**IGNITING CHANGE: A CASE STUDY OF RUST BELT ACTIVISM**

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Policymakers in small and midsize communities (populations under 200,000) throughout the Rust Belt are searching for ways to reinvent their region to be competitive in the global, knowledge-based economy. Universities can play an increasingly important role in a region's economic development approach if they can effectively engage with their respective communities and their communities can effectively engage them. In Erie County, Pennsylvania, four universities reacted to this challenge by publishing a joint position on their community engagement ambitions known as The Path Forward (2014). In it, they commit to address the regional economic development needs of Erie County in collaboration. Capacity building grant funds to do so have been provided by a local funding agency – the Erie County Gaming Revenue Authority (ECGRA) – that administers grants out of revenue from the Pennsylvania casino gaming industry.

Based on a theory of action that views the university as a catalyst, they created Ignite Erie, a cross-sector, multi-university collaborative that can work to increase job opportunities by helping legacy industries reinvent themselves through prototypes, startups develop an effective business model, and nonprofits solve community problems. As a platform, Ignite Erie is grounded in the assumption that adaptive networks consisting of triple helix stakeholders –

private industry, university, government – is the best approach to addressing some of the community's most complex problems. And, when institutions of higher education shift their role from producers of talent to supporting company creation, they become an entrepreneurial university creating a significant advantage.

This case study is a mid-term review (2015-2018) of the Ignite Erie initiative's state of multi-university collaboration, network formation, and outcomes. It captures the collective contributions of Erie County's universities toward community engagement. Then, it summarizes the state of the Ignite Erie initiative's success in achieving multi-university collaboration and regional economic development via literature review, document analysis, and interviews. Finally, it provides discussion on how to move the initiative forward describing one community's efforts at reinvention.

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# 1.0    INTRODUCTION

Universities are important contributors in a region's economic development efforts. They can help create jobs, strengthen companies, build wealth, and bring others to the collective table of problem solving because they are producers of talent. However, the engagement of a university with industry to solve a technical problem or with a community group to solve a social problem is not simply transactional. In Erie County, Pennsylvania, four universities – Edinboro University, Gannon University, Mercyhurst University, and Penn State Erie, the Behrend College – have come together to facilitate university-industry and university-community collaborations under the auspices of an initiative known as Ignite Erie. Their community engagement strategy is summarized in a brief titled *The Path Forward* (2014). The plan can best be summarized as a collaborative statement about the university's role in regional economic development.

Ignite Erie has been in existence for three years and has developed a network of people and services to interact with entrepreneurs, firms, and community groups outside of their respective institutions. In other words, Ignite Erie is a platform to bring people together and to support entrepreneurs and industry innovation for Erie County. It is a network of passionate people who represent some of the largest and most resourceful institutions, corporations, and financiers in the region. Advice and involvement from industry leaders like Fortune 500 company Erie Insurance, Fortune 1,000 company Lord Corporation, economic development

agencies like the Ben Franklin Technology Partners, and the venture capital firm PennVenture Partners supplement the universities' resources.

In the context of Erie County's simultaneous decline in traditional manufacturing employment and population, Ignite Erie has designed interventions to support a shift to a knowledge-based economy with the universities collaborating in a leadership role. Through a careful, iterative approach, Ignite Erie has been implementing and measuring tactics to assist a) legacy companies in commercializable R&D; b) startups to develop products, services; and crowdfunding, and c) nonprofits to solve community problems. Iterative approaches through networks are sometimes referred to as "**adaptive networks**" in economic development literature. Multi-university collaboration and adaptability are both unique strengths of the Ignite Erie initiative.

The initiative began as a pilot project. It recently surpassed the midway point. This paper serves as a **mid-term review** designed to describe the current state of the Ignite Erie Initiative. Mid-term reviews can be important tools for decision-makers to capture <u>project milestones</u>, for policymakers to understand <u>what is happening</u>, and for participants to <u>compile findings</u> and <u>share recommendations</u> with fellow steering committee members. To do these things, this case study employs the following research questions:

How has Ignite Erie faired in creating a culture of collaboration to implement the goals of *The Path Forward* (2014)?

1. What are the core activities undertaken by Ignite Erie?

2. What are the interim outcomes?

3. What are the conditions that fostered multiple university collaboration?

4. What was the network formation process like?

These questions ask if this initiative is on its way to building an infrastructure capable of transformational effects on Erie's economy and similarly challenged midsize communities. Through secondary research, documents that have been produced by Ignite participants summarizing direction as well as outcomes, and semi-structured interviews with university and administrative participants, this case study captures progress, challenges, outcomes, and principles in building a successful multi-university collaborative network that gets results through action.

There are limitations to the research. The author's participation in the initiative and career in economic development as both a practitioner and executive director of a funding agency creates the potential for bias, but also offers access to data and participants. Beyond general principles, the extent to which this case study is generalizable is also limited, since the literature tells us that regional economic development approaches are most effective when tailored to a specific region's context and strengths (Etzkowitz & Klofsten, 2005; Isaksen & Karlsen, 2010; Svensson, Klofsten, & Etzkowitz, 2012). Finally, there is a shelf-life to a mid-term review, although it might be used to design a summative evaluation capturing longitudinal effects later.

Before these research questions can be studied, it is helpful to understand the context for and the organizational characteristics of Ignite Erie, while drilling down on the specific problems at hand. Then, the paper presents a literature review of concepts and studies that will help clarify the complexity of studying such a phenomenon. This includes: adaptive networks and their make-up and evaluation, as well as triple helix stakeholder approaches to regional economic development with specific attention paid to the entrepreneurial university, industry-university collaboration, and agents of innovation. Next, the paper lays out the connections between the research questions, methods, and other aspects of the research design. Finally, the results of the

case study are organized and its findings are presented. In conclusion, there is a discussion of the findings, an identified set of core beliefs, questions that any midsize community should ask introspectively, study limitations, and policy implications.

## 1.1    THE RUST BELT PROBLEM

Rust Belt cities are those that have suffered from population loss (populations under 200,000) and erosion of jobs and firms associated with manufacturing, and are primarily located in the northeast United States (Hollingsworth & Goebel, 2017, p. 8). Known as the Rust Belt question, "how to bounce back economically" is being asked by business, civic, and political leaders; change theorists; think tanks; and urban problem solvers as well as policymakers at all levels of government. The transitioning of Rust Belt economies away from traditional manufacturing toward an innovation economy is a difficult and challenging problem. The statement itself implies there are winners and losers in the global economy. On a spectrum of successful from stagnant to distressed, communities are labeled as "tech towns" and "comeback cities," while others bear the "Rust Belt" moniker. It's a generic narrative that overgeneralizes the value of a location or the condition of a regional economy. The characterization should be between communities that are actively evolving and building from their assets, and those that are not.

Instead, the Rust Belt label creates a deficit narrative. This relegates defeat to the Rust Belt, rather than prescribed activism. The question of what to do with these small and midsize communities sprinkled across the northeast U.S. is a problem worth finding answers to because the Rust Belt region of the country represents a significant size of the population that is not benefiting economically from the innovation economy or what the Brookings Institute calls

"advanced industries" (Muro, Rothwell, Andes, Fikri, and Kulkarni, 2015). Small and midsize communities often lack the resources of larger metro areas. For example, the Erie region does not have a research hospital, and there is only one Fortune 500 corporate headquarters. Through Penn State Erie, the Behrend College, the Erie region does have access to a major research institution, although the research dollars pale in comparison to University Park's capacity. These assets have been shown to be at the core of creating significant economic multipliers in a regional economy (Hollingsworth and Goebel, 2017, p. 10). In sum, the means and assets available for self-directed reinvention are limited.

In addition to limited resources, it's important to start with the notion that there's no one-size-fits-all answer to these inquiries. Each community takes on a different approach based on their stakeholders, context, and capacity. These unique characteristics shape an intervention based on historical factors like the economy and potential factors like successful entrepreneurs and institutions. Put plainly, the elements of renewal are highly contextualized and regional. One can witness these elements in Erie County's political context and in shaping the Ignite Erie network.

## 1.2    POLITICAL CONTEXT

A shrinking tax base comes from many sources: population decline, fewer commercial businesses, and deferred maintenance to housing and resulting blight. These are the main symptoms of a problem that results from a competitive system of federalism, in which municipalities compete with one another instead of collaborating. The system rewards suburban sprawl, centralizes poverty in urban neighborhoods, and segregates young people into school

districts based on their socio-economic status and zip code (Rusk, 1999). Despite the complexity of the problem, one sector is continually pressured to make up for these realities: nonprofits.

In the context of talking about the tax base, the term nonprofit normally refers to institutions of higher education and hospitals. In many regions, "Eds and Meds," as they are commonly called, employ significant numbers of people and occupy vast tracts of prime real estate. They are under increasing pressure to justify their tax-exempt status to local government. Universities have viewed their community engagement activities as one way to alleviate calls for taxation. Through outreach programs, research projects, internships, service-learning, and other forms of engagement, some university systems have moved toward placing their resources at the disposal of the communities. These resources include human assets like students and faculty, institutional assets like tech transfer offices and facilities, and knowledge centers that conduct research. Human, institutional, and knowledge assets are at the heart of what a university has to offer as an economic development strategy.

Universities, sometimes referred to as anchor institutions, are one of the few nonprofits a community has with potential to generate economic activity. That does not mean that having a university or multiple universities will result in economic development. In fact, the resulting tension between municipalities and universities over tax exempt land, parking, and student housing complicates the relationship (Soska, 2015, p. 111). However, with the right leadership at the university and the will to do so, these anchor institutions can become catalysts for job creation, firm formation, product development, and equity for a more prosperous economy.

There is mounting evidence that university-based community engagement can create economic development. Wachter and Zeuli (2014) identify a region's high measurements of university-based human capital as an important indicator for an educated workforce, productive

economy, and entrepreneurial region (p. 33). Van Agtmael and Bakker (2016) explain that "brainbelts" – complex collaborations between universities, corporations, hospitals, philanthropy, and government – are the new competitive vehicle for regional economic development because of their ability to leverage the region's brightest minds (p. 25). Katz and Bradley (2013) use case studies to illustrate the importance of the university in driving innovation concepts, company formation, and regional leadership. Moretti (2012) observes a "sorting of highly educated Americans" to illustrate employment disparities by region explaining that innovation has a geography that's quickly becoming a defining characteristic of the winners and losers in a global economy (p. 5). Miller and Cox (2014) look at the scenario primarily from a governance perspective offering up the complexities of rule by collaboration to create capacity and resiliency. In their model, universities are central to the regional strategic equation.

There is no single model for community engagement, nor are there mandates for a university to do so. Universities enjoy the protection of nonprofit status under the U.S. tax code and the IRS. So, the policymaker dilemma is not a question of coercion, but rather a strategy for effective engagement. If universities are significant institutions in making a region the best 21$^{st}$ century version of themselves, how might a community effectively engage them?

## 1.3    IGNITE ERIE NETWORK

Ignite Erie is an adaptive network utilizing a **triple helix stakeholder approach** that brings together talent from Erie County's four universities, venture capital, local government/quasi-government agencies, and industries with a strong presence in the regional economy. The adaptive piece is defined as the group's ability to function in an iterative manner, experimenting

with various tactics, and settling on high-yield activities. The partners are representative of the spheres in society necessary for sustaining innovation and change. Bringing these spheres together in order to collaborate is known in the literature as a "triple helix" approach to regional economic development (Etzkowitz & Klofsten, 2005). They meet to work collectively on developing entrepreneurial support services for the region's economic development system, accelerating entrepreneurial ideas, and creating spaces for research and development. Ignite Erie's triple helix seeks to leverage the talents of multiple stakeholders, share resources, and act as a communication platform to build the region's capacity for innovation.

Networks are not created in a vacuum. They are built upon a theory of action biased toward change and innovation. This theory informs the network's form and mission. Ignite Erie's adaptive network and triple helix components can be found in the initial grant application to the ECGRA. Titled *Creating a Robust Innovation Ecosystem in Northwestern Pennsylvania* (Bridger, Dillon, Fillbeck, Ford, Georger, Gleason, Parikh, Rajagopalan, & Wheaton, 2015), the application is a strategy of how the northwest corner of Pennsylvania, with Erie County as its anchor, can create innovation-based services and spaces, building on existing strengths and laying the foundation for the entrepreneurs of tomorrow. Since inception, Ignite Erie has added participants to the network and refined its implementation, but it has stayed true to the core tenants of its original mission. Table 1 is a snapshot of the Ignite Erie network components.

**Table 1.** Ignite Erie Network

| Purpose | Create a collaborative network of entrepreneurs, innovators, industry partners, and service providers creating businesses, jobs, and wealth in the Erie region by assisting: <br> a) Legacy companies in reinvention, others in growth <br> b) Startups in prototype development, crowdfunding <br> c) Nonprofits in solving community problems |
|---|---|
| Network Membership | Triple helix membership model – industry, university, economic development agencies/quasi-government entities |
| Core Activities | Innovation Teams – multi-university teams of faculty and students to propose |

**Table 1** continued

| | |
|---|---|
| | entrepreneurial solutions in concert with entrepreneurs and industry<br>Crowdsource Funding Assistance – technical assistance in implementing a method for effective solicitation of crowdsource-based funding known as Quickstarter (based on the prolific crowd funding website kickstarter.com)<br>Innovation Spaces/Maker Spaces – providing space for entrepreneurial thinking, interactions, development, and production |
| Sectors/Stakeholders | University faculty from business, communications, engineering, applied intelligence, digital media.<br>Industry representation includes insurance, aerospace, venture capital.<br>Regional Economic Development Agencies includes: innovation-based economic development, small business development |
| Geography | Erie County is the target footprint for assisting entrepreneurs, involving students, faculty, industry, & entrepreneurs. |
| Sustainability | ECGRA has provided funding for 4 years. Sustainability will be largely dependent on:<br>  A. the group's willingness to continue after the initial seed funding expires<br>  B. identifying funding streams from additional sources<br>  C. demonstrating outcomes consistent with the proposed strategy, adaptive tactics, and effective interactions with end users |
| Size | The initial steering committee consisted of 17 members (as of 7/20/15). As the network looked to best serve its users, it has expanded the governance structure to 21 adding additional institutions and agencies (as of 1/25/18). |
| Funding source | The ECGRA granted flexible, capacity-building seed funds to launch the network. Since then, Ignite Erie has developed relationships with other funders including: the Appalachian Regional Commission, the Economic Development Administration, and Pennsylvania's Department of Community & Economic Development. |

## 1.4     ERIE'S UNIVERSITIES AND THE PATH FORWARD

In January 2014, four universities in Erie County published a document that stated how they might engage with the community to strengthen the Erie economy, how they might collaborate to engage entrepreneurs, and how university resources could be deployed collectively. Those institutions were: Edinboro University of Pennsylvania, Gannon University, Mercyhurst University, and Penn State Erie, the Behrend College. The document was titled *The Path Forward* (2014). It was written as a roadmap for collaborative university-community engagement and touted as a significant step toward breaking down the silos within the

universities and between the universities and community. It identified four initiatives listed in Table 2.

**Table 2.** Initiatives from The Path Forward

| Initiative #1: | Collaborate to Develop New Industries | Faculty & students will assist entrepreneurs through: <br> • Internships & research <br> • Jointly established & supported incubators, and the <br> • Promotion of the Erie region as friendly to startup firms. |
|---|---|---|
| Initiative #2: | Partner to Build Strengths in the Emerging Technology Areas that will Generate Opportunity for the Region | Emerging sectors such as <br> • Energy, digital arts & media, intelligence, cybersecurity, as well as <br> • More mature industries like advanced manufacturing & healthcare can generate jobs through: <br> • Joint research projects <br> • University/industry networks <br> • STEM education & career pathways programs |
| Initiative #3: | Accelerate Collaboration to Promote an Improved Quality of Life across all Erie Communities | Support projects that solve problems in <br> • Health & public safety at the neighborhood level <br> • Leverage students & faculty to address "grand challenges", and <br> • Hold business competitions to address community needs. |
| Initiative #4: | Establish the Erie Regional Education & Training Consortium | The universities will work together to ensure information and access for <br> • Young people, <br> • Job seekers, and <br> • The existing workforce, <br> so they have better access to the entire education & training continuum. |

## 1.5    THE PATH FORWARD THEMES

These four initiatives share recurring themes. First, each institution views its faculty, administration, and students as untapped resources for **technical assistance**. In other words, they can be deployed to solve problems or provide expertise. These faculty-administration-student projects may provide mutually beneficial outcomes from solving current problems across business, government, and nonprofit sectors to contributing to research objectives.

Second, **collaboration**, or joint activities, leverage talent and other resources. Multi-university collaboration and industry-university collaboration lead to optimized outcomes. However, the document does not identify a process or potential funding sources for implementation.

Third, universities currently play a critical role in **regional economic development** and can increase their engagement industry and entrepreneurs. Emerging industries require innovation and knowledge transfer that are the basis of business, computer science, engineering, digital media, intelligence analysis, and other analytical-based programs at the university.

Fourth, **human asset development** is important to the future of the region's workforce and industry. The university can encourage, train, and support entrepreneurial thinking and behavior.

## 1.6     ECGRA & LOCAL SHARE GAMING REVENUE

Ignite Erie is supported financially with capacity building funds from the ECGRA, a county-based authority established to administer gaming proceeds from the local casino for economic development projects. Endowed with funds from the Commonwealth of Pennsylvania's local share gaming revenue (local share) provision, the ECGRA has a unique level of flexibility in its decision-making process that is governed by the broadly written Pennsylvania Economic Development Financing Law. Pennsylvania's casino gambling legislation pushes control of the local share, which means 2 percent of the funds, to the county level. One percent of the funds, or about $5 million annually, are administered by the ECGRA.

Locally controlled decision-making is central to the story. Leaders from Erie County have a say in funding priorities through a board of directors appointed from County Council and the County Executive's Office. These appointees oversee the ECGRA staff in reviewing studies and best practices, and ultimately designing grant guidelines that fit with the community's needs. Then, they take applications from economic development agencies, nonprofits, and municipalities. In *The New Localism* (2017), authors Katz and Nowak write, "Cities and metropolitan communities are in many cases the right geographies to invent, apply, and test new methods and mechanisms for resolving the challenges of the modern era" (p. 242). Locally controlled grant funds, a broad definition of economic development, and a stable source of revenue all contribute to Erie County's ability to take calculated risks with regional economic development approaches like Ignite.

The ECGRA has been nationally recognized for its innovative approach to grantmaking and described as a potential model for the Commonwealth of Pennsylvania by elected officials. Katz and Nowak (2017) refer to the authority as a source of "unexpected leadership" in a realm normally dominated by the largest institutions of a community (p. 229). Mark Muro of the Brookings Institute writes that "…the region's energetic Erie County Gaming Revenue Authority – an interesting philanthropic story in its own right – has been flooding the zone with grants instigating or supporting technical education and training of all sorts (along with regional economic development)" (Muro, 2016). Upon hearing testimony of the ECGRA executive director at the Pennsylvania House Gaming Oversight Committee Hearing on March 28, 2017 in Erie, the committee Chairman Scott Petri said, "…maybe you have the model that the rest of the state should be following" (p. 58).

In the summer of 2016, two writers from *The Atlantic*, James and Deb Fallows, visited Erie. The Fallows report on overlooked cities and towns across the U.S. that suffer from narratives like the Rust Belt. Looking beyond the oversimplification of economic collapse, blight, and resulting despair, they observe the resiliency of people and organizations that refuse to accept the narrative of Rust Belt decline. James Fallows (2016) wrote,

> The system ECGRA has evolved might look unfamiliar to many gaming-revenue authorities, but it would be immediately recognizable to many of the economic-development and civic-building strategists we've seen in places like Fresno and Riverside in California, to Bend, Oregon, to Greenville, South Carolina. That is, Erie has matched a familiar source of money (gambling) with a widespread civic goal (economic and technical renewal), in a novel and apparently successful way.

Observations made by Fallows, Katz, Nowark, Muro, and Petri summarize perfectly the authority's adaptive approach and broadly defined mission of economic renewal. The ECGRA, an impact investment grant-maker, is focused on creating a system of economic development funding while studying its effects through a process of community R&D. This involves investing in a context that recognizes national trends while adapting projects to local variations. It is feasible to use casino revenues to fund initiatives that there is little to no political will to fund, such as civic innovations, public-private collaborations, and experimental approaches to problem-solving. In short, ECGRA can take calculated risks on projects that fall outside the scope of traditional business-as-usual behavior without the same level of criticism and skepticism that accompanies the use of property taxes. For this reason, the source of the funds is just as important as what's being done with them.

The creation of local share gaming revenue in Pennsylvania was the beginning of a new experiment on how economic development funding can be decentralized from the state to effectively address local problems with local stakeholders directing local funds. Local share was originally intended to mitigate the impact of casinos on local government. Visions of crime, drug use, prostitution, and losing the family farm have not manifested as epidemics. Therefore, the funds have become the fuel for driving new localism that allows the community to set its priorities for funding economic renewal.

In Erie County, local share is the fuel used both to sustain the civic sector and to provide seed money to grow the local economy. Local share is sustaining and growing Erie County's assets. Rather than focus solely on the services provided by local government, like physical infrastructure, Erie County's local share is used to create competitive advantage, jobs, and collaborative ventures. One ambitious program that fit the ECGRA's vision of community R&D with an eye toward long-term economic transition of Erie's economy was Ignite Erie.

## 1.7    SYNTHESIS OF ELEMENTS

When they published *The Path Forward* (2014), Erie County's universities signaled a willingness to invest institutional resources to engage the community and benefit the region's economy. In response, the ECGRA put forth a grant application process to support the universities' aspirational intensions. The goal was to provide them with capacity building funds to unlock their economic development potential as a collaborative network for the regional economy. Grant funding would provide the financial resources to universities in support of innovation and entrepreneurial activities.

Ignite Erie, as a funding stream, was experimental and risky, as are most capacity-building grants. It made assumptions about the feasibility of each university's willingness and ability to collaborate, leverage resources, create jobs, foster innovation, and build the social capital necessary to sustain itself. The successful grant application was spearheaded by a partnership between Penn State Erie, the Behrend College and Mercyhurst University. These institutions formulated a new network for the express purpose of contributing entrepreneurial support services to the region's economic development system. Then, the Ignite Erie network became an ECGRA-funded initiative. Within months of winning the grant, both Edinboro and Gannon University were at the collective table of Ignite Erie working toward the mission.

In the next chapter, this case study explores the constructs and literature necessary to describe and analyze a complex initiative like Ignite Erie. Beginning with a summary of adaptive networks and their benefits, the paper captures analysis approaches concerning network assets, network development, and network evaluation. Then, the literature review moves through strands of the triple helix studies such as: the entrepreneurial university, industry-university partnerships, and agents of innovation. The section concludes with a brief description of the role played by geography and place. These constructs and analysis approaches assist in developing the research design in Chapter 3 and the findings in Chapter 4.

## 2.0    LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

Networks are collections of people working toward common goals. Ignite Erie – a collaboration of Edinboro University, Gannon University, Mercyhurst University, Penn State Erie, the Behrend College – envisions a robust system, focused on innovation and guided by a collaborative network in northwest Pennsylvania, starting with Erie County. In order to do this, they employ collaboration, bringing industry and nonprofits into a common space with the university to work on product development, crowd funding, and other entrepreneurial support services.

Ignite Erie has reached a midterm point three years into a pilot project phase. A midterm case study is being performed for the purposes of describing both progress of the network and interim outcomes in evolving the regional economic development system. This section is focused on two constructs in the literature that inform the practice of regional economic development: **adaptive networks** and the **triple helix** stakeholder approach. In the following pages, each construct is defined, an outline of studies applying them is summarized, and finally indicators helpful to analyzing Ignite Erie are listed.

## 2.1    CONSTRUCT #1 – ADAPTIVE NETWORKS

Increasingly, those who make funding decisions from government to philanthropy are realizing the potential of iterative or adaptive networks to solve complex community problems (Britt and Coffman, 2012).  **Adaptive leadership** via a network is defined as "iterative: you try something, see how it goes, learn from what happened, and then try something else. You tailor your interventions to the individuals involved and to the unique (and shifting) characteristics of the situation facing you" (Heifetz, Grashow, and Linsky, 2009, p. 10).

Adaptation is a concept drawn from evolutionary biology. Central to the adaptive network approach is the notion that addressing complexity requires organizations to experiment, diagnose, then act (p. 32). Figure 1 is a visualization of what Heifetz et al. (2009) have learned about adaptive network process. Exercising adaptive leadership is not like implementing technical aspects of a successful model that has been implemented elsewhere. Adaptation accepts the inevitability of evolving priorities, goal shifting, and abandoning low-yield tactics in favor of high yield practices. In a situation that requires iterative learning during execution, models are not guiding the initiative; they are informing the actors as to what others have attempted (Britt et al., 2012). This process can create conflict because it challenges status quo thinking. Status quo is upholding the current system, which means the adaptive network must look past individuals and see the attributes of a system that's driving the current results (Heifetz et al., 2009, pp. 49-53).
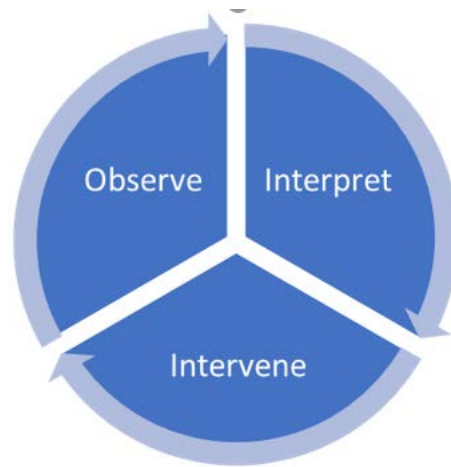
**Figure 1.** Adaptive Network Process. Reproduced from The Practice of Adaptive Leadership by Heifetz, Grafshaw, & Linsky, Chapter 2, p. 32. Copyright 2009 by Cambridge Leadership Associates.

Iterative network planning is process oriented and involves network building. It does not work well with the process behind traditional grantmaking. A traditional approach would have grantees state their goals, attach a budget to the action plan, and then strictly hold the grantee to the deliverables of their grant application. This implies that the grantee knows the exact remedy to the problem before beginning work. However, in a situation that requires iterative learning during execution, models are not guiding the initiative; they are informing the actors as to what others have attempted (Britt and Coffman, 2012). Adaptation considers contextual circumstances such as place, stakeholders, and political agendas that require consensus building and compromise toward constructing a shared vision. Models fit well with traditional grantmaking because most of these factors are already settled as they address technical problems with agreed upon solutions. Adaptive leadership accepts the inevitability of shifting priorities and tactics because of the learning that's involved. Stakeholders are tasked with iterative learning to both define the problem and work toward a solution.

Beginning with *The Path Forward* (2014), the urgency of cross-university collaboration in Erie County was formalized for the first time. With difficult goals like catalyzing emerging industries and entrepreneurial product development, there was a need to build capacity for effective community engagement through industry-university partnerships in and among the universities before they could tackle the goals they listed. For example, each university had an external relations policy for community engagement, and each was different. How would this affect multiple universities working on the same project? They needed to solve technical problems before they might approach adaptive ones.

### 2.1.1 Network Capacity

As the Erie County Gaming Revenue Authority (ECGRA) developed grant guidelines to build capacity among the universities, the imperative of building network capacity revealed itself as the highest ideal over the replication of touted models from other communities. Just as other funders have awoken to the value of networks and a multi-sector approach, the following benefits were identified:

a) Reaching a **higher level of complexity**. Multi-sector representation generates multiple perspectives on the problem or challenge at hand. Also, it recognizes that universities, as repositories of knowledge, alone are insufficient for creating lasting community change. In short, community engagement via the university that is multi-directional implies that the university has just as much to learn from the community in the process of innovation. The final product, then, is the "co-creation of knowledge," not simply the dissemination of it (Saltmarsh, Hartley & Clayton, 2009, p. 11).

b) **Increasing effectiveness** in the use of limited and scarce funding. Making the most effective use of grant dollars is a constant consideration for grantmakers like the ECGRA. As an example, communication can be greatly enhanced as the four universities – Edinboro University, Gannon University, Mercyhurst University, and Penn State Erie, the Behrend College – commit to a regular schedule of meetings, jointly agreed-upon outcomes, and policies that they believe will result in collaboration. However, these actions may create barriers in the administration of the grant. Effectiveness may, in some cases, sacrifice quick, efficient deployment of dollars toward a project. Efficiency is not necessarily a quality to strive for when building long-term linkages between institutions.

c) Assisting each institution in **building capacity to address challenges**. Each university has its strengths emanating from talented faculty, pools of students, unique resources, unique history, and processes developed to perfect their respective disciplines. In this approach, industry has the incentive to make scientists, equipment, and other resources available for open innovation to occur. Innovation that all stakeholders have in common simultaneously benefits the individuals and the group. The intended results of a well-structured network builds capacity for all those participating: individuals, institutions, and the network itself (Beaver and Weinbaum, 2012).

### 2.1.2   Network Assets

The Brookings Institute work on the advanced industries sector or high technology sector, as well as the concept of innovation ecosystems, is informing practitioners in the Rust Belt and internationally. Networks and multi-sector partners are central to their definition of regional economic development. For example, when Katz and Wagner (2014) write about regional

development in terms of innovation ecosystems, they categorize them into three interlocking asset classes that a community needs to flourish: economic, physical, and networking. These asset classes are a basis for conceptual analysis, metric creation, and comparison. Every community has to have these assets in their inventory as a prerequisite for system development. Therefore, this approach operates under the assumption that building on your existing assets is a maxim in regional economic development. The three asset classes are:

a) **Economic assets** are the companies, firms, and, more broadly, the community's share of economic sectors that have a higher location quotient. In Erie County, these assets, known as the "advanced industries," were described and analyzed in an essay titled *Erie's Advanced Industries* (Wertz and Wood, 2015). In the essay, the authors capture Erie's strength in advanced manufacturing and emerging advanced services sector (pp. 19-20). While Erie has experienced significant declines in manufacturing jobs in the aggregate, the wages of the advanced manufacturing jobs that remain are far higher on average. And, with growth in advanced services, Erie has the potential to diversify its economy. This data can serve as the basis for how a regional economic development system can exploit its established and emerging economic assets.

b) **Physical assets** are the places where people do business, meet with social purpose, and run into each other. Some refer to these places as "collision spaces" (Amoroso, Bermudez, Gideon, Guensler, Mitchell-Boyask, & Selzer, 2016). They could be formal places like incubators, accelerators, or product development labs, or informal spaces like coffee shops, museums, and events. It also includes the infrastructure, equipment, and telecommunications capabilities available for entrepreneurial activities and creative communication.

c)  **Networking assets** are the ways in which social capital is generated between economic assets and physical spaces. Key to relationship building, every successful innovation system has properly positioned intermediaries, platforms, or networks of dedicated people working toward connecting the players and resources within the innovation system. These networks provide the platform for spreading knowledge that serve as the basis for economic development.
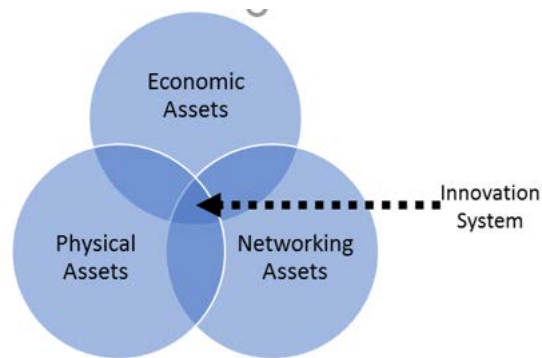


**Figure 2.** Interconnected Assets of an Innovation System. Reproduced from *The Rise of Innovation Districts: A New Geography of Innovation in America* by Katz and Wagner, May 2014 retrieved from: https://www.brookings.edu/essay/rise-of-innovation-districts/.

### 2.1.3   Network Development

Ignite Erie's network development can be viewed in phases with multiple lenses. A political lens, for example, can be quite helpful. The mobilization of stakeholder groups, reaching consensus, scarce resources, and coalition building are political aspects. As Ignite enters the midway point of its implementation plan, the phases listed below are a tool to measure its systemic progress. Etzkowitz and Kofsten (2005) are the first to layout out the four stages of development in regional economic development: inception, implementation, consolidation, and renewal. Then, Svensson, Klofsten, and Etzkowitz (2012) improve upon those observations when they study a

declining industrial city in Sweden by diving further into the inception phase. They subdivide the inception phase (see Figure 4) of regional economic development into four phases:

1. **Mobilization** – The relevant stakeholders are convened and the existing processes that each brings to the table are discussed. They begin to attract firms with what they have to offer.

2. **Consensus & Reconceptualization** – This is the point where things may fall apart or a common agenda is reached. Leaders acknowledge that the old strategy is not working and a new one is needed. Institutional strengthens and weaknesses are assessed and, if they continue, a new strategy is formed.

3. **Institution Formation** – Stakeholders develop appropriate organizational formats for interacting and set aside physical space for innovation, and each stakeholder sets aside resource to sustain the new strategy.

4. **Birth of an ecosystem** – At this point, there is continuous action toward the group's common mission, maximizing the resources of each institution to achieve the stated goals, a shared vision and buy-in from participants.



**Figure 3.** The Four Phases of Regional Economic Development Networks

### 2.1.4   Network Evaluation

While the prevalence of the adaptive network is gaining legitimacy, evaluation remains in its infancy. To evaluate Ignite Erie as a case study, one needs to understand the conceptual framework of an adaptive network based on its ability to be assessed. Since all networks are unique because of their context, membership, and ultimate goals, Whately, Coffman, & Taylor (2015) created a framework for evaluation through three concepts: connectivity, health, and results.

### 2.1.4.1 Network connectivity

When one looks at the human and social capital aspects the Ignite Erie network through informant interviews, it may reveal who is interacting with the network and how these interactions take place. This is one way to understand the network's capabilities, limits, and shared understanding of the mission to collaborate. Looking at the structure alongside the network's membership may illuminate ideas of program coherence, collective competence, working conditions, and common frameworks, thereby providing insight regarding participant preparedness to engage in this type of network.

### 2.1.4.2 Network health

Every network has aspects in common that indicate its status of function. These aspects include infrastructure, resources, and the ultimate advantage the network creates for users. By looking at internal systems, rules, and processes, one might illuminate infrastructure effects. Resource analysis might include sources of funding, access to people, materials, and machinery, and

finally, accessible spaces of innovation. Advantage impact refers to the capacity for joint value creation versus innovation in isolation.

### 2.1.4.3 Network results

Expenditures from publicly-funded sources such as the ECGRA require a measurement of outcomes. One might look at interim outcomes on two levels. First, interim outcomes at 24-36 months to capture evidence of the network's short-term wins. Second, one might look at longer-term intended impacts to see if the network is on the trajectory to achieving its ultimate goals and objectives. Perspectives from informants are considered to examine the relationship between expectations and outcomes.

### 2.1.5   Summary of adaptive networks literature

In this section on adaptive networks, the iterative nature of networks versus the prescriptive nature of models and ways to describe, develop, and measure networks are discussed.

- In building networks, the technical problems are changes that rest in the hands of authority, while adaptive ones require stakeholder buy-in and a change in behavior. **Indicators**: the co-creation of knowledge, communication infrastructure, Institutional strengths from each university
- In identifying network assets, a framework exists to separate them into three categories. **Indicators**: economic assets defined as advanced industries, physical assets such as innovation space, "collision" space, communication infrastructure, and networking assets such as intermediaries create social capital that ties participants together.

- In network development, a formula for looking at a network during the inception phase is summarized like guideposts through a four-step process. **Indicators**: mobilizing/convening the stakeholders, reaching consensus toward a common agenda, and institutionalizing the process through buy-in. Ecosystem rebirth is reached when behavior and resources are centered around achieving a shared vision at each respective institution.

- Finally, a framework utilizing three concepts of measurement is introduced. **Indicators**: connectivity of the initiative's participants, health of the network's infrastructure, resources, and value statement, and interim results from the initial 24-36 months, but also signs of incremental progress on long-term goals.

## 2.2    CONSTRUCT #2 – TRIPLE HELIX

Much has been written about the benefits, challenges, and obstacles of universities successfully (or unsuccessfully) collaborating with industrial partners and entrepreneurs (D'Este and Perkmann, 2011; Goldstein, 2010; Hodges and Dubb, 2012; Jeong, 2014; Viale and Eztkowitz, 2010). What has not been documented is the application of an adaptive network at work with the triple helix stakeholder approach. Therefore, this study contributes a new perspective to the triple helix literature. No studies have been found that involve multiple universities acting in collaboration and utilizing the constructs: adaptive network and triple helix stakeholder approach.

Triple helix studies are a branch on the tree of regional innovation approaches. They are concerned with institutional and relationship networks of three core policy and programmatic

sectors of society – government/quasi-government, industry, university – in explaining regional economic development. These three sectors come together to create an adaptive network organizational structure that operationalizes the university as a core player in the regional economy. Lazzeroni and Piccaluga (2003) describe this in four ways:

A) Knowledge transfer, which entails basic research

B) Building human capital

C) Transferring technology to industry for commercialization

D) "Territorial development," or regional economic development (p. 40)

In their thinking, universities are required to evolve their interpretation of success by creating new indicators that are consistent with entrepreneurial faculty, students and administrators. These new indicators include: community engagements, project design consistent with community goals, collaboration with local networks, and providing services to local stakeholders such as entrepreneurs and other private sector actors (p. 46).

This evolution in thinking about the university's role is captured by Etzkowitz and Klofsten (2005) when they draw a distinction between the "learning region" and the "innovating region." Learning regions focus on human capital development and consulting services (goals B and D listed above), while innovating regions' ultimate goal is R&D that leads to firm formation (p. 247). An indicator of this transition is when a business or science park affiliated with one of the universities shifts from acting as an office location for industry to "destination sites for research-based firms" (p. 247). True R&D sites generate firms, which they see as the main tenet of the innovative region or the ultimate goal of regional economic development.

There are also motivational factors to consider. In a triple helix relationship, each stakeholder has to justify its participation through motive and they have to realize they are

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stronger together. Value generation must be mutual. One sees this with industries that create formal internship programs or locate an R&D center on campus. Motivations by sector are listed below:

a) Universities collaborate to gain access to resources such as equipment, learn about industry trends from contemporaries, acquire funding,

b) The entrepreneur collaborates to reduce risk in the R&D process, tap into a knowledge base, and mobilize researchers (Calcagnini, Giombini, Liberati, Travaglini, 2016).

c) Governments fund and evaluate these relationships. They are motivated by economic development goals such as job creation, new firm creation, and growth of the tax base.

Ultimately, government agencies like the Economic Development Administration or the Appalachian Regional Commission fund triple helix networks that spur the reinvention of regional economies by transitioning to something with a higher intensity of technology.

The behavior of private sector firms and government actors is not the focus of this concept review. Although there have been studies of each sector's capacities to collaborate, the focus will be on the entrepreneurial university and its mission to engage with the community to create a regional economic development strategy through the ways listed previously. The literature on community engagement, forming effective industry-university partnerships, and the agents of innovation that compel partnerships forward are closely related. The section ends with a brief discussion about geography and place as important factors for innovation to flourish.

### 2.2.1 Entrepreneurial University

In Europe, entrepreneurship is called the "third mission" of the university. This is a reference to the evolution of the university from repository of knowledge (mission #1), to teaching institution

(mission #2), to social and economic development catalyst (mission #3) (Jacob, Sutin, Weidman, & Yeager, 2015). Some have written that the concept of the entrepreneurial university is the most significant event in a region's decision to reinvent itself (Etzkowitz and Klofsten, 2005). According to Etzkowitz (2013), the entrepreneurial university is part of an evolution from knowledge holder to knowledge producer to regional economic growth engine (p. 487). In other words, the university's role as a vehicle for community engagement was not always envisioned to accomplish the goals of regional economic development. However, when it has decided to internalize the entrepreneurial mission, it has become a significant catalyst for change. Etzkowitz (2013) estimates that this new paradigm will replace the agglomerated power of multi-national corporations with regional technology clusters led by entrepreneurial universities (p. 489). If this claim is correct, then the entrepreneurial university literature, a branch of triple helix studies, is essential to fully understanding the university's potential in the regional economic development equation.

Some worry that entrepreneurship is mission creep, or getting away from one's intended purpose, and could have harmful results such as conflicts of interest between knowledge production and profit motive. This perception appears in a recent survey of U.S. and European faculty about their attitudes toward academic entrepreneurship. It revealed favorable opinions toward university-community engagement for the benefit of regional economic development as opposed to commercialization (Goldstein, Bergman, & Maier, 2013, p. 475). They viewed their role as having social impact on the community, a natural extension of their university teaching and research mission. Only in circumstances in which there were mass layoffs did they react favorably toward the mission of technology commercialization (p. 469). This key distinction

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between economic development and commercialization is informative for policymakers working with universities to explore the entrepreneurial turn.

The entrepreneurial mission acknowledges an evolution away from strictly academic research/teaching toward applied knowledge in markets, the community, and in the ventures of entrepreneurs. Central to the university's new role as active participant in the regional economic development system is the idea of permeable boundaries (Etzkowitz, 2012). Permeability can be understood through internal policies like tenure and external ones like building a university affiliated science park. Barriers to the entrepreneurial paradigm include the university's culture, lack of peer mentors engaging, and tenure or promotion policies that do not reward faculty engagement (Philpott et al., 2011, p. 167).

Structural mechanisms such as policies that guide faculty and student interactions with civic groups, business, and/or government are the guiding force behind permeability. These are called community engagement policies. In this review, the community engagement literature is analyzed in the context of triple helix studies. It provides inwardly facing insights on the university to explain their outwardly facing behaviors. University policies have a direct relationship to the success of community engagement in practice (Mtawa, Fongwa, Wangenge-Ouma, 2016).

Caldwell (2012) explains that university policies create a culture of risk tolerant or risk adverse behavior. Some of this depends on the preferences of the individual, but the policies that guide tenure, promotion, and research products shape engagement because of what they incentivize. This can be a point of tension. As Caldwell points out, most U.S. corporations prefer R&D that leads to short-term profits, while many entrepreneurial faculty are focused on long-term research because of the university incentive system (p. 2).

Silka, Teisl, and Settele (2015) describe the various vehicles that an entrepreneurial university might create in order to engage. In their work, they identify champion faculty members, programs, centers of excellence or institutes, a policy- driven or experiential school, and a multi-campus initiative as the means through which connections are made between town and gown (pp. 90-97). Hodges and Dubb (2012) categorize engagement in three ways: facilitation, leadership, or convener (p. 11).

- *Facilitation* – this role is educational in nature, the university acts as a community caretaker, an honest broker of knowledge applied to community problems, university funding is limited/low, administration supports engagement, but it stops short of economic development.

- *Leadership* – a technical assistance role, the university knows the problems and deploys resources toward addressing them, sometimes in the wake of a community crisis around crime/violence, health, or socio-economic, university administration often oversees these activities as opposed to empowering a nonprofit, if there is a separate nonprofit it is often university dominated or controlled, significant funding is provided often to areas adjacent to the campus.

- *Convener* – a capacity building role, convener institutions build coalitions around problems, share in agenda setting, bring significant financial resources to the table, economic development is the result of the mission, not adjacent pressures to preserve the campus setting or address community problems impinging on the campus (pp. 11-16).

These roles inevitably shape university-community engagement policies. One way of understanding roles is through the collaboration process.

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### 2.2.2 Industry-University (I-U) Partnerships

Beyond the government funding, the main triple helix stakeholder engagement is between industry and the university. Since all community engagement activities are not created equal, Philpott, Dooley, O'Reilly, and Lupton (2011) record a spectrum of university activities that range from entrepreneurial to the traditional university role (see Table 3). Representing a high degree of entrepreneurship, the activities listed as high are most closely associated with the entrepreneurial university paradigm, which describes the strongest interventions into regional economic development. Those categorized as low are most closely tied to the traditional paradigm of teaching, researching, and publishing. Policymakers might view these activities as a menu of options that depend on the university's capacity to engage outside their institution.

**Table 3.** Entrepreneurial University Activities by Degree

| Low | Moderate | High |
|---|---|---|
| • Grantsmanship<br>• Publishing academic results<br>• Producing high quality graduates | • Contract research<br>• Industry training courses<br>• Consulting | • Creation of a technology park<br>• Spin-off firm formation<br>• Patenting & licensing |

Ivascu, Cirjaliu, and Draghici (2016) offer a business model for the I-U relationship that takes a technocratic approach to adaptive network development. They identify evaluation parameters, success metrics, outcomes, and barriers to collaboration in their model (p. 676). Much like Calcagnini et al. (2016) who identify cultural similarities that make I-U collaboration palatable, their model makes overcoming the barriers of cultural differences the centerpiece. Ivasu et al. (2016) follow the trend that establishment of a positive I-U collaboration at the outset

is more effective. Adamuti-Trache and Hyle (2015) identify social capital and structural dimensions as essential to university engagements that form effective partnerships (p. 75). They apply these perspectives to understand the process of I-U relationships.

The literature illustrates I-U partnerships as a menu of activities or as a series of processes. There are barriers and challenges both structural and social in nature. And finally, the aspects of I-U partnerships can be broken down into components. An area that drills down further on components are the authors that look at individual agents in the innovation process.

### 2.2.3   Agents of Innovation

Most of the literature to this point has been focused on how structural elements affect actors. However, some have provided insights from the perspective of individual agents.  van Agtmael (2016) observes that an entrepreneur, a university president, or a company CEO can play the role of connector or innovation agent in regional economic development. His thesis on "brainbelts," or innovation ecosystems, builds off the strategic nature of engaged and entrepreneurial universities by documenting innovation brokers in various settings. He sees the importance of the university in this process, but he does not limit a regional innovation system's success to it. Mostly consisting of case studies in the U.S. and Western Europe, van Agtmael's work affirms that generalizability is limited. Instead, context matters, institutions matter, and individual personalities can drive regional innovation.

In *Advancing a New Wave of Urban Competitiveness* (2017), the authors lay out three roles that mayors can play in establishing an innovation district: convener, champion, and catalyst. Innovation districts are "geographic areas where leading-edge anchor institutions and companies cluster and connect with start-ups, business incubators, and accelerators" (Katz and

Wagner, 2014). Mayors can be catalytic figures playing a prominent government sector role in developing a district in their downtown. Economic development efforts are often centered around downtowns in a region's signature city. As an example, Chattanooga, Tennessee's Mayor Andy Berke plays more of a regional role in development as the convener of the city's innovation district (*Innovation Districts: The Chattanooga Story*, 2016). Mayors and other local elected officials can be agents of innovation just as university presidents and company CEOs have in numerous settings.

Philbin (2010) explores the collaborative network approach from the perspective of agents involved in structuring and sustaining industry-university contracts. He lays out a five-step process involving: terrain mapping, proposition, initiation, delivery, and evaluation (process factors), supported by the technical and business mission (knowledge factors) with impacts from relationships and networks (social capital factors). His unique contribution is the role of the innovation agent or multiple agents, which may pick up during different stages of the process.

### 2.2.4   Summary of the Triple Helix Literature

The triple helix studies are important to understanding how and why stakeholders interact with an adaptive network like Ignite Erie. The following summarizes triple helix perspectives:

- In complex initiatives where multiple stakeholders are collaborating, the forms of measurement should reflect the context. New **indicators** include: number of community engagements, project designs that meet the region's goals, collaboration with other local networks, and providing services to local entrepreneurs.

- Understanding motivations and expectations are important. Government wants economic impact like job creation, firm creation, and increased tax revenue. Industry wants access

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to knowledge, talent, and an immediate ROI. University wants access to new resources and applied knowledge. In addition, a university's role dictates its expectations for involvement when it decides if it will be a facilitator, leader, or convener. **Indicator**: the value statement in a triple helix must recognize that value-creation and proper expectations are central to community engagement.

- When a region's universities move from learning to innovating, the results can be seen in R&D that benefits industry and results in firm formation. This happens because "innovating regions" have universities with permeable boundaries. **Indicators**: a university culture that encourages engagement, university peer mentors that are actively collaborating with industry, tenure/promotion policies that reward community engagement, vehicles such as centers or programs that facilitate, lead or convene university resources to engage with the community.

- Industry-university engagements are the core activity of a triple helix network. There's a spectrum of entrepreneurial activities that define the engagements. Agents of innovation can come from the private, civic, and/or government sectors. **Indicators**: entrepreneurial activities can be categorized by degree, engagements have components and processes that have been documented.

## 2.3    GEOGRAPHY & PLACE

Moretti (2012) calls it the "Great Divide" between American cities (p. 4). It is the idea that those with higher levels of education are continually sorting themselves by city, aggregating by education. There is no in between. A city is either growing its knowledge and talent base or it is

shrinking. Although the conversation about the geography of innovation is a relevant one to contemporary policymakers, it is not the focus of this case study. However, it is worth mentioning to any practitioner reading this study for the express purpose of replication, that sorting is a trend effecting results.

Proximity of industrial sectors and universities is another prominent theme in extant literature. For example, Abramo, D'Angelo, and Costa (2011) find that universities are more likely to establish partners with industry sectors that are in physical proximity to the university (p. 179). Others have looked at the spending of industry on university R&D contracts and found that proximity was more important than university quality (Muscio, Quaglione, and Scarpinato, 2012). Maietta (2015) concludes that proximity to a university is a major factor in R&D relationships and that "knowledge spillovers" that result in product innovation are more likely within 150 kilometers (p. 1356).

This is another area that the case study does not address. Ignite Erie is a place-based initiative, so all of its clients (Erie County entrepreneurs) are within the immediate geography of the triple helix territory, making proximity a moot point. However, it is worth briefly noting that, at a micro level, geography matters. And, at some point, the association between an innovation network like Ignite Erie and innovation districts like Knowledge Park and the proposed downtown innovation district will need to be addressed by respective leaders and policymakers.

Naghizadeh, Elahi, Manteghi, Ghazinoory, and Ranga (2014) broke down regional innovation models into three categories: industrial districts, industrial clusters, and innovation networks. Similarities include collaboration with place-based stakeholders, replacing funding from a diminishing government role, and the local networks as a platform for global engagement (p. 2500). While this case study focuses on the importance of the network approach, the district

concept cannot be ignored since it draws from the same stakeholders and is growing in popularity amongst contemporary policymakers and economic development practitioners. Hence, the new wave of regional economic development thinking has been deemed an innovation district. Integral to the innovation district construct is the presence of a network. Without an effective social and structural network of stakeholders, any effort is left to the market forces of the economic and physical assets in isolation from the momentum generating effects that come from social capital-based intermediaries.

## 2.4    CONCLUSION

Tackling regional economic development in the Rust Belt is one challenging application for the adaptive network approach. This challenge requires that diverse representation from triple helix stakeholders do their part, see value in the effort, and provide a plethora of creative strategies. Since each region's assets and resources are different based on contextual factors, there is no one size fits all approach. This is where the adaptive network combined with the diversity of the triple helix can be a productive conceptual framework in addressing complexity. As practitioners look at other case studies, it is helpful to understand how these constructs – adaptive network and triple helix – have contributed to a general understanding of regional economic development systems.

## 3.0    RESEARCH DESIGN

### 3.1    BACKGROUND

Much has been written on universities playing a catalyst role in a region's economic development strategy. Entrepreneurial university advocates view educational institutions as the single most important competitive advantage in producing knowledge and supporting entrepreneurs (Etzkowitz & Klofsten, 2005). Others see the university's role as pivotal in the process of triple helix stakeholder collaboration, in which academia engages with industry, philanthropy, and economic development agencies (Viale & Etzkowitz, 2010). Universities can play the role of anchor institution in facilitating, leading, or convening the community toward economic development (Hodges & Dubb, 2012). The literature is quite extensive on single universities embarking on engagement. However, a thorough review of the literature was unable to find any studies in which multiple universities from the same region were collaborating to engage industry toward regional economic development.

Multi-university collaboration in service to regional economic development is a phenomenon that has happened in Erie County. It began when four universities – Edinboro, Gannon, Mercyhurst, and Penn State Erie, the Behrend College – published a joint statement on their intent to collaborate on community engagement with the ultimate goal of improving the region's economy. In *The Path Forward* (2014), the universities laid out the aspirational goals of

sharing resources, putting their respective knowledge assets to work for industry, and solving community problems. Then, in 2016, the Erie County Gaming Revenue Authority (ECGRA) made a $750,000 capacity building grant in Ignite Erie. Led by the universities and supported by private sector partners, the investment was designed to address a lack of funding for universities to engage with industry and the community. They formed a multi-university, multi-sector group called Ignite Erie to begin this work. Three years into the initiative, the funders of the program and local policymakers are interested in better understanding the status of the initiative.

This case study is designed to capture the progress of these universities and their partners in implementing their plan. It does this by asking the following research questions:

How has Ignite Erie faired in creating a culture of collaboration to implement the goals of *The Path Forward* (2014)?

1. What are the core activities undertaken by Ignite Erie?

2. What are the interim outcomes?

3. What are the conditions that fostered multiple university collaboration?

4. What was the network formation process like?

## 3.2    CASE STUDY APPROACH

The case study occurred during the months of November 2017 through February 2018 in Erie County, with key stakeholders involved with the Ignite Erie Initiative. Erie County's Ignite Erie Initiative is the unit of analysis. A single descriptive case study approach was selected for this inquiry because the phenomenon being studied is about complex behavior in a specific context

with multiple stakeholders. This review is designed to capture complexity with summative and formative aspects, employing both primary and secondary research.

Case study affords the opportunity to capture what is working in the program from multiple perspectives and how it can be improved (Yin, 2014, p. 119). Bypassing the political risks of evaluation, the case study allows for deep observation and group learning. The primary audience is the Erie County Gaming Revenue Authority (ECGRA) board of directors and the Ignite Erie team (administrators and steering committee). Tertiary audiences include county and state government officials, policymakers in the regional economic development field, and researchers in the field of university-industry engagement, triple helix organizations, and the entrepreneurial university. This review will summarize the progress of Ignite Erie, analyze the available data, and communicate the results in a manner that illustrates a status report. For a better understanding of how that will be done, the paper turns now to the methods of data collection.

### 3.3    METHODS

This research seeks to understand how the Ignite Erie initiative is progressing by triangulating data via three methods (see Figure 4.):

a)    secondary literature

b)    planning and programmatic documents, and

c)    the perspective of the participants captured through interviews.
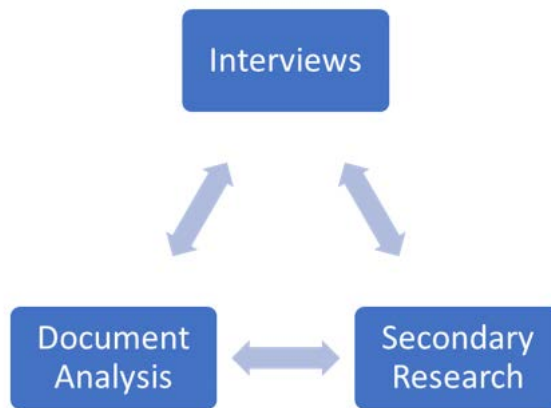
**Figure 4.** The Triangulation of Data

### 3.3.1 Primary Research – Interviews

The author conducted six semi-structured interviews with steering committee members representative of the program administrators and the four universities leading Ignite Erie (see Table 2 for a list of stakeholder interviews). Turnover of participants is always an issue when determining a sample. Several members are relatively new to the group. So, selecting interviewees was based on their participation in the formation of the initiative and implementation of core activities

Two types of interviews were conducted: background and programmatic. Background interviews were designed to collect information about the initiative's status and to design the programmatic interviews. (See appendix for the interview guide, disclosure, and questions.) A sample of steering committee members were interviewed. Several members are new to the group. I focused focused my interviews on the members who have been engaged since the formation of the initiative. All known documents associated with Ignite Erie were reviewed.

**Table 4.** Stakeholder Interviews

| A.  Relation to Ignite Erie | B.  Position | C.  Organization | D.  # of Interviews |
|---|---|---|---|
| Program Manager | Administrator | Penn State Behrend | 2 (1 background, 1 programmatic) |
| University #1 Representative | Administrator & Steering Committee | Penn State Behrend | 1 (programmatic) |
| University #2 Representative | Steering Committee | Edinboro University | 1 (programmatic) |
| University #3 Representative | Steering Committee | Gannon University | 1 (programmatic) |
| University #4 Representative | Steering Committee | . Mercyhurst University | 1 (programmatic) |

### 3.3.1.1 Interview Procedures

Each informant was contacted via email and asked to participate in a voluntary interview. Arrangements were made via email or phone. The interviews took place in a private office setting. An interview guide was emailed to the interviewee ahead of time. The guide informed the interviewee of the study's purpose, their rights, contact information of the researcher's advisor, and the questions.

Before beginning the interview, the researcher read the interview guide to the informant. Interviews were recorded digitally. At times, the researcher deviated from the questions in order to dive deeper into a topic that came up during the interview or for clarification.

### 3.3.2  Primary Research – Document Analysis

The author collected documents from the Ignite Erie Initiative such as agendas, minutes, reports, marketing material, press releases, and media. These documents served to confirm or support the findings in the interviews.

**Table 5.** Ignite Erie Documents

| Type | Source |
|---|---|
| Ignite Erie Grant Application | Ignite Erie Administration |
| Ignite Erie Agendas & Minutes | Ignite Erie Administration |
| Ignite Erie Interim Reports | Ignite Erie Administration |
| Ignite Erie Budget & Financials | Ignite Erie Administration |

### 3.3.3   Secondary Research – Literature Review

The author conducted a review of the literature assessing the role of the university in regional economic development. There was a significant body of literature by scholars, think tanks, and practitioners on university engagement policy and practice toward economic development. This manifested in various threads of the literature including: the triple helix studies, the entrepreneurial university, industry-university partnerships, innovation agents, and, more broadly, university engagement studies. Similarly, the author reviewed the literature on the use of adaptive networks, how they are used by grantmakers, and how to measure them in a way that is useful in understanding Ignite Erie as an initiative organized as a network. However, no studies involving a multi-university approach to regional economic development were found. In addition, the concepts of adaptive networks combined with triple helix stakeholder approaches were also absent from the review. (See Table 2 for a list of documents and secondary sources used in the research design phase.)

Table 6. Secondary Sources

| Comparable Case Studies | Source |
|---|---|
| *Advancing a New Wave of Urban Competitiveness: The Role of Mayors in the Rise of Innovation Districts* (2017) | The Brookings Institution & Project for Public Spaces |
| *Little Town, Layered Ecosystem: A Case Study of Chattanooga* (2016) | The Ewing Marion Kauffman Foundation |
| *Innovation Districts: The Chattanooga Story* (2016) | National League of Cities, Center for City Solutions and Applied Research |
| *Revitalizing America's Smaller Legacy Cities: Strategies for Postindustrial Success from Gary to Lowell (2017)* | Lincoln Institute of Land Policy |
| *America's Advanced Industries: What They Are, Where They Are, and Why They Matter* (2015) | The Brookings Institution |
| *Erie's Advanced Industries* (2016) | The Jefferson Educational Society |
| *An Entrepreneurial University Strategy for Renewing a Declining Industrial City: The Norrkoping Way* (2012) | European Planning Studies |
| *The Innovating Region: Toward a Theory of Knowledge-Based Regional Development* (2005) | Science Policy Institute |

## 3.4     BOUNDARIES AND LIMITATIONS

This study is not designed to look at individual, small group, or macroeconomic dynamics. Instead, the organizational components and evidence of progress are the focus. This study is not designed to make a judgement on the future funding of Ignite Erie. When complex networks like Ignite are reviewed at a mid-term point, it is difficult to make a judgement that funding should continue or stop, unless informants have withdrawn from participation. Networks need time to form. Outcomes are often elusive or preliminary during the inception phase. This study is not designed to evaluate the personnel involved in administering the program. Grant recipients

should take on this role internally, putting human resource practices in place to determine if personnel are performing at acceptable levels. Finally, the study does not interview users. Three years into the initiative, there is a list of users to speak with. However, as Ignite continues to evolve, this review is focused is on the organizational aspects currently being developed and implemented, not the user experience.

There have been numerous evaluations and case studies of regional economic development programs and strategies. While their findings have some generalizable qualities, much of what is learned is most relevant to the geographic area they reside in and to those stakeholder groups who are implementing initiatives. In other words, the context matters when looking at programs, because some of the findings may be generalizable while others are likely to be more localizable. Nevertheless, there are lessons to be gleaned from the work of other communities.

Since the ECGRA is a funder of economic development, one might assume that strictly using an economic lens or conducting a cost-benefit analysis would be the ideal research design. However, after looking at the relative infancy of network evaluation, and observing that some foundations and agencies were moving away from a purely economic quantitative analysis, this paper also looks at concepts like connectivity, health, and interim results. In the short-term especially, it made sense to use an economic lens for summative purposes that inform other observations.

## 3.5 EPISTEMOLOGY

It is important to point out that this inquiry is limited by the technocratic lens it employs to review the Ignite Erie Initiative. This means that research should attend to the incremental progress made possible through adaptive networks created among institutional players and their multi-sector collaborations. Economic development approaches like Ignite Erie – technical and collaborative – are designed to make incremental change to transition the region's economy from traditional manufacturing to a knowledge-based economy. By assessing local stakeholder perceptions along with the other documented evidence available, this review is a pragmatic, mixed methods case study. Mertens (2015) describes the pragmatic paradigm as participatory and fitting with the mixed methods approach of quantitative and qualitative research (pp. 8-11).

## 3.6 ANALYSIS

This case study utilizes explanation building in the analysis process. Yin (2014) suggests that good explanations are built on a series of theoretical propositions that are refined through an iterative process as the data leads the researcher to new insights (p. 149). In other words, the researcher makes an assumption, compares it to the findings, then revises his or her position. This process could go through several revisions. The following assumptions have been made about the Ignite Erie case study:

- Multi-university collaboration will produce a better end result. Each university has something that they excel at. By combining forces in a single platform, they collectively bring their strengths to bear.

- Multi-university collaboration does not happen organically. It requires a unique set of circumstances to foster and nurture.

- When forming a network through which to collaborate, the process is important and can be instructive.

- Universities engage in multiple forms of community engagement. Ignite Erie is different because its theory of change rests on collaboration as an organizing principle.

## 3.7    RESEARCHER'S REFLEXIVITY

It is important to note that the researcher is the executive director of the ECGRA, the agency that has seed-funded Ignite Erie. As a career professional of economic development, the researcher's perspective of the initiative may be biased. The researcher has been involved with university engagements with industry, having run a trade association for technology companies as well as a nonprofit that supports downtown redevelopment. In addition, the fact that the funding agency's director is studying the initiative, as opposed to a third-party consultant, may shape the research results and create a threat to the validity. Informants may be reluctant to provide critical feedback in fear of consequences such as funding loss or losing face. Loyalty to the administrator of the program may also influence responses. These factors may shape data collection. To mitigate potential bias, the researcher established protocols for conducting interviews.

## 3.8    PROPOSED DEMONSTRATION OF PRACTICE

The primary audience for the review consists of two groups. First are the ECGRA board of directors and local public officials in county and state government. The review is a tool to understand how their investment in a capacity-building grant played out. Second is the Ignite Erie Team, including administrators and steering committee. This group has been pioneering the program for two years. The report will assist them in developing a shared language, supporting efforts to improve the program, and anchoring the group's collective experience.

A tertiary audience would be a professional group like the International Economic Development Council (IEDC), a nonprofit that convenes economic development professionals, acts as a repository for information, and publishes reports. The IEDC has annual conferences, certification training, and best practices publications. On a local level, the report would appeal to civic groups like the Jefferson Educational Society, the Erie Regional Chamber, and Rotary/Kiwanis groups. On a national level, think tanks like the Brookings Institute and Kauffman Foundation have an interest in this vein of research. In addition, the report could inform the nascent Erie Innovation District. These results are intended to provide a blueprint for collaboration.

With these audiences in mind, the final product should be an easily readable report with infographs, charts, and narrative accessible to a policymaker. Up front there should be a clear and concise summary of findings and recommendations. The report should be available online for free download. It should be disseminated through Twitter, Facebook, LinkedIn, eNewsletter, and press release. To make it more accessible to policymakers and interested parties, a PowerPoint presentation summarizing its main points could be a companion tool in disseminating the report.

## 3.9    FUTURE STEPS

Beyond this case study, the researcher recommends that programs like Ignite Erie develop creative ways to communicate their outcomes to the public. Entrepreneurial developments and university engagement can serve as source of positive news to the Erie region. Locating some type of national network is a positive way to work toward continuous improvement through sharing and benchmarking. If federal policy in the United States could view regional economic development systems as assets for job creation, wealth creation, community development, and national competitiveness, then the country might be able to formulate its first cohesive national innovation policy.

This study is a mid-term review, which implies that there will be a future review of the initiative. In updating research questions, future practitioners might consider the following:

1. The user experience – How do users of Ignite Erie interact with the platform, what are the quantifiable outcomes from their engagement, and do they have suggestions to improve the process?

2. The macro effects – How does Ignite Erie fit into the regional economic development system? How can it improve integration with other stakeholders? What commonly accepted macro indicators should be measured (e.g. jobs, firm creation, R&D investments, tax base)? What has improved as a result?

## 3.10    SUMMARY

The Ignite Erie review is a case study that explores a unique phenomenon taking place in Erie County, Pennsylvania. Four universities have created a platform to collaborate with each other and engage with industry and the community. By asking participants for their perspectives, collecting documents generated from the program, and reviewing the literature, this paper provides insights and patterns, and better explains concepts concerning the initiative's progress. This review may be valuable as a guide for other midsize communities looking at reinventing their economies through innovation. However, similar case studies of this type remind the reader that context is a powerful factor that varies among regions. Finally, this review should be used as an immediate formative tool for improvement of the next phase of the Ignite Erie Initiative.

## 4.0    FINDINGS

This case study is designed to capture the state of the Ignite Erie initiative (Ignite), the interim outcomes it achieved, and its potential for building a multi-university collaborative culture. As the initiative surpasses its third year, this analysis will serve as a mid-term review offering summative and formative observations. Mid-term reviews can be helpful in describing to funding agencies, policymakers, practitioners, and other stakeholders what is happening, the interim results, and where things might be headed. The findings are summarized in this section.

A survey of the recent triple helix and regional economic development literature uncovered no comparative case studies of multi-university collaboration providing entrepreneurial support services. Ignite, narrowly defined as an adaptive network of triple helix stakeholders, may be the first of its kind to be documented. Since this is an undocumented phenomenon and the nature of collaboration is amorphous, there's a need for representative indicators capable of describing and analyzing an emergent framework. This case study uses concepts like permeability and network formation as proxy indicators for a culture of collaboration, while discussing the interim as well as intended outcomes.

The study triangulates data through a literature review, numerous documents produced over the course of the initiative, and six semi-structured interviews. First, a literature review was conducted by searching for case studies on regional economic development and constructs relevant to industry-university collaboration, and by visiting think tank websites that publish

practitioner reports. Relevant constructs included the adaptive network, triple helix approach, and the entrepreneurial university. Practitioner studies from think tanks like the Brookings Institution and Kauffman Foundation were also helpful. The literature on efforts by Foundations in the United States to measure networks helped define the case study's boundaries by laying out concepts like network connectivity, -health, and -outcomes.

Then, documents were collected by attending Ignite Erie meetings, interacting with the initiative's administrators, and conducting internet searches. Documents included meeting agendas, meeting minutes, PowerPoint presentations, interim reports, news articles, and press releases. Documents were used to corroborate the interviews and create a timeline.

Finally, interviews included Ignite administrators and at least one person from each collaborating university. An invitation to participate in the study, along with an interview guide describing voluntary participation, was sent to each interviewee. All six participants consented. The interviews were conducted between November 2017 and March 2018.

Research questions were designed by identifying gaps in the literature, understanding what was useful by reading practitioner reports, and asking Ignite stakeholders how a study could assist them. The inquiry into how Ignite has fared in creating a culture of collaboration to implement the goals of *The Path Forward* (2014) was informed by the following sub-questions:

1. What are the core activities undertaken by Ignite Erie?

2. What are the interim outcomes?

3. What are the conditions that fostered multi-university collaboration?

4. What was the network formation process like?

These questions are designed to appeal to a broad range of stakeholders. For example, the funding agency and policymakers are interested in an objective accounting of the interim

outcomes. They want to know how the grant was spent and subsequent outcomes. Ignite's steering committee is interested in understanding what has been achieved with interim outcomes and long-term intended outcomes, and how the initiative can be improved based on the data and recommendations from interviewees. Also, they need to know if their time was spent effectively in the pursuit of their goals. On a macro level, some researchers observing the university as an entrepreneurial actor are interested in the specific ways in which the institutions engaged with industry and the community. Other researchers are studying the evolution of networks, how they effectively accomplish their goals, and accurate ways to measure them. And finally, grant makers have a stake in understanding how their funding can be most impactful (financially, organizationally, and socially) through adaptive networks and triple helix stakeholder approaches. The literature, documents, and interviews produced a substantial amount of data. After reviewing the data, three themes were identified and the findings organized based on those themes, described on the following pages. After each theme, a description of the results follows. Discussion or interpretation of the findings rounds out each section. Findings are broken down into digestible descriptions that incorporate answers to the research questions. Narrative, quotes, tables, and diagrams are used to describe the findings in a way that helps the reader to develop a deeper understanding of the Ignite Erie phenomenon.

## 4.1    IGNITE ERIE AS AN ACTION AGENCY

Understanding Ignite Erie as an action agency helps in describing the initiative and diagnosing adaptive network challenges inherent in triple helix collaborations. Examination of documents revealed that three assumptions underlie Ignite as an action agency. First is an assumption that

multi-university collaboration can be maximized toward regional economic development when each institution brings its niche strengths to the table. This is a tacit belief held by policymakers and the universities as articulated in *The Path Forward* (2014), represented in the grant application, and confirmed in the case study interviews. The aspirations for multi-university collaboration are a driving force behind the theory of action and a belief that Erie County's universities excel at certain things that, when taken as a whole, could manifest entrepreneurial university-like outcomes.

Second, there is an understanding by stakeholders that adaptability is important to and essential for the Ignite network to succeed. Ignite is an initiative about innovation at all levels – the entrepreneur, the university, the network, and the Erie region's economy.

Third, there is an assumption that the universities needed funding in order to collaborate toward meaningful industry-university and community-university engagement. The Erie County Gaming Revenue Authority (ECGRA) has provided Ignite Erie with a $750,000 capacity-building grant to facilitate multi-university collaboration, implement the programmatic goals listed in the application, and measure the outcomes.

This case study describes Ignite Erie's performance as an action agency in three parts (See Figure 5):

a) its strategy to collaborate as a network,

b) the programmatic goals designed to evolve the region's economic development system, and

c) the interim results and intended outcomes.
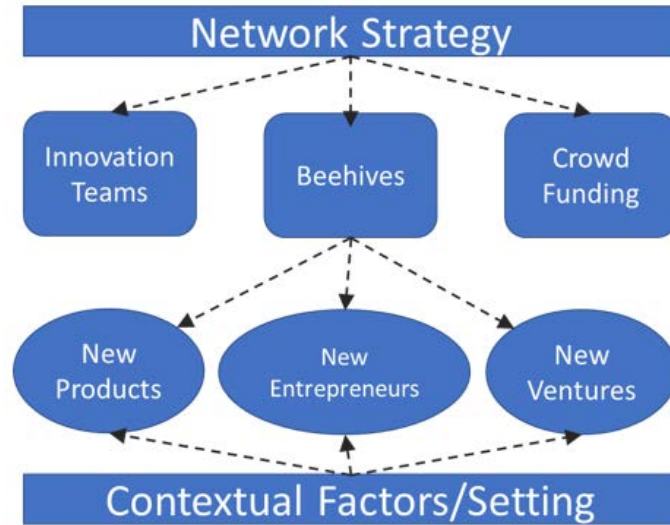
**Figure 5.** Ignite Erie as an Action Agency

## 4.2    NETWORK STRATEGY

Ignite Erie's network strategy is to support collaboration and experimentation among the universities in Erie County by utilizing their strongest programs or niche assets in order to engage with industry and the community to implement the four goals of *The Path Forward* (2014). It does this by convening stakeholders from a broad range of sectors. According to the grant application titled *Creating a Robust Innovation Ecosystem in Northwestern Pennsylvania: A Collaborative University-Industry Approach (2015)*, successful regions

> …are built on collaborative networks of innovators, entrepreneurs, knowledge
>
> creators, industry partners, and service providers that are committed to the long-
>
> term success of the region…. The plan lays out the strategies for building a
>
> collaborative network among the region's educational, industry, and community

partners that will spur innovation by students, faculty, local businesses, and emerging entrepreneurs. (p. 3)

The network strategy has both structural and social elements. A review of Ignite Erie documents shows that bi-monthly gatherings of the steering committee, presentations from entrepreneurs, and financial reviews by the partners are part of the collaborative's meeting routine. One interviewee said, "…we've always collaborated with each other on a street-side level...but we had never done it in any kind of formalized way. So, there are barriers to that; it's meshing four university cultures, two private, two public – that's not lost on us" (Interview #3). Another described the network as an open window: "You're getting the universities to work together at levels which do not necessarily require the regular involvement of the CEO's. Its provided windows, where you can at least play catch between the windows" (Interview #5).

While the window metaphor quite literally describes a structure, the implication is that relationships have developed because of the network. Unseen and much more elusive to measure is the social capital – trust, respect, relationships – that binds the group beyond the formal structure of Ignite. Interviewee #3 spoke about this dynamic in the context of people coming and going from the initiative: "You have changes in leadership, staff, teams, and that's a small group dynamic problem that is going to occur in any business. Some changes have helped the collaboration some changes have not" (Interview #3). A successful network strategy recognizes that structural and social capital elements are two sides of a coin.

## 4.3    PROGRAMMATIC GOALS

Ignite lays out four programmatic goals in its grant application. Each goal has an important role to play in the theory of action. Central to each goal is the importance of involving university students in assisting entrepreneurs in real world situations and making their efforts an important part of regional economic development. One interviewee described the programmatic elements as substantive because they deliver a service: "The Ignite Erie program…I think it has turned into a very good program for Erie because truly it's the third or fourth effort that actually delivers something to entrepreneurs…it's been the first successful attempt to bring together and unite the capabilities of each of the universities" (Interview #5). Beyond the traditional internship experience, students engaged through Ignite by joining teams to solve problems, developing business models, and interacting with company leadership to assist entrepreneurs through four programmatic approaches:

1. **Student Innovation Teams –** Working with faculty and university staff as mentors, students are matched with companies to work on a range of engineering projects from proof of concept to manufacturing challenges to business growth models.

2. **Business Innovation and Acceleration** – Working with faculty and staff as mentors, students provide market research, business modeling, and competitive assessment to crowd funding campaigns and business launches. This program existed prior to Ignite Erie and is called Quickstarter.

3. **Maker Spaces and Research Facilities** – This programmatic element has two parts. First, students design curriculum and advise on equipment purchasing and implementation of maker spaces at high schools. Advisement of the Erie County Blasco Library's maker space occurs in the high schools. Second, on campus space called

Beehives are constructed at each university in order to work on niche topics related to each school's strengths. The pilot hive is called Innovation Commons. Subsequent hives will be based on assessment of the pilot.

4. **Network Development** – Overall, the growth of an ecosystem of stakeholders and services requires development of a strong network of resources, communication, sustainability, and adaptive change to serve the needs of both the network participants, the end user or entrepreneurs, and the regional economy.

These four approaches are represented in Figure 5 as innovation teams, Beehives, and crowd funding. There were two tactical approaches to these four programmatic goals that were mentioned repeatedly in Ignite documents and interviews: Quickstarter and Beehives. This case study also identified internships, high school maker spaces, and innovation teams as Ignite programs. However, they were considered to be lower yield activities.

### 4.3.1 Quickstarter

Quickstarter is a tool that is consistently present in Ignite Erie Agendas, minutes, and mentioned by interviewees. The methodology created by Quickstarter's founder is designed to help an entrepreneur identify an immediate market, promote the business to that marketplace, and study the most effective comparable campaigns in online crowd funding platforms like Kickstarter.com. There was evidence that it served as a pipeline and vetting tool for Ignite:

> Not that it has produced any great Amazon.com but just trying to get people to engage with the universities that wouldn't have normally engaged and then

getting them one step further to trying a business…I think that Quickstarter has allowed that 'quick in, quick fail' to take hold. (Interview #3)

Put another way, Quickstarter became an important tool to identify marketable companies and serious entrepreneurs.

…it was designed to connect college students who have skills with pre-entrepreneurs, people who really are just developing the ideas of being entrepreneurs who don't typically have a lot of skills…we put those together and use crowdfunding to get some sort of seed capital and maybe more at some point. (Interview #6)

Quickstarter projects or pre-entrepreneur services make up 20 percent of the overall Ignite Erie grant budget of $150,000. These funds are used initially to screen entrepreneurs' ideas through market research. Then, a team of students helps the entrepreneur to launch a campaign on a crowdfunding platform that makes the most sense for the product. Students provide a range of services in branding, social media, and sales. Utilizing approximately $50,000 of Ignite funds, Quickstarter has engaged 36 students in order to bring 11 campaigns to completion; these campaigns have received $67,897 in crowdfunding. The program attracted additional grant funding of $45,000.

Quickstarter was not created by the Ignite network, but it is consistent with the kind of industry-university engagement that Ignite strives to produce. It was the brainchild of a single faculty member, and its success was proven before the Ignite network's inception. It was incorporated as an element to Ignite, which enabled its growth as a vehicle for collaboration. Put simply, Quickstarter was in demand as an industry-university engagement service. In the

formation years of Ignite, it was very much the focus of the initiative because of its quick results in engaging entrepreneurs.

### 4.3.2   Beehives

Beehives are physical on-campus innovation spaces that provide opportunities for collaboration between university and non-university stakeholders. The location of equipment and talent to work together helps in solving an entrepreneur's problem. One interviewee said, "My understanding of the Beehive Network is that it is a startup loop, if you will, not just for startups, but also for organizations that might be trying to rethink their brand and their operations" (Interview #4). The substance of a Beehive is the student-driven interactions that take place between the entrepreneur and the university. Students are matched with problems. The result is an enriching experience for both the student and the entrepreneur. Not all projects succeed, which mirrors the realities of the marketplace.

The Beehive concept is the first project that has grown out of Ignite. That is to say, it was not in existence before the initiative launched, and the triple helix actors all have provided input on its creation. Interviews revealed unanimous support for the Beehive direction. One interviewee said,

> Particularly now that we are getting into this Beehive phase, I think this is the first time you're seeing a fully collaborative initiative from the four schools. I think that things that Ignite Erie was doing up to this point paid lip service to that collaboration but it was hard to really manifest and to come up with a project that would truly allow each institution to exercise its strengths in a particular way. What Beehive does is it takes, from my vantage point, it takes control of the entire

initiative outside of the nucleus of Ignite Erie and places a significant amount of responsibility with each institution. (Interview #4)

The decentralization effect mentioned in this quote is a reference to influence over the initiative. This space is a physical manifestation of each university's role in a larger initiative. Each university will have a physical connection to the initiative through its Beehive and a permeable network connection to Ignite Erie through participation in bi-monthly meetings.

In addition, physical space that welcomes stakeholders not affiliated with the university will create a permeability between the university and the community and the overall Ignite network and the community. Entrepreneurs will be able to access the network from the participating university that makes the most sense for their needs (e.g., the university they are most comfortable with or the university that is closest to them). One interviewee put it this way:

Everything is on campuses, which is good…it breaks down the other barrier, which is people think campuses are off-limits, scary places where weird people with tweed suits and bow ties condescend to the public, which is just the wrong opinion in every way. The doors are open. (Interview #1)

Another distinguishing feature of the Beehive approach is its focus on an area of strength. (See Table 7.) The Ignite Erie theory of action assumes that the niche strengths of each university can be aggregated into one network in order to transform the region's economic development system. Beehives do just that. Below is a list of each Beehive and its niche focus based on university strengths.

**Table 7.** Proposed Beehives

| Proposed Innovation Beehive Network | |
|---|---|
| *University* | *Focus* |
| Edinboro University | Branding & Strategic Communications |
| Gannon University | Applied Business Innovation |
| Mercyhurst University | Intelligence & Cybersecurity |
| Penn State Behrend | Prototyping & Product Development |

## 4.4 DIFFICULTIES OF UNIVERSITY ENGAGEMENT

No university engagement strategy takes place in a vacuum. There are policies governing internal and external engagements. There are successes and failures. There are champions and opponents. Interviewee #4 said the following in regards to a short-lived incubator project that has shaped discussions surrounding Ignite:

> The legacy of the incubator and the way that it is remembered fondly and not-so-fondly by the folks here on campus helped precipitate what we're doing with the Beehive and branding innovation because it restarted some of the old conversations about what that incubator was intended to be, how we might do it better, and how we might engage more faculty in the process and get that faculty buy-in. From a university perspective that's always the hardest piece of this; when you try to do community engagement and community development is getting your experts to commit locally. (Interview #4)

As Interviewee #4 continued, it was clear that faculty buy-in was the main point. Even though Ignite's services are predominantly provided by students, they are still referred,

encouraged, and mentored by faculty who champion the concept of industry-university engagement.

Participation incentives are important to faculty buy-in. Issues surrounding tenure and promotion are focused on the need to publish. It is difficult to get faculty to participate when they are focused on national or international issues, not local ones. It is not seamless to adjust a national research agenda to the local level. These challenges go to the idea of incentives:

> You take somebody from an academic discipline whose publishing cycle is outside the region and you try to get them to redirect their attention toward a community or an economic development initiative locally.  That could be a difficult turn for them to make, and it could be difficult for them to translate what has been a research agenda into that local initiative and still be able to articulate how that fits into the research agenda and why….it's kind of a "catch twenty-two." (Interview #4)

Incentives and research agendas speak to \motivation. Without the right university policies in place to reward local or regional engagement and the right faculty interested in local or regional engagements, the university has an environment that is structurally incongruent with the goals of *The Path Forward* (2014) and the theory of action behind Ignite.

> When you come onto a college campus, as an outsider I think you expect to have a lot of interaction with the people in the field that you're interested in and that's not always the case…when expectations aren't met or the experience doesn't necessarily rise to the same level…that could be difficult to bridge and then that starts to filter out into the community as well. (Interview #4)

Those steering Ignite have communicated through interviews, in budget documents, and in meeting minutes that the Beehive is their main thrust moving forward. Interviews reveal consensus that this is perceived as a positive direction. However, at least one interviewee warned of community engagement difficulties. There is an expectation that access to the university campus means access to faculty in the departments the entrepreneur perceives as valuable. There are expectations and perceptions around the Beehive project that may not be congruent with reality.

## 4.5     INTERIM RESULTS AND INTENDED OUTCOMES

There are two ways to view Ignite Erie's outcomes. First are the measurable, tangible interim results. Grant applicants proposed measuring the number of products developed, businesses started, jobs created, financial leverage, venture capital raised, successful crowdfunding campaigns, and new industry-university collaborations. Figure 5 lays out the main outcomes for the initiative as new products, new entrepreneurs, and new ventures. These are standard metrics required by funding agencies in the economic development field.

Second, there are intended outcomes, which are more difficult to measure and often involve building something long-term. For example, Erie County's universities have collaborated on projects in the past, but not by offering entrepreneurial support services in a sustained fashion. A well-funded, organized platform like Ignite can provide stability for a long-term collaborative culture. When viewed together, the interim results and the intended outcomes provide unique value to the Erie region's economic development system.

### 4.5.1 Collaborate to Develop New Industries

The first initiative of *The Path Forward* (2014) is to collaborate to develop new industries. The intent is for faculty and students to assist entrepreneurs through internships, incubation, and promoting the region as startup-friendly. Ignite Erie administration has tracked interim results through a database organized by metrics established in the original grant application. Table 8 captures the product and business development metrics set out in the application, the specific Ignite tactic deployed, and the measurable outcome.

**Table 8.** Ignite Erie Products & Business Development Metrics[1]

| Metric | Ignite Erie Tactic | Number |
|---|---|---|
| Products & Business Development | | |
| Product Development | Quickstarter | 8 |
| | Accelerator | 1 |
| | Innovation Commons | 12 |
| | Internship | 2 |
| | | |
| Intellectual Property | Innovation Commons | 2 |
| | Legal Funding | 1 |
| | | |
| Businesses Started | Quickstarter | 1 |
| | Innovation Commons | 3 |
| | | |
| Jobs Created | | 5 |

Financial support for the initiative is a goal for sustainability, continuation funding, and a success metric for economic impact. Ignite is exploring the initiative's ability to attract other sources of funding, not simply organizational sustainability, so the leverage of grant dollars becomes an

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[1] Source: Ignite Erie

important metric. Ignite has successfully leveraged funding at a rate of almost 3-1. Table 9 illustrates the financial goals and metrics of Ignite Erie.

**Table 9.** Ignite Erie Financial Goals[2]

| Financial Leverage | |
|---|---|
| Grant Expenses (ECGRA) | $188,555 |
| Match | $515, 527 |
| | |
| Match by Source | |
| Industry Partners | $179,011 |
| Quickstarter Entrepreneurs | $74,401 |
| Penn State Behrend | $262,115 |
| | |
| Other: venture capital | $50,000 |

Ignite is measuring collaboration by counting the number of interactions between a) faculty from multiple institutions, b) Industry-University and Community-University collaborations in which at least two universities work with an entrepreneur, and c) prototype development services through Innovation Commons. Table 10 categorizes the faculty collaborations. Table 11 organizes the I-U and C-U collaborations. Table 12 summarizes Innovation Commons engagements.

**Table 10.** Ignite Erie Faculty Collaborations[3]

| Faculty Collaborations | | | | |
|---|---|---|---|---|
| **Project** | **Ignite Erie Tactic** | **Partner 1** | **Partner 2** | **Other Partners** |
| Council of Academic Advisors | Business Acceleration | Behrend | Edinboro | Economic Research Institute of Erie, County Executive |
| Firearms | Internships | Gannon | Mercyhurst | |

**Table 10** continued

| Discharge & Sensory Integration | | | | |
|---|---|---|---|---|
| Ernst Seeds | Internships | Behrend | Gannon | |
| Solar Sack | Quickstarter | Mercyhurst | Behrend | |
| Innovation Beehive Planning | Innovation Commons | Behrend | Gannon | Edinboro Mercyhurst |

**Table 11.** Ignite Erie Collaborations between Industry-University and Community-University[4]

| Industry-University & Community-University Collaborations | | | | |
|---|---|---|---|---|
| **Project/Company** | **Ignite Erie Tactic** | **Partner 1** | **Partner 2** | **Other Partners** |
| Camea | Internships | Mercyhurst | Behrend | |
| Firearms Discharge & Sensory Integration | Internships | Gannon | Mercyhurst | Behrend Erie Police Erie Insurance |
| Ernst Seeds | Internships | Behrend | Gannon | Ben Franklin Tech Partners |
| Erie Sproutz | Internships | Edinboro | Behrend | |
| Unearth | Quickstarter | Mercyhurst | | |
| All Aboard Erie | Quickstarter | Mercyhurst | | |
| Hornby School Restoration | Quickstarter | Mercyhurst | | |
| Porcupine Project | Quickstarter | Mercyhurst | | |
| Marble Plates of America | Quickstarter | Mercyhurst | | |
| D'Lish 1000 Dog Dash | Quickstarter | Mercyhurst | | |
| Back Home | Quickstarter | Mercyhurst | | |
| Total Flex | Quickstarter | Mercyhurst | | |
| Swine Dining | Quickstarter | Mercyhurst | | |
| Solar Sack | Quickstarter | Mercyhurst | | |
| Working Man's Cake | Quickstarter | Mercyhurst | | |
| BoXYZ Development | Quickstarter | Mercyhurst | | |
| CMI Smoke Stacks | Quickstarter | Mercyhurst | | |

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[4] Source: Ignite Erie

**Table 11** continued

| Hunting Arm Band | Quickstarter | Mercyhurst | | |
|---|---|---|---|---|
| Count Spatula | Quickstarter | Mercyhurst | | |
| LifeSwipe | Quickstarter | Mercyhurst | | |
| Air Baker Pro | Quickstarter | Mercyhurst | | |
| Multiple PoC Testing | Quickstarter | Mercyhurst | | |
| Stirrup Insert | Quickstarter | Mercyhurst | | |
| Woodrow Wilson Middle School | Quickstarter | Mercyhurst | | |
| Phone Throne | Quickstarter | Mercyhurst | | |
| Tub Safety Device | Quickstarter | Mercyhurst | | |
| Ford Explorer Bracket | Quickstarter | Mercyhurst | | |

**Table 12.** Ignite Erie Innovation Commons Engagements[5]

| Innovation Commons Prototype Projects | | |
|---|---|---|
| **Clients** | **Product** | **Service Provided** |
| CMI | Smoke stack for client visuals | CAD, 3D Printing |
| Jacob Hirshman | Hunting Arm-Band | Product Design, CAD, 3D Printing |
| Max Weber | Water Bottle | Intellectual Property, 3D Design & Printing |
| Thermoform Mold | Thermoform Mold | 3D Printing |
| Ryan Bookhamer | Game Field Sensor Cones | Consulting |
| Sarah Wilkerson | Count Spatula | Product Design, CAD, 3D Printing |
| Eriez Development | Musical Glove | Consulting |
| F&S Tooling | Molded Test Sample | 3D Printing |
| Brian Metzger | Seat-Belt Cutter | Product Design, CAD, 3D Printing |
| Air Baker Pro | Cooking Device | Product Design, CAD, 3D Printing |
| Erie County Blasco Library | IDEA Lab | Consulting |
| TM Fluid Engineering | Water Filter Mold | Consulting |
| Vavian Energy | Solar Signs | Product Design, CAD, 3D Printing |
| Lace-N-Lock | Lace-N-Lock | Product Design, CAD, 3D Printing |
| Tim Bokol | Phone Throne | Product Design, CAD, 3D |

[5] Source: Ignite Erie

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**Table 12** continued

|  |  | Printing |
|---|---|---|
| Nolan Carll | Healthcare App | Consulting |
| Mitchel Amos | Drill Bit Invention | Advice |
| Lisa Montefiori | LED Glasses | Advice |
| Jill Johnson | Rapid Prototyping Class | Course Integration, 3D Printing |

## 4.6    A CULTURE OF COLLABORATION

Social capital, or relationship building toward collaboration, can be seen in circumstances where universities choose to trust each other. Universities compete in recruiting students and writing grants. One interviewee said, "The EDA [Economic Development Administration] Grant, the one million dollars that Gannon wrote for the group, is the ultimate example of that trust" (Interview #1) in reference to the fact that three universities trusted one institution to take the lead on a grant, which signifies trust built over time. Figure 6 represents milestones like the EDA grant application that provide evidence of a culture of collaboration.
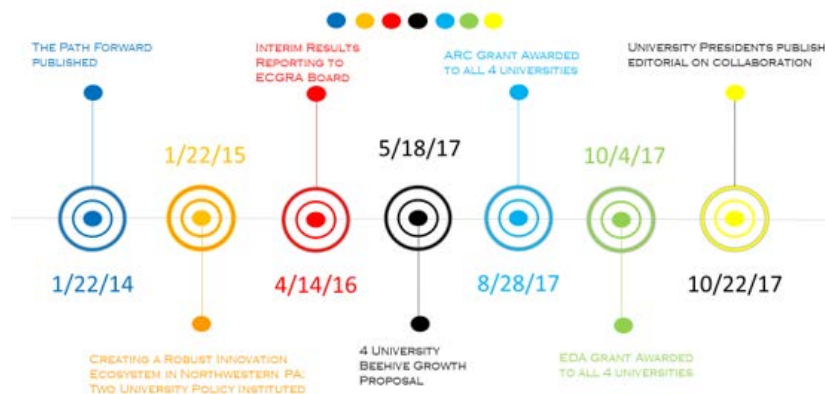


**Figure 6.** Ignite Erie Milestones

Through record keeping, one can see that engagements are taking place that put the resources of the university into play for entrepreneurs and community projects outside university

walls. However, it does not capture participants' deeper form of commitment. This long-term culture building is hard to quantify. One interviewee put it this way:

> …I would say that even though the intent is to jump-start innovation and the ecosystem, which is really important, at the end of three or four or five years, the most important thing out of this is if the universities are in a meshed network. (Interview #3)

The documented interim results of Ignite Erie have shown that university collaboration can help grow a local economy through students working with entrepreneurs. At the level of intended outcomes, Ignite has demonstrated stability toward long-term collaboration. Multiple interview participants agree that Ignite is positioned to make a long-term difference in the region's economic development system. The above quote sums up the general optimism around the initiative. In summary, that first finding is:

**Finding #1:**

**Core activities Quickstarter and Innovation Commons have been the central programmatic outcomes of Ignite Erie during the initiative's startup phase.** These programs are led by university students with support from faculty, industry volunteers, and economic development agencies. Short-term outcomes include new entrepreneurs, new products, and new firms. In the long-term, Ignite is positioning itself as an adaptive network supporting triple helix actors in developing entrepreneurial support services for the Erie region's economic development system.

## 4.7    PRE-IGNITE ERIE UNIVERSITY-COMMUNITY ENGAGEMENTS

Erie County's universities are engaged in various types of entrepreneurial activity. These activities demonstrate some level of ability to cross institutional boundaries and engage with the community or industry. In the literature, this behavior is known as *permeability*. Permeability is the idea of porous institutional boundaries, or the ability to interact outside of current boundaries. Collaboration requires permeability. Discussing systems theory, Monroe (2004) writes, "if the boundary is too rigid or impermeable, the system suffocates or becomes excessively isolated from its environment; if the boundary is too porous, the system loses energy and, perhaps, even its identity" (p. 112). Therefore, a balance is necessary.

Etzkowitz (2012) finds that a "culture of permeability can be explained in terms of endogenous (internal) and exogenous (external) approaches" (p. 775). The stronger a university's foundation in building endogenous policies favorable to permeability, the better off they will be in reaching successful exogenous strategies (p. 776). In other words, if a college or university's house is in order, has good tenure policies around engagement, and is an institution that rewards engagement, then the ability to engage externally will be improved.

Endogenous policies affect issues like financial incentive, promotion/tenure, and the social prestige of being involved (uninvolved) in an off-campus activity. One might clarify the expectations around university-community engagements by thinking in terms of social capital and structural governance (Adamuti-Trache & Hyle, 2015). Social capital is part of the culture-building equation – trust, respect, prestige – while the structural elements include mission and vision, objectives, governance, planning, resources, and sustainability (p. 75). These ingredients are a formula for successful processes and dynamics underlying university-community engagements. One might operationalize these ingredients in terms of the university vehicle for

making the engagement possible. Familiar university vehicles include institutes, outreach centers, centers of excellence, conferences, speaker programs, nonprofit affiliates, and/or limited liability corporations (Silka, Mario, & Settele, 2015).

At an institutional level, Hodges and Dubb (2015) offer a typology of university-community engagement roles in regard to economic development: facilitation, leadership, and convener. Understanding these roles is essential to properly locating the expectations for resources, aspirational intentions, and commitment. A university signals its role by drawing up a charter for an institute or approving involvement through an institutional review board (IRB). From educational to hands-on to coalition building, these roles have consequences for how a university behaves. If there's a gap between institutional commitment and community expectation, that's where the university can have difficulty in its public relations. Defining roles, then, is an essential step in understanding the level of institutional permeability when engaging the community.

Finally, one may look at a university's entrepreneurial activity in varying ways. The framework established by Philpott, Dooley, O'Reilly, and Lupton (2011) provides a building block. They recorded a spectrum of university engagement activities that range from entrepreneurial to traditional. The spectrum recognizes that not all university-community engagements are created equal. To that end, one can establish a measure of entrepreneurial degree. For example, Penn State Erie, the Behrend College creating Knowledge Park is a high entrepreneurial degree because it involves creating space in which industry can permeate the campus with its physical presence at the college. Gannon University's Small Business Development Center is a moderate degree because it entails inviting industry onto campus for consulting services and technical assistance. The Mercyhurst Civic Institute is a low degree of

entrepreneurial activity because the central activity is surveying, publishing the results, and sometimes facilitating a community conference or initiative. In each case, the degree of entrepreneurial activity varies based on type of engagement, role of the university, and use of university resources. Table 13 surveys Erie County's exogenous approaches to university-community engagement.

**Table 13.** Erie County's Exogenous Approaches to University-Community Engagement

| Entrepreneurial Vehicle (Silka, Mario, Settele, 2015) | University Role (Hodges & Dubb, 2012) | University Activity (Philpott et al, 2011) | Degree of Entrepreneurship |
|---|---|---|---|
| Civic Institute | Facilitation | Publishing Academic Results, Surveying, Reports | Low |
| Economic Research Institute of Erie | Facilitation | Publishing Academic Results, Conferences | Low |
| Quickstarter | Leadership | Consulting | Moderate |
| Small Business Development Center | Leadership | Consulting | Moderate |
| Erie GAINS | Leadership | Consulting | Moderate |
| Ignite Erie | Convener | Startups, Crowd funding, Prototype Development | High |
| Erie Technology Incubator | Convener | Startups, Spin-off Firm Formation | High |
| Knowledge Park | Convener | Industry-university R&D projects | High |

Through structural elements such as institutes, centers, and facilities, Erie County's universities have the vehicles necessary to engage with the community. When these vehicles play a facilitation role, the activity or output is more traditional and the degree of entrepreneurial behavior is low. As the vehicles move the university to the leadership role, consulting or technical assistance becomes the main activity of engagement, resulting in a moderate degree of entrepreneurship. When the vehicle becomes a facility like a business park or incubator, the

convener role produces new firms as well as R&D projects between industry and the university, exemplifying a high degree of entrepreneurship. Ignite fits this pattern.

Ignite is the only network-based initiative in Erie County with multi-university participation in sustained university-industry engagement. Through the convener role, Ignite has reached a high level of entrepreneurial activity that has resulted in new firms being created, research that leads to new products, and active involvement in crowd-based financing. As the initiative continues to evolve its service delivery through on-campus innovation spaces known as Beehives, it is consistent with the literature to say that as a multi-university collaborative, the universities of Erie County have made the "entrepreneurial turn" together. Further leveraging the physical spaces of Knowledge Park and the Erie Technology Incubator, Ignite's triple helix stakeholders are well positioned to evolve the region's economic development system through other forms of entrepreneurial activity from the position of an adaptive network.

## 4.8     THE PATH FORWARD CREATED ASPIRATIONAL COLLABORATION

The first policy affecting the conditions of multi-university collaboration is called *The Path Forward* (2014). The document was a joint statement or declaration of aspirational collaboration by Edinboro, Gannon, Mercyhurst, and Penn State Erie, the Behrend College. It initiated the university-community engagement discussion by laying out principles and initiatives for the universities to contribute to the region's economic development. It was the first time the institutions had formalized, in writing, a desire to create a platform for collaboration.

The political context was an important factor in moving the conversation from individual university contributions to collaborative contributions. When the universities published *The*

*Path*, they laid out four initiatives designed to get their institutions engaged in the local economy and working collaboratively:

1. Collaborate to Develop New Industries

2. Partner to Build Strengths in the Emerging Technology Areas that will Generate Opportunity for the Region

3. Accelerate Collaboration to Promote an Improved Quality of Life across all Erie Communities

4. Establish the Erie Regional Education & Training Consortium

They were reacting to calls for nonprofits that are exempt from taxation to play a greater role in improving the region's quality of life and economy. As a policy, *The Path* laid the groundwork for a public-facing position of proactive university-community engagement. It signaled a willingness to break from the past practice of single university engagement. The document repeatedly mentions the universities, their faculty, and students as catalysts to job creation, innovation, and entrepreneurship in cross-institutional collaboration.

Reacting to this powerful declaration, the ECGRA responded by creating a set of grant guidelines that recognized the need for each university to build capacity in order to collaborate effectively with one another and engage jointly in regional economic development. By taking their aspirational plan public, the conditions were fostered for financial support to build the capacity necessary to begin collaboration. *The Path* served as a pretext for support from partners outside of the university system. It was the catalyst that began a deeper dialogue around university-community engagement.

## 4.9    THE TWO UNIVERSITY POLICY INSTITUTIONALIZED COLLABORATION

The second policy affecting collaboration conditions pertains to how projects are funded with Ignite Erie grant dollars. It is known by Ignite participants as the Two University Policy. It can be found in the grant application submitted by Penn State Erie, the Behrend College and Mercyhurst University. It requires a minimum of two universities to collaborate on a single project in order to access grant funds. As a self-imposed mandate by the triple helix actors, the policy institutionalized collaboration.

The governance structure of Ignite took a unique turn when the initiative's steering committee strictly enforced a two-university collaboration draw-down policy. This policy would prove to be foundational as it was mentioned repeatedly by interviewees. As a group, the university participants agreed that to access grant funds, a minimum of two universities would need to be actively participating on a project. Participants could be students, faculty members, or administrators from any of the four institutions. This proved to be difficult because often the expedient path was to fast-track a project with its current university connections. Finding a second university slowed that process down, but it institutionalized the principle of collaboration as a value and a guiding force in participant's thoughts processes. One interviewee said of the policy:

> We've forced collaboration to happen with every project, and it is hard and no one likes doing it because it adds a level of complexity that isn't perceived as necessary for the actual project to succeed…But it's been the most valuable part, hands down, because it forced us to build these bridges and they were bridges that definitely did not exist two and half years ago (Interview #1).

Collaboration became a mission for the Ignite participants. The two-university policy structured the mobilization and implementation phase of the initiative when relationships were forming and participants were deciding how to interact. However, the two-university draw-down policy was tested during the second year when a philosophical disagreement emerged between the institution acting as the primary contractor and a second university that was in a subcontracting position. This point of disagreement created temporary gridlock with an interpretation of the policy at its center. Despite this disagreement, the two-university policy remains a point of consensus with the other partners.

## 4.10    THE CONTRACTING PROCESS MAY HAVE COMPLICATED COLLABORATION

There are two levels of contracting necessary to make the Ignite Erie initiative functional. The first is the contract between the grant recipient and the funding agency. The second is the sub-contracting process between the grant recipient and the collaborating universities. Penn State Erie, the Behrend College took on the role of grant recipient or prime contractor with the ECGRA. The other three universities were subject to sub-contracts through Penn State Behrend.

When the ECGRA created the capacity-building grant opportunity for Erie County's universities, it was seeking to empower them by using financial incentive as the primary method to build their capacity. The ECGRA's funding process required a primary applicant with collaborating partners committed to the initiative in the form of an memorandum of understanding (MOU). This scenario created an unintentional power dynamic in which the prime contractor takes on legal and fiduciary duties with the funding agency, while the sub-contractors

take on responsibilities with the prime. The ECGRA promoted collaboration, which implies equality, but required one university to exercise authority over the others.

Initially, contracting did not serve as a barrier. Each institution worked through its legal and bureaucratic channels to establish a working relationship through Ignite. They sidelined early attempts to create a comprehensive MOU between each institution, which led to the flexibility of adaptive network development. Instead, they defaulted to a negotiated sub-contract as their guiding document. The flexibility of the sub-contracting dynamic allowed for the initiative to move into a consensus phase when they began implementing goals. However, this dynamic was tested as the implementers of Quickstarter found themselves at odds with the two-university policy.

Interviewee #6 believed that the policy was standing in the way of serving more entrepreneurs. The Quickstarter implementors found that the policy's mandate to access funding only after two universities had active participation was not flexible enough to realize that the program often only required a single student to complete. This conflict resulted in a difference of opinion, calling into question which was more important: the principle of collaboration or serving the end user? This example illustrates that collaboration can be complex and that mandating it may complicate the process, especially when the quandary is framed as a conflict between competing principles.

## 4.11    A FLEXIBLE SOURCE OF SEED FUNDING TO INCENTIVIZE COLLABORATION

Funding sources often dictate project goals. Federal and state funds come with mandates, prescribed legislative objectives, and bureaucratic rules. Known as inducements, these grants offer very little flexibility to local actors. Local share gaming revenue (local share) deviates from this top down approach to funding. This makes the Commonwealth of Pennsylvania's gaming law a unique piece of legislation that recognizes the importance of devolving funding policy to the local level. A vision for deployment of local share is determined by the ECGRA board of directors, appointed by the Erie County Council and Count Executive's Office. Explaining the importance of flexible funding, an interviewee said,

> I think an obvious part of the story is not just the funding source, but the flexibility of this particular funding source…made the pivot possible. That's super important. If we were tied to the original funding timeline of a three-year initiative, $250,000 a year, if that funding were to disappear unspent, the temptation at the beginning would have been to create work to create results that were reportable, if fuzzy. We didn't have that temptation. We had the drive to make something real instead. With the flexible timeline, with the ability to re-budget and change and pivot to this new, more successful concept – that's a really important part of the story, I think. (Interview #2)

One quarter (25 percent) of local share under the auspices of the ECGRA is invested in a traditional manner – e.g., roads, water infrastructure, and public safety. The remaining 75 percent is invested in economic development. The Commonwealth's gaming law specifically requires Erie County to make economic development investments outside of municipal grantmaking. This

section of the law has become the basis for the ECGRA's decision to make transformational investments through initiatives like Ignite. With the exception of private philanthropy, no other source of funding in Erie County provides financial support to initiatives driven by the triple helix and adaptive networks constructs. The availability of local share is a crucial condition for funding multi-university collaboration. Without it, Ignite would not exist in its current form. These factors in context and in aggregate lead to the second finding:

**Finding #2:**

**The multi-university collaboration seen in Ignite Erie is shaped by conditions that include past experiences with university-community engagement, policies, contracts, and funding.** These conditions are unique to Ignite but have some generalizability value to other small and midsize Rust Belt communities. They capture the importance of university permeability at the levels of organization, activities, and roles in developing the entrepreneurial university.


## 4.12   IGNITE ERIE AS A NETWORK ASSET


To begin the process of analyzing the network's formation, it was helpful to understand the initiative in terms of a regional economic development system described by Katz and Wagner (2014). They describe three interlocking asset classes – economic, physical, and networking – synergistically producing a system that adapts to the global economy and results in competitive advantage for the region. These asset classes are useful in describing the context of Ignite Erie's network formation.

### 4.12.1 Erie's Economic Assets

The advanced industries are categorized as advanced manufacturing, -services, and -energy. Advanced manufacturing is Erie County's strongest economic asset. Erie County has followed the pattern of many Rust Belt communities since the 1980s. That pattern included a series of large-scale industrial layoffs, downsizing, and moving corporate headquarters out of the region, resulting in declining employment. Erie County employment in manufacturing dropped from 50,000 jobs in 1980 to under 20,000 today (Wertz & Wood, 2015). Key to this transition was the evolution of technology in the manufacturing process. Traditional manufacturing relies on producing parts on a contract basis. Contracts are volatile as they ebb and flow with the consumer economy. Advanced manufacturing is a more stable industry. It offers higher-wage jobs, even for those positions that require less education. In the post-Great Recession period in America, the advanced industries led job recovery in Erie County and across the United States. Erie County's transition to the advanced industries has been led by the manufacturing sector. Although employment in traditional manufacturing has dropped dramatically, the introduction of technology has created an economic asset in the remaining industrial sector forming the basis of Erie County's competitive assets.

Advanced Services is at a distant second when one reviews the data on Erie's economy. However, one cannot ignore the behemoth that is Erie Insurance. A Fortune 500 company, with a corporate headquarters located downtown, and the region's second largest employer, Erie Insurance is a homegrown success story. In 2017, they announced plans to expand their corporate headquarters by doubling down in Erie. This physical investment totaled over $130 million in capital development downtown and over 1,000 new jobs. In parallel with this expansion, they engaged in the region's innovation system by spearheading new investments in

cybersecurity through a proposed innovation district, while serving in an advisory capacity to Ignite.

Erie County has always maintained a diversified economy in terms of jobs and sources of income. Tourism, retail, and government make up proportional pieces of the economic pie, with manufacturing holding the largest location quotient (*Erie Guide to the Economy*, 2015). Advanced manufacturing should be recognized as the key competitive base from which to build a strategy of economic renewal. The ability of Erie Insurance to build an emerging industry in cybersecurity products and services should not be underestimated. Large layoffs from one sector have proven to produce opportunities for growth in new ones, as experienced management and technical personnel faced with relocation sometimes turn to entrepreneurial ventures (Mayer, 2011). Large anchor institutions, like Erie Insurance, may serve as the seeds of renewal by providing for spinoff business opportunities through their procurement, information technology, and business development needs.

### 4.12.2  Erie's Physical Assets

Every community has buildings, roads, bridges, and sewer/water infrastructure that are important to the region's functionality and quality of life. A region's physical assets in terms of advanced industries are slightly more nuanced. In a world where access to reliable electricity and clean water is standard, locally owned fiber infrastructure in small or midsize cities through a local Erie company such as Velocity Network becomes a strategic advantage. In Chattanooga, Tennessee, the publicly owned electric company branched out into fiber deployment, making it the first Gigabit city in America. This became essential to the Chattanooga story of renewal (Motoyama, Fetsch, Jackson, & Wiens, 2016) and required significant public investment.

Velocity's fiber ring has grown organically. The company continues to engage locally, including a new $8 million headquarters downtown and participation in local economic development initiatives.

Incubation space for new technology-based startup companies is centralized at the Erie Technology Incubator (ETI) at Gannon University. ETI has co-located the small business development center and business school into one common footprint, encouraging "collision space" between entrepreneurs and faculty. At Knowledge Park, Penn State Erie, the Behrend College has located 34 corporations in a business park adjacent to campus. These companies skew toward technology, and recently the park attracted an R&D center from a large aerospace manufacturer as the first tenant in its Advanced Manufacturing Innovation Center. Mercyhurst University has employed its Intelligence Studies Department in support of cybersecurity, partnering with the firm MCPC to build the region's first cyber lab to train undergraduates in the emerging industry.

## 4.12.3 Erie's Networking Assets

Networks are a combination of people and ideas working toward a shared vision. Networks common to most small and midsize cities include chambers of commerce, economic development corporations, civic associations, and various trade councils. These groups tend to represent siloed interests with commonalities in their respective industries. In the race to innovate, the triple helix stakeholder approach consists of a network that spans sectors – private sector, higher education sector, and quasi-government sector. Ignite is the only university-based network in the Erie region that employs the triple helix approach. If networks are the fuel for innovation, then Ignite is the spark. With a proper description of economic, physical, and

networking assets inventoried, this case study looks at the stages of network formation: mobilizing, consensus, institutionalization, and ecosystem.
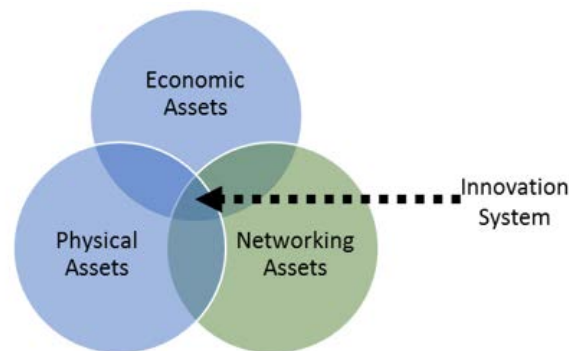


**Figure 7.** Interconnected Assets of an Innovation System

## 4.13    BRIEF DESCRIPTION OF THE FOUR PHASES

The linear formation of regional knowledge-based economic development has been described by Etzkowitz and Klofsten (2005) in four phases. Throughout this process comes collaboration from the triple helix actors. The process leads to the emergence of the entrepreneurial university, which is the ultimate end to a knowledge-based economic development strategy. Those four stages are: inception, implementation, consolidation, and renewal (pp. 250-252). Svensson, Klofsten, and Etzkowitz (2012) apply the linear approach to "triple helix spaces" – knowledge space, consensus space, and innovation space – when conducting a regional economic development case study (p. 509). In their model (see Figure 3), they dive deeply into the inception phase, dividing the spaces approach in four phases: mobilization, consensus, institutional formation, and the birth of an ecosystem (pp. 509-510). These phases are helpful in understanding how concepts like connectivity of the network, health of the network, and network results are realized.

- **Mobilization Stage** – At this stage, there is an urgency to collaborate, a sense that collective strengths or impacts are important and driven by a desire to participate in creating a regional economic development strategy.

- **Consensus Stage** – Triple helix actors reach consensus about the network's value statement; they experiment with implementation trying different tactics and learning as they go.

- **Institutional Formation Stage** – The actors settle on a strategy and tactics, embracing them at an institutional level means setting aside resources, space on-campus, and university talent.

- **Birth of an Ecosystem** – The actors begin to work seamlessly despite their former apprehension about institutional boundaries; the best result is to champion the needs of the project, not the institutional prestige of each university.

## 4.14   MOBILIZING A NETWORK

Ignite Erie's mobilization phase is heavily influenced by the political context of Erie County and the resulting statement of aspirational collaboration, *The Path Forward* (2014). Therefore, when the ECGRA places capacity-building grant dollars into the equation, there is motivation to move toward creation of an action network with triple helix actors as its composition. Mobilizing toward a common direction took another step forward when two of the four universities were awarded the grant application. They immediately set about incorporating the remaining universities into the process by inviting them to planning meetings and actively engaging their institutional leadership. The result was a unified network at the communication level. In other

words, they were all at the table, along with industry leaders and economic development agencies, at the infancy stages of building consensus. The triple helix was mobilized.

Stakeholder interviews reveal that the Ignite partners spent about one year in the mobilization phase of network formation. During this time, the meeting agendas focused on governance, budgeting, and the beginning of a decision-making process. Examination of Ignite documents, corroborated by interviews, reveal the following insights about the mobilization phase:

- There were significant **changes in leadership, liaison roles, and areas of interest** from each participating university. Three of the four universities had hired new Presidents. Several participants at the Dean level, who had helped establish Ignite, left the region. As an example, one institution's main liaison was a Dean who oversaw the sciences and technology departments. He was replaced with an Associate Dean of the Humanities; a significant shift in interest and access to student/faculty talent ensued. One interviewee said,

> I think that along with trying to mesh four different cultures, you have changes in leadership, staff, teams, and that's a small-group dynamic problem that is going to occur in any business. Some changes have helped the collaboration and some changes have not…Then we developed a trusted group with the other universities. Then people changed and added and left, we need to get back to that trusted group and we are not there yet. It's been one of those changes that hasn't been as positive from year one to year two. (Interview #3)

Changes in university participants can be problematic when it slows progress in building social capital, or what some call connectivity within the network.

- Despite turnover in steering committee participants, the network showed signs of **health in building infrastructure toward governance, competitive advantage, and personnel**. Internal systems were established to produce meeting agendas, minutes, presentations from entrepreneurs, and budget reviews. Each university began mapping its institutional strengths, inviting those resources to participate, and bridging the connections between steering committee and engagement with entrepreneurs. Then, a full-time project manager was hired to oversee the operations of the network, staff the steering committee meetings, and monitor outcomes.

- **One way of delivering quick wins was to build off an existing program**. This was the case with Quickstarter. The concept of Quickstarter was the brain child of a single faculty member at one university. Its success in attracting entrepreneurs by word of mouth made it an immediate benefit to Ignite because it filled the pipeline with existing entrepreneurs. However, the program was three years old by the time Ignite adopted it as a core activity. In other words, it was an existing program with policies and procedures attached to it that were developed by its founders and a single institution. Although it was expedient to adopt Quickstarter to show early wins in the mobilization phase, the project was at the center of a contract dispute by the end of year two. That dispute is still unresolved.

- **Adoption of the Two University Policy gained universal acceptance during this phase**. As part of the initial grant application, it was accepted by the steering committee as a core principle.

## 4.15    REACHING CONSENSUS

When the stakeholders of Ignite Erie reached consensus on a direction, they began to experiment with serving the entrepreneur. This phase involved trying out several approaches, learning from each, discarding the less effective activities, and focusing on the high leverage ones. During the consensus-building phase, one can see adaptive network behavior in action as the participants observe, interpret, and intervene (Figure 1). An interviewee put it this way:

> I think the first year in a way, was more dynamic because we were trying all sorts of things. Some of the things we thought were going to be wins just didn't fly. So, we got to say ok…Let's try innovation…It's fun to try out new things…and then the second year is really about making it sing. You see the Innovation Beehive Network coming out of it…It has evolved because all four universities kept talking about it and talking about it and talking about it so we ended up with a better product than our initial product because all four universities were in the room. (Interview #3)

Experimentation with Quickstarter, student-led innovation teams, maker spaces at Erie County high schools, and a number of other one-off projects were instrumental to group learning. They tried innovation, as the interviewee puts it. What's interesting is that a completely new concept emerged around which the group reached consensus. The Beehive was the product of buy-in resulting from ongoing discussions and experimentation. Innovation Commons acted as the pilot project. After demonstrating its success, each university wanted an on-campus

innovation space. More importantly, they reached consensus as a network and tied in their respective institutional strengths. Each Beehive would focus on an area identified by the university as a unique contribution to the overall network (see Table 7).

- There was a **spirit of innovation** within the steering committee of Ignite Erie. Early efforts looked at creating maker spaces in Erie County's high schools. The concept was embraced at some locations and was a non-starter at others. Innovation teams convened around solving community problems that could have future commercial applications. For example, there was a lot of discussion around gun violence in the city. A team consisting of representatives from multiple universities explored drone deployment software to assist local law enforcement. Although the project was meeting a community need, it was consuming resources without yielding an entrepreneurial result. The consensus phase allowed the group to experiment and move on when they didn't like the results. A culture that allowed the network to adapt, allowed it to evolve.

- During the consensus phase, Ignite continued to create innovation teams of faculty and students; however, they were time consuming and did not always make sense. Interviewees revealed that the **complications of having to implement the Two University policy deterred some faculty members** from bringing industry-university projects to Ignite. According to one interviewee, some faculty decided that access to grants and the resources of Ignite was not in the best interest of the entrepreneur. These comments recognized the natural tension between the steadfast policy of collaboration and the ability to serve the entrepreneur most effectively.

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- **Tension over the Two University policy would come to a head** toward the end of the consensus phase, when a contract dispute over reimbursements of Quickstarter's student analysts resulted in an impasse. The university heading up Quickstarter was paying students to conduct market analysis using a methodology specifically designed to promote successful crowdfunding campaigns. Some projects ended at the analysis phase because the product was not the right fit for crowdfunding or the entrepreneur abandoned the business. This meant that the project never had the opportunity to add another university, thereby making it ineligible for reimbursement under the Two University policy. The four universities had agreed upon the Beehives as the next iteration and central focus of Ignite, while the Quickstarter project was stalled in a contract dispute.

- Some viewed the collaboration during the mobilization phase as "lip service," citing the development of the **Beehive concept as the first step toward substantive collaboration**. In other words, there was a lot of talking about collaboration, but unless participants found themselves actively engaged on an Innovation Team or Quickstarter campaign that involved their institution, some felt isolated from the process. Beehives were conceived with the idea of institutional strengths in mind and created a space of operation for each institution to rally around, while at the same time having a connection to the larger initiative.

- The concept of Beehives – innovation spaces on each university campus that allow for interactions between faculty, students, and entrepreneurs – grew out of an experiment at Penn State Erie called Innovation Commons. Interviewees agreed that the Beehive concept was evidence that Ignite was on the right track to **actively engage each**

**institution, provide the entrepreneur with services, and change the region's economic development system**.

- Finally, the consensus phase was about realizing that there would be areas the universities would be unable to collaborate on. One area was development and marketing:

> So, we can all collaborate on grants and research. When you get into the marketing or the development aspect and the reason why your marketing department is successful or development division is successful is because they are inherently very selfish in what they do. It doesn't make them good at what they do; that's where we trip and fall. (Interview #3)

## 4.16    INSTITUTIONAL FORMATION

At this stage, the Ignite Erie stakeholders settle on a strategy and tactics at an institutional level. This includes the dedication of resources like setting aside innovation space on campus to allow industry and the community to permeate the university.

- The consensus phase could roughly be described as taking shape over years two and three, culminating in the **commitment of institutional resources toward the Beehive concept**. At this juncture, the institutions are committing long-term resources to their respective Beehives by committing space on campus, personnel to oversee the Beehive, and an agreed-upon process to communicate with other Beehives to maximize benefit to the entrepreneur.

- Along with the Beehive commitment comes **new infrastructure, dedicated resources, internal rules and systems to govern an on-campus initiative, and a source of funding**, which can be seen in the university's budget. One interviewee spoke about communication:

> As we build the Beehives, having liaisons present at each of the Beehives on a regular basis would not only assist the entrepreneurs by informing them of what is available at other Beehives that the one they're at can't necessarily address, but it also works to maintain a thread of collaboration around the group. (Interview #5)

Communication between universities was a common theme in the interviews. One interviewee offered a recommendation for improvement:

> I wish I had a more senior point of contact at each of the universities, somebody who knows the faculty. In my mind, the perfect person is whoever is the vice president of academic affairs or their secretary. They know every faculty member on campus and if they pick up the phone and call and ask for help, you will get the help that you need. I would give that person a stipend just to do that for me just because you would get a much faster response and you would be certain to get good students. (Interview #6)

Access to people, materials, machinery, and campus innovation space are representative milestones affiliated with reaching institutional formation.

## 4.17    BIRTH OF AN ECOSYSTEM

The goal of Ignite Erie is to create entrepreneurial support services for the region's innovation ecosystem. According to Svensson, Klofsten, and Etzkowitz (2012), joint value creation through collaborative networks, as teams instead of individual institutions, is a sign that the network has resulted in the birth of an ecosystem. When institutional players look to the entrepreneur, the community project, or the end user's success as the goal, then a true ecosystem of collaboration has been created. While Ignite is not there yet, one must remember that the initiative is only three years old. As evidenced by interviewees, the guideposts toward the new ecosystem components are being embraced, and collaboration is slowly replacing competitive advantage in areas like community engagement. The Beehive concept has emerged as the institutional strategy to accentuate individual institutional strengths. According to one interviewee, the initiative is gaining momentum outside the network:

> …now that the Innovation Beehive Network has gotten a lot of press, people want in; they want to be a part of it. So, you have to create opportunities for people to be a part of it and figure out how you can be a part of this and how can you leverage it. But a constantly changing inner circle is a detriment to the overall group. (Interview #3)

As this system builds, a culture of collaboration that allows for permeability at the level of adding new partners with other resources will be key. Making sure the needs of the entrepreneur are met means adding new talent, which might include additional institutions, agencies, and regional industry. One interviewee said, "The one place that there is a hole is growing the business. This is post-campaigning…that you can get almost anything made within fifty miles of Erie" (Interview #6). This statement is a reminder that growing new ventures from

the traditional manufacturing assets still present in the regional economy provides a competitive advantage. Building new forms of connectivity by remaining porous enough to add new partners, talent, and resources keeps the initiative focused on the needs of the end user: the entrepreneur.

Another important indicator on the path to a new ecosystem is network health. One way of viewing network health is its ability to achieve sustainability. One interviewee observed:

> I think that one of the things that has been a good success for Ignite Erie, in general, is our ability to leverage other funds. I've said this before. In my decade of bouncing around the economic development area, this funding has brought in and leveraged more external funding than anything else I have ever seen…I can't think of anything else that has brought in as much private/external funding and that's a big piece of what other people should be watching. (Interview #3)

External funds serve to validate the network's value to the triple helix actors, policymakers, and the initial funding agency (Table 14). When a broad range of funders join an initiative's implementation budget, it demonstrates a key milestone on the path to sustainability.

**Table 14.** Matched and Leveraged Ignite Erie Funding

| Matching and Leveraged Funding by Source, Use, Amount | | |
|---|---|---|
| **Match Source** | **Use** | **Amount** |
| Appalachian Regional Commission (ARC) | Technology funds for Beehive setup and equipment | $200,000 |
| Economic Development Administration (EDA) | Implementation funds to support Beehives at each university | $1,000,000 |
| Gannon University | Matching funds for the shot-spotter project | $2,000 |
| IBM | Smarter Cities grants was used in support of the shot-spotter project | $3,000 |
| Industry Partnership | Match from industry and entrepreneurs; Quickstarter user contributions; industry investment in Knowledge Park | $270,000 |

**Table 14** continued

| | | |
|---|---|---|
| Penn State Behrend, School of Engineering | Equipment and staffing for the creation of Innovation Commons; Automation Lab | $157,000 |
| Penn State Behrend, Black School of Business | Innovation Commons staffing, travel, faculty support | $106,000 |
| Mercyhurst University | Quickstarter support | $10,000 |
| | Total Match | |

**Finding #3:**

**Formation of Ignite Erie as an adaptive network with triple helix actors follows a linear process observed by those who have studied the entrepreneurial university phenomenon.**

## 5.0    CONCLUSION

Rust Belt activism is about constructing a resilient economy by utilizing historical strengths, political context, and future aspirations to harness the collective influence of a regional economy. Collective influence can be captured in the construct known as the **triple helix**. It means that three sectors of society – quasi-government, industry, and university – work in collaboration. For Erie County, the universities have been a lynchpin in this process as they have evolved to become more entrepreneurial in their use of resources. The **entrepreneurial university** role can be understood in four ways:

A) Transfer knowledge from the university through basic research

B) Developing human capital or talent

C) Translational research that brings technology to industrial application

D) Regional economic development (Lazzeroni & Piccaluga, 2003, p. 40).

Universities working in collaboration is not new to Erie County, but it is unique for them to work collectively on entrepreneurial support services on a sustained basis. This is the unique value proposition that the Ignite Erie network creates. As one interviewee said, "the most important thing out of this is if the universities are in a meshed network" supporting each other and the entrepreneur with their respective strengths (Interview #3). Adaptation in such an environment is a way of understanding how the Ignite partners learned together. Known as **adaptive networks**, Ignite experimented with various approaches to providing entrepreneurial

support services. Two programs, Quickstarter and Innovation Commons (Beehives), were maintained throughout the program because they yielded the best results.

Results, then, can be understood on two levels. Systemic improvements or intended results of Ignite, like culture changes, occur over the long-term. In the short-term, Ignite demonstrates results in helping entrepreneurs with immediate needs like prototyping, crowd source funding, and branding.

This case study provided an interim review of short and long-term goals. It contains both summative and formative perspectives of Ignite. The primary audience is the ECGRA Board of Directors, who asked for an evaluation of the initiative's outcomes. A secondary audience is the Ignite steering committee, which has spent three years convening around this topic. They are interested in understanding what the fruits of their labor have produced and how they might improve the initiative. Tertiary audiences include elected officials at the local and state levels that provide ECGRA oversight; practitioners in regional economic development; and scholars studying adaptive networks, triple helix organizations; and the entrepreneurial university. This review aimed to describe Ignite in a way that assisted these audiences in understanding what happened and how they might learn from the findings.

The case study aimed to do three things:

a) effectively describe the initiative's core activities and interim outcomes to targeted audiences,

b) utilize constructs in the literature, documents from the initiative, and interviews with university stakeholders to effectively analyze conditions surrounding the initiative, and

c) explain how Ignite Erie used collaboration through networks to create a unique contribution to Erie's regional economic development system.

Ignite Erie represents a unique opportunity for Erie County to establish a strong system of entrepreneurial support services. As Erie faces employment decline in the manufacturing sector, the will to reinvent itself by combining the resources of the university with industry has the potential to transition its economy. Many communities face this dilemma; not all will act on it. Ignite's action agency approach combines the institutional strengths of Erie County's universities and creates a platform to place them in co-development with industry. Universities working with industry is not new. Multiple universities organizing based on their respective strengths to support entrepreneurs in the name of regional economic development is worthy of further discussion.

## 5.1    DISCUSSION OF FINDINGS

**First, the core activities of Ignite Erie known as Quickstarter and Innovation Commons are high-yield industry-university activities doing the most to create entrepreneurial support services.**

Quickstarter became a high yield activity immediately. (See Tables 8 through 11.) Developed by Mercyhurst University, it was already being implemented successfully prior to the launch of Ignite. From 2015 through 2017, it attracted large numbers of entrepreneurs to the Ignite pipeline as well as provided a match for the grant. The Quickstarter relationship with Ignite has been symbiotic. It provides a solid service, tried and tested, and Ignite provides a steady source of grant dollars to keep the service going. Quickstarter's primary contribution is its

crowd funding methodology, which fits naturally with the goal of creating university-based entrepreneurial support services. The methodology involves students assisting entrepreneurs in designing optimal campaigns on the internet's most popular crowd funding websites, such as Kickstarter. Crowd funding, as a service, continues to be in demand from Erie County entrepreneurs.

Two obstacles to maintaining Quickstarter are scalability and sustainability. It requires two things to function: a project manager that plays matchmaker between university students and entrepreneurs, and a continuous subsidy to pay the stipends necessary to research campaigns. The role of matchmaker is unique because it requires an understanding of the program, the ability to interact with entrepreneurs to refine their campaign, interactions with students, and communication with other universities. Quickstarter will need to assess how many matchmakers it requires in the future. This decision will depend on the program administrators' aspirations and the supply of local entrepreneurs. Assuming the program successfully scales its implementation resources, it will require a subsidy to grow in parallel.

Innovation Commons also served a significant number of entrepreneurs and provided substantial match for the grant after it opened in January 2016. (See Tables 8, 9, 12.) Innovation Commons is a prototype development center located on the campus of Penn State Behrend. It provides entrepreneurial support services delivered by university students on campus in a space designated for external engagements. Like Quickstarter, Innovation Commons creates permeability between industry and the university. As one interviewee said, "it breaks down the other barrier, which is people think campuses are off-limits" (Interview #1). Designated innovation space on campus has been identified as a key step in evolving toward the "entrepreneurial university" concept (Svensson, Klofsten, & Etzkowitz, 2012). Innovation

Commons served as a pilot project for the initiative's partners, who are calling the other innovation spaces "Beehives." Beehives draw out the institutional strengths from each university by focusing their function on the university's exceptional resources. (See Table 7.) Furthermore, the partners have rallied around the Beehive concept as the first program born from Ignite. One interviewee went as far as to say, "I think this is the first time you're seeing a fully collaborative initiative from the four schools" (Interview #4).

Beehives face several challenges. First, replicating the Innovation Commons success on their respective campuses will require champions like those at Penn State Behrend. Second, offering a service that the entrepreneur wants and needs is a lot like launching a startup. It will require the universities to continually tweak and perhaps pivot in their service offerings. The risk of replication is that it assumes each university has the drive and talent to start up an entrepreneurial support center. On the other hand, the universities – Edinboro, Gannon, Mercyhurst – have completely bought in to the concept and have designed their Beehives around existing strengths that are currently producing industry-university engagements. In other words, they are not starting from scratch. Just as pre-Ignite university-community engagements benefited from setting up the network, the Beehives are building off the same foundation.

It is worth noting that, initially, Innovation Teams were intended to be the primary focus of Ignite's multi-university activities; however, they proved to be too difficult to realize. Some projects only required a single student. This may have been based on available student talent or limited need from the entrepreneur. Single student projects are not eligible for Ignite funding under the Two University policy. Also, some professors viewed engaging with Ignite as an impediment to the entrepreneur moving swiftly to market. For example, Ignite meets six times a year and requires steering committee vetting. Another impediment was that some entrepreneurs

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had previously established trusted relationships with university faculty. Ultimately, Innovation Teams were abandoned as a low-yield activity.

An effort to establish maker spaces at Erie County high schools was designed to promote an innovation and entrepreneurial culture pipeline. Ignite supplied each school with equipment, technical assistance to integrate the spaces with curriculum, and university students to train teachers on using the equipment. 3D printers, laser engravers, and metal cutting machines were distributed to each school based on survey responses. Although successful in setting up a fruitful industry-community engagement, it proved to be a low-leverage activity, resulting in no new opportunities for entrepreneurial ventures. Its value lies in the facilitated interactions between the high schools and university students that have a special interest in maker spaces.

**Second, throughout Finding #2, the idea of porous boundaries or permeability was a prerequisite that led to collaborative activity.** A unique set of conditions contributed to an environment that supported multi-university collaboration seen in Ignite Erie. These conditions included past experiences with university engagement, the Two University policy, how contracts were designed, and a flexible source of funding.

For at least one university, interviews uncovered how past experiences with industry-university engagement had shaped current attitudes toward Ignite (Interview #4). It is a reminder that all the universities in Ignite have varying experiences and have achieved different levels of internal and external strategies when it comes to industry-university engagement. When compared to other university engagement initiatives in Erie County, Ignite was consistent in its entrepreneurial role, activity, and contributions to the economic development system. (See Table 13.) The universities were able to collaborate in the "convener" role, delivering services to

startups, which signified a "high" level of entrepreneurship. All combined, these are the guideposts in reaching entrepreneurial university status.

Flexible capital from the ECGRA allowed Ignite to develop its own identity and direction by making the grant funding flexible. The Ignite steering committee responded by experimenting – implementing, observing, and interpreting – like an adaptive network. Patient capital led to patient collaboration through a strictly enforced Two University policy. A truly unique and innovative policy, it tested the patience of participants, potential partners, and the entrepreneurs. However, it institutionalized multi-university collaboration.

These unique circumstances created an amalgamation of leadership and circumstance. Past experiences, flexible funding, and policies developed by those in steering committee and grant writing positions created conditions necessary to sustain multi-university collaboration as a guiding principle. It should not be considered a completely replicable set of circumstances. It is highly contextualized. The environment that Ignite evolved is partially explained by the context of Rust Belt activism in Erie County, PA.

**Third, formation of Ignite Erie as an adaptive network with triple helix actors follows a linear process observed by those who have studied the entrepreneurial university phenomenon.**

In looking at the adaptive network as a descriptor, experimentation was limited to services to benefit the entrepreneur. That is to say, the network was adaptive in its efforts to provide user services, but not necessarily in its internal functioning. For example, Ignite removed resources from the Innovation Teams and redirected them toward Beehives when the Innovation Commons pilot project was fruitful. When it came to formation, consensus, and implementation of the network, Ignite followed a linear path consistent with observations of other entrepreneurial

university scholars (Etzkowitz & Klofsten, 2005; Svensson, Klofsten, & Etzkowitz, 2012). As a result, it was helpful to look at findings from a phased approach, defining and illustrating milestones on the path to consensus and implementation.

Those phases support the findings of scholars who have measured applied networks by creating a set of concepts to inform the phases. Specifically, the work of Taylor, Whatley, and Coffman (2015) and the Center for Evaluation Innovation, provided helpful language. Concepts like connectivity, health, and results, along with subcategories like membership, structure, infrastructure, resources, competitive advantage, interim, and long-term outcomes, served as a basis for locating this study with a larger audience of grantmakers, policymakers, and practitioners interested in measuring adaptive networks (p. 26).

### 5.1.1 Ignite Erie Core Beliefs

There was a set of core beliefs communicated through the data collection process. These principles may serve as a point of reflection for steering committee members or as a guide to new members as the initiative expands it connectivity and replaces participants.

1. **Effective collaboration depends on the development of trust**.

   Although good organizational principles can create a foundation that thrives beyond individual personalities, when collaborating across boundaries, results in a network are heavily dependent on relationships. Sometimes referred to as social capital, respect, or relationship building, developing trust among the participants is not easy and requires time, as resources are scarce and competition is traditional. This is further complicated by the usual churn in personnel from each stakeholder group, some of which help and some of which hinder the process of building trust.

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2. **Institutionalize collaboration through policy**.

Documents like *The Path Forward* (2014) capture aspirational goals but stop short of effecting governance. In contrast, the Two University policy, which was agreed upon by the initial stakeholders, endorsed by the steering committee, and enforced by the principal grant applicant, became a doctrine that shaped behavior by setting expectations about ground rules in dispersing grant funds.

3. **Mutual advantage drives participation**.

Motivation lies at the heart of a successful collaboration. Participants will come to a collective table and continue to engage and communicate with their peers when it is mutually beneficial. Beyond the grant dollars, the initiative needs to demonstrate comparative advantages that help participants reach their individual goals within the goals of the collective. There will always be other sources of funding for research, consulting, and projects. Initiatives like Ignite develop participation and sustainability through mutual advantage.

### 5.1.2 Recommendations

1. **Connectivity** – connect with additional stakeholders in order to build out the network and improve the value statement of Ignite Erie. There has been a surge in interest around innovation and entrepreneurship by various institutions in Erie County. Several new organizations have entered the space, including funding agencies, that have been reluctant to take a chance on intellectual property-based companies. Figure 8 illustrates the institutions, firms, and quasi-government agencies that are active in providing value to the innovation system and potential partners. Next, create synergy

between the Ignite Network and Erie County's two innovation districts. Knowledge Park is a well-established innovation district with significant R&D taking place between university and industry, space available for industry to locate, and immediate access to Penn State University faculty and students. The nascent downtown Erie innovation district is partnering with employers in the central business district to support startups in the cybersecurity sector. Knowledge Park is focused on advanced manufacturing. Downtown is focused on advanced services. Finding a complementary tie-in through the Ignite network would further leverage the resources of each institution in each district.
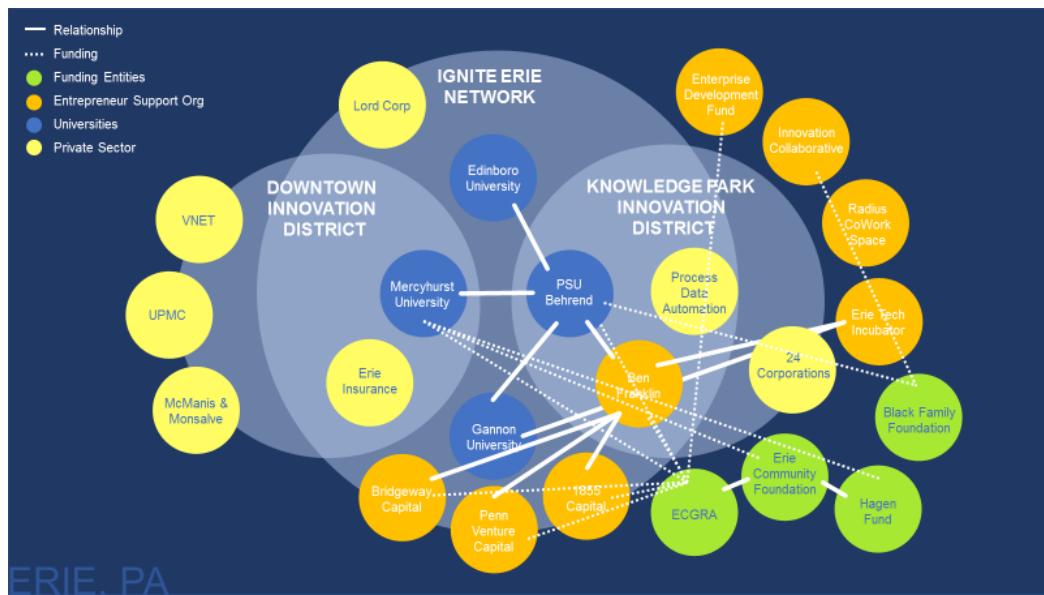


**Figure 8.** Connections Among Institutions, Firms, and Quasi-Government Agencies

2. **Health** – As Beehives are established at each university, the importance of effective communications infrastructure between them will emerge as a pressing need. Different forms of communication will ensure that the steering committee stays in touch with the Beehive operators, that the Beehive operators talk with each other, and

that potential partners understand how the network functions and how they can plug in.

3. **Results** – Finally, the Ignite network should conduct follow up surveys with entrepreneurs to see what happened after their Quickstarter campaign or Innovation Commons/Beehive engagement. This data is an essential component of justifying funding for the initiative and attracting other sources of funding to sustain the initiative.

### 5.1.3   Policy Implications in Erie County

The way Ignite Erie was designed, how it functions, and how it was funded all have policy implications for Erie County. For example, Ignite illustrates how the adaptive network was deployed to address a complex problem with inter-institutional collaboration. Adaptation was key to experimenting with activities, determining if they were low or high yield, then moving on to focus on what works. Funding that allowed organizational capacity building fits with an adaptive approach. Capacity building denotes that current organizational personnel do not have the time, knowledge, and/or resources to accomplish the mission. This may sound normal, but in the grantmaking world, both adaptive leadership and capacity building are risky propositions as opposed to replicating established models. The ECGRA can use the Ignite case study as an example of what is possible when an adaptive network is put in place to solve a complex problem with inter-institutional collaboration. A capacity-building approach to funding can be experimented with in other problem areas.

## 5.2    FURTHER RESEARCH

This case study was conducted at an organizational level and limited its interviews to steering committee members from each participating university. Further research of the organization should look at the process to admit entrepreneurs into the Ignite Erie program, track their progress, and ensure effective communication between the up-and-coming Beehives. As the initiative evolves, it is advisable to interview the entrepreneurs who have accessed Ignite services in order to understand what that experience is like and how to improve it. End user research would give the administrators and steering committee the kind of feedback needed for continuous improvement of the initiative. This line of inquiry recognizes that Ignite is dependent on the co-creation of knowledge. As a result, the industrial actors need to demonstrate permeability and collaborative culture, as well as have internal policies and leaders that position their companies to work with universities. Finally, at a macro level and in the long term, the steering committee should establish indicators that signal shifts in the economy, the extent to which Ignite could have an impact.

# APPENDIX A

## INTERVIEW GUIDE FOR IGNITE ERIE INITIATIVE CASE STUDY

**Dear Colleague,**

I'm conducting a review of the Ignite Erie Initiative to document how things are going. I've asked you to participate in an interview because I appreciate your time and insight in making the program what it is. I plan to use the findings to report back to the ECGRA board of directors, the Ignite steering committee, and Ignite administrators to establish a mid-term review of the status of the Initiative.

Your participation is completely voluntary and appreciated. You can choose to decline the interview or stop it at any time. Anything you say in the interview is confidential. I plan to record the interviews, transcribe them, and aggregate the results into findings.

There are two levels of interviewees. I'll be talking with: a) steering committee members and b) administrators. I'll be conducting a semi-structured interview consisting of three questions listed below. I'm providing you with the questions in advance so we can make the most of our time. I hope the interview will be conversational, so please feel free to bring up subjects that you feel are outside the scope of these questions.

If you have any questions about the interview, please do not hesitate to contact me directly or my advisor Dr. Maureen McClure [mmclure@pitt.edu](mailto:mmclure@pitt.edu).

Regards,

Perry N. Wood

### Interview Questions

1. Why are you involved with Ignite Erie? How did you get involved? What did your organization put into it?
2. Is Ignite Erie achieving what you hoped it would? Is it working?
3. What would you change about it? Where's it headed?

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