



Regional Knowledge Ecosystems



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Introduction

This White Paper was published July 28, 2011 with the financial support of the Western Economic Partnership Agreement. It takes a concise look at the core attributes of regional knowledge ecosystems and implications for economic developers in Saskatchewan.

Overview of Regional Knowledge Ecosystems

Innovation is a key driver of competitiveness and economic growth in regional economies. The core elements of an innovation economy include:

- Workforce
 - o Successful knowledge ecosystems are dependent upon a pool of regional talent that can work at all stages of the company lifecycle.
- Technology commercialization
 - o The process of turning inventions into economic opportunity
- Public-Private partnerships
 - o It is easier for a region to leverage its resources to become more competitive when there is a positive, supportive environment between private and public sector to pursue and develop innovative initiatives.
- Capital formation and investment
 - o Developing and attracting venture capital and risk capital investment pools are key to achieving regional economic growth.
- Professional networks
 - o Creating and reinforcing relationships across various disciplines in economic development through professional networks can inspire the process of idea generation that is critical in a knowledge ecosystem and will foster successful commercialization of innovations.
- Entrepreneurs/Entrepreneurship
 - o People are required who are prepared to connect innovations from research, commercialize them and create business and economic opportunities from marketable innovations.
- R&D Infrastructure
 - o Regions with laboratory space, instrumentations and all the physical infrastructure needed by technology researchers to create innovations.
- Business Climate
 - o Policies and programs that create an environment that encourages business start-ups, expansions, and relocations are necessary to attract innovative companies and entrepreneurs. (RTI, 2011)

These elements are distinct pieces but when combined as a whole system, they define a knowledge ecosystem. Economic developers need to assess their regions for the presence of these elements and identify any gaps that could be filled to strengthen the region as a participant in a regional knowledge ecosystem.

Processes that can help foster an ecosystem over time include:

- Strategic Planning
 - o Regions must accurately identify their assets and how they can be used in a knowledge driven economy. Determining how to mobilize those assets for economic growth and coordinating the effort is an important role in creating a knowledge ecosystem.
- Regional Innovation Policy and Programs
 - o All levels of government must be prepared to create policies and programs that support a knowledge ecosystem for a region to achieve the best possible economic success. Programs should address any gaps that must be filled for a region to be competitive.
- Management
 - o The process, programs and facilities must be effectively managed to ensure that all the partners in the ecosystem are contributing to the potential economic success of the region. Leadership is a critical skill in moving a region forward.
- Economic and Social Impact Analyses
 - o Regions that focus on an innovation strategy should conduct regular analyses to enable accurate reporting back to stakeholders and the community to keep them informed and on board with the progress of the strategy.

Regions can achieve competitive advantage and growth by creating an environment that turns technological innovations into marketable value. (RTI, 2011)

A successful knowledge ecosystem will foster economic development by using a holistic approach that brings together businesses, government and research institutions with the appropriate infrastructure, business and financial support. These elements combined with networking, and tools for commercializing research provide innovators and entrepreneurs with the best opportunity for commercial success. (RTI, 2011)

Many regional leaders believe that sustainable economic gain and social good can only come from a knowledge ecosystem. This assessment comes from observing economic growth and change over a long period of time where manufacturing economies followed by service economies both struggled as times changed and the world experienced economic and financial crises. (The New York Academy of Sciences, 2011) Knowledge ecosystems are built on the principle of equipping regions to adapt to change and minimize dependence on specific companies and sectors.

In an innovative knowledge region, the economy is not defined by political and geographic boundaries, but by a diverse group of industries supported by infrastructure, investment and an availability of local talent. Successful regions must be able to generate and encourage innovation by networking innovation assets such as people, institutions, capital and infrastructure to generate economic growth and

prosperity. Key elements that are present in successful knowledge ecosystems are: workforce skills and lifelong learning strategies, investment and entrepreneurship strategies and regional infrastructure and economic development strategies. (<http://www.doleta.gov/wired/about/>)

The Institute for the Future (ITF) published a paper in 2009 entitled *Future Knowledge Ecosystems*. It incorporated views from dozens of experts in innovation and entrepreneurship, scientific collaboration, university research management and urban design and development, from different countries and professions, who were asked to forecast the next twenty years of technology-led economic development. From the summary and evaluation of emerging trends identified in the research, all likely scenarios for success would involve region-based innovation. The conclusion was that regional knowledge ecosystems will become the framework for how research parks, venture capitalists, universities and others interact. Silicon Valley is a successful example of a regional ecosystem. The region is made up of entrepreneurs, venture capitalists and Stanford University which all interact to create a self-sustaining knowledge ecosystem.

“For instance, when enough people in Silicon Valley begin experimenting with a new technology, inevitably a whole array of firms launch to develop it further. The firms emerge from the ecosystem, not the other way around.” (ITF, 2009)

Self-contained research parks have been the primary method for regions to drive technology-led economic development strategies for the past fifty years (ITF, 2009). Regional knowledge ecosystems are a new way to use the assets of a research park to inspire innovation, commercialization and economic growth.

Implications for Economic Developers

Building regional knowledge ecosystems (RKE) is a new way to model technology-led economic development in a global environment that changes rapidly. The new economy requires a quick response time from entrepreneurs and researchers to remain competitive.

The RKE approach to building a technology led strategy in a region is a process that involves many partners – research parks, large research-driven companies, start-ups, universities, investors and professionals – working together to develop regional knowledge ecosystems. These networks consist of a number of elements, some formal and other informal:

- Research partnerships between universities and companies
- Social networks of entrepreneurs, professionals and amateurs
- Investor cliques and clubs
- Virtual networks and their members both inside and outside the region.” (ITF, 2009)

Clusters are limited to a single industry and are very much focused on the individual companies located there. RKE's are very different in that the businesses are not the primary focus. Businesses are the method of commercializing and making available to the market an innovation and idea that has been generated by researchers or entrepreneurs. Businesses become the product of an RKE whereas in a cluster, the businesses are the primary tenants and driver of the region. Innovation drives the development of new businesses to deal with specific elements of an enterprise, and will tend to generate a number of spin-off initiatives. An innovative region driven by an RKE will generate entrepreneurial activity from the talent that had been attracted to the region for the knowledge environment.

Regional partnerships of labs, universities, companies and entrepreneurs can adapt faster to new ideas or changes in the economy and/or consumer demand than individual research parks or municipalities. (ITF, 2009)

To remain competitive in a fast-paced changing world that has witnessed economic and financial disasters in recent years, regions must constantly look for ways to maintain sustainable economic growth and prosperity. In a world characterized by rapid new developments in information technology and communications, many questions exist with respect to the best approach to drive economic development and the importance of location versus the importance of technological infrastructure.

The extensive demand for and use of wireless internet, smartphones, tablets, Twitter and Facebook illustrate the effectiveness of the virtual world where collaborations can take place instantly from across town or around the world. Economic Developers must weigh benefits of virtual infrastructure against the value of investment in location specific technology parks where collaboration can take place in a hallway, restaurant or shared office space to generate innovative economic development successes.

Billions of dollars have been invested in science parks world wide for the purpose of gathering infrastructure and people resources in one place to replicate the success of the Silicon Valley model where the "interconnectedness" of the region has evolved it into a technology hotspot for commercializing innovations. (Brown, 2010) The success of such a hotspot is the ability to continue to attract innovative, creative and talented people where the exchange of ideas and services will continue to create wealth. Regions that invest in such infrastructure do so in order to build a self-sustaining knowledge ecosystem in their area. (Brown, 2010)

"When a valuable idea emerges, local entrepreneurs line up the capital, talent, and workforce to commercialize the technology locally."
(Brown, 2010)

The Silicon Valley region has not been successful simply because of the physical infrastructure, but also because of success in commercializing innovations within the region. This is the difference between technology-led economic development and regional knowledge ecosystems. It goes beyond providing a research park and a university environment; it is the successful collaboration of financial, academic, government and entrepreneurial assets to successfully commercialize innovation within a region to drive economic growth and prosperity using local resources. An entrepreneurial culture is critical for a region to create sustainable development and wealth from within.

Richard Florida in his 2002 book, *The Rise of the Creative Class*, indicates that throughout most of history, the stimulation, population and possibilities in cities have drawn creative, entrepreneurial people. Although the ability to have virtual collaborations is possible, regional knowledge ecosystems remain a draw for innovative, creative individuals. There is still a need to have personal contact, linkages and creative stimulation that will drive the development of location based regional ecosystems, but virtualization and advances in communications technology will open up a greater array of collaborative options.

Regional knowledge ecosystems could be less structured than a typical research park and will more likely take the form of several small independent research spaces tied together with social software. (ITTF, 2009) People will still have the opportunity for face-to-face collaboration, but will be connected to other groups of people in a number of locations.

Science and technology has become more complex and is less likely to be successfully tackled by any one company, campus or research park in isolation. (ITTF, 2009) The focus of RKE's is on the interaction between all the players in the process. The emphasis is on the various bodies of knowledge and skillsets versus a traditional technology-led economic development focus which is founded on specific institutions such as universities, research parks, companies and venture capital funds. This holistic approach to innovation reframes the traditional philosophy that it is an isolated activity performed by individual companies. It is now viewed as a cooperative cohesive system. (ITTF, 2009)

An important shift in technology-led development is to put emphasis on linking innovations to global markets in a way that generates value versus a single focus on developing real estate and infrastructure for technology firms. (ITTF, 2009)

As they work to support linkages in new ways, regions may need to develop space for collaborative groups to meet on a regular basis to discuss ideas and common interests. Research parks may have less demand for permanent space and more demand for temporary spaces where people can gather to share information and innovations in progress. The need for temporary meeting spaces for face-to-face interactions could be another result of more mobile and virtual work spaces. It is a change to the type of space traditionally needed in a cluster or research park environment.

The concept of Regional Knowledge Ecosystems provides more opportunity for Saskatchewan communities to participate in a technology-led economic development environment than the predecessor to RKE's which were traditional clusters as defined by Michael Porter. The geographic expanse of the province and its' sparse population does not provide fertile ground for the development of clusters. RKE theory allows for virtual collaborations of partners and smaller groupings of expertise in various locations connected by networks.

With the advancements of technology, the challenge of developing traditional clusters within Saskatchewan's geography is minimized. The province has some well established organizations, entrepreneurial resources and research institutions that are accessible to all communities in Saskatchewan. This is a good foundation for the development of a regional knowledge ecosystem.

However, our province that has a long history of being risk-adverse, and therefore the biggest challenge in developing a regional knowledge ecosystem will be strengthening the entrepreneurial culture that has been identified by researchers as the key to a successful knowledge-driven innovation economy. Economic developers wanting to nurture the growth of regional knowledge ecosystems should start with initiatives that support the development of an entrepreneurial culture. Involving high profile entrepreneurial role models in the development of the community strategy is an effective way to encourage more people to consider local investments. Quality leaders are critical to all community and business initiatives.

Regions and communities could start with small initiatives to encourage a greater use of technology in local businesses in order to build a stronger base for regional knowledge ecosystems.

For example:

Chambers of Commerce can use technology to help small business in the following ways:

- Provide guidance and training to members on how to use technology to help their small business.
- Ideas that have been explored at several Chambers in the United States include:
 - o guidance on how to use social-networking site to find job candidates,
 - o tips on web prospecting and new websites where firms can solicit work proposals and network with peers. (Wall Street Journal, Feb. 23, 2009)

The opportunity for virtual chambers in regions such as Saskatchewan is in itself a 21st century solution to building and maintaining strong peer networks.

Regions need to embrace a spirit of risk-taking. Identifying potential local investors and encouraging angel investment activity, as well as providing professional support to entrepreneurs in the start-up phase is required.

Recruiting high profile, strong leaders to drive progress forward in the region and to communicate and educate the region through local media about the importance of an entrepreneurial climate could begin to cultivate a change in attitude toward entrepreneurship. These tactics should build capacity in a region to be able to have a knowledge ecosystem over time.

Resources

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