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SHOALS SHIFT

The Shoals Shift Project: An Ecosystem Transformation Success Story

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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 four 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 practical, replicable, sustainable, scalable, applicable, and is a model for university-led entrepreneurial ecosystem development and transformation.

Keywords: collaboration, economic development, entrepreneurial ecosystem, reflective theory, reflexive practitioner, Strategic Doing

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 (Etzkowitz & Leydesdorff, 2000; 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.

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). 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.

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 Chart 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 et al., 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.

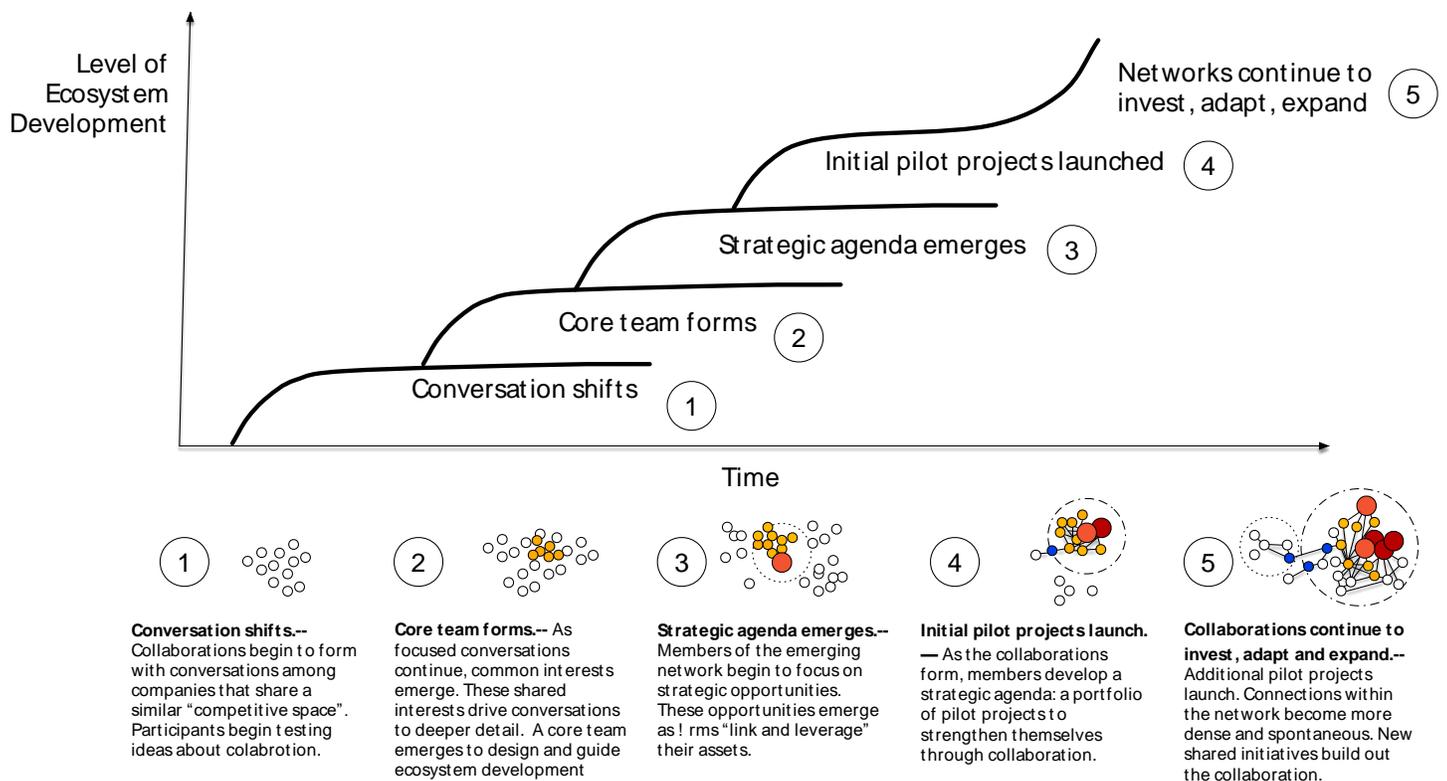


Chart 1: Phases of ecosystem development

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.

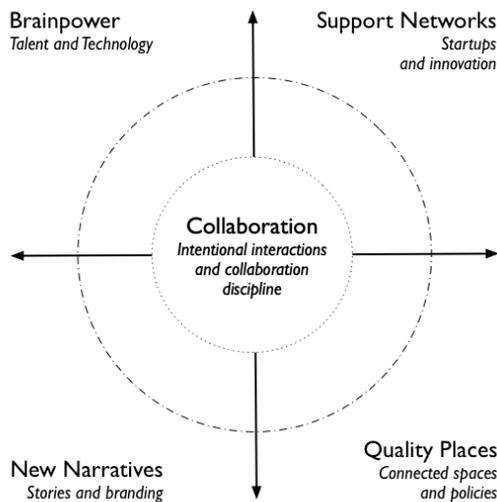
Collaborations to support entrepreneurs — Entrepreneurs convert brainpower in to value. They represent central actors to the entrepreneurial ecosystem (Roundy et al., 2018). Yet, they cannot act alone. To be successful entrepreneurs need teams and networks (Klotz, et al., 2014; Nikiforou et al., 2018; 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, 2018).

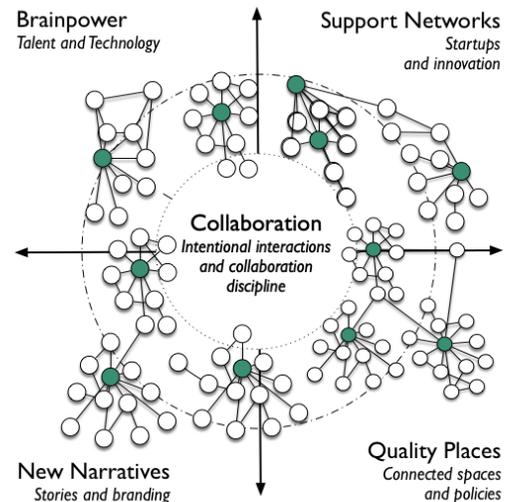
Collaborations to increase intentional interactions and develop collaborative skills — Finally, new and developing ecosystems need activities and shared skills to stimulate collaborations. These activities extend beyond networking events to include both 1) forums that serve to uncover hidden assets within 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.



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Strategic focus areas.— Ecosystems grow as networks form within four strategic focus areas. Shared habits of collaboration enable these networks to link, leverage and align their activities.



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- Core Teams: Guide the development of new networks base on pilot projects
- Individuals and organizations join networks as they see opportunities for shared value

Chart 2: Portfolio of collaborations for ecosystem development

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.

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.

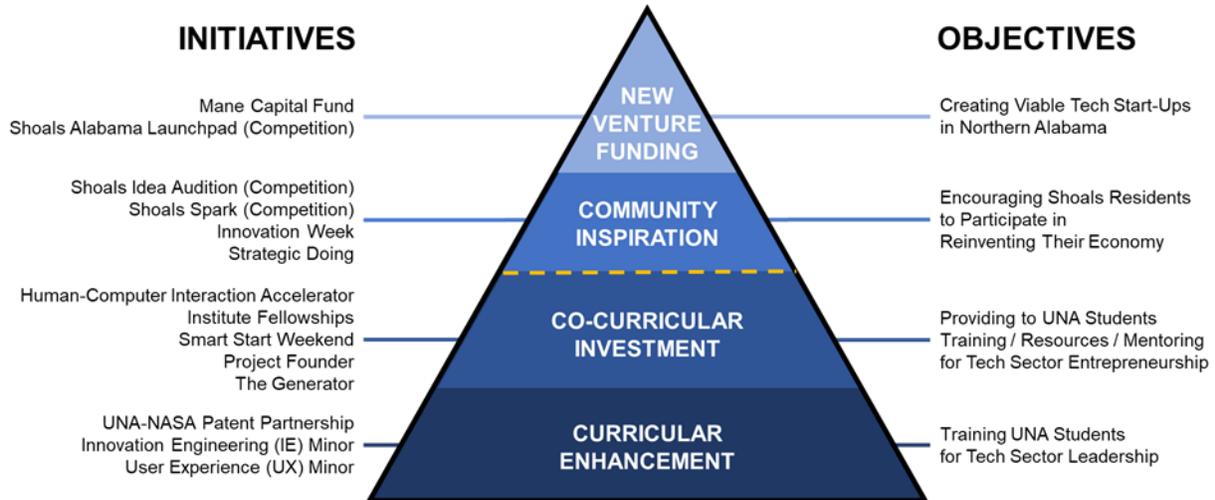


Chart 3: Shoals Shift Initiatives

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. 16 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, the 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 loop 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 3 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.)

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 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. Chart 4 below 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 Chart 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. 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.

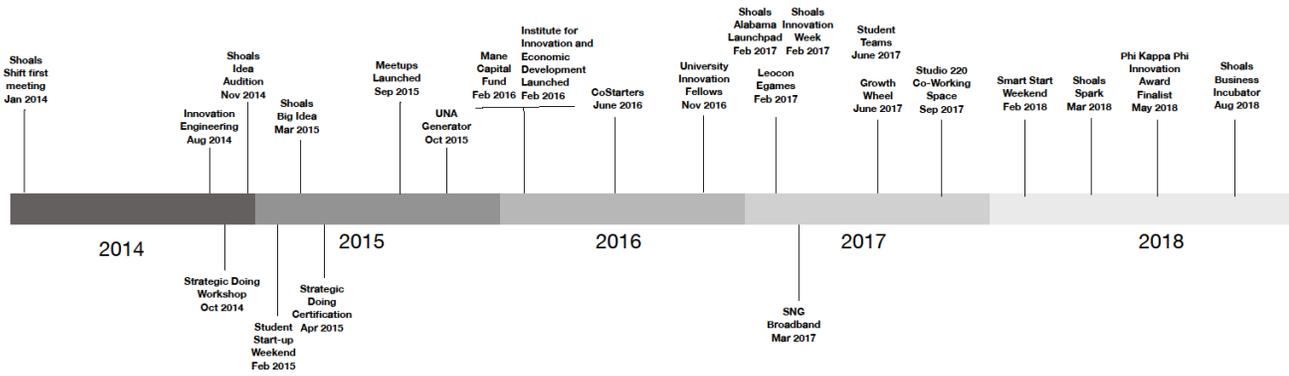


Chart 4 Shoals Shift programs introduction timeline

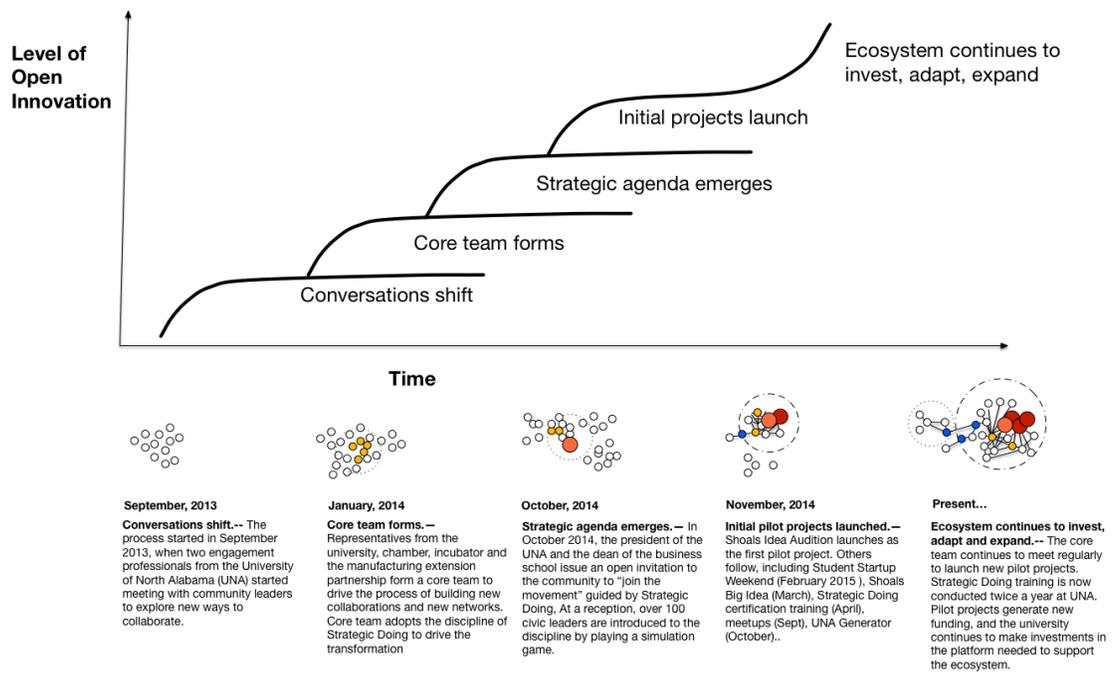


Chart 5 Shoals Shift ecosystem development phases

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