Clusters have become the sine qua non for economic developers around the world. In some places they have emerged out of the ashes of discredited network programs to rise again in the form of clusters, in other places more directly from regional competitiveness theories based on agglomeration. While networks and clusters have much in common, they have different goals, operate at different levels, and require different approaches. This paper examines the evolution of clusters from networks, describing a range of strategies and their applications. In discussing difficulties and pitfalls in identifying clusters and formulating strategies, localised essential assets are distinguished from those that are nonessential or can be imported. To help inform future cluster policy, the paper concludes with some insights into past experiences.

In the mid 1980s, U.S. development agencies were seeking ways to help their struggling industries compete with the modern and remarkably efficient production facilities of Western Europe and Japan. That search eventually led them to northern Italy, where scores of technologically advanced but small artisan firms were capturing large shares of European and global markets. The epicentre was the now legendary Italian region of Emilia Romagna. Some 40,000 small and medium size enterprises (SMEs) were operating in dense industrial districts with the efficiency and scale of multinational corporations. No one had yet applied the word “cluster” to these districts, but under any name, local specialisation and collaboration were instrumental to their success.

Agglomeration theory has been a popular area of research for economists and geographers for decades. But for the most part discussions took place within the academic community. Conventional economic development pursued diversification and specialisation and avoided any sort of “industrial policy” that suggested winners and losers. In 1990, however, Harvard Business School professor Michael Porter took the concept to a new level by examining it from the perspective of the firm. He effectively turned specialisation, which he called industry clusters, into a national and regional competitiveness strategy. This demand-driven approach helped to legitimate clusters as a target for public policy.

The model used by Porter (1990) to describe competitiveness was called the “diamond.” Its four corners were (1) factor conditions; (2) related and supporting industry; (3) demand conditions; and (4) firm strategy, structure, and rivalry. More important than creating a model for an economy, Porter met—and created—a global demand for consultants with policies to fit it. As a result, over the period of about ten years, industry clusters have moved from a relatively obscure idea situated on the periphery of economic development to a core practice.

Clusters have become the pot of gold for economic development. Places that don’t have clusters either redefine their industries to reach scale, claim them anyway, or aspire and plan to get them. At last count, some 47 U.S. states claimed to have a biotechnology cluster even though 75 percent of all the biotech companies with 100 or more employees are in just nine cities (Cortright & Mayer, 2002).

Part of the popularity of clusters lies in its vagueness and definitional elusiveness.
(Martin & Sunley, 2002). Rarely has an idea captured the imagination of so many leaders in so many regions so quickly, or have theoretical concepts expanded so quickly to fit with local circumstances and expectations. Clusters that have been identified by development agencies and researchers in recent years range in size from two companies to thousands, cover geographies as small as a neighborhood and as large as nations, and include members as narrowly defined as a four digit industry code such as men's hosiery and as loosely defined as “professional services” or “high tech.”

**Variations on a Theme: Networks, Associations, and Clusters**

A small number of small companies that make plastic parts join together to acquire less costly training and pursue contracts that exceed their individual capacities. A group of food processors on the west coast decide to join forces to get into new Asian markets. Upholstered furniture companies in northeast Mississippi reach a scale that attracted suppliers of springs, foam, and textiles and justified an advanced technology centre for furniture upholstery at a local community college. The interdependencies among firms in each of these places gave them certain advantages over more isolated firms. But are they all clusters?

The “associative economy” is the term that encompasses all forms of business-based interdependencies. But that term includes many distinctive forms of association, which includes both clusters and networks. Both represent a means for companies to acquire economies of scale that are external to their firm, but they are quite dissimilar economic structures and respond to very different public sector approaches. A decade ago, networks were the strategy of choice for increasing industrial competitiveness in most of the world, with major programs promoted, supported, and studies by United Nations Industrial Development Organization, the World Bank, USAID, the European Union, and Organization for Economic Cooperation and Development. The transition from policies to build networks to policies to build clusters—and to a large extent back to networks—is a story of evolving economic development practices and the benefits of shared experience.

**Networks:** The concept of the “flexible manufacturing network,” like the cluster, originated in western Europe—particularly northern Italy, where inter-firm collaboration was documented and explained by researchers such as Brusco (1995). The concept was simple: companies would join together to achieve economic goals unattainable alone. They would network to produce more complex goods, extend their market outreach, acquire costly resources or services, or simply reduce costs.

The policy model used to increase networking among SMEs was designed in 1990 at the Danish Technological Institute. It consisted by five steps: publicizing the concept among SMEs; training network brokers to organize and facilitate networks; training “multipliers” (e.g., accountants, consultants, and lawyers) to identify potential network opportunities; creating a three phase grants programs as incentives for firms to network. The Danish program became the principal construct for the rest of the world. Lacking local industry associations that provide services, the U.S. used network programs to form local associations, or “soft” networks, which in reality were business associations that provided the social infrastructure necessary to create the trust that enabled firms to do business together and do favours for one another simply on the basis of expected reciprocity. Even if firms saw value in networks and associations, without an industrial environment to create opportunities for cooperation and support norms of reciprocity, networks would remain an exception, not rule.

**Clusters:** Unlike networks or associations, clusters are not based on membership. They are simply geographic concentrations of interrelated companies and institutions of sufficient scale to generate externalities. The minimum number of firms with common or overlapping needs to be acknowledged as a “cluster” is the number that attracts suppliers and specialised services and
resources. Clustered firms have access to bankers and accountants who understand their technologies and markets, trusted consultants who can solve specific problems, marketing and advertising companies that know their customers, and the industrial extension service or small business centre able to give advice. The geographic boundaries of clusters are set by the distances those in firms and entrepreneurs are willing to travel for informal face-to-face meetings and by how far employees are willing to travel to work.

Like networks, clusters are composed of firms that co-locate around a variety of common interests or needs. But, unlike networks, neither “membership” in an organisation nor cooperation is required to be “in” a cluster. “Free riders,” simply by virtue of geography, are able to realise non-exclusive external economies that accrue to members of cluster associations. They have access to information that flows informally, the local “buzz.”

Much of the initial research on—and policy actions for—clusters focused on the two corners of the diamond that produce these hard externalities, which Porter calls “factor conditions” (Rosenfeld, 1996) and “related and supporting industries.” The advent of the Internet and overnight delivery, however, reduces the value of localisation economies, i.e., access to the intermediary inputs to production, including parts, services, and information at lower costs. Proximity still matters for some critical components or supplies that are knowledge-intensive and depend on interactive research and design or special support in assembly or utilisation, but sectors included in cluster maps that derived from input-output tables are a diminishing local advantage.

The glue that continues to make proximity matter consists of “soft” externalities, i.e., greater access to tacit knowledge, opportunities for deliberate acts of cooperation and collaboration that give companies the strength of numbers to influence customers, markets, or policies, and access to experienced labour. This view suggests a social network model of clusters (Schmitz, 1997). Soft externalities are more difficult to quantify, but their value is readily recognised by businesses and entrepreneurs. Leaders depend on personal relationships and trust, such as the acquisition of the tacit knowledge that is buried in the minds of individuals and the routines of organizations and not easily communicated without personal interaction (Morgan, 2001). They know more about their competitors’ products and processes and can monitor innovation and benchmark themselves. Robert Putnam’s analysis of Italy’s economy (Putnam, 1993) inserted another academic term, “social capital,” into the vernacular of economic development.

In evaluations of clusters by the Northwest Area Foundation, firms ranked access to knowledge their most important reason for associating with similar firms, including competitors—over any of the harder business outcomes (Rosenfeld, 1996). Similar studies of networks in Wales and Australia confirmed this finding (Folop & Kelly, 1995).

Misperceptions and Misapplications of Clusters

Like any popular and heavily marketed idea, clusters can be an effective strategy but, if misapplied or over-promoted as panaceas for economic growth and sustainability, it becomes an empty promise. At its best, clusters are a means for understanding an economy to formulate effective and cost efficient public sector interventions that serve the public good. At its worst, clusters are gimmicks for justifying poorly conceived public sector interventions.

A. Clusters can be identified by formula

Virtually every analysis of regional economies that sets out to identify clusters begins by aggregating related industry sectors into clusters. In the U.S. most rely on national data on enterprises compiled by sector in the North American Industrial Classification System (NAICS). Analysts look first for absolute scale, as measured by ranking numbers of establishments or employees and relative scale as measured by comparing the proportion of total companies or employment in the place of interest to the same proportion in the nation.
Table 1 – Organisational structures of the associational economy

<table>
<thead>
<tr>
<th></th>
<th>Hard Networks</th>
<th>Associations</th>
<th>Clusters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Membership</td>
<td>Closed</td>
<td>Open, membership based</td>
<td>None required</td>
</tr>
<tr>
<td>Relationships</td>
<td>Collaborative</td>
<td>Cooperative</td>
<td>Cooperative and competitive</td>
</tr>
<tr>
<td>Basis for agreements</td>
<td>Contractual</td>
<td>Majority determination</td>
<td>Social norms and reciprocity</td>
</tr>
<tr>
<td>Value added</td>
<td>Allows firm to focus on core competencies</td>
<td>Aggregates &amp; organizes demand for services</td>
<td>External economies</td>
</tr>
<tr>
<td>Major outcomes</td>
<td>Increased profits and sales</td>
<td>Shared resources, lower costs, benchmarking</td>
<td>Access to suppliers, services, labor markets</td>
</tr>
<tr>
<td>Basis of external economies</td>
<td>Shared functions and resources</td>
<td>Membership</td>
<td>Location/proximity</td>
</tr>
<tr>
<td>Shared goals</td>
<td>Business outcomes</td>
<td>Collective vision</td>
<td>None required</td>
</tr>
</tbody>
</table>

The simplest data sources are the U.S. Department of Commerce’s County Business Patterns, with employment security databases next best. These sources, however, have major limitations. First, they suppress data in places where the numbers might reveal a company’s identity. Second, they fail to include companies without employees and most micro-enterprises, a major barrier for clusters dominated by micro-enterprises, such as tourism or creative enterprises. Third, they classify companies in a single sector when many companies have multiple products and competencies—or in the wrong sector. Fourth, many so-called new economy clusters are not classifiable by industry codes. New Media clusters, where content is combined with IT, and Optics and Imaging clusters, are joined by core technologies used by firms across many sectors.

Finally, the scale of a cluster is dependent on the type of relationships the analyst chooses for grouping sectors. The most common grouping is product line or service, but the firms may prefer to locate in places populated by other companies with similar production processes, skill needs, distribution channels, customer bases, or critical resources. For many of these, NAICS codes would not only be insufficient but also would be misleading.

For example, in Connecticut’s Naugatuck Valley BIC, Schick, and Lego are among the largest users of plastics technologies and workers, however they are not classified as plastics companies.

Finding the relationships that cause firms to cluster requires local knowledge of the factors that provide the firms their competitive advantage and the relationships that enhance those advantages. Experience with policies to encourage firms to form business networks taught us that the most successful networks—and most successful cluster organisations—are to a large degree self-selecting, built on a core set of pre-existing relationships.

B. In the age of the Internet proximity no longer matters

After many predictions of the death of geography by futurists, companies still find proximity to be important. Companies still cluster, as witnessed by the quickly growing concentrations of similar firms in China’s coastal regions, with firms producing nine billion pair of socks in the cities of Datang (“Socks City”) and Zhuji; a half billion wedding and evening gowns made in Chaozhou; and 300 million ties manufactured in Schengzhou (Barboza, 2004).
Transportation and communications technologies have altered the way clusters function as systems, but their potential for replacing face-to-face relationships has been greatly exaggerated. Companies want knowledge and information beyond what they can get from the literature, Internet, and telecommunications and they want a labour force that understands their work environment. Clusters represent a mediating environment, with norms of reciprocity that support inter-firm relationships and higher levels of un-traded interdependencies, i.e., social capital (Putnam, 1993). In clusters tacit information and knowledge about new technologies, markets, or services is gleaned more readily from personal friendships and collaborative business arrangements. Local know-how is passed on by doing things and seeing how other people do things through informal chit-chat (Brusco, 1995). Knowledge flows or “leaks” unintentionally and technologies spread to smaller companies, for example, through swapping of employees within a common pool of skilled and technical labour developed around the region’s core technology (Doringer & Terkla, 1995).

C. Clusters require membership

Clusters are eco-systems, not associations. They are geographically bounded groups of firms that depend on other nearby firms and institutions for their livelihood in a variety of ways. The organisations that represent members and individuals are the result not source of interdependencies. The danger in promoting cluster associations is that they become confused with the cluster itself and are not just an element of a larger cluster-based strategy. Measures of success of the cluster association, such as membership or grants received, are mistaken for measures of success of the cluster. Cluster activities are defined exclusively by the actions of the association. Moreover, they are believed to be dependent on a broker or facilitator. The “Green Book,” an analysis of cluster activities, claims that 89 percent of all cluster initiatives have a facilitator to manage the activity, most of which do this at least part time and have an office.

This distinction does not reduce the value of membership associations, which can create the milieux in which new relationships are built. But using a system as the framework recognizes that clusters are informal and inclusive and free riders are not only unavoidable but strengthen the cluster. Associations, on the other hand, are formal and exclusive. Members gain advantages over non-members.

D. Clusters are contained within political boundaries

Porter’s cluster model had no geographic requirements. He used nations, regions, and cities to illustrate his clusters. The geographic boundaries of clusters are defined, in the loosest sense, by the distance and time that people are willing to travel for employment and that employees and owners of companies consider reasonable for meeting and networking.

The geography over which know-how can efficiently spread is influenced by transportation systems and traffic but also by cultural identity, personal preferences, and social hierarchies. In a city with traffic congestion, the ostensible cluster limits might be a metropolitan area or even a neighbourhood. Silicon Alley is located in Manhattan south of 41st street. In some neighbourhoods, social barriers created by class or race may restrict residents’ real connections and related opportunities to a much smaller area than the full cluster. In rural areas where roads are relatively free of traffic and people are more accustomed to driving long distances, a cluster may include a region that encompasses a circle of up to a hundred mile radius.

Political considerations also influence cluster boundaries. Even where clusters spill over political borders, government data are collected by political jurisdictions and funds must be used within certain jurisdictions. Therefore, governments define clusters by the borders of states, counties (shires), or regional groupings of counties within their states. But it is important to be aware that aggregating data according to these boundaries may miss edge clusters that cross regional
boundaries. The sizable metal working cluster in western Minnesota near the North and South Dakota borders was not obvious even to the firms operating there before foundation-led efforts to develop it. Ultimately, geographic boundaries are porous. There is substantial advantage to firms and people in national and global networks and communities of interest so that the best thinking can be absorbed into the cluster and so that member companies are made aware of benchmark practices and changing markets.

E. The public sector can create clusters

The more attention is paid to the importance of clusters to regional competitiveness, the more places want one. But businesses, not governments, form clusters. The evidence suggests that clusters emerge out of a solid foundation that is either embedded in existing companies, local expertise, or some special resources. The world’s best-known clusters have taken a long time—often decades—and were unplanned until they reached a level activity that attracted attention. The roots of clusters can be found in one or two successful companies with entrepreneurial and resourceful employees; in the development of value added chains around very large employers; in efforts by redundant employees to use their competencies in innovative ways; in access to critical natural resources or infrastructure; or by opportunities for commercialisation around sources of new technologies.

Table 2 – Selected Cluster Origins

<table>
<thead>
<tr>
<th>Place</th>
<th>Year</th>
<th>Cluster/Origin</th>
<th>Reason</th>
<th>Catalyst</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aalborg, Denmark</td>
<td>1948</td>
<td>Mobile communications/ SP radio</td>
<td>Fishing industry</td>
<td>Aalborg Univ (’72), NOVA Science Park, R&amp;D (’85)</td>
</tr>
<tr>
<td>Southern Scotland</td>
<td>1940</td>
<td>Electronics/ National security</td>
<td>Safety from attack</td>
<td>Scottish Enterprise (’91)</td>
</tr>
<tr>
<td>Carpi, Italy</td>
<td>1950s</td>
<td>Knitwear/ Straw hats</td>
<td>Fashion shift</td>
<td>ERVET (’72)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CITER (82)</td>
</tr>
<tr>
<td>Tupelo, Mississippi</td>
<td>1948</td>
<td>Motion Furniture/ Tutorian Furniture</td>
<td>Surplus labor, Raw materials</td>
<td>Showrooms, Itawamba Comm College, (’84)</td>
</tr>
<tr>
<td>North Central Massachusetts</td>
<td>1760s</td>
<td>Plastics/Shell combs</td>
<td>Serendipity</td>
<td>Entrepreneurs</td>
</tr>
<tr>
<td>Connecticut River Valley</td>
<td>1816</td>
<td>Springfield Armory</td>
<td>Water power, logistics</td>
<td>Government contracts, training programs</td>
</tr>
</tbody>
</table>

Most clusters have been historical accidents. No one would have predicted or planned the carpet cluster in Dalton, Georgia or knitwear in Carpi, Italy. But plastics in western North Carolina had its basis in the competencies within General Electric’s plastics plant and the demand for parts.

Some clusters began as large companies that originally located in less populated areas to take advantage of low wages and surplus labour markets and that later disintegrated into smaller firms. This scenario describes the origin of the furniture manufacturers in Tupelo, Mississippi and in County Monaghan, Ireland. Others developed by investing the
surplus from an agricultural economy into another industry, such as the hosiery industry in Castel Gofreddo, Italy. Others were created by transforming a common local craft into a related value-added cluster, such as straw hats into fashion knitwear in Carpi, Italy.

The serendipitous development of clusters does not mean that the public sector has no role to play. Public sector initiatives have proven effective in improving clusters’ ability to compete and, in selected instances, even influencing growth patterns (Wolfe & Gertler, 2004). Kick starting clusters has in almost all cases added value by filling gaps and providing incentives for innovation.

The numerous “cluster initiatives” led by “clusterpreneurs” have increased levels of activity within clusters. Although there have been no rigorous assessments of outcomes, recent global surveys that describe priorities among various kinds of efforts also reveal positive changes in behaviour among firms and institutions (Solvell, Lindqvist & Ketels (2003).

F. Clusters are a fair and equitable way to grow an economy

The limitation of a demand driven development strategy is that clusters, if left to their own devices, will not meet the social goals of the public sector. Clusters that have organised in order to set priorities and define their own interests rarely place equity very high on their agendas. A quick scan of the many state, regional, and metropolitan cluster analyses and studies in industrialised nations finds very few references to distributional outcomes according to wealth or to specific intents to reach low- and middle-income populations.

Efforts to improve equity should payoff in profits, such as by increasing productivity, building good will that results in additional sales, or reducing employee turnover. In tight labour markets, the payoff may be the ability to maintain a full work force. This gives some advantage to poorer regions that still have surplus labour forces and it causes companies to invest more in training less educated populations to meet their employment needs. In weak labour markets, manufacturers benefit from an untapped labour force that they can attract into and train for positions that have become unpopular among students, such as machinists and tool and die makers.

Clusters that are dominated by locally owned firms that expect to remain locally owned, in particular, are concerned about fairness. The more dependent clusters are on attracting mobile and discriminating talent, the more important their contributions to building community amenities and supporting a high quality of life. Where community and business interests are intertwined, businesses are willing to make trade offs between maximising quality of life and maximising income.

Learning from Experience

Porter’s diamond provided the first common framework for understanding clusters and, as mentioned earlier, reached high-level policy makers and influenced the first wave of cluster strategies. His model focused initially on factor conditions and rivalry among firms to drive innovation. The first wave of cluster strategies thus emphasised the basic non-specialised conditions for growth and the factors that could be influenced by the public sector—but without appreciably changing the structure of the public sector.

A second wave of strategies, bolstered by Putnam’s (1993) research, emphasised the value of relationships, networking and strategies targeting cluster organisations. Organisations became the symbol of a cluster’s very existence; the growth of the association or its resources a proxy for success of the cluster.

Now that cities and states all over the globe have attempted strategies to create, strengthen, or salvage clusters, what has been learned that can inform future policies?

First, even if clusters are as much in the mind of the beholder as a product of analysis, some limits must be set to maintain conceptual integrity. Second, workforce has emerged as the most definitive local externality. Third, cluster success requires some form of
differentiation, or brand. Fourth, local amenities and attitudes are closely associated with success of clusters that rely heavily on attracting and keeping talent. Fifth, the competitive advantages of clusters are changing as a result of globalisation and technology. Finally, clusters need global pipelines as much as they need local networks and tacit knowledge.

A. Clusters must be kept in proper perspective

There is a tendency to oversimplify and thus trivialise the definition of “cluster” to where clusters are found everywhere. In today’s policy world, clusters are acquiring “the discreet charm of obscure objects of desire” (Martin & Sunley, 2002). They are tools for better understanding the special comparative strengths of an economy so the public sector can better organise itself to build on those strengths and help companies take better advantage of them. Part of the loss of clarity to the definition of the term clusters is due to resistance to industrial policy and any initiative that hints of favouritism. That leads regions to want to find enough clusters so that no major employer is excluded—which leads to long lists of local clusters with very generic and inclusive titles. Policy efforts to support regional specialisation and branding tend to shift cluster initiatives towards basic, more general needs such as education, infrastructure, and capital.

B. Clusters depend on local competencies and knowledge: The workforce imperative

Labour market pooling and experience has remained a leading cause of clustering (Krugman, 1991). Companies depend on an uninterrupted flow of workers with the necessary skills and the knowledge of the industry to apply them to both routine and unanticipated situations. Nearly every cluster depends heavily on the availability of a mid-skilled (technicians, sales staff, network administration, etc.) and skilled labour force that understands the particular context in which the cluster operates. Most of the mid-skilled labour force is educated at local technical and vocational colleges and institutes. Some of these educational institutions have been able to develop the specialised programs, expertise, and services to support cluster-based economic development strategies.

C. Successful clusters in developed and high cost regions rely on differentiating themselves from their competition

Industrialised countries will not be able to compete with places that have the combination of large labour forces and low salaries and wages unless they can create products or services for which consumers will pay a premium. Most strategies have looked to the universities as the source of new and distinguishing innovations. Many cluster analyses include rates of patents, business start-ups and evidence of innovation. Another form of differentiation can come from appearance, feel, or sound. One of the key and vastly underappreciated success factors in northern Italy is the way companies were able to integrate art and culture in their products.

D. Local attitudes and amenities matter to “new economy clusters”

Creative centres, according to Richard Florida (2002), tend to be the economic winners of our age, as they have the attributes—physical, amenities, diversity, and experiences—to attract what he defines as ‘the creative class’. The result is that economic development agencies are beginning to recognise the importance of quality of place and give more attention to the arts and culture as part of the cluster support structure. Some places have recognised that arts and culture represent a value added cluster in its own right, with specialty businesses, networks, and a dedicated support structure.

E. Globalisation is changing the functions that remain in mature clusters and functions are becoming a raison d’être for clusters

In the middle third of the 20th century cost was king. Companies introduced cost reduction programs and organised work to get the lowest possible labour costs. In the last two decades, the adoption of new production technologies and increased competition among advanced nations has
shifted the arena of competition to quality, delivery, and creative applications of technology. Today, with the competition moving to less developed regions, the focus is again changing. If the ability to make a good becomes ubiquitous, the competitive on-shore advantage of the cluster shifts from the production line to management strategies, transportation and logistics, communications, inventory control, packaging, design, or marketing (Table 3). Many of these functions remain in the home offices. The challenge for clusters will be to reinvent themselves in ways that keep a level of local employment.

Table 3 – Looking for Competitive Advantage

<table>
<thead>
<tr>
<th>Period</th>
<th>Goal</th>
<th>Advantage</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960s -1970s</td>
<td>Making things cheaper</td>
<td>Cost</td>
<td>Division of labor, MTS, mass production</td>
</tr>
<tr>
<td>1980s -1990s</td>
<td>Making things better</td>
<td>Quality and Speed</td>
<td>TQM, JIT, flexible specialization, automation</td>
</tr>
<tr>
<td>2000s</td>
<td>Making better things</td>
<td>Aesthetics and Authenticity</td>
<td>Design, innovation, uniqueness</td>
</tr>
</tbody>
</table>

F. Clusters need global pipelines to avoid stagnation

To continue to compete as technologies advance and markets change, clusters need “global pipelines” as much as they need “local buzz.” Many strong clusters have failed because they became complacent and shut themselves off from competing regions. Successful clusters establish linkages to companies and closely monitor trends in other parts of the world and provide different perspectives. They balance their local networking with connections in distant competition and markets, through international professional associations and trade shows and by extending their value added chain outside of their region.

Where Next

Policy makers have already taken the term clusters well beyond the original industrial district model, both in degree of specialisation and in scale. Almost any geographic grouping of similar or complementary firms can now be described as a cluster. The term also now defines a broad array of functions and resources that appear to act as magnets for certain types of businesses. “Innovation clusters” form around universities and other research complexes; “knowledge clusters” have become the alternative rural model, claiming clustering around knowledge based industries; and “functional clusters” are those that form around common corporate functions such as headquarters, distribution, or R&D.

While most places have accepted the theory of clusters, fewer public sector agencies have invested in programs at a scale that would affect the cluster. The efforts of most government agencies have been aimed at altering the behaviour of companies, getting them to organise, associate, trust one another, and form networks. Few agencies have made changes in their own behaviour by, for example, organising their services around clusters, creating cluster hubs, or even employing people with special cluster expertise. Investments in cluster initiatives—other than high cost recruitment efforts—have been minimal.

The major benefits of clusters have been to change mindset of public sector officials. They now better understand and accept the value to firms and to growth of associative behaviour, networking, and learning. It moves places to pay more attention to niche strengths and branding. It offers a way to aggregate demand and address the collective needs of their economy rather than focusing on individual employers. Finally, the synergy and scale of clusters can produce economies of scale and cost efficiencies for public sector services.
References


