

A Case Study of Clustering in Regional Australia: Public Policies and Private Action

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ABSTRACT

The paper starts with an evaluation of a group of ICT organizations in a regional Victorian town and using a range of qualitative and quantitative data evaluates whether there is a cluster emerging and if so what are the processes of clustering that underpin this. Using archival and interview data the paper then examines key events and turning points in the development of what might be identified as a nascent cluster (Rosenfeld, 1997). In the context of current public policy that directly or indirectly supports 'clustering', the paper then assesses the effectiveness of public policy versus private action in the development of regional agglomerations of organisations and institutions that may be called clusters.

INTRODUCTION

Clusters are dynamic groupings of firms, institutions and other organisations that speed up innovation and growth creation processes. The concept of clustering has become a central policy focus for nations, industries and firms. Over the last decade there has been considerable interest and activity in clustering. It is widely accepted that technological change underpins a global economy and that geographic location and concentration is of foremost importance for regional development and competitive advantage (Porter, 2000).

The literature is saturated with views on geographic proximity, or clustering of industries, companies and institutions (Asheim, 2001; Brusco, 1990; Krugman, 1995; Porter, 1990, Saxenian, 1998). Well known examples include: Silicon Valley's high technology cluster; film making in Hollywood; fashion and design in Northern Italy; wine in California and financial services in London, Tokyo and New York. As industry clusters have become more accepted, their definition, boundaries and composition become more complex, which has led some cluster researchers, e.g., Rosenfeld (1997, 2003), to focus on clustering activities rather than on clusters as such. With the exception of virtual clustering, where geographic proximity is not necessarily applicable, regional cluster studies all emphasize the importance of local networks and local/regional relationships for competitive advantage (McRae-Williams, Lowe, & Taylor, 2005; Braun, McRae-Williams & Lowe, 2005, Thompson, 2005).

PUBLIC POLICY

Policy makers have long since acknowledged clusters as a potentially effective mechanism for enhancing regional competitive advantage (OECD, 1999). In examining how clusters may benefit Australian businesses in Victoria working together, Ammirato et al. (2003, p. 6-7)

identified various policy statements that note how clusters can make a substantial contribution to Victoria's economy. These include:

- Encourage the development of skills.
- Facilitate the creation and commercialisation of ideas and knowledge.
- Are essential to building a competitive, innovative and connected economy.
- Harness overlapping strengths and generate opportunities to boost the international competitiveness of related businesses.
- Help to create the critical mass necessary for productivity gains and infrastructure development.
- Help attract a skilled pool of labour.

Because clusters build upon and augment local strengths and capabilities and integrate non-metropolitan areas into metropolitan and overseas markets they can succeed in both metropolitan and regional areas (Ammirato et al., 2003). The inclusion of a cluster strategy within Victoria's broader economic development framework is designed to position the State as a leading innovation economy which effectively supports the development of skills and the creation and commercialisation of ideas and knowledge (Regional Development Victoria, Office of Science and Technology, 2004).

In 2004, the State of Victoria launched a \$2.9 million *Regional Innovation Clusters Program* with an emphasis on innovation & enhancing competencies. Industry sectors targeted include food processing/agriculture, aquaculture, manufacturing, biotechnology, health, and information and communication technology (ICT). The program set out to identify/develop potential/emerging clusters; understanding regional strategies/key industry sectors; encourage innovation in business/technology development; and to encourage better partnerships between regional firms and higher education. Through this cluster program support is being provided for the development of approaches which identify actual and potential clusters and promote their formation, operation and expansion. Thus, for example, a possible cluster around ICT was identified in the Ballarat region.

In 2005, the State of Victoria provided the City of Ballarat with funding to review the nature, breadth and potential of the ICT industry; provide an evidence base to support future activities; identify current utilisation of ICT by firms in the region; identify the networks/relationship between local IT firms; identify needs and/or opportunities to support cluster activities and growth; and determine an appropriate ICT cluster action plan to facilitate interaction between ICT firms (especially between smaller and larger firms such as IBM), between ICT firms and local institutions, as well as between ICT firms and external opportunities, including access to larger tender opportunities.

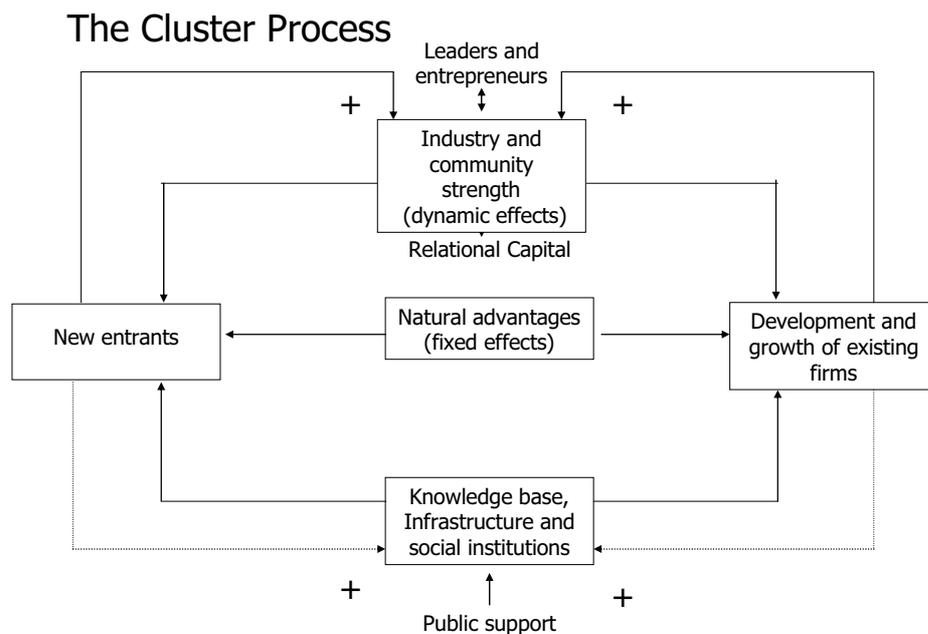
The City of Ballarat engaged the research team to conduct the first comprehensive study of the Ballarat Information and Communications (ICT) cluster. The study's aim was to assist the City of Ballarat and other key stakeholders in identifying (1) the economic role that and ICT cluster may have on the Ballarat region; and (2) how regional ICT activities could be underpinned with appropriate support. This paper presents the results of the *Ballarat ICT Cluster Profile Study (2005)*, which profiles suppliers and users of ICT and then asks the question: is there a dynamic grouping of ICT firms and organisations in Ballarat? It also examines whether the development of the cluster is the result of the market forces or the result of public intervention designed to promote regional growth.

CLUSTERING FRAMEWORKS

The paper references two of a number of clustering frameworks. The first is the well known diamond of advantage that Porter (1990) uses, the second is one developed by the authors but also based on earlier work by Swan et al (1998). We start with Porter's framework as this is a commonly used starting point. Porter identifies an emerging firm rivalry and demand conditions among a group of co-located firms as the pressure that forces firms located close to competitors and faced with demanding customers, to innovate and improve productivity. This is complemented by support in a cluster provided by specialised factor inputs and related and supporting industries. The cluster works by collaborative behaviours and networking, and through benchmarking against competitors, complementing each other. Porter's approach explains how a cluster, once established, generates innovation but fails to provide insight into the social structure of the cluster or how the cluster achieved its status. Whilst Porter identifies scope for public action, this is limited to leveraging up existing advantages.

Swan et al (1998) provide a complementary theory. For them clustering is about the shift of attraction from a static resource to a dynamic and knowledge based resource. Figure 1 summarises this model.

Figure 1. How Do Clusters Work?



The natural advantages of a location provide the initial conditions for a cluster to start by providing a base for existing firms to thrive and attracting new firms, organisations and resources. The interaction between the existing agents and the new entrants, create dynamic effects that are based on the growing knowledge and resource base of the location and a developing horizontal and vertical linkages. This 'resource' starts to attract new entrants and provides strength to incumbents. Over time institutions emerge that capture knowledge, and support economic activity. These institutions can be leveraged and assisted by public support, whilst the dynamic effects are a result of individual transactions and market forces. The essence of this model is that it provides an understanding of how clusters develop and also where public and private action can influence cluster development. This model and the conventional Porter approach throw light on an assessment and the development of the ICT cluster in Ballarat.

METHODOLOGY

The research team used a range of information gathering methods in undertaking this study. These included hosting an *Innovation through Clustering Workshop*; the administration of two surveys via the web; and regular consultation with the key stakeholders.

During the 2005 Ballarat Innovation Festival the research team held an *Innovation through Clusters Workshop*, which informed the subsequent development of project stages. Two separate questionnaires were developed, one for ICT organisations and one for ICT users. This paper focuses on the survey of Ballarat's ICT organisations. The target population for the ICT survey was Ballarat organisations whose primary business activity is the provision of ICT related goods and services. The final sample frame comprised 112 ICT organisations.

The initial basis for the questionnaire was drawn from the project's research objectives and a review of instruments used in similar studies. Each organisation was sent an email inviting them to participate in the study. A reminder program was also administered, in order to maximise response rates. The Ballarat ICT Survey can be viewed online at www.ballaratict.com/survey.php.

During the data collection period it became apparent that a number of firms within the sample frame were no longer operating either at all or within the Ballarat region. Such organisations could not be contacted via the details within the sample frame nor could updated details be found from alternative sources (e.g., websites, yellow pages). This process reduced the estimated number of ICT firms within the Ballarat region, with 98 firms being successfully contacted to participate in the study. As demonstrated by Table 1, the response rate for the ICT organisations survey was 30%.

Table 1 - Response rate (Ballarat ICT firms)

Status	Frequency	Per Cent	Per cent still operating (n = 98)
Completed	34	30%	35%
Did not complete	64	56%	65%
No longer operating	16	14%	–
Total contacts ¹	114	100%	

1. Two respondents to the survey were not within the original sample frame of 112 organisations.

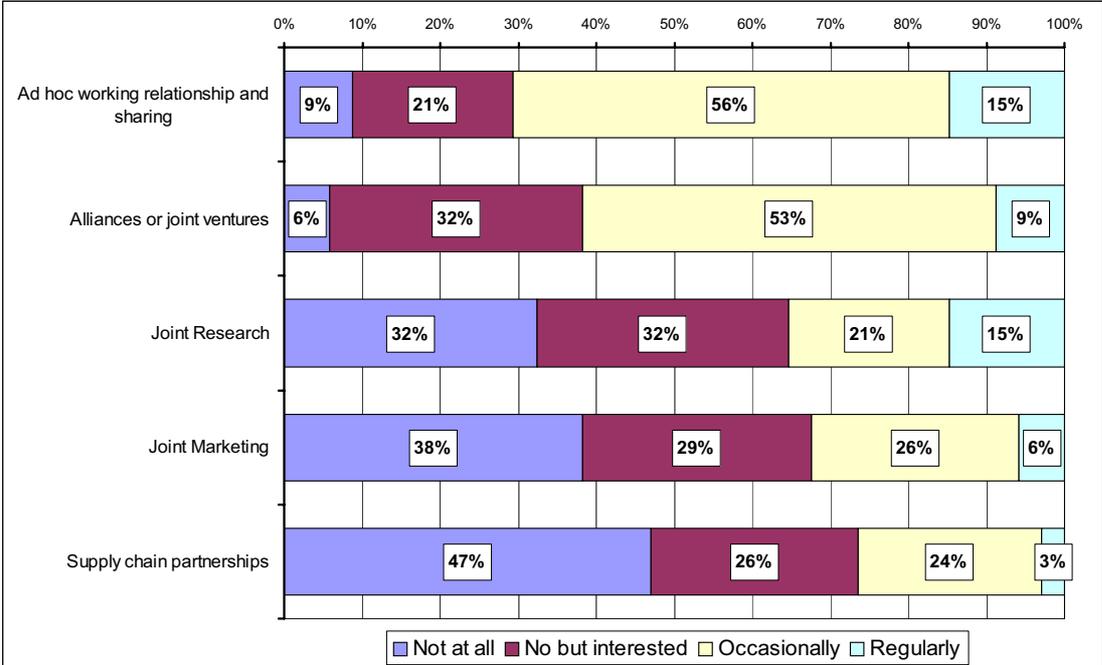
Survey responses were summarised in the email and automatically stored in the PHP Easy Survey Program database, from which top line results were collated. The data collected was entered into an SPSS worksheet and interpreted into information through mathematical and statistical analysis.

SURVEY FINDINGS

While organisational demographics such as size, number of employees, time in business, and primary ICT activities were included in the survey, selected findings pertinent to clustering – such as networking and collaboration with other ICT suppliers, research organisations and users in Ballarat; learning from and benchmarking against other ICT organisations; and Ballarat as a location to access skilled labour research and other ICT resources – are reflected in this paper. Since the response rate for the survey was relatively small, the results are generalised with some caution.

Figure 2 demonstrates that the majority of respondents undertook *ad hoc working relationships and sharing* and/or *alliances or joint ventures* on an occasional or regular basis. More strategic collaborative activities such as joint research and marketing, and supply chain partnerships were not undertaken by the majority of respondents.

Figure 2 - Networking and Collaboration Activities Undertaken by Respondents (%)



Base – Total respondents (n=34)

Respondents were asked to indicate their level of agreement with a number of statements relating to collaboration with other Ballarat ICT firms. As indicated in Table 2, respondents generally agreed that

- Their dealings with other Ballarat organisations were based on strong relationships and trust;
- They expected working relationships with other Ballarat organisations to grow; and
- They try to buy ICT services from other Ballarat providers.

In contrast, there was a level of disagreement with statements relating to the nature of existing collaborations with other local ICT businesses (e.g., joint research and innovation; close working relationships).

As indicated in Table 3, there was a degree of disagreement with all statements relating to learning from and benchmarking against other ICT organisations. In general, respondents disagreed that they recognise and adopt business improvements made by other Ballarat ICT organisations, particularly in the areas of logistics and supply, operations and human resource management.

Table 2. Prevalence of Collaboration with Other Ballarat ICT Firms

	Average
Our ICT dealings with other Ballarat organisations are based on strong relationships and trust	3.71
We expect our working relationships with other Ballarat organisations will grow in the future	3.59
We try to buy ICT services from other Ballarat providers where possible	3.53
We are aware of what other local ICT businesses are doing	3.32
Working relationships with ICT organisations in Ballarat are important to the development of new products, services and processes in my organisation	3.15
We are not influenced by what other local ICT businesses do	3.09
We know and network with many other ICT providers or users in Ballarat	2.91
We see other local ICT businesses as direct competitors	2.82
We work closely with other local ICT businesses	2.56
We engage in joint research and innovation with other local ICT businesses	2.18

Rating scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree.

Table 3. Prevalence of Learning and Benchmarking Activities

	Average
We learn or benefit from observing what other Ballarat producers or suppliers do.	2.79
We recognise and adopt technical improvements made by other Ballarat ICT businesses	2.71
We recognise and adopt marketing improvements made by other local Ballarat businesses	2.65
We recognise and adopt human resource management improvements made by other Ballarat ICT businesses	2.53
Generally we recognise and adopt operational improvements made by other Ballarat ICT businesses	2.53
We recognise and adopt logistics and supply improvements made by other local Ballarat businesses	2.47

Rating scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree.

Table 4 indicates that respondents generally agreed that Ballarat is a good place to develop ICT products and processes. However, respondents were generally neutral in their opinions relating to the region being an important source of skilled labour, new ideas and new product/service improvements. Furthermore, there was some level of disagreement with the statement *the local banks and financial institutions understand our specific needs*.

Table 4. Attitudes towards the Region's Labour, Research and Other ICT Resources

	Average
We believe Ballarat is a good place to develop ICT products	3.79
We believe Ballarat is a good place to develop ICT processes	3.65
The region has a pool of creative people and ideas that help us be innovative	3.32
We are generally aware of the ICT innovations and developments made by other Ballarat organisations	3.29
The local region is an important source of skilled labour	3.18
The local region is an important source of new ideas	3.12
Local buyers are an important source of new product/service improvement	2.94
Local educational institutes are important to us and help us with ICT new product/service development	2.91
The local banks and financial institutions understand our specific needs	2.62
Generally the local region is <u>not</u> important to our innovation and efficiency (-)	2.62

Rating scale: 1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree.

In summary, the survey findings indicate that significant relationships in the ICT cluster are with ICT organisations' individual clients, not with each other. The survey findings further indicate a lack of sustained communication as well as information and knowledge flows.

Ballarat ICT Cluster

Considering the survey findings, is there in fact a dynamic grouping of ICT firms and organisations in Ballarat or a so-called Ballarat ICT cluster? Prior to providing a response to this question, it is necessary to present a historical overview of Ballarat's IT industry development as it is argued that cluster emergence is closely linked to cluster antecedents. Cluster antecedents or cluster pre-conditions are the cumulative processes that create the conditions for the emergence of a cluster.

Ballarat has been heavily involved in the development and nurturing of the ICT sector for a number of years, starting with the City of Ballarat's *Ballarat IT 2010 Strategy* developed with the attraction of IT enterprises as its centrepiece. The Ballarat ICT cluster was initiated by a former Vice Chancellor (VC) of the University of Ballarat who had a vision of establishing a Technology Park at the University. A visionary leader, the former VC took advantage of State of Victoria's IT 2010 policy to attract IBM to the Technology Park. With IBM as the lead IT firm, over time the Technology Park was able to attract a number of smaller IT firms to the region, while the IT industry outside of the Technology Park has also enjoyed considerable growth.

Table 5 summarises key events and developments which have shaped the development of the local ICT industry. These factors have been drawn from descriptive information in the Ballarat Economic Development Strategy 2003 (City of Ballarat 2003), from the Ballarat Technology Park website www.ballarattechnologypark.com and from University of Ballarat Annual Reports for the period 2002–2005 (see www.ballarat.edu.au/vco/planning).

Table 5 – Key Events: Ballarat IT Industry Development

Year	Ballarat ICT Sector: Key events and developments
1994	First <i>Ballarat IT 2010 Strategy</i> developed with the attraction of ICT enterprises as its centrepiece.
1995	IBM attracted to Ballarat with the Victorian Government establishing an IT centre for the delivery of services for the Public Transport Commission and VicRoads.
1995	Ballarat Technology Park located on the Mt Helen campus of the University of Ballarat officially launched as the first step towards implementing a strategic initiative for the region to promote and develop information technologies.
1999	Revised strategy for Ballarat IT 2010 adopted with a balance between supply side and demand side strategies
1999	Ballarat Televillage project funded, planned and implemented under the Connecting Victoria program.
2002	cBallarat established to coordinate, lead and champion ICT activities in Ballarat. <i>Ballarat the Connected Community</i> strategy adopted to support the development of business and community usage of ICT and the attraction and growth of new and existing ICT business to Ballarat.
2002	IBM and the University of Ballarat launch the <i>Earn As You Learn</i> undergraduate program, the Bachelor of Information Technology (Professional Practice) with Commonwealth Government funding support through the <i>Backing Australia's Ability</i> initiative.
2002	Ballarat IT (BITs) Professionals network was established with bi-monthly breakfast meetings held to support greater networking and to provide growing IT industries with access to a series of informative guest speakers.
2003	IBM Global Services extends its partnership with the University of Ballarat by the establishment of a Regional Software Solutions Centre. The Victorian Government contribute \$1.5 to the refurbishment of the former Arts Building at the Mt Helen Campus to house IBM.
2003	Emergency Communications Victoria a state-owned organisation delivers leading edge emergency services communications from the Ballarat Technology Park
2003	City of Ballarat Economic Development Strategy identifies the establishment of an ICT cluster as the next step to improving industry competitiveness, innovation and research.
2003	\$3.4m Global Innovation Centre established on the University of Ballarat's Technology Park – a critical link in the strategy to develop a leading world-class business growth centre.
2004	Victorian Minister for Innovation identifies that 'The Ballarat Technology Park is fast becoming known for its excellence in information and communication technology expertise'.
2004	Collaborative Optical Leading Text-bed Project (COLT) initiated with Ballarat selected as a test-bed for the development of effective 'last mile' connectivity solutions.
2005	Ballarat ICT Cluster project launched by Minister, observing that ICT was shaping up to be a key driver of growth in Ballarat, with the number of people employed in the sector increasing five-fold in six years.

From the above table it is clear that the IT sector has emerged as a distinctive industry sector in Ballarat and has captured the attention of both State and Local Government. In 2003, the City of Ballarat identified the ICT sector as reaching a critical mass and that the establishment of a formal ICT cluster would achieve a more strategic position; drive innovation and competitiveness; further business development and attraction; and assist in positioning Ballarat as a Centre of Excellence in ICT (City of Ballarat 2003).

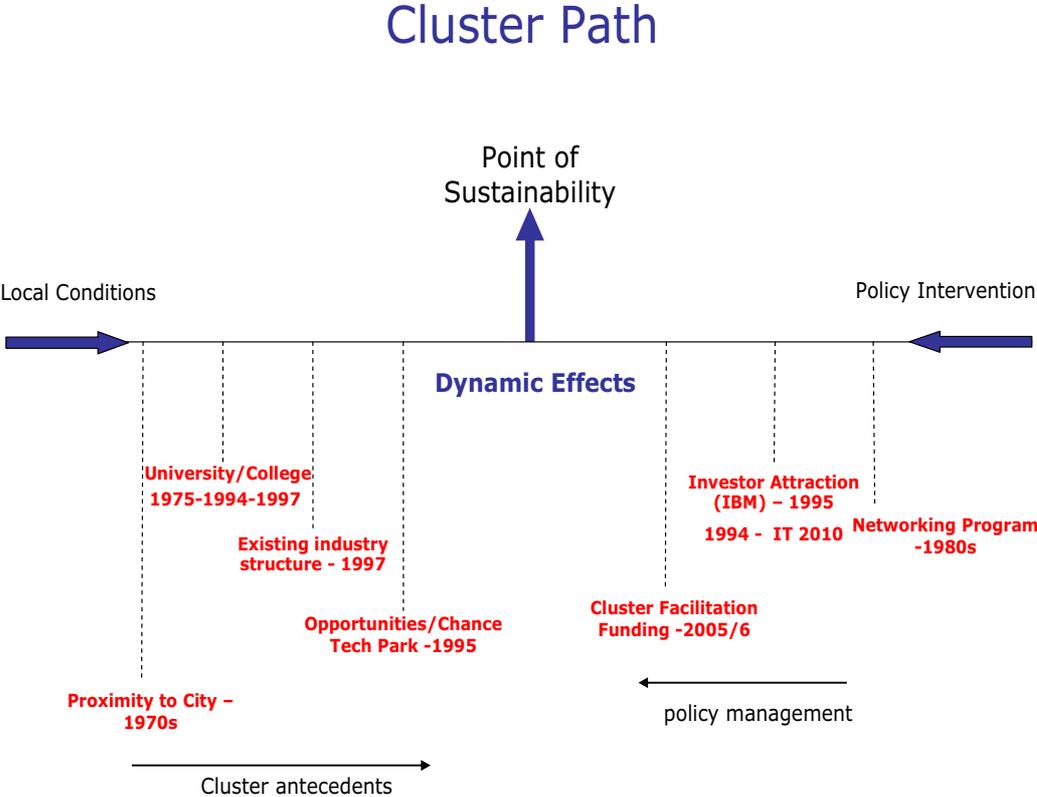
Despite considerable IT industry presence, IT firms in the region, as above survey findings indicate, have not actively pursued a clustering model. Significant relationships in the ICT cluster are predominantly external and the Ballarat ICT cluster suffers from a lack of identity. To date the Ballarat ICT cluster has hence remained a latent or nascent cluster without a specific cluster development structure or program and cluster governance model.

DISCUSSION

In reviewing the cluster path followed by the Ballarat ICT cluster, it has become apparent that the effects between local antecedents and government intervention determine where a cluster is located in terms of its lifecycle. Generally the cluster model identified in Fig 1 provides the best support for understanding cluster development. Fig 3 illustrates this.

Although Ballarat had benefited from the Victorian State IT 2010 policy, which altered local conditions, until 2005 it has experienced little policy intervention in terms of actively building a cluster. As a result, the Ballarat ICT cluster is still seeking to establish itself and current policy intervention is directed towards building critical mass.

Figure 2. Cluster Path



From the Ballarat ICT cluster experience it may be deduced that the role of policy intervention is to spark cluster emergence and ongoing development until the cluster reaches critical mass. This role can, however, not be separated from local antecedents in terms of cluster development. Local conditions do not only play an important role, they are the co-drivers of cluster emergence and cluster evolution. Thus, policy intervention and local conditions (and support structures) co-create the cluster evolution process. Together these forces create dynamic effects, which in turn lead to the growth and sustainability of the cluster. Using Ballarat as the example, this process is illustrated in Figure 3. It may be argued that these dynamics effects will not occur if local conditions are unfavourable or if government support were to be withdrawn.

CONCLUSION

This paper has presented the results of the *Ballarat ICT Cluster Profile Study (2005)*. The study was undertaken to assist the City of Ballarat and other stakeholders in developing a solid understanding of local capabilities and attitudes. It has also informed the development of strategies to promote growth within the Ballarat ICT cluster.

The paper has profiled suppliers and users of ICT and asked the question – is there a dynamic grouping of ICT firms and organisations in Ballarat? In discussing whether there is indeed a Ballarat ICT cluster, the authors have proposed that the role of policy intervention is to create critical mass in clusters, but that the role of government can not be separated from local conditions. Critical stages in cluster emergence and growth were identified as dynamic effects between local conditions and government intervention. This has obvious public policy implications in terms of future investment into the cluster lifecycle. However, government actions need to be paired with local antecedents and industry actions to create dynamic effects for the cluster.

The questions must be asked whether this is a sustainable and replicable process. The authors believe that this process is replicable provided that local conditions, the cluster lifecycle position and policy actions are matched with an appropriate cluster governance structure and investment strategy program.

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