

# EcosystemDNA: Developing an Entrepreneurial Ecosystem with a Portfolio

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Effective ecosystem builders work like jazz musicians. They learn to improvise within a framework that both balances constraints with the freedom to explore and experiment. Ernest Andrade provides a model.

**“Ev'ry step you do leads to something new.”**

**Y**ou may not know the lyric; but you'll likely know the tune. The song is “Charleston” written and composed by James Price Johnson in 1923. If you don't know the tune, you've almost certainly seen the dance. Long before Spotify and TicTok, the song and the dance went viral. The school-dance scene in the holiday classic “It's a Wonderful Life” features Jimmy Stewart and Donna Reed dancing the Charleston as they fall backward into a swimming pool underneath a retracting gymnasium floor.

“Charleston” is considered “ragtime,” a genre that sits at the intersection of the music that came before it – the honky-tonk tunes played in the bars and salons all across the south in the late 19<sup>th</sup> Century, and the music that would follow – American jazz. Johnson counts among the ranks as an early pioneer of American jazz.

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Over the last 150 years, Charleston, South Carolina has continued to serve as muse to songwriters and composers. It's a place with a remarkable musical legacy. Charleston Jazz Initiative lead researcher Jack McCray writes, "For Charleston, jazz is just like the distinctive taste of okra soup, the plaintive cries of the early-20th-century street vendors, and the meticulous artistry of sweetgrass baskets. The trail of this soulful music leads back to the port city, one of the birthplaces of American jazz."

Jazz's influence is still strong in Charleston. Every night of the week one can stroll down King Street and hear music spilling out into the street from a number of venues. The city hosts several jazz festivals and events each year. You can't easily separate the music from the place. The features that make jazz unique are some of the same features that have made Charleston unique. It makes sense to pause a moment and reflect on that point.

Moira E. McLaughlin, in a 2012 Washington Post article, noted that "Jazz has all the elements that other music has: It has melody; that's the tune of the song, the part you're most likely to remember. It has harmony, the notes that make the melody sound fuller. It has rhythm, which is the heartbeat of the song. But what sets jazz apart is this cool thing called improvisation."

McLaughlin continues, "It's not that jazz songs don't have recognizable melodies. They do, but that's just a small part of it. In jazz, a melody begins a song, but then each musician will take turns improvising, playing all kinds of crazy notes: high, low, long, short, gravelly and clear. The performers who are not soloing are playing quietly in the background, or comping, short for accompanying. Then at the end of the song, the melody returns. Improvising is what makes a jazz song different every time you hear it, unlike any pop song you hear on the radio."

## ***Ev'ry step you do leads to something new.***

As ecosystem builders there are lots of lessons we can learn from jazz in general and from Charleston, specifically. This practice brief will explore

some of those lessons. It will also provide a helpful framework ecosystem builders can use to apply these learnings.

## **The Portfolio Approach: A Practitioner's Model**

Ecosystems fascinate scholars. New publications about ecosystems are skyrocketing. Yet, when it comes to understanding ecosystems and how they form, scholars can quickly get wrapped around the axle. A practitioner perspective is more helpful.

The portfolio approach to ecosystem building is a practitioner's model developed over the past 30 years. These ideas began forming in Oklahoma City in 1993. Leaders in Oklahoma City were trying to come up with a business-led strategy to transform their economy. This was happening at a time when Oklahoma City had been languishing for over a decade, battered by low oil prices and a banking collapse. The leadership had given up on the idea that one project — a big manufacturing plant, for example — would lead to transformation. Instead, they began working from with a different assumption. Their strategy needed to consist of a balanced portfolio of initiatives.

But what type of investments? In the 1980s, many industries were globalizing and in a global economy, brainpower is the only unique asset in any region. It all starts there. The portfolio approach begins there, discovering what research, technologies, and capabilities are unique to geographic area — a community or economic region, region.

By the early 1990s — the dawn of the Internet — it became clear that networks and our ability to design and guide them would be critical to creating wealth. Prosperity would emerge from open networks and “link and leverage” strategies. The leaders in Oklahoma City also learned that both individuals and organizations are mobile. They can locate anywhere. If they were going to make Oklahoma City “sticky”, they needed quality, connected places to attract and hold people.

Equally important, to guide people to a more promising future, they would need to change the prevailing narrative in Oklahoma City. They needed to

point to opportunities, rather lament their problems. Finally, they needed a new discipline of collaboration to focus and align all of these initiatives. Oklahoma City is where Strategic Doing began. began.

By 2001, it was clear this model worked. The next application of the portfolio approach was in Charleston where a city employee, Ernest Andrade, used it to design the Charleston Digital Corridor. In monthly meetings with Ed Morrison, Ernest sat down and learned the lessons of Oklahoma City's portfolio strategy to building a vibrant economy.

The portfolio approach is represented by a simple but powerful model that includes four quadrants: (1) Brainpower, (2) Open Networks, (3) Quality Connected Places, and (4) Opportunity Narratives. To foster activity that occurs within each of these quadrants the ecosystem builder will play different roles. They may be a curator of brainpower, a connector of open networks, a cultivator of quality connected places, and a chronicler of opportunity narratives.

## **Brainpower: Talent + Technology**

Back in 2001, when Ernest Andrade began to conceptualize what a Charleston Digital Corridor might look like, he knew that it would all start with "brainpower." According to Andrade, "Cheap land, financial incentives and low-cost labor were the economic drivers for yesterday's economy. Progressive American cities seeking to diversify into an innovation economy, must recognize that skilled talent is the currency for the 21st century."

Charleston, however, does not have many of the historic and institutional assets one thinks of as traditional sources of talent and brainpower. For instance, research universities are often valuable sources of both talented people and new technologies. Charleston didn't have a research university. Still doesn't. Historically, the Charleston economy had been built on maritime trade and later tourism.

Ernest knew, however, there was 21st century "brainpower" out there, even if it wasn't evident. So, what did he do? He started creating opportunities to bring that talent to the surface. Ernest began hosting regular forums. These

forums were an ongoing, open conversation about the future of Charleston, what a “digital corridor” might look like.

### ***CURATING BRAINPOWER: FROM THEORY TO PRACTICE***

Strategic Doing practitioners understand that the successful innovation, change, and strategic transformation efforts must be asset-based. Building on what you have, is nearly always a better bet than focusing on what you lack. The same is true when it comes to the brainpower that can fuel economic growth. One of the most valuable lessons from Charleston is the idea of the “forum.” Creating these opportunities for people to come together. These forums are not a numbers game. They are, rather, a consistency game. Some practitioners who have experimented with these kinds of forums, have seen only 2-3 people show up. That can be discouraging, of course. But, what if it’s the right two or three people?

In one rural community, at a community forum, a soccer mom and a soccer dad met and shared their experiences coaching their little ones in soccer. They lamented that there were few resources available to help volunteer coaches. One conversation led to another, and soon an idea of a coaching app was born. Both had day jobs, one in IT at a local manufacturing facility and the other in marketing at a hospital. They may have never found one another if not for those forums.

Strategic Doing practitioners interested in surfacing brainpower through forms should apply the first two rules of Strategic Doing. First, assure that these forums are a safe space for deep focused conversations. Second, use an appreciative question to frame the conversations at these forums. A question like, “Imagine Charleston, S.C. as a hub for digital technology. What would that look like?” It a simple question, but a powerful question, one that may surface a whole different set of assets than a “listening session” on downtown parking, for instance.

It didn’t take long for 21st Century talent to surface. One of Earnest’s next steps was to create a talent portal - a locally curated showcase of tech companies, jobs and talent in the area. The portal, recently rebranded as “CharlestonWorks,” continues to help those with talent and those looking for talent to find one another.

CharlestonWorks now focuses on the following seven industry categories - aerospace, biomedical, creative, defense, software, tech products, and tech services. A more recent brainpower-related initiative is the Charleston Digital Corridor University (CDCu). The CDCu offers a series of business and technical seminars, workshops, and talks presented by business experts and successful entrepreneurs in the Charleston region.

## **Open Networks: Speeding the Flow of Resources**

Curating brainpower is one thing, but forming new open networks is another. The power of the kind of forums hosted by the Charleston Digital Corridor was in the new value created by the “structured serendipity” that occurred. Those who have studied places like Silicon Valley recognize the value of the “knowledge spillover” that occurs on geographic areas densely populated by talent. In the 1960s, with the presence of Stanford University in the region and a handful of large companies well-funded by the U.S. Department of Defense, you couldn’t stand in line at the grocery store without bumping into computer scientists and engineers.

As webs of formal and informal relationship began to form, knowledge spillover began to occur. People learned quickly...together. That sort of serendipity is harder to duplicate in most communities, including Charleston. So, practitioners like Andrade need to create structured serendipity. As these networks form, they serve an important function for the ecosystem: they speed energy and resources to promising ideas.

Andrade used forums to help people find one another. For example, when Daniel Dechert moved his bioscience business from Los Angeles to Charleston, the Charleston Digital Corridor to help him make the connections he would need to grow his business.

Ernest is a relentless connector, weaving open networks in which the network members co-create shared value together. Why is this important? For lots of reasons, but one reason is especially worth noting. Open networks are resilient. They are resilient in a way that hierarchies are not. Information travels fast in a network. In densely connected networks if one

node goes offline there is lots of redundancy to keep the network up and running. Networks self-organize and evolve over time.

Valdis Krebs and June Holley, help us understand the four stages of open-network formation in their publication, “Building Smart Communities through Network Weaving.” The stages are (1) scattered fragments, (2) single hub and spoke, (3) multiple hubs and spokes, and (4) core and periphery.

- **Scattered Fragments.** Krebs and Holley point out that without an active leader (like Andrade) who takes responsibility for building a network, spontaneous connections between groups emerge very slowly, or not at all. Instead of allowing these fragments to drift in the hope of making a lucky connection, the weaver actively creates new interactions between them. The network weaver now becomes a hub.
- **Single Hub and Spokes.** The network builder, now serving as a hub, likely has the vision, the energy, and the skills needed to connect directly to the individuals and groups in the network. The network builder also serves as a conduit that starts information flowing to and from the various members. The network builder often has external links outside of the community. This allows them to bring in new information and fresh ideas. Krebs and Holley contend that this is a critical phase because everything depends on the network builder who is the hub in the network.
- **Multiple Hubs.** The next step in network building is to strengthen loose ties in the network so they become strong ties. Krebs and Holley warn that this can only happen after “turf issues” have been handled. They note that a multi-hub network may be difficult to achieve if issues of politics and power are raging through the network. For instance, if two or more entrepreneurship support organizations in the same community start battling over turf and control of the entrepreneurship-related agenda, then the result may be two or more competing, single hub networks that ignore the larger community needs and just focus on survival of their own network.
- **Core and Periphery.** The most resilient and sustainable network is one with a solid core and porous periphery. This type of network emerges after many years of network building through the efforts of multiple hubs.

## ***CONNECTING OPEN NETWORKS: FROM THEORY TO PRACTICE***

A Strategic Doing practitioner can draw from rules three and four to become a skilled connector of open networks. A network is made up people and people have assets. Rule three of Strategic Doing is uncover hidden assets people are willing to share. Whether it is conversations at a forum or chats at the local farmers market, the skilled practitioner is surfacing assets. Discussions about assets represent a sort of “trick,” if you will. When an asset gets identified it becomes a tangible representation of someone’s otherwise hidden assets. Returning to the story of the soccer parents, their obvious “assets” were evident in the positions they held at work – IT in manufacturing, marketing at a hospital. It was only through deeper conversation was the asset of “experience as a volunteer soccer coach” emerge.

The conversation could have stopped there. Instead, the practitioner applied rule four of Strategic Doing – link and leverage your assets to create new strategic opportunities. When the two were asked to consider what combining frustration soccer coaches + It experience + marketing expertise an idea emerged – “we could design and develop a coaching app!”

Here’s another technique for building networks: closing triangles. Several Strategic Doing practitioners build purposeful networking into all of their events. Here’s how that can work. Let’s say there is a break coming up in a meeting of some sorts. The practitioner announces something like this, “during the break, have a conversation with someone and find one thing you have in common. Then decide on a follow-up activity related to your common interest.”

Then after the break, the practitioner will ask a few people to share about the connection they made and the follow-up activity to which they’ve agreed. One example is of two people who met and discovered that one collected antique photographs and another collected antique photo frames. Their follow-up activity was to get together for coffee to talk about how they might put some of the photos on frames and sell online.



Krebs and Holly offer that this is a stable structure that can link to other well-developed networks outside the community. The network core contains the key community members who have developed strong ties among themselves. The periphery of this network contains three groups of nodes: (1) those new to the community and working to get to the core, (2) bridges to diverse communities elsewhere, and (3) unique resources that operate outside of the community.

## **Quality Connected Places: Spaces for Knowledge to Grow**

Even in an age when more and more people work from home, place still matters. People and business can't thrive in a dump. At first, the Charleston Digital Corridor was just a concept. It quickly, however, became a quality connected place. Today, it is a collection of quality connected places. One of the lessons here is that when it comes to place, form should follow function. "Building a building was not the first project undertaken at the Charleston Digital Corridor. Andrade focused first on building relationships – surfacing the brainpower, connecting that brainpower in open networks. Then, with better understanding of what infrastructure would be needed to accelerate value creation, start investing in place.

Before building their own facilities, the Charleston Digital Corridor leadership continued their asset-based approach by asking, what infrastructure already exists that they could leverage. One of their first space-based initiatives was Corridor Properties an online user-friendly inventory of available space. Next, was "Touchdown Space" where people could pop in to conduct a meeting or rent an office to begin growing their business. Then in 2009 Flagship came online, a 5,100 square foot facility in downtown Charleston, focused on tech and life science. The hub of the Charleston Digital Corridor today is Flagship – WestEdge and Flagship at Charleston Tech Center with a combined available space of 23,000 square feet of space. These facilities are truly quality connected places and hubs for technology-related companies.

## ***CULTIVATING QUALITY CONNECTED PLACES: FROM THEORY TO PRACTICE***

Twenty-five years ago, two scholars helped us explain a quality, connected place. They introduced the Japanese concept of "ba" (Nonaka, I., & Konno, N. , 1998. The concept of "Ba": Building a foundation for knowledge creation. California Management Review, 40(3), 40-54). You can think of ba as a shared space for emerging relationships. It's more than a physical space. So, for example, we can create the space for emerging relationships online, as we've learned from the pandemic. Ba is also a mental space, a space in which we can transcend our limited perspectives or boundaries.

Ba is similar to a "third place", a term coined by sociologist Ray Oldenburg. The "third place" refers to places where people spend time between home (a 'first' place) and work (a 'second' place). In third places within our communities, people exchange ideas, have a good time, and build relationships. But the idea of ba goes further. The key concept to understanding ba is interaction. It's a "psychologically safe" place in which we can have deep, focused conversations. We can generate knowledge with each other. Strategic Doing teaches us that these conversations have a hidden structure. Through them, we discover hidden assets and link them to form new opportunities. We innovate.

Of course, in building entrepreneurial ecosystems, we often think of incubators and accelerators as safe spaces. And they can be. The transformation of Youngstown began at the Youngstown Business Incubator downtown. What if you don't have a space? Then you need to ask. Community college and university campuses are often good places to start. But be open to the unexpected. In Ascension Parish, Louisiana, for example, we learned that people would meet in volunteer fire departments and church basements. Both are unlikely spaces to start an economic transformation.

Recall, though, that ba is not just a physical space. It's place for interaction. So, ecosystem builders need to program the space with regular events. By bringing people together regularly, ecosystem builders make invisible networks visible. They then can strengthen the networks that make up the ecosystem. The good news is that these events are inexpensive and engaging. In the Charleston Digital Corridor, we started with "Fridays at the Corridor", a regular gathering to explore some dimension of Charleston's emerging digital hub.

At Case Western Reserve University, we created "Tuesdays@REI". Here we started to shape new opportunity narratives for a region stuck in patterns of dysfunctional civic behavior. Young professionals in Youngstown launched "Thinkers and Drinkers". They met at a different bar every month to explore future paths for their city. In Lafayette, Indiana, we started with conversations on the second floor of a downtown bar. We ended up creating a co-working space, The Matchbox, in an old storage building owned by the public library (<https://mbx.studio>).

## **Opportunity Narratives: Creating Maps and Coherence**

In his book, *The Journey Beyond Fear* (McGraw Hill, 2021), John Hagel captures the idea of opportunity narratives. Unlike stories, which are self-contained and focus on the past, opportunity narratives are open and focused on the future. They invite us on a journey.

Opportunity narratives are important for ecosystem builders for a simple reason. They provide coherence. In the complexity of today's economy, traditional vision statements are virtually worthless. Our challenge involves providing a sense of coherence and direction. With a sense of coherence, we can overcome paralyzing fear. By looking into the future, opportunity narratives engage our positive emotions. We start to visualize what could be and what we could do to move on that direction. An opportunity narrative brings forth a call to action to move toward a future that we can't quite see yet.

Opportunity narratives provide two important functions for ecosystem building. First, they help us surface hidden networks in our communities. Developing an entrepreneurial ecosystem is not rocket science. It's harder. The challenge is more like molecular biology. We are trying to uncover and understand networks that we can't see. Like a watering hole in a desert, an opportunity narrative draws people together.

As people engage in deeper conversations around this narrative, they reveal their hidden assets. And as we link, leverage, and align these assets new opportunities emerge. The process of Strategic Doing is organized around these ideas. The Framing Question in a Strategic Doing workshop presents an opportunity narrative in the form of a question to explore. The workshop then guides deeper conversations and develops a strategic action plan to pursue the most promising opportunities.

Opportunity narratives provide a second important function. They engage our emotions. By drawing a picture of what could be, an opportunity narrative triggers future thinking, a process psychologists call prospecting. As we picture of the future in our mind, we generate the positive emotions that provide the energy for us to act.

In 2001, when Ernest Andrade began his journey to develop the Charleston Digital Corridor, few in Charleston could imagine the future he saw. The city, steeped in history, focused mostly on events designed to stimulate tourism. The regional economy, shocked by the closure of a Navy base, followed the well-worn path of other Southern regions. They launched recruiting campaigns trying to snag new manufacturing plants.

Ernest saw a different future for his city. To get access to the resources he needed to develop his ecosystem, Ernest face the challenge: convincing others to see the future that he envisioned. In sum, he needed an opportunity narrative. He used his opportunity narrative to identify like minded people. Who else could see Charleston's future as an innovation hub for digital businesses? Ernest conducted regular monthly forums, Fridays at the Corridor, to begin shaping his opportunity narrative and attracting allies.

## ***CURATING OPPORTUNITY NARRATIVES: FROM THEORY TO PRACTICE***

In a 2003 article in the magazine *The Economist*, novelist William Gibson came up with a “go to” quote: “The future is already here, it's just not evenly distributed.” True enough. In every community there are people thinking about the future. They have initiatives underway that are often unrecognized, disconnected, operating in the shadows. Ecosystem builders can draft an opportunity narrative from the emerging pattern of these activities.

The small town of Medora, Indiana, used an opportunity narrative to convert the hobby of one software engineer into the National Maple Syrup Festival. Sam White, a research professor at the University of Wisconsin-Milwaukee, saw a pattern in the regional economic data, a cluster of companies engaged in fresh water technologies. With a small team, he converted that pattern into an opportunity narrative that to help transform Milwaukee's economy. He started with a Strategic Doing workshop in 2008. Fast forward and now Milwaukee stands out as a global innovation hub for fresh water technology.

The opportunity narrative that sparked Oklahoma City's transformation beginning in the 1990s started with a simple question: What would it look like if Oklahoma City were as cool as Dallas for our young people? In the beginning the question sounded farfetched.

The downtown was a deadline at night. Often, the one downtown hotel had only a handful of guests. Civic leaders designed two strategies to move on their opportunity. The mayor, representing the public sector, led one (MAPS), and the chamber of commerce, representing the private sector, led the other (Forward Oklahoma City). By 2010, commentators were seeing Oklahoma City as a model for economic transformation. The city has emerged as a widely recognized entrepreneurial hot spot.

Ernest Andrade followed the same path. He detected an emerging pattern of digital companies locating in Charleston. Out of that early pattern he crafted an opportunity narrative for the Charleston Digital Corridor. You can see how he put that narrative into practice in this video (<https://youtu.be/QCVyEWqNR4A>). He built this narrative around the portfolio of initiatives that he started beginning in 2001. The portfolio follows this practice brief.

## **Jazz Improvisation and Building Ecosystems**

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Jazz improvisation emerges from flexible structures. There are just enough constraints, just enough structure to encourage coordination and maximize diversity. As Frank Barrett, leadership scholar and jazz musician, puts it, jazz creates the conditions for guided autonomy. A jazz band avoids getting weighted down with fruitless rules. Instead, they give people freedom to experiment and respond to hunches. They relentlessly encourage exploration and experimentation.

Ernest Andrade took the structure that emerged from Oklahoma City's transformation, and he improvised. The Oklahoma City experience provided him with a theory of change and enough practical constraints to enable him to improvise. Like a good jazz musician, he jumped in and took action. He created a portfolio of initiatives in four areas: brainpower, open networks, quality places, and opportunity narratives. As he created these initiatives, networks formed and people interacted. The ecosystem grew and developed.

Entrepreneurial ecosystems are emergent. As Barrett suggests to us, these complex systems emerge from the relentless pursuit of learning, disciplined imagination, and continuous experimentation. For decades, economic developers assumed that success would follow corporate planning models: gathering data, analyzing, deciding, and controlling. Because they were often unsure of themselves, developers often hired outside consultants to guide the process. But this approach doesn't work very well. While consultants can offer strategic insights, they cannot implement a strategy. Why? Because they lack the implicit knowledge -- the knowledge of networks -- on which successful implementation relies.

There's a better way: Improvisation guided by a portfolio model. We call it EcosystemDNA.

## **Dig Deeper into EcosystemDNA**

When we talk about EcosystemDNA, we are referring to the portfolio model introduced in this Practice Brief. We power the development of ecosystems using Strategic Doing. That's an open-source protocol of simple rules to develop complex collaborations quickly and move them toward measurable outcomes. We are currently developing an online course, so ecosystem builders can learn and practice these skills.

The figures below will explain different dimensions of the model. They make the following key points:

1. Ecosystems form on platforms that exist outside the boundaries of any one organization.
2. Ecosystem builders design and guide activities on these platforms. The ecosystem emerges from these activities. (Strictly speaking, ecosystem builders do not build ecosystems. They build the platforms on which ecosystems grow.)
3. Much of this work is experiments and improvisational. It involves making connections that hold the possibility of creating new value through collaboration. Scholars call this process effectuation or recombinant innovation. The ecosystem builder acts as a guide so that participants on the platform can create new, shared value.

4. Strategic Doing provides an open-source operating system that accelerates the formation of these collaborations.
5. To develop an ecosystem, focus on developing collaborations in four strategic focus areas: brainpower, open networks, quality connected places, and opportunity narratives.
6. Start by mapping out activities that are currently taking place within each quadrant. Recognize that each activity represents a network. Also recognize that there is no such thing as a complete map. Just start.
7. Next start exploring connections among these networks. Where possible, strengthen them with simple e-mail introductions or longer conversations.
8. Conduct regular forums to test ideas about how these networks could be more linked, leveraged, and aligned. Use a framing question (Strategic Doing Rule #2) to attract people to the conversation.
9. If you come across someone who is doing exceptional work — but largely unnoticed — create a forum or an event. That will help you surface the “adjacent possible”: other people who are interested and may provide resources.

Figure 1

As Ed Morrison taught Ernest Andrade the lessons of Oklahoma City, he used a simple quadrant map to emphasize the importance of building a portfolio.

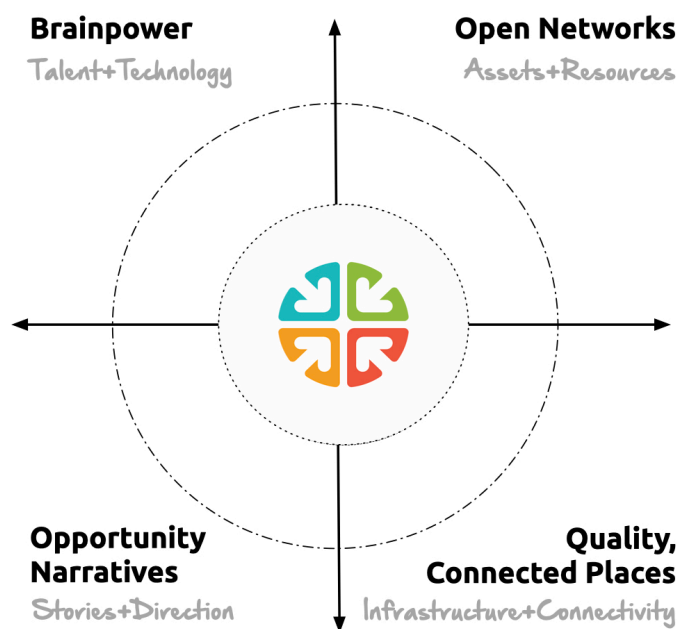




Figure 2

You can start understanding your ecosystem by mapping activities that are already taking place. Position them as best you can. Many activities overlap.

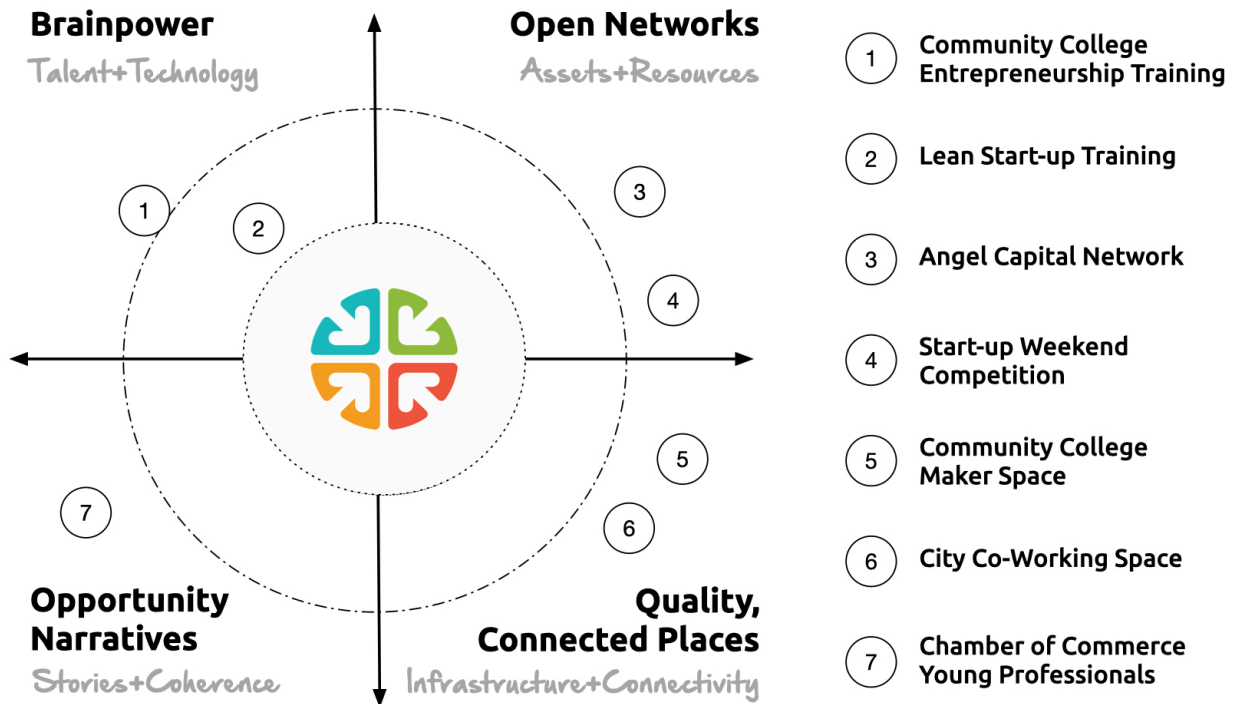


Figure 3

The next step involves engaging people on the platform. The easiest way to do that is through regular forums. Ernest started with Fridays@The Corridor.

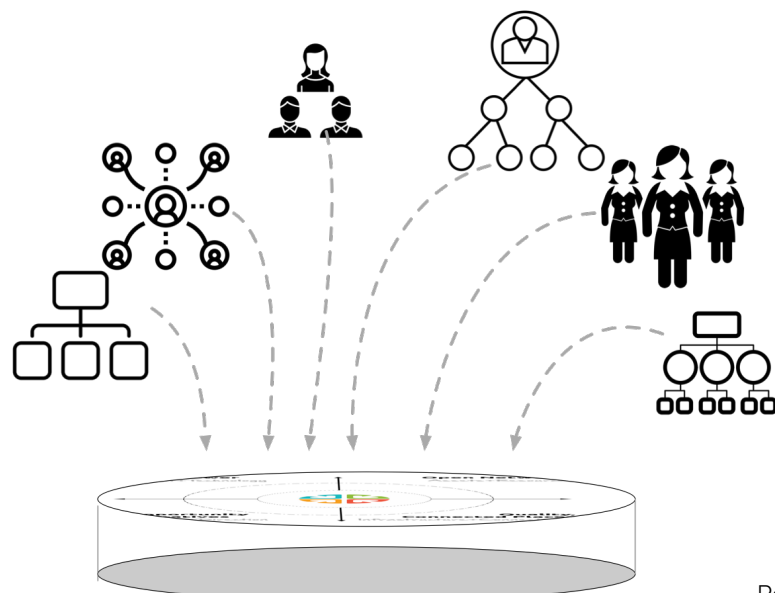


Figure 4

Each person that comes to a forum represents a hidden network of assets. Ecosystem building involves revealing these hidden assets and connecting these assets to define new opportunities.

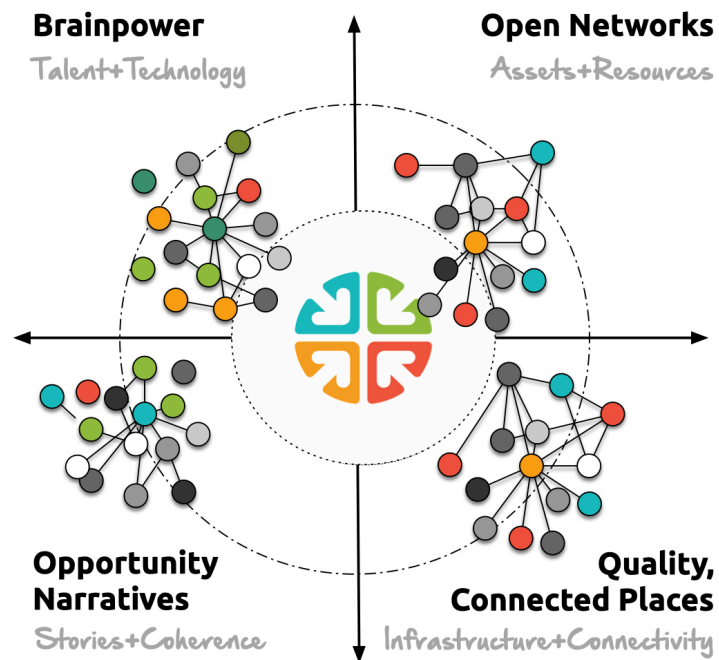


Figure 5

The ecosystem emerges from these hidden networks. The characteristics that define an ecosystem — what we typically see and measure — emerge from these networks.

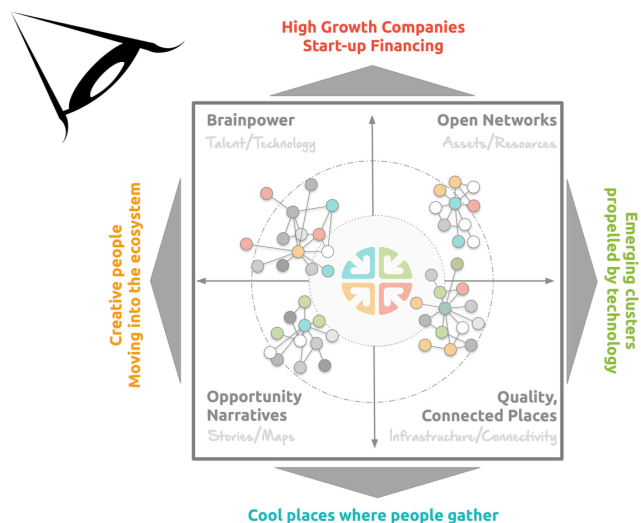


Figure 6

An effective ecosystem builder works with a cognitively diverse core team. This team can guide the various different dimensions of ecosystem development.

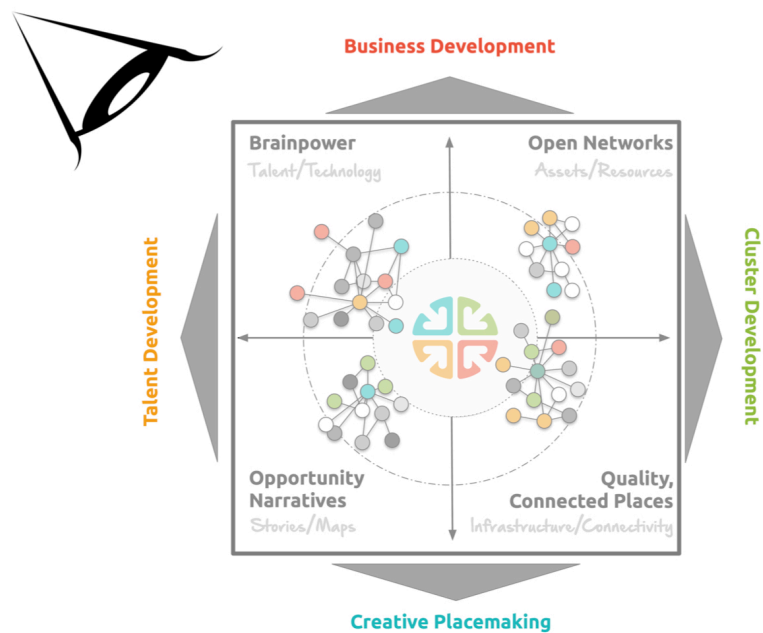
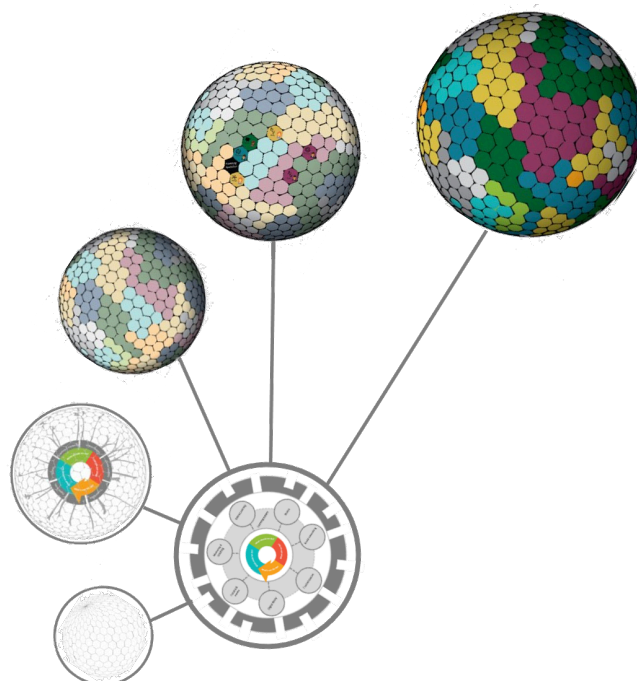
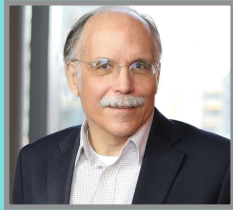


Figure 7

The ecosystem passes through identifiable development horizons as it emerges and matures from this platform.



Ecosystem DNA is a translational research initiative of the Agile Strategy Lab at the University of North Alabama, supported by the Kauffman Foundation. The initiative integrates theory and practice to develop practical models and frameworks that accelerate the development of entrepreneurial and innovation ecosystems. Contact: Ed Morrison: [emorrison1@una.edu](mailto:emorrison1@una.edu)



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