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Regional Clustering in Australia

by

Michael J. Enright

Brian H. Roberts

1. Introduction

Two seemingly competing tendencies, the globalisation of economic activity and the localisation of industries, have captured the interest of scholars, economic development professionals, and policymakers in recent years. While trends towards globalisation of industries and companies might appear to reduce the importance and distinctiveness of (sub-national) regions, a tendency towards localisation of certain industries and economic activities appears to do exactly the opposite. The simultaneous globalisation and localisation tendencies have created policy challenges for national and local governments. One response to these challenges has been a dramatic proliferation of regional development policies based on regional clusters of firms and industries. This chapter explores the phenomena of clustering in the international and Australian contexts. A brief description of public policy initiatives, recent research and three brief case studies of regional initiatives to foster the development of industry clustering in Australia are presented. The conclusion discusses lessons and future directions for clustering in Australia.

Industry clusters exist where there is loose geographic concentrated or association of firms and organisations involved in a value chain producing goods and services and innovating. Clusters can be interpreted as part of the sub-national or global innovation and production system (Guinet 1999). Firms and organisations involved in clusters are able to achieve synergies and leverage economic advantage from shared access to information and knowledge networks, supplier and distribution chains, markets and marketing intelligence, competencies, and resources in a specific locality. The cluster concept focuses on the linkages and interdependencies among actors in value chains. It goes beyond the traditional ideas on clusters, which involved horizontal networks of firms operating on the same end-product market in a same industry group.

The modern concept of clusters involves integrated and often dissimilar firms and public agencies/institutions specialising and collaborating on R&D, innovation, commercialisation and marketing to produce a range of new or re-engineered products and services which are often cross-sectoral in nature. Clusters range in size from very large agglomerations of industries and firms that dominate the structure of regional and metropolitan economies, such as Microsoft and Boeing in Seattle, to small networks of firms that work collaboratively often in isolated localities. Some service clusters have virtual characteristics.

One of the most important trends in the world economy that has led to a strong interest in clustering has been the globalisation of economic and business activity. Several forces have contributed to the globalisation trend. These include the expansion of global finance and financial markets, the spread of knowledge facilitated by improved communication, the widespread availability and use of technology, the active expansion of multinational firms, the decoupling and decentralisation of economic activities within and between firms, the blurring of nationality of multinationals, reductions in barriers to trade and investment, the increased importance and power of supranational organisations such as the European Union, and the emergence of regions and regional identities that transcend borders (Amin & Thrift 1994; Dicken 1992; Dicken 1994; Dunning 2000). Added to this list today would be the rise of electronic communities over the Internet and the fact that nations comprising nearly one half of the world's population (including China, India, South Africa, the former Eastern bloc, and the

formerly import substitution driven economies of Latin America) have either entered or have dramatically changed their relationship to the world economy (Enright 2000).

As globalisation has accelerated, paradoxically, interest in localised groups of firms in the same or related industries, or 'regional clusters', has accelerated as well. This has been due to the examples found in growing or prosperous regions, in disappointment with economic development models based on large firms, and on the sheer ubiquity of the phenomenon (Enright 1991; Enright 1996; Enright 2000; Storper 1992) (Sub-national) regional¹ clustering can be seen in the industrial districts of Northern Italy or Spain, the metalworking and machinery clusters of Germany or Switzerland or the American Midwest, the high technology agglomerations of Silicon Valley or Route 128 or Cambridge or Sophia Antipolis (France), the company towns of Ludwigshafen (BASF) or Toyota City or Seattle (Boeing and Microsoft), the fashion capitals of Paris or Milan, and the metropolitan business service centres of Hong Kong or New York or London (Enright 2000; Saxenian 1996; Conejos, Duch, Fontrodona, Hernandez, Luzarraga & Terre 1997; Becattini 1989; Brusco 1992; Goodman & Bamford 1989; Pyke, Becattini & Sengenberger 1992). It can even be seen in the emergence of 'anti-cluster clusters', clusters of firms in non-location sensitive activities which we would normally think of as not subject to clustering at all. Omaha in telemarketing, South Dakota in credit card processing, Ireland in back office processing for financial services, Bangalore in software services, and Manila in data entry are only a few examples of mobile activities that one generally thinks of being decentralised FROM places being decentralised TO places. The fact that even such 'placeless' activities have shown tendencies to cluster indicates the strength of the phenomenon (Enright 2000).

The numerous examples of regional clustering provide evidence that even as competition and economic activity globalise, competitive advantage can be localised. Of course, the apparent paradox is really not a paradox at all. Globalisation can result in a geographic spread of economic activities over space, but it also can allow firms and locations with specific sources of competitive advantage to exploit their advantages over ever wider geographic areas, often, though not always, at the expense of other areas. As long as globalising forces move at a faster pace than forces that influence the geographic sources of competitive advantage, economies will become in some ways more distinct, rather than less distinct. Globalising and localising tendencies make 'place', in particular the attributes that determine whether a given place will benefit or suffer from the globalising and localising tendencies, more important, rather than less important, to a region's economic well-being (Enright 1993, 2000; Scott 1998).

Recent work has highlighted the importance of regional clustering to the economic development process (Enright 1996). Historical investigation, in fact, suggests that economies tend to develop through the emergence of regional clusters. In many economies, an industry emerges, perhaps around some particular natural resource, market need, or local skill (Enright 1991, 1998). As the industry develops new firms in the industry are founded. Soon suppliers emerge to provide inputs and services. New industries are formed through spill-overs and transferred knowledge.

1. In this chapter, 'region' will be used in the sense of sub-national regions, regions within nations, rather than supranational regions, regions that encompass several nations, except where clearly specified otherwise.

Downstream industries develop to take advantage of supplies and inputs, and so on. This is not to say that the regional clustering phenomenon is present in all industries or even most industries (in fact the geographic profile of different industries varies widely), but that it is an important part of the economic landscape. In particular, it is found throughout prosperous economies and regions, such as North-Central Italy, Baden-Württemberg and Bavaria in Southern Germany, London and the M4 region in the Southern United Kingdom, the Los Angeles and San Francisco Bay areas in California, and several others.

2. Reasons for Localisation

There are several forces that despite of, or in some cases because of, globalisation, localisation of particular industries or economic activities persists or increases. In general, the forces of globalisation will tend to lead to the concentration rather than dispersion of economic activities if the forces have a greater impact on the marketing side than on the production side.² The rationales for localisation include economic and sociological rationales, as well as the contribution that localisation can make to the innovation process.

The economic reasons for the geographic concentration of particular industries involve the presence of unique natural resources, economies of scale in production, proximity to markets, labour pooling, the presence of local input or equipment suppliers, shared infrastructure, reduced transaction costs, and other localised externalities. Unique natural resources and extreme economies of scale in production provide the most straight forward, and perhaps least interesting, rationale for localisation. Saudi Arabia has a strong cluster in oil and basic petrochemicals because it has oil. Quebec has substantial hydroelectric generating capacity that is used in the aluminium industry. Economies of scale are such in large commercial airframes, large commercial jet engines, and some chemical products to allow for a limited number of efficient scale facilities worldwide. Proximity to markets helped establish the textile industries of Prato and the Kyoto area, the pharmaceutical industry in the New Jersey area, the auctioneering and insurance industries of London, and the fashion industries of Europe and North America, among others. While proximity to consumer markets need not be an advantage in a world of global transportation, for products that are difficult to transport or that require ongoing close interaction with customers, proximity to market can still be an advantage.

Labor pooling, the presence of local input or equipment suppliers, and shared infrastructure all involve supply side externalities or agglomeration economies. Labor pooling that allows either a higher level of specialisation, and therefore efficiency, or that allows for a more efficient labour market, can be a force for localisation. The large labour pools associated with the motion picture industry in the Los Angeles area, for example, allow producers to bring together a unique workforce for each motion picture. The presence of local suppliers can provide quicker and more efficient access to local companies. This is true in industries in which companies in the sector are among their own largest customers (such as

2. The rationales for the existence of regional clusters, and localized industries in general, have been explored by several authors dating back to Weber (1929) and Marshall (1920a, 1920b) and including Enright (1991), Krugman (1991), and Doeringer and Terkla (1996).

chemicals and certain financial services), or in industries where there is rapid change in inputs and equipment. Even the artistic community around Carrara has benefited from the variety of stone available in the area. Shared infrastructure provides support beyond that which can be provided by a single company. The fishery industry in Nelson (New Zealand), the cargo services industries of Hong Kong and Singapore, the chemical industry of the US Gulf Coast, the flower industry and food industries of the Netherlands, and most tourism centres benefit from shared infrastructure.

Localisation can reduce the costs of transactions, including the costs of negotiating and monitoring contracts and the costs associated with the potential for opportunistic behaviour. When suppliers and buyers are physically close together, negotiations and monitoring become less costly. This will be true if information is transmitted through personal contact, communication costs increase with distance, or if there is degradation in communication with increased distance. In addition, some localised industries develop standardised contracts and transaction mechanisms as well as a common language that lower the cost of negotiation. This is true not only in financial markets, but also in textile clusters in Italy and Japan, Hong Kong's trading cluster, and in agricultural clusters in New Zealand. The Hollywood motion picture industry routinised the casting of extras through Central Casting in the 1920s. More recently, area-specific guild and union contracts have standardised many of the industry's transactions. The repeated close-quarter transactions and cultural similarities often allow localised industries to develop such mechanisms even when dispersed firms do not.

Localisation can also improve the effectiveness of market transactions by reducing the chances that a firm might engage in opportunistic behaviour. Institutional economics approaches, focus on reputation effects and the potential for sanctions are invoked to explain the limits to opportunistic behaviour by transacting partners often found in regional clusters. See Scott (1986); Enright (1991, 1996, 2000) and Lundvall (1993). Sociological approaches focus on cultural similarities, community cohesiveness, interdependence among local firms, repeated interaction, and familiarity allow transaction partners to trust that their counterparts will not act opportunistically (Harrison 1992; Piore & Sabel 1984; Sabel 1992; Becattini 1991; Staber, Schaefer & Sharma 1996; Chandler, Solvell & Hagstrom 1998). Supply-side agglomeration economies and reduced transaction costs can allow for a greater range and fluidity of organisational structures than either a geographically dispersed configuration or the existence of a single large firm. As a result, they can make regional clusters more able to adapt quickly to changing circumstances (Enright 1995).

3. Innovative Performance in Regional Clusters

The growth and persistence of regional clusters results from the development of pressures, incentives, and capabilities to innovate provided by the local environment. Innovative performance, in turn, is a function of innovative investment, technological opportunities, and the effectiveness, direction, and degree of focus of innovative activity. Investment in innovative activity, in turn, depends on the incentives to innovate and the gains associated with innovation. The effectiveness of innovative activity is a function of the skills and knowledge of

workers, researchers and managers, the information that is available to them, and the firm's ability to bring innovations to the marketplace, which in turn depends on access to appropriate styles of financing; service and material suppliers; customers; cultures and institutions which enable all of these to work together (Craig 1993). The direction and focus of innovative activity is affected by the opportunities and problems perceived within an industry (Enright 1991). Each of these features can be influenced by localisation (Enright 1995).

The literature on innovation suggests that informal, unplanned, face-to-face, oral communication is critical to the innovation process (Utterback 1974; Saxenian 1996; Enright 1998). It is precisely this type of communication in which geographic concentration provides a distinct advantage, even in the age of rapid communication and advanced information systems. The geographic concentrations of firms, suppliers, and buyers found in many clusters provide short feedback loops for ideas and innovations. This is particularly important for products and services that emerge through an iterative process between producer and customer, or in industries in which suppliers or buyers are important sources of new products or services. The Sassuolo ceramic tile industry, the Silicon electronics industry, the Hollywood motion picture industry, the Scottish oil and gas industry, the Wetzlar optical industry, and numerous others have found proximity to specialist local suppliers to be a major contributor to innovative performance (Russo 1985; Enright 1995).

Regional clusters often become repositories for industry-specific skills and capabilities that add to the innovation process.³ Over time, knowledge cumulates, skills are handed down from person to person, and industry-specific knowledge becomes common knowledge within the cluster. Talented people, both locals and outsiders in some cases, are drawn into the cluster. Clusters such as Prato's or Biella's in wool textiles, Solingen's in cutlery, Murano's in glass, and Geneva's in luxury watches have built upon centuries of experience. Pharmaceutical clusters in New Jersey and Basel, financial service clusters in New York or London, motion picture clusters such as Hollywood and Bollywood, aerospace clusters such as those in Los Angeles and south of Paris, chemical clusters around Osaka and in the German Rhineland, electronics clusters in Japan and California, biotechnology clusters in California and Massachusetts, and others, attract talented people from far beyond their locations.

Regional clusters often provide focal points for investments and new business activities. Local industry associations provide commercial research on foreign markets. Local governments often make contributions to industry-specific infrastructure. Local universities often provide industry-specific research and specialised training. Such investments allow firms within the cluster to leverage their own investments in innovative activities. In addition, regional clusters can provide the suppliers, information, and role models that create a favourable environment for innovative spin-offs. Many regional clusters, in fact, have developed largely through the formation of spin-offs. Many of the packaging machinery companies in the Bologna area can be traced to a single firm, as can several Wetzlar optical firms, several Piacenza area factory automation firms, and

3. Marshall (1920a) pointed out that people in such communities discuss new developments in the industry, improve upon them, and combine them with other ideas.

virtually every semiconductor firm in Silicon Valley (Enright 1991; Saxenian 1996).

4. Government Policies to Foster Clustering in Australia

The internationalisation and reform to the Australian economy since the 1980s has presented a significant challenge to governments and industries on how to make the nation more competitive and productive. Clustering has been an approach to economic development that has been experimented with by governments and industries in different regions of Australia to help foster the growth of new, and/or to re-engineer older, transforming industries. By the 1990s, the structure of many older national industries had been replaced by more globally integrated businesses networks and systems of production, most of which are now controlled by multinational interests. Networking and innovation emerged as important platforms of public policy to integrate Australian industries more into global business structures (Bureau of Industry Economics 1991; Australian Manufacturing Council 1994). The *Australian Manufacturing Report* (Pappas, Carter, Evens, Koop & Telesis 1990) introduced the concept of clustering, although not by name, by proposing regional industry partnerships involving core or flagship local industries working with other regional industries to strengthen networks, encourage innovation and development, and technology transfer.

In 1993, a federal government taskforce on regional development investigated the development potential of regions (Kelty 1993). This was followed by the McKinsey Report *Lead Local, Compete Global* (McKinsey & Company 1994) which was the first report to explicitly suggest clustering as a basis of industry and economic development. *Working Nation* (Keating 1994) policies and other initiatives by state and federal governments led to investigations and the implementation of policies to facilitate the development of clustering as a means of stimulating regional industry and economic development in Australia.

The change government in 1996 led to the abandonment of many regional clustering initiatives as federal government support for the regional development program established under the previous Working Nation program ceased. Many of the initial efforts at clustering failed, owing to the lack of experience, resources and training of regional development organisation staff in facilitating industry cluster development programs.

More recently, the federal government has shown renewed interest in industry clustering. The *National Innovation and Technology Development Conference* (Ministry of Industry and Business Council of Australia 2000) gave tacit support to the value of industry clustering. The Resource and Infrastructure Consolidation and Cooperation and Building Industry working group reports recommended strongly government support for clustering as a means of increasing innovation and industry development—especially in regions. The need for partnerships, especially between universities and industries through collaborative research centres (CRC) was emphasised. The federal government's *Regional Summit* (2000) produced several initiatives to support the development of regional Australia, including limited funds for developing industry clusters. The *Regional Solutions Program* administered by the federal Department of Transport and Regional Services and the *Regional*

Assistance Program administered by the Department of Workplace Relations and Small Business have supported clustering initiatives in regional Australia.

There have been significant differences in public policy support for clustering at all levels of government in Australia. There is philosophical debate within Australian governments as to whether clustering should be left to industries to drive, or whether governments should take a stronger leadership role. At the state level, South Australia and Queensland are the only two states to have embraced strongly clustering as a framework for regional economic development. NSW, Victoria and Western Australia have pursued industry development policies focused on attracting major national and foreign firms. However, there are some promising regional initiatives ongoing from 'Working Nation' in these states. Clustering has not been adopted as a policy framework for economic development in Tasmania or the territories.

5. Research on Clustering in Australia

Very little research has been published on industry clustering in Australia. The first contemporary reference to clustering was by Morkel (1993). Drawing on the ideas of Porter (1990) and Prahalad and Hamel (1990), Morkel identified the importance of clusters and value chains to industrial output in Australia. He notes the importance of developing local competencies to support the development of clusters. The best prospects for clustering, Morkel believed, were in the natural resource sectors, where Australia had significant competitive advantage. Liyanage (1995) identified collaborative research programs as having a significant impact on the structure of national innovation systems by creating and strengthening networks, which are essential for breeding innovation clusters. In the *High Road the Low Road*, Marceau, Sicklen and Manley (1997) notes the importance of industry clusters and knowledge networks associated with them.

Brown (1996), drawing on leading academic researchers, conducted some preliminary investigative work on regional clusters in Australia to raise awareness of their value in facilitating regional economic development. The strengths of regional firm and industry networks forming clusters has been investigated in the Hunter region (Martinez-Fernandez 1999) and Adelaide metropolitan area. Studies have been conducted of the marine and multi-media industry clusters in southeast Queensland, and the food processing industry in Melbourne (McDougall & Roberts, forthcoming). In a study on Clusters, Innovation and Investment presented at an OECD conference, Brown (2000) described 70 regional cluster initiatives in Australia. He identifies three major problems with cluster development in Australia: insufficient critical mass, lack of focus and distinctiveness, and political and administrative difficulties.

Marceau (1999) in a paper to the OECD proceedings on *Boosting Innovation: The Cluster Approach* used national input-output tables to analyse changes in the domestic transactions between industry sectors for 1975 and 1989. The research demonstrated a significant reduction in the strength of domestic linkages in the Australian economy as the result of globalisation and structural change, demonstrating clearly the hollowing out of many older industry clusters. The problem of hollowing out is exemplified in table 1 taken from the *State of the Regions Report (2000)*. It shows the importance of the share of domestic supply

chains for selected key industries in Australia compared with OECD averages in 1996.

While Australia might be expected to have lower domestic market linkages for some of the industries shown in the table, the table provides compelling evidence to support Marceau's research that Australian clusters are very weak. The National Economics study (2000) investigated 22 industry clusters in selected regions, including 11 manufacturing sectors and showed that there were significant weaknesses in knowledge networks in the regions studied, suggesting that the failure to develop soft infrastructure is undermining the competitiveness of regions to develop industry clusters.

Table 1
Import Share of Domestic Market, in Selected Key Industries,
Australia compared with OECD Average, 1996

	OECD %	Australia %
Aerospace	33	80
Computer/Office Equipment	61	71
Drugs & Medicine	20	48
Communications Equipment	34	70
Professional Equipment	42	79
Automotive	30	43
Electrical Machinery	25	57
Chemicals	34	42
Non-Electrical Machinery	26	67
Rubber & Plastics	16	25

Note: Sourced from National Economics (2000).

Marceau (1999) points to the failure of Australian business and government policy to develop stronger networks of collaboration, information and technology exchange within and between industries. She also identifies the importance of the development of virtual clusters in recognition that Australia's geography and the size of industry sectors preclude the creation of local economies of scale that enable regional firms to compete for global business. Virtual clusters can be described as networks of local firms and industries that collaborate with similar types of firms in other regions to form a virtual industry cluster linked by information/technology/marketing networks. Ffowcs-Williams (1996) refers to these as regional cluster networks.

Much of the investigation conducted to develop regional clusters in Australia has involved exploring and mapping the supply and distribution chains and networks of local industries and firms. Little research has been done to explore smart infrastructure and human capital requirements, core competencies, and marketing intelligence needed to support and sustain the development of local clusters. Core competencies and risks affecting the competitiveness of industry

clusters have been investigated for Far North Queensland region (Roberts 2000). This research covering 25 industry sectors identified significant competency weaknesses in innovation, research and development, collaboration and networking.

5.1 Case Studies of Cluster Development Initiatives in Australia

The first attempt to apply the concept of clustering to develop new industries in Australia was for the Cape York International Spaceport project in Queensland in 1988. Strategic management techniques involving a partnership between government, industry and the engineering profession, were used to focus on a commercial spaceport based on Cape York's advantages as a near equatorial launch site and the investigation process was open to allow participation and initiative by all of the diverse functions associated with commercial space activities. Some positive results were achieved with the discovery of large potential benefits through networking and participants' initiatives and large numbers of international commercial proposals. The subsequent transition to traditional project management techniques (and perhaps other factors) then prevented this dynamic from being translated into a reality.

Subsequently similar techniques were used for the Multi-Function Polis (MFP) project. MFP was based on the concept of Japanese Technopolis (Castells & Hall 1994). Japan proposed the MFP with Australia, nominally for international technological and cultural interchange. One initial concept of the polis involved the idea of industry network partnerships to create a regional industry cluster. The polis was also an experiment for a new concept of urban development, lifestyle and working. The polis concept was extensively investigated, leading to the initial selection of a large site on the northern part of the Gold Coast. The Queensland government refused to fund the purchase of the site, and it was subsequently moved to Adelaide, where it provided the catalyst for the development of several industry clusters, which are described in a case study later. The Polis, however, attracted little international investment interest and after 12 years in development, the MFP Corporation was wound up in 1998.

Three regions of Australia have embraced strongly the concept of industry clustering as a means of stimulating local economic development. The approach taken by each has been different. The following presents three brief case studies on the initiatives and lessons learned from the clustering experience of these regions.

6. Adelaide Metropolitan Industry Cluster Initiative

Prior to World War II, South Australia was predominantly a rural industry state. During the post war years, the state underwent a period of rapid industrialisation, most of which occurred in the Adelaide metropolitan area. The automobile, metals, food and construction industries began to dominate the structure of the region's manufacturing sector. However, by the mid 1980s the initial impact of globalisation and national economic reforms had resulted in a significant contraction of the regional economy, with the closure of many manufacturing firms. In the early 1990s, Adelaide was facing a crisis, with unemployment in the North Adelaide manufacturing areas reaching 21 percent. The awarding of the MFP project to

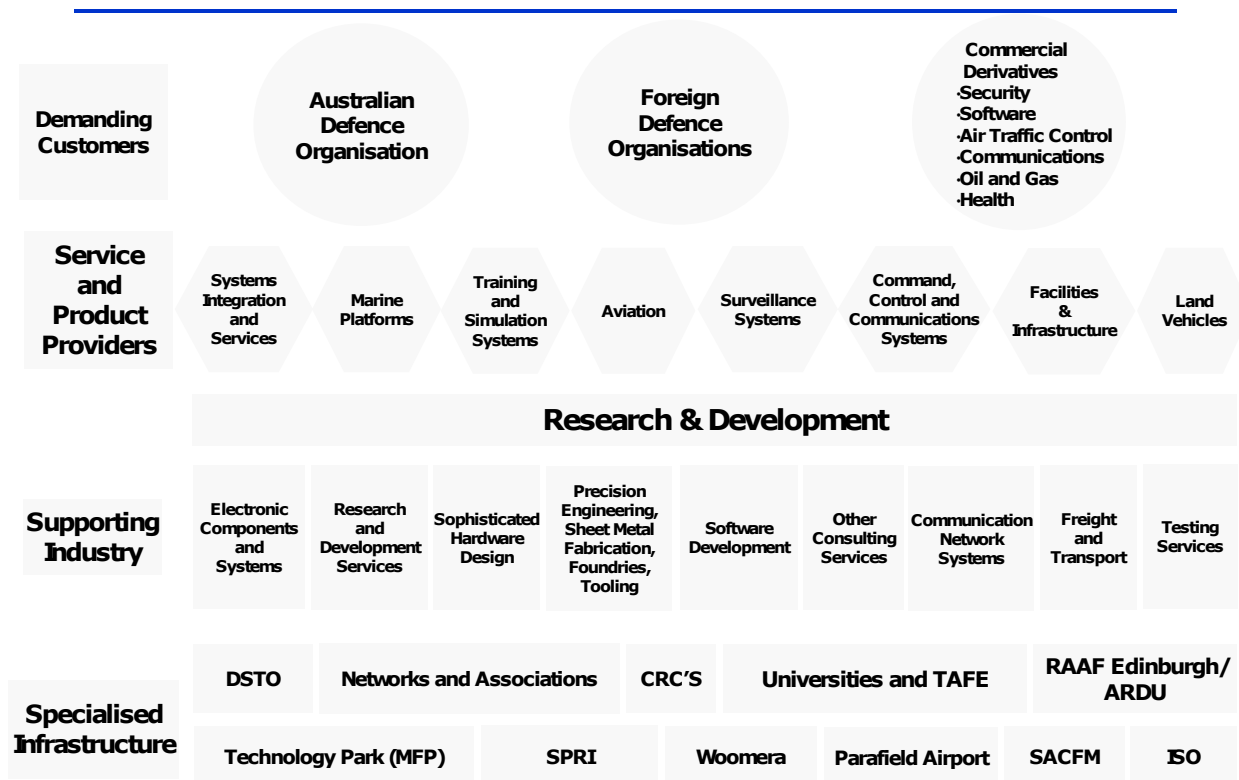
South Australia was seen as an opportunity to address a chronic unemployment problem facing the region by developing new technology based industries and to restructure older industries to compete effectively for business in national and international markets.

In 1995 planning for the MFP was well advanced. The Development Corporation recognised the value of industry clustering as an approach to spearheading new industry development in regions experiencing a decline in manufacturing. The approach adopted to foster clusters was based on the initiatives undertaken by the Joint Venture Silicon Valley Partnership (JVSV 1995) to turn the Silicon Valley economy around during the 1989–91 global recession. Collaborative Economics, which had a key role in JVSV, was commissioned by the MFP Development Corporation to provide the intellectual and implementation drivers to adapt and apply the JVSV model for the Adelaide Metropolitan region. The cluster development process involved a six-stage process that took nine months to complete. The steps involved:

1. The engagement of industry champions and key stakeholders to develop a cluster leadership group;
2. Background research and investigations by facilitators to map the structure of regional clusters;
3. A series of carefully planned meetings to develop trust and consensus on how industries and firms involved in a cluster could work together;
4. The preparation of an action and business plan for each cluster to undertake strategic projects;
5. The review of the leadership group and securing of resources necessary to support the development of the cluster; and
6. The preparation of a framework for the ongoing development and management of each cluster.

In conjunction with the State government, employers' and the Chamber of Commerce & Industry, the MFP Development Corporation introduced the above model and launched a pilot project in September 1995 to trial and adapt the industry clustering approach for the local environment. Two clusters, defence and multimedia, were selected as initial clusters for development. Extensive research was undertaken to map these clusters. Figure 1 shows the cluster map for the defence cluster. The Defence Teaming Centre Inc cluster was formally launched on 25 September 1996. The cluster has a membership of forty-four companies with a fully functional office. Members of the cluster include industry, defence and defence support companies, state and federal governments, and universities. The multimedia cluster process coincided with the establishment of the Ngpartji Cooperative Multimedia Centre under the Keating Government's 'Creative Nation' program. This provided the institutional home to support the action-focussed projects that emerged from the cluster process to promote awareness and uptake of multimedia and electronic commerce within business and the community.

Figure 1
Map of the Adelaide Metropolitan Region Defence Industry Cluster



Note: Sourced from SA Business Vision 2010.

Following the success of the defence industry cluster initiative, the MFP Development Corporation extended the program to develop other clusters utilising the facilitators trained during the pilot project. Further investigations were undertaken of the spatial information and water industries. The Department of Administration and Information Services sponsored the formation of the spatial information cluster. This cluster has over 50 members and collaboratively markets the spatial expertise of its members nationally and internationally. The initiative complements the government-led Spatial Information Industry Project. The water cluster initiative led to the formation of the Water Industry Alliance in 1998. The Alliance has over 100 members, and the management organisation fosters and promotes sustainable export-orientated water products and services to many countries.

The termination of the MFP project in 1998 did not undermine the sustainability of the defence, spatial, and water clusters. These clusters have continued to grow with the support of State government funds to maintain the basic administrative infrastructure need to service each cluster. The Department of Industry and Trade has provided substantial resources through SA Business Vision 2010 (a partnership of business, government and community) to support the facilitation effort required. Business Vision 2010 continues to facilitate the development of other industry clusters and support those that have emerged. The Federal Department of Industry, Science and Resources and the State

Environmental Protection Authority are supporting an environmental cluster, and the Office of Sport, a sports cluster.

Much has been learned from the experience of industry cluster development initiatives in the Adelaide metropolitan area. Leadership, vision and a long-term commitment to capacity building are key factors contributing to the successful cluster building process. A sense of crisis was also important in the beginning to change the mindset of many industries and firms in the region to look at alternative ways of doing business. A considerable period of learning and mentoring was necessary before firms trusted each other sufficiently to accept that collaboration can enhance firm competitiveness and create opportunities to develop new products, services and markets. Achieving some initial results was essential to keep the momentum of the process going.

7. The Far North Queensland Region

In the 1970s, Far North Queensland Region was a branch line economy producing sugar, bananas and tobacco. It is now one of the fastest growing and internationalised regional economies in Australia's. The region has large bauxite, silicon and gold deposits located in very remote areas and two outstanding World Heritage listed areas in the Great Barrier Reef and Wet Tropics Rain Forests. These natural assets form the backbone of the region's tourism industry. In 1982 the Cairns Port Authority, with state government funds, developed the Cairns International Airport to stimulate the development of the tourism industry. Between 1984 and 1991, over \$1 billion of foreign investment poured into tourism and related infrastructure projects. The region's gross regional product grew annually by over 7 percent, with visitor numbers rising from 400,000 in 1985 to over 1.8 million in 2000. The 1989–91 recession, a prolonged airline pilot strike and a massive drop of Japanese foreign investment caused the economy to contract rapidly in 1991 (Roberts 2000). Concerns were raised by business and the community about the long-term sustainability of the economy, and the need to develop more specialised industries to compete for global business.

In 1994, the region embarked upon an extensive regional planning process to prepare an integrated growth management plan for the region up to 2010 (Far North Queensland Regional Planning Advisory Council 1998). A key output of the process was an economic development strategy, which had a major thrust on the development of clusters (Roberts & Dean 2001). The Far North Queensland Regional Economic Development Organisation (FNQREDO), supported primarily by federal government regional development program funds, began an investigation into the feasibility of developing industry clusters. Using models for cluster analysis based on the American and New Zealand experience, 16 clusters were identified as listed below:

1. Agri-Business;
2. Manufacturing;
3. Business;
4. Health Services;
5. Food Industries;

6. Transport Services;
7. Multimedia;
8. Tourism;
9. Mining;
10. Retail;
11. Education;
12. Resources;
13. Arts and Culture;
14. Marine;
15. Utilities; and
16. Construction.

In 1998, federal funds were cut and the FNQREDO was dissolved in favour of an industry driven economic development organisation, the Cairns Regional Economic Development Corporation (CREDC). CREDC is partially supported by State government funds and managed by a board representing the heads of industry clusters. The operations of the industry clusters and companies are funded from membership fees and State government grants assistance. CREDC has provided considerable resources to support the cluster-building program.

The cluster program began with a series of 'cluster musters'. These were meetings comprised mainly business representative, whose firms or organisations shared similar markets, suppliers and information networks. Trained staff from CREDC facilitated the cluster musters. The musters were designed to explain the benefits of local industries learning to collaborate. The following guidelines, adapted from the Greater Tucson Strategic Economic Plan, were used for screening, and prioritising firms to become part of an industry cluster.

- Firms that are stable or able to form growth industries;
- Industries with the capacity to become globally competitive;
- Industries that have a unique competitive advantage;
- Firms that use significant local labour and suppliers;
- Firms that assist export-orientated businesses; and
- Firms with the best potential to joint venture internationally.

All clusters are made up of a range of firms that identify with and share common suppliers and distributors. Most of the clusters are not true clusters within the strict definition of the literature. They comprise mostly firms and organisations with strong local networks of association with a desire to work together collaboratively to develop fledgling regional industries and new export markets. An important step in the clustering process was to develop industry cluster strategic plans. The strategic plans included an analysis of the competitiveness of core competencies, strategic infrastructure, regional risk and economic development opportunities. The plans described key elements of strategic infrastructure needed to support the development of each industry cluster and opportunities for cross-cluster leveraging of resources and infrastructure.

The clustering process has met with mixed success. Several clusters are well advanced in their development. The marine industry cluster, centred on the region's \$150 million fishing industry, has established a company, Eco-Fish, which represents the interests of the industry. It has over 150 members and raises funds from a levy on fishing vessels according to size. Eco Fish promotes the interests of the industry, supports research, and the development of export markets and education courses for the industry with the local technical college. The education cluster established a company, Cairns International Education Providers, which collaboratively markets regional education services into Asia. Cairns International Technology Enterprises was established in 2000 to represent and promote the interest of IT industries in the regions. Other clusters likely to form companies include the film and television, tropical fruits, arts, environmental and agribusiness industries. The tourism industry is the largest cluster, which is represented by Tourism Tropical North Queensland. The tourism cluster contributes to over 24 percent of the region's gross domestic product.

8. Hunter Region Experience

The Hunter Region, in NSW, which includes the City of Newcastle, is one of Australia's leading export regions. Founded primarily on agriculture and coal mining in the mid 19th Century, the region's industrial base expanded significantly in 1915 with the establishment of the BHP steel mill. The Hunter Region is also a major producer and exporter of coal, aluminium, wine, and electricity, and a popular domestic tourism destination. In the late 1980s, the region's economy was affected severely by the national restructuring of the manufacturing sector and has undergone a significant transformation since then. The structure of the economy has changed significantly, with services accounting for more than 78% of regional employment in 1996 compared to 61% in 1971.

As part of the Australian Labour government's *Working Nation* program, the Hunter Urban and Regional Development Organisation (HURDO) was formed in 1994 to facilitate economic development in the region. Faced with massive losses in employment in the steel and metals fabrication industries, HURDO was charged with developing an economic plan to revitalise the region. Work on an interim economic development strategy commenced in 1996 with a conference involving a satellite link up with Professor Michael Porter from the Harvard Business School. The conference was a catalyst for the development of a planning framework to reorientate the economy of the region. HURDO undertook a program of cluster mapping which was funded with assistance from a BHP Development trust fund.

This research provided information for regional meetings to explain the clustering process. Workshops were held with representatives from business, government, regional development and community groups representing 23 clusters identified by the mapping process. These included the larger well-established regional clusters, such as wine, coal, mining, aluminium and steel, as well as potential new clusters such as sustainable energy, education and information technology. The clustering development process adopted for the Hunter region was similar to that undertaken in Adelaide. The first phase involved meetings to gain stakeholder commitment to an agreed process to develop local industry clusters. The second phase involved a commitment to the preparation of strategic plans to

guide the development of selected clusters. This stage was designed to firm up and formalise networks and the management structure proposed for each cluster. The third phase involved the selection of priority projects, their detailed feasibility and design and implementation.

Four industry clusters, which went through the process, have been registered as corporate bodies, with several others in various stages of incubation. Other clusters, such as defence, wine, equine and engineering manufacturing, developed independently with support of industry organisations. The education cluster, EdNet, was formed in 1999 and includes most of the region's higher education and training institutions. Several joint-venture training products have been developed, and improved marketing of regional education services have eventuated as the result of the cluster.

The Sustainable Industries cluster is an incorporated body representing the interests of renewable energy and renewable energy management, water and land quality management and products that contribute to environmental sustainability. Newcastle is a leading international research centre for the development of wind powered generated electricity. The cluster has developed a number of products and services through to commercialisation. Global Build Incorporated is an industry cluster, which includes industry, government, university and employee organisations with interests in building and construction. Hunter Tech Inc is a network of information technology, which is involved in extensive cross-industry cluster collaboration. Agribusiness and mining services are industry clusters at an early stage of development.

The cluster development process in the Hunter Region has been a difficult learning process. Many industries and firms were sceptical of a process that involved collaboration with competitive firms. Fear of sharing information, lack of trust and a 'what's in it for me' attitude are factors that had to be overcome through the cluster development learning process. Significant public funds were invested in the process, and ongoing government assistance has been necessary to maintain a basic secretariat to support cluster activities. The experience in the Hunter region suggests that it takes between three and five years of learning and capacity building before clustering is embraced by local firms and industries, and that clusters are capable of becoming self-financed. Even then, size is a major factor in industry clusters becoming self-financed.

In 2000 HURDO was dissolved owing to the finish of the 3 year funding arrangement under the previous Australian government's Regional Development Program. The *Hunter Advantage* Economic Development Plan (Hunter Regional Development Organisation 2000), which was the final piece of work undertaken by the organisation, puts in place a long-term strategy for the development of new clusters in the region. The cluster development process has been transferred to the Hunter Economic Development Corporation (HEDC) and the Industry Development Centre (IDC), which together with other regional development agencies continue to drive the process. The clustering process has led to the development of stronger local industry networks and the realisation of many new industries in the region.

9. Clustering in Australia: Lessons for the Future

This chapter began with the observation that there are two seemingly competing tendencies influencing the development of all economies. Globalisation is a phenomenon that has led to the hollowing out of traditional clusters and the emergence of new networks, partnerships and alliances that have fundamentally changed the way industries and firms do business. The second tendency, localisation, is being driven by social, environmental and economic agendas of regional communities seeking to maintain their local identity and to protect cultural, heritage and social values. Naisbitt (1994) describes these seemingly opposite tendencies as the global paradox. One response to this paradox has been the proliferation of regional and local initiatives to foster the development of clusters linking firms, industries and public agencies in various partnerships to support new industries and economic development.

Business managers and economists have understood for a long time the advantages of industry agglomeration and clustering. Characteristics of industry clustering can be observed in most countries, albeit at different scales and complexity. However, in the later part of the 20th Century, many old industry clusters in OECD countries have experienced a hollowing out and are being replaced by more service-orientated industry clusters. There are emerging powerful global clusters in selected locations and, at the same time, there is greater specialisation and global integration occurring in small regional firms and industries. This process is leading to the development of local clusters and industry networks.

The investigation of clustering activities described in this chapter indicates that much of the recent effort to foster the development of industry clusters in Australia has been regionally driven. Most Australian industry clusters are very weak compared to those in other OECD countries. Federal and State government support for industry clustering to foster economic development was strong in the early 1990s but has been treated with indifference by most Australian governments in recent years. This is unlike the situation in most OECD countries, where national and state/regional governments have shown strong interest and support for initiatives to foster the development of regional industry clusters.

The success of industry clustering is dependent upon a long-term commitment by local firms, industries and governments to the processes of developing regional and national strategic architecture to sustain the clustering process. Clustering only works if there is commitment by regional industries and firms to a process that builds trust, respect, collaboration and an effort resulting in the achievement of common goals or targets. At the same time, clear performance benchmarks can be defined in the process of evaluating the gains from collaboration. These might take the form of export targets, identification of opportunities for innovation or (at a regional level) employment growth.

The success of the Australian national wine industry (Marsh & Shaw 2000), which by its very nature is made up of many regional industry clusters, has been based on a commitment to collaboration and the development of an ambitious industry vision. A parallel can be drawn here with the Australian tourism industry. These were not significant export industries in Australia less than 20 years ago. The three regional case studies demonstrate that cluster development processes can achieve positive economic outcomes and develop new industries for regions. Yet

the potential value of industry clustering will be greatest in the nation's capital cities. This is a policy area that is in need of further research and development.

Industry clustering is a dynamic process that must be learned and cultivated. There is still much to be learned about the nature, means and benefits of clustering in supporting regional and local economic development. We must also learn how to identify and build the national and regional strategic architecture to support the development of industry clusters. The International and local case study experiences cited in the paper show the benefits achieved from industry clustering can be significant. The challenge facing Australia is how to apply the lessons learned from this brief exploration of industry clustering in setting future strategic directions and initiatives that will strengthen the capacity of firms and industries in regions to develop and compete for new business, trade, investment and employment opportunities.

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