



IGNITE ERIE 2018

# MID-TERM REVIEW

UNIVERSITIES ENGAGING WITH ENTREPRENEURS



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## EXECUTIVE SUMMARY

Universities can play an important role in a region's economic development strategy. Ignite Erie, a industry-university engagement collaboration of Erie County's four universities, industry, and economic development agencies, is the organizing vehicle to assist in legacy companies, startups, and community projects in creating new entrepreneurs, new products, and new ventures. The Erie County Gaming Revenue Authority (ECGRA) has provided the collaborative with capacity building grant funds in 2015. This case study is a mid-term review of the Ignite Erie Network from the organizational perspective of university participants. Its aim is to effectively describe Ignite Erie's core activities, the interim results, processes put in place to make the network function, and how the network has evolved.

### *Summary of Findings*

#### **Finding #1:**

**Core activities Quickstarter and Innovation Commons (aka Beehives) have been the central programmatic results 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 results include assisting **48 new entrepreneurs** in creating prototypes, developing their business models, and pursuing crowd funding. They have developed a short-term strategy to exploit their individual specialties as universities. They call it the Beehive strategy.

Long-term outcomes: Ignite Erie is positioning itself as an adaptive network supporting stakeholders in developing **new entrepreneurial support services** for the Erie region's economic development system.

Proposed Innovation Beehive Network	
Institution	Focus
Edinboro University	Branding & Strategic Communications
Gannon University	Applied Business Innovation
Mercyhurst University	Intelligence & Cybersecurity
Penn State Behrend	Prototyping & Product Development
Erie County Blasco Library	Maker Space

### 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 capture the importance of university permeability, that is, the ability of a university to engage with industry and the ability of industry to engage with a university. At the policy level, joint statements like *The Path Forward* (2014) signaled a willingness to collaborate. The Two University Policy, which states that ECGRA funds can only be used on a project where a minimum of two universities are engaged, institutionalized a culture of collaboration. Finally, the flexibility of locally-controlled capital from ECGRA created stability for measured experimentation in improving the region’s economic development system.

#### *Erie County’s Exogenous Approaches to University-Community Engagement*

<u>Entrepreneurial Vehicle (Silka, Mario, Settele, 2015)</u>	<u>University Role (Hodges &amp; Dubb, 2012)</u>	<u>University Activity (Philpott et al, 2011)</u>	<u>Degree of Entrepreneurship</u>
Civic Institute	Facilitation	Publishing Academic Results, Surveying, Reports	Low
Economic Research Institute	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

### Finding #3:

**Formation of Ignite Erie as an adaptive network with multi-sectors stakeholders follows a linear process observed by those who have studied the entrepreneurial university phenomenon.** The writings of think tanks, thought leaders, and publications provided language that we are familiar with in Erie County. Ideas like network asset building, innovation systems, and industry-university partnerships. In other words, we could learn a lot from what others have learned about how initiatives like Ignite Erie are created, developed, and sustained.



## Recommendations

1. Work with the Ignite Erie Team to tell their story of results, collaboration, and vision to local elected officials and the media.
2. Connect with additional stakeholders to continue building Ignite Erie’s value as an adaptive network.
3. Create a grant to seed fund Beehives at each university and the Blasco Library.
  - a. Build out effective communication infrastructure between Beehives to ensure they system remains focused on the entrepreneur.
  - b. Conduct follow up surveys with entrepreneurs that have accessed the Ignite Erie ecosystem, interpret that data, and intervene.

## Introduction: The Rust Belt Problem

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 – Edinboro, Gannon, Mercyhurst, Penn State Behrend - 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 a) helping legacy industries reinvent themselves through prototypes, b) startups develop an effective business model, and c) nonprofits solve community problems. As a platform, Ignite Erie is grounded in the assumption that **adaptive networks** consisting of industry, university, and economic development agencies are the best approach to addressing some of the community's most complex problems. And, when institutions of higher education shift their role from solely producing talent to supporting company creation, they become an **entrepreneurial university** creating a significant advantage for regional economic development efforts.

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, specifically assistance to entrepreneurs. Then, it summarizes the state of the Ignite Erie's success in achieving multi-university collaboration and regional economic development informed by secondary sources, document analysis, and interviews. Finally, it provides discussion on how to move the initiative forward describing one community's efforts at reinvention.

## Context: Policy and Setting

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 referred to, employ significant numbers of people and they 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 this pressure, while achieving their mission. 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 community. 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 should offer an economic development strategy...to be an entrepreneurial university.**

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, 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 no single model for industry-university engagement, nor are there mandates for a university to do so.** Universities enjoy the protection of nonprofit status under the US 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<sup>st</sup> Century version of themselves, how might they engage each other effectively?

### *Erie’s Universities & 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 1.

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Table 1.

## *Initiatives from The Path Forward*

Initiative #1:	<b>Collaborate to Develop New Industries</b>	Faculty & students will assist entrepreneurs through: <ul style="list-style-type: none"> <li>• Internships &amp; research</li> <li>• Jointly established &amp; supported incubators, and the</li> <li>• Promotion of the Erie region as friendly to startup firms.</li> </ul>
Initiative #2:	<b>Partner to Build Strengths in the Emerging Technology Areas that will Generate Opportunity for the Region</b>	Emerging sectors such as <ul style="list-style-type: none"> <li>• Energy, digital arts &amp; media, intelligence, cybersecurity, as well as</li> <li>• More mature industries like advanced manufacturing &amp; healthcare can generate jobs through: <ul style="list-style-type: none"> <li>• Joint research projects</li> <li>• University/industry networks</li> <li>• STEM education &amp; career pathways programs</li> </ul> </li> </ul>
Initiative #3:	<b>Accelerate Collaboration to Promote an Improved Quality of Life across all Erie Communities</b>	Support projects that solve problems in <ul style="list-style-type: none"> <li>• Health &amp; public safety at the neighborhood level</li> <li>• Leverage students &amp; faculty to address “grand challenges”, and</li> <li>• Hold business competitions to address community needs.</li> </ul>
Initiative #4:	<b>Establish the Erie Regional Education &amp; Training Consortium</b>	The universities will work together to ensure information and access for <ul style="list-style-type: none"> <li>• Young people,</li> <li>• Job seekers, and</li> <li>• The existing workforce,</li> </ul> so they have better access to the entire education & training continuum.

These four initiatives have re-occurring themes. First, each institution views their 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 and contributing to research objectives.

Second, **collaboration** or joint activities leverage talent and other resources. Multi-university collaboration and industry-university collaboration leads to an optimized outcome. 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.

### *Aspirational Intentions and Capacity Building*

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 intentions. 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.

### *Ignite Erie Network*

Ignite Erie has been in existence for a little over 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, support entrepreneurs, and industry innovation for Erie County. It is a network of passionate people that 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 legacy companies, startups, and nonprofits. Iterative approaches through networks are sometimes referred to as "**adaptive networks**" in the economic development community. Multi-university collaboration and adaptability are both unique strengths of the Ignite Erie initiative.

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 2 is a snapshot of the Ignite Erie network components.

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Table 2.  
*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: <ul style="list-style-type: none"> <li>a) Legacy companies in reinvention, others in growth</li> <li>b) Startups in prototype development, crowdfunding</li> <li>c) Nonprofits in solving community problems</li> </ul>
Network Membership	Triple helix membership model – industry, university, economic development agencies/quasi-government entities
Core Activities	<p><b>Innovation Teams</b> – multi-university teams of faculty and students to propose entrepreneurial solutions in concert with entrepreneurs and industry</p> <p><b>Crowdsource Funding Assistance</b> – 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)</p> <p><b>Innovation Spaces/Maker Spaces</b> – providing space for entrepreneurial thinking, interactions, development, and production</p>
Sectors/Stakeholders	<p><b>University faculty</b> from business, communications, engineering, applied intelligence, digital media.</p> <p><b>Industry representation</b> includes insurance, aerospace, venture capital.</p> <p><b>Regional Economic Development Agencies</b> includes: innovation-based economic development, small business development</p>
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: <ul style="list-style-type: none"> <li>A. the group’s willingness to continue after the initial seed funding expires</li> <li>B. identifying funding streams from additional sources</li> <li>C. demonstrating outcomes consistent with the proposed strategy, adaptive tactics, and effective interactions with end users</li> </ul>
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.

## Mid-term Review Questions

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 project milestones, for policymakers to understand what is happening, and for participants to compile findings and share recommendations with fellow steering committee members. To do these things, this case study employs the following research questions:

How has Ignite Erie fared 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?

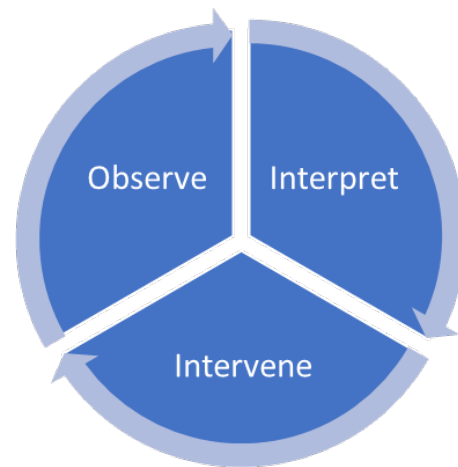
These questions are asking if this initiative is on its way to building an infrastructure capable of transformational effects on the Erie region's economy. Through secondary research, documents that have been produced by Ignite participants summarizing direction as well as outcomes, and semi-structured 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.

Next, this review explores the ideas 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. The main ideas are summarized for future reference. These ideas and analysis assist in developing the evaluation design and results.

## Conceptual Framework: 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).

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 the adaptive network process. Exercising adaptive leadership is not like implementing technical aspects of a successful model that’s 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, Grashow, & 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 the grantee state their goals, attach a budget to the action plan, 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 effect multiple universities working on the same project? They needed to solve technical problems before they might approach adaptive ones.

### *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, 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).

### 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 (see Figure 2). These asset classes are a basis for conceptual analysis, metric creation, and comparison. Every community must 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, PA 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 that 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, product development labs or informal like coffee shops, museums, and events. It's also the infrastructure, equipment, and telecommunications capabilities available for entrepreneurial activities and creative communication.

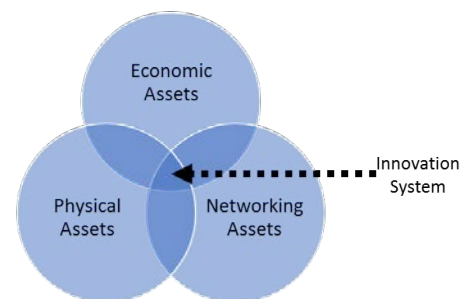


Figure 2. Interconnected Assets of an Innovation System. Reproduced from *The Rise of Innovation Districts: A New Geography of Innovation in America* by Katz and Wagner, May 2014 retrieved from: <https://www.brookings.edu/essay/rise-of-innovation-districts/>.

- c) **Networking assets** are the ways in which social capital is generated between your 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.

### *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 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 can 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 strengths and weaknesses are assessed and, if they continue, a new strategy is formed.
3. **Institution Formation** – stakeholders develop appropriate organizational formats for interacting, they set aside physical space for innovation, and each stakeholder sets aside resources to sustain the new strategy.
4. **Birth of an ecosystem** – at this point, there's 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 4.*

The Four Phases of Regional Economic Development Networks



### *Network Evaluation*

While the prevalence of the adaptive network is gaining legitimacy, the evaluation of them 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.

- **Network Connectivity.** When one looks at the human and social capital aspects the Ignite Erie network through informant interviews, it may reveal who's 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.
- **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. Impact advantage refers to the capacity for joint value creation versus innovation in isolation.
- **Network Results.** Expenditures from publicly-funded sources such as the ECGRA require a measurement of outcomes. One might look at interim results on two levels. First, results at 24-36 months to capture evidence of the network's short-term wins. Second, one might look at longer-term intended outcomes 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 results/outcomes.

### *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. The following indicators help to better conceptualize a network's advantages:

- 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.

## Case Study Approach

The case study data collection occurred during the months of November 2017 thru February 2018 in Erie County, PA with key stakeholders involved with the Ignite Erie. It 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). 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.

### Methods

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

1. the secondary literature
2. planning and programmatic documents, and
3. the perspective of the participants captured through interviews.

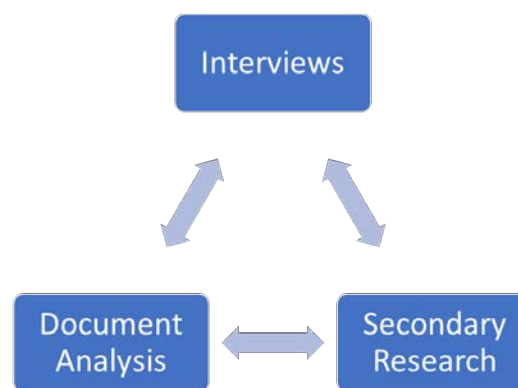


Figure 4.  
The Triangulation of Data

### Primary Research - Interviews

I conducted 6 semi-structured interviews with steering committee members representative of the program administrators and the four universities leading Ignite Erie (see table 4 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

Table 4.

*Stakeholder Interviews*

Relation to Ignite Erie	Position	Organization	# 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)

*Primary Research – Document Analysis*

Then, I collected documents from the Ignite Erie Initiative such as agendas, minutes, reports, marketing material, press releases, and media (see table 5). 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

*Secondary Research – Literature Review*

A review of studies involving the role of the university in regional economic development was conducted. 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 literature on the use of adaptive networks, how they are used by grantmakers, and how to measure them 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.

### *Limitations*

This evaluation was not designed to look at individual, small group, or macroeconomic dynamics. Instead, the organizational components and evidence of progress are the focus. This study was 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 illusive or preliminary during the inception phase. This study was 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 their personnel are performing at acceptable levels. Finally, the evaluation does not interview users. Three years into the initiative, there is a list of users to speak with. However, as Ignite Erie continues to evolve, this review is focused is on the organizational aspects currently being developed and implemented, not the user experience.

## Results

### 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 Erie is positioning itself as an adaptive network supporting stakeholders in developing entrepreneurial support services for the Erie region's economic development system.

### *Interim Results and Intended Outcomes*

There are two ways to view Ignite Erie's results and outcomes. First, there's 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 toward projects in the past, but not in 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 are providing unique value to the Erie region's economic development system.

### *Collaborate to Develop New Industries*

The first stated 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 according to 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*

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

Source: Ignite Erie

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

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

Source: Ignite Erie

Ignite is **measuring collaboration** by counting the number of interactions between  
a) faculty from multiple institutions, b) Industry-University and Community-University

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collaborations where 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*

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

Source: Ignite Erie

Table 11.

### *Ignite Erie Collaborations between Industry-University and Community-*

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		

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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		
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		

Source: Ignite Erie

Table 12.

*Ignite Erie Innovation Commons Engagements*

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 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

Source: Ignite Erie

### *A Culture of Collaboration*

Social capital or relationship building toward collaboration can be seen in circumstances where universities choose to trust each other. Universities are competitive 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). Referring to the fact that three universities trusted one institution to take the lead on a grant signifies trust built over time. Figure 6 represents milestones like the EDA grant application that are evidence of a culture of collaboration.

Through record keeping, one can see that engagements are taking place, which put the resources of the university into play for entrepreneurs and community projects outside university walls. However, it does not capture a deeper form of commitment that is intended by the participants. 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 universities collaborating 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 interviewees 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.

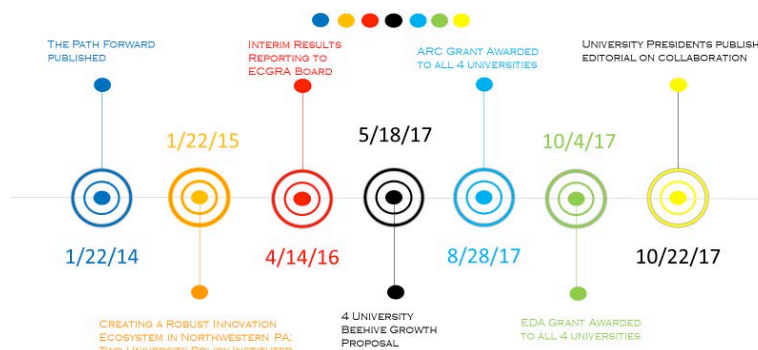


Figure 6.  
Ignite Erie Milestones

## 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.

## 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. Articulating 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 your house is

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in order, you have good tenure policies around engagement, and your institution rewards engagement, then your ability to engage externally will be improved.

The following are ways to measure exogenous or external approaches to university-community engagement:

- Familiar university vehicles include: institutes, outreach centers, centers of excellence, conferences, speaker programs, nonprofit affiliates or limited liability corporations (Silka, Mario, and 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.
- Finally, one may look at the university’s entrepreneurial activity in varying degrees. The framework established by Philpott, Dooley, O’Reilly, and Lupton (2011) is a building block.

Table 13 surveys Erie County’s exogenous approaches to university-community engagement.

Table 13.

*Erie County’s Exogenous Approaches to University-Community Engagement*

<u>Entrepreneurial Vehicle (Silka, Mario, Settele, 2015)</u>	<u>University Role (Hodges &amp; Dubb, 2012)</u>	<u>University Activity (Philpott et al, 2011)</u>	<u>Degree of Entrepreneurship</u>
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 are playing 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 that has multi-university participation in continuing, 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.

### *The Path Forward created aspirational collaboration*

The first policy effecting 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 they 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. 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 Forward* 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 engagements. The document repeatedly mentions the universities, their faculty, and students as catalysts to job creation, innovation, and entrepreneurship in cross-institutional collaboration. *The Path Forward* 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.

### *The Two University policy institutionalized collaboration*

The second policy effecting 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 to access grant funds. A self-imposed mandate by Ignite's stakeholders, 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. It could be a student, faculty member, or administrator 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 as 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.

### *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 toward their aspirational goals by using financial incentive as the primary method to build their capacity to do so. The ECGRA's funding process required a primary applicant with collaborating partners that committed to the initiative in the form of an MOU. This scenario created an unintentional power dynamic where 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 was promoting 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 their 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 whereas they began implementing goals. However, this dynamic was tested as the implementers of the programmatic goal, 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 implementers 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 contract interpretation 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.

### *A flexible source of seed funding to incentivize collaboration*

Funding sources often dictate the goals of the project. Federal and state funds come with mandates and 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 government. 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%) of local share under the auspices of the ECGRA is invested in a traditional manner – roads, water infrastructure, public safety. The remaining 75% 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. Except for private philanthropy, no other source of funding in Erie County provides financial support to initiatives driven by the constructs: entrepreneurial university and adaptive networks. The availability of local share is a crucial condition for funding multi-university collaboration. Without it, Ignite would not exist in its current form.

### **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.**

### *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: chamber of commerce, economic development corporations, civic associations, and various trade councils. These groups tend to be 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, 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, ecosystem.

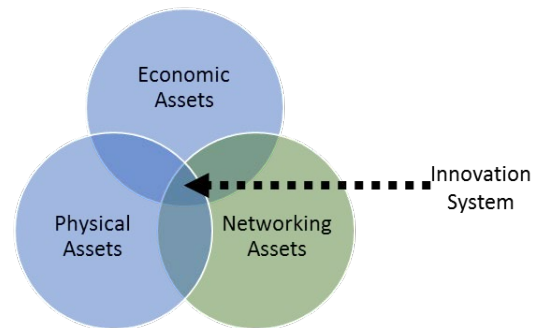


Figure 7.  
Interconnected Assets of an Innovation System

### *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, 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 clarify 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.

### *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). So, when the ECGRA places capacity building grant dollars into the equation, there’s 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 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. 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 their 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 policy and procedure 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.

### *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 in 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 (see 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 a non-starter at others. Innovation teams were convened around solving community problems that may have a future commercial application. For example, there was a lot of discussion around gun violence in the city. A team consisting of multiple universities looked at 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 most effectively serve the entrepreneur.
- **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 strengthens 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).

### *Institutional Formation*

At this stage, the Ignite Erie stakeholders settle on a strategy and tactics, embracing it 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,

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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 its 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.

## *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, & Etzkowitz (2012), joint value creation through collaborative networks, as a team 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 be additional institutions, agencies, and regional industry. An 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 quote is a reminder that growing new ventures off the traditional manufacturing assets still present in the regional economy is a competitive advantage. Building new forms of connectivity by remaining porous enough to add new partners, talent, 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 (see 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.

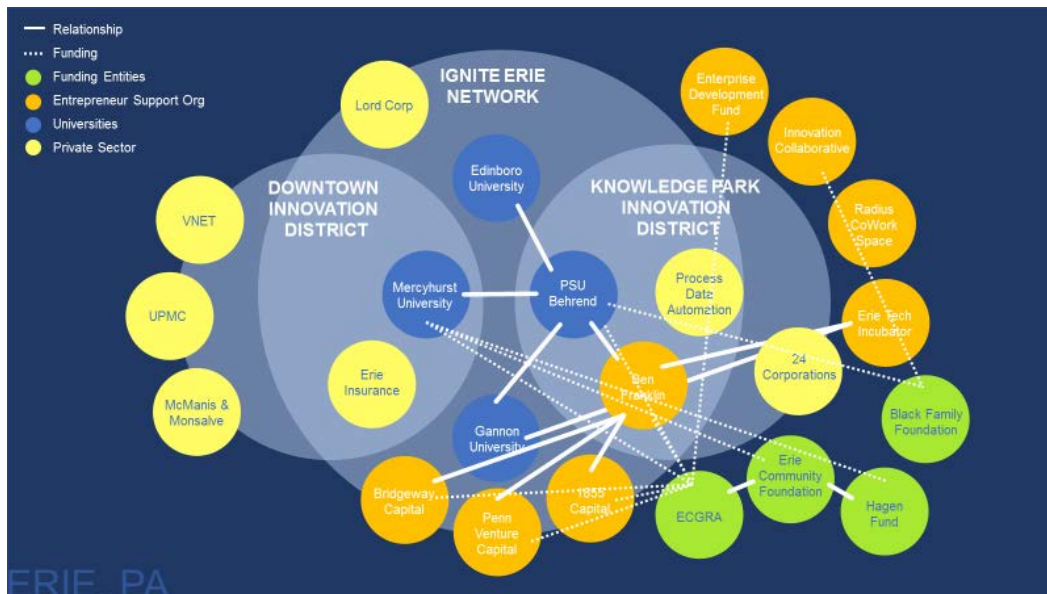
Matching and Leveraged Funding by Source, Use, Amount		
Match Source	Use	Amount
Appalachian Regional Commission (ARC)	Technology funds for Beehive setup and equipment	\$200,000
Economic Development Administration (EDA)	Implementation funds to support Beehives at each university	\$1,000,000
Gannon University	Matching funds for the shot-spotter project	\$2,000
IBM	Smarter Cities grants was used in support of the shot-spotter project	\$3,000

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Industry Partnership	Match from industry and entrepreneurs; Quickstarter user contributions; industry investment in Knowledge Park	\$270,000
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		

## Recommendations

- 1. Connectivity** – connect with additional stakeholders to build out the network and improve the value statement of Ignite Erie. There's 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.



- 2. Health** – As the 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 the 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.



### *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 Erie 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.

### *Future 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 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 it needs 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, collaborative culture, and have internal policies and leaders that position their companies to work with universities. Finally, at a macrolevel 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



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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 Erie 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 Erie, like culture changes, over the long-term. In the short-term, Ignite Erie demonstrates results in helping entrepreneurs with immediate needs like prototyping, crowd source funding, and branding.

This evaluation provided an interim review of short and long-term goals. It contains both summative and formative perspectives of Ignite. This review aimed to describe Ignite in a way that assisted the ECGRA Board of Directors and Ignite Erie Steering Committee in understanding what happened and how they might learn from the findings.

Ignite Erie represents a unique opportunity for Erie County, PA 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.