter of support. If you have questions or would like to speak more on what I've shared, please do not hesitate to reach out if I can be of further assistance. Best of luck with this program and thank you for all you do every day to help entrepreneurs.

Sincerely,

Andy Stoll

Sehior Program Officer, Ecosystem Development

Entrepreneurship Department

Ewing Marion Kauffman Foundation

astoll@kauffman.org

816.932.1133 (office)