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Collaboration for Global Success: A Tool Kit for Effective Industry Collaboration

Version 1.0
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**Management Summary**

New Zealand’s export-focused businesses must maximise all available resources and partnering opportunities in order to compete effectively in the fast-paced, ever-changing global marketplace.

To secure opportunities in this frenetic international environment, local exporters need a seemingly contradictory mix of small business agility and the resource base of a large enterprise.

This powerful mix of business agility and corporate clout can be achieved through industry ‘clustering’ – the process of inter-firm collaboration aimed at seizing market opportunities as they arise.

This document explains how effective collaborative ventures are best established and outlines likely pitfalls and success factors involved.

It examines the experiences of the New Zealand Health IT Cluster as a practical example of what can be achieved.
Introduction

In today’s knowledge economy, the ability to collaborate and network with other organisations is a fundamental requirement for success.

Technological advances, increasing customer demand and buyer sophistication have combined to create hyper-competitive markets which are in a state of constant flux.

At the same time, today’s fast-paced business cycle creates windows of opportunities that come and go so rapidly that even the most agile enterprises, when working alone, find it hard to move with the speed required of take full advantage of them.

Large multinational companies (MNCs) have the power and reach to execute effectively in these hyper-competitive markets, but even they rely on a multitude of smaller suppliers and service organisations to create innovation and get it to market.

For smaller companies the challenges are significantly greater as they lack most of the internal resources required to meet opportunities in the market. By the time they have identified suitable partners to fill these gaps, the opportunity has usually gone.

For both large and small companies, inter-firm collaboration substantially improves their competitiveness.

Recent research has also identified that for small-to-medium companies, the ability to create and manage relationship networks\(^1\) and to collaborate with other companies, leads to success on the international stage\(^2\).

In New Zealand, collaborative business models have enabled groups of companies to overcome the dual barriers of company size and distance from markets in order to both innovate and execute on the global stage, creating increased export revenues.

\(^1\) Strategic benefits and the small firm (Kelly 2004)
\(^2\) Agitavi Cluster and Collaboration Research 2004-2006
This Document

This document provides a practical roadmap for companies wanting to build successful collaborative business models to execute on the global stage. It is divided into three sections:

**Background:** We start with an overview of the history and research of inter-firm collaboration and provide an example of successful collaborations by New Zealand companies.

**Best Practices:** The best practices that build and support collaborative executions are then presented, with a collaboration model provided that is underpinned not only by the successful New Zealand examples, but also by the significant international research undertaken in the area of collaboration and business networking.

**Collaboration Step-by-Step:** The final section sets out a step-by-step process for the establishment of inter-firm collaborations and provides a summary of the key success factors and possible roadblocks to sustaining that success.

By following these steps, New Zealand firms will develop the capability and resources required to not only execute on an opportunity, but to also provide a consistent and sustainable business model that copes with the speed and flux of today’s marketplace.
Background

The rise of the knowledge economy has brought with it more turbulent business environments and a constant churn within markets.

The resulting growth of interconnected and interdependent networks requires that companies now act more as a complex adaptive system, rather than, as was the case in the past, a hierarchical industrial-age factory executing a series of linear processes.

Research\(^3\) has found that New Zealand technology collaborations originate via informal relationships and chance encounters, rather than formal business meetings or introductions, and are motivated by market opportunity and success.

These collaborations have, in the first instance, either succeeded or failed through the personal motivations and relationships of key individuals inside the companies and, in the second instance, by the continued success of the collaborative market offering.

New Zealand has examples of effective collaborations that mirror both research and best practices in Europe where the European Union (EU) has spent significant funds to develop and sustain collaborations as a means of fostering economic growth.

The New Zealand Health IT Cluster\(^4\) is an example of a collaborative organisation which has implemented the key elements required for the creation of a successful collaborative business model.

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\(^3\) Ministry of Economic Development (NZ) 2006

\(^4\) While called a ‘cluster’ the NZ Health IT Cluster is in fact a ‘collaborative network’. For discussion on the differences between networks and clusters please see appendix.
New Zealand Health IT Cluster

In search of new opportunities and markets, a group of 38 New Zealand businesses banded together to form the Health Information Technology Cluster, laying the foundation for a new business model that attracted investment from the government and Microsoft.

The idea was to present a single access point for customers wanting to do business with the health information technology sector in New Zealand. A full-time coordinator was appointed to promote the Health IT cluster and broker any business leads.

The enhanced profile provided by the Health Information Technology cluster attracted the attention of Microsoft in the USA which saw an opportunity to demonstrate how collaborative solutions for healthcare can be developed on a Microsoft platform. For the cluster, Microsoft’s involvement offered the possibility of demonstrating how stand-alone products can be plugged together via Microsoft .NET technologies to create new solutions.

Microsoft arranged for a number of cluster companies and the cluster coordinator (broker) to attend the Microsoft Health Informatics conference in the USA and the project started to take shape. The plan was to develop an interoperability showcase to present to the global Healthcare Information and Management Systems Society (HIMMS) conference in early 2006. The proposal was put out to cluster members and a subset of eight businesses signalled their interest in being involved.

To accommodate the new business relationships and collaborations, the Health IT Cluster developed a separate limited liability company as a freestanding entity. Its role was to act as a conduit for the participating businesses and to provide the necessary infrastructure and legal structures for the Microsoft interoperability

"The (Health IT) Cluster Company is a new beast: an enabler in respect of companies that collaborate …”

(ICT sector team leader, NZT&E)
showcase. Although new to New Zealand, this type of networked organisations was very similar to collaborative models which have been used in Europe since 1998\(^5\).

Through this mechanism, the Health IT companies and Microsoft jointly own the intellectual property for the interoperability core while the contributing companies retain the intellectual property rights for each one of their systems.

Appointment of an independent cluster coordinator, who was not attached to any of the constituent businesses, was considered crucial to the project’s success. The appointment avoided any suggestions of conflict of interest that may have arisen had one of the constituent businesses provided the service. The position also provided a dedicated resource to drive the opportunity to closure.

Key Elements of the NZ Health IT Cluster’s success include:

- **Formation within a specific industry vertical**, the Health Information Technology Sector,
- The creation of a single access point for customers that provided a ‘brand’ in the market and allowed customers to engage with the group,
- The appointment of an ‘honest broker’ (the independent cluster coordinator) to promote the group and engage with opportunities on behalf of collaboration member companies,
- The creation of a separate entity to execute on a specific project – the separate entity comprising the subset of collaboration member companies best suited to deliver the project needs.
- The establishment of systems and processes that supported the brand, project entity creation and creation of intellectual property rights.

These key elements translate directly into the best practices established by over 10 years of research by the EU on collaboration. They are:

- **The Industry Vertical:** The Collaborative Breeding Ground
- **The Brand Entity:** The Collaborative Network Organisation
- **The Separate Project Entity:** The Virtual Enterprise

\(^5\) ECOLEAD 2004
The Honest Broker: The Network Broker
**Best Practices in Collaboration**

Based on the New Zealand example, and the European reference models of the ECOLEAD project, the following best practices are presented below.

**Phases of evolution**

The creation of collaborative networks evolves through four phases:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Description</th>
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<tbody>
<tr>
<td>Getting Ready</td>
<td>In this phase, individuals from companies within a certain industry and its related social/business networks come together to review the drivers for collaboration.</td>
</tr>
<tr>
<td>Getting Set</td>
<td>This phase sees the creation of the collaborative network organisations and the establishment of a permanent or interim ‘network broker’.</td>
</tr>
<tr>
<td>Go</td>
<td>The Go phase takes the opportunities identified in the Getting Set phase and executes them via the virtual enterprise model.</td>
</tr>
<tr>
<td>VE Disestablishment, New VE Establishment</td>
<td>Once the project contained in the VE is completed, the VE is disestablished. New opportunities are established pursued.</td>
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through the creation of a fresh, project-focused VE.

The Process

It is important to note that the process of placing opportunity projects in their own VE is critical to the success of the collaboration.

Opportunities will come and go, industry companies will come and go, and with each opportunity different configurations of member companies will be required.

The process of establishment and disestablishment of the VE around each project caters for this dynamic and provides an agile capability across the network that can respond efficiently and effectively to varied customer requirements.

The identification of market opportunities by the CNO provides members of a potential VE with the ability to configure themselves to fit their combined competencies in a business model that extends beyond their traditional industrial boundaries.

Similarly, company membership in a collaborative network organization exposes companies to learning, innovation and opportunities that would otherwise have not been apparent.

What Stops Collaboration?

Collaborations like those outlined above can only be learned through experience and the process is a fragile one.

If the culture of the various companies involved is proactive, inclusive and collaborative, then success will follow. If however, the cultures are reactive and/or exclusive then failure is a more likely outcome. Success starts with a collaborative internal culture, which is a necessity before a company can collaborate with external partners.
It is vital that companies understand their own internal value chain, the value proposition they can deliver and, most importantly, what types of other companies they can work with.

**The Collaborative Breeding Grounds**

Research shows that the origin of most collaborations between companies is informal chance meetings and weak-tie relationships, coupled with the presence of a market opportunity\(^6\).

Typically, these informal relationships and market opportunities exist in high-trust environments such as inter-firm networks and ecosystems such as trade associations or regional industrial clusters. As such these networks or ecosystems come under the heading of collaborative breeding environments, as they support the social and business networks in a particular industry, to create potential collaboration opportunities.

These New Zealand collaborative breeding environments mirror the breeding environments as outlined by the European Union research on collaborative business models\(^7\), where they comprise both individuals and organisations and are either geographically based, or ‘networked’ across the regions.

Across both European and New Zealand based collaborations, these collaborative breeding environments were central to the creation and sustainability of inter-firm collaboration.

They provide the requisite environment of common cooperation and a level of trust among the individual organisations and individuals necessary to share knowledge and identify opportunities based on shared experiences and challenges.

\(^6\) Ministry of Economic Development 2006  
\(^7\) ECOLEAD and VOSTER 2003
The Collaborative Network Organisation:

The ‘collaborative network organisation’ (CNO), is formed to ‘get ready’ to exploit opportunities in the marketplace via the virtual enterprise (VE) model. The central objectives of the CNO are:

1. Marketing of the CNO
2. Opportunity seeking, qualification and engagement
3. Provision and support of the various processes and infrastructure required to promote the CNO, and support the establishment of the various virtual enterprises (VEs).

The key CNO areas of competency\(^8\) are:

- **Legal Framework area**, including the establishment and negotiation of VEs’ contractual issues, VEs’ legal identity, VE internal/external liabilities, regulations as well as VE collaboration principles such as benefit/profit sharing, IPR and property of the results, etc.

- **Organisation & Roles area**, including the definition of roles within the VE, along with their relationships with the VE partner legacy organisational structures, VE business models, strategic planning, enterprise engineering, etc.

- **Concurrent Activities area**, including the execution by dislocated partners of different tasks of value-adding processes, synchronous concurrent tasks, etc.

- **VE Creation/Management area**, including the definition and execution of the VE management processes as well as the VE product, process and organisation information utilised for managing the VE set-up and operation, etc.

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\(^8\) Adapted from the ECOLEAD Reference model. ECOLEAD is an “Integrated Project” co-funded by the European Commission within 6th Framework Programme (2002-2006). Commencing in April 2004, ECOLEAD is a 4-year project involving 20 partners from 14 countries across Europe.
• **Technical Services area**, including the utilisation of specific ICT applications for enabling the cooperation among the VE partners, the choice of network technology, the use of standards, data security, etc.

**The CNO Network Broker**

The opportunities that may arise from the promotion of the CNO capability will result in a requirement to work with other companies, individuals and even divisions of large MNCs.

The Network broker’s responsibility is to market the CNO and seek opportunities that require the competencies of group companies (either in their entirety or a subgroup) via the virtual enterprises. This person is an entrepreneur working predominantly in the early phase of a virtual enterprise, procuring new projects for the network. Thus, the broker acts as a facilitator between customers and production⁹.

**The Virtual Enterprise**

When the network broker of the CNO identifies an opportunity, their first step is to establish the right form of virtual enterprise model and identify, via a process of cooperation, the best set of partners to be involved.

A virtual enterprise is then created to contain the project required to meet the opportunity. This specific VE is usually dissolved once the project is completed. However, the constituent firms of the virtual enterprise are still members of the CNO, and form other virtual enterprises to meet other market opportunities with members of the CNO.

All virtual enterprises are by definition temporary, therefore systematic establishment and disestablishment are critical. VEs may take a number of forms: from an informal memorandum of understanding (MoU) between the CNO companies, to a formal joint venture based around the establishment of limited liability companies (as in the case of the Health IT cluster).

⁹ ECOLEAD 2003
As such, in order to respond to market opportunities via the VE model, the implementation process needs to be already in place and on standby. Ensuring readiness on this front is one of the key roles of the CNO.

The success of a virtual enterprise depends on a balanced provision of all management competencies or co-ordination roles. Virtual enterprises are constrained in their performance by the ‘weakest link in the chain’, the weakest role or phase in the virtual enterprise. Again, the advantage of the virtual enterprise is its ability to link the most suitable supplier to each individual service to so deliver a customer specific solution.

The virtual enterprise is designed to create value out of a business opportunity. The value is the force that drives continuous restructuring of the virtual enterprises of the CNO.
**Collaboration Step-by-Step**

<table>
<thead>
<tr>
<th>Step</th>
<th>Focus</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Identify the industry networks and collaboration breeding grounds</td>
<td>Review and map the collaborative breeding grounds in your industry. Map the industry value chain and determine who provides which part of the puzzle. Look for key people and opportunities for the products or services your industry provides.</td>
</tr>
<tr>
<td>2</td>
<td>Summit</td>
<td>Run a ‘summit’ to explore these opportunities and more.</td>
</tr>
<tr>
<td>3</td>
<td>Form CNO</td>
<td>If the opportunities exist and the willingness is there, form a CNO from within the industry.</td>
</tr>
<tr>
<td>4</td>
<td>Appoint network broker</td>
<td>Appoint a network broker who is independent of any of the CNO member companies to avoid conflict of interest and provide the ‘honest broker’ facilitation role to the CNO. Implement the CNO process contained in the appendix of this document.</td>
</tr>
<tr>
<td>5</td>
<td>Establish VEs</td>
<td>Establish VEs to meet the various opportunities.</td>
</tr>
</tbody>
</table>
Appendix

Clusters vs Networks: A Summary

For the full paper on Clusters and Networks in the ICT sector, see The Creation and Growth of ICT Based Industrial Clusters: The New Zealand Case (Fraser and Kelly 2004)

Clusters

Industrial Clusters are by nature;

• usually concentration in small geographic locations, which facilitate close face-to-face communications between the constituents of the cluster;

• have rich ‘sediment’ history centred on a particular industry, with close links to related or complementary product, service and research organizations; and

• tightly integrated and networked across social, economic and knowledge perspectives.

This close geographic proximity facilitates:

• interaction and exchanges between cluster constituents (Rullani 2001)

• supports the processes of collective learning and flexible adjustment to changed conditions (Saxenian 1996)

• the richness of the face-to-face human interactions to support the exchange of more subtle forms of information i.e. diffuse and tacit knowledge (Bathelt et al 2002).

• Highly flexible and innovative to changing conditions

Networks

In contrast, geographic-independent networks (translocal networks) must build collaboration processes, communication systems and assurance systems to link companies together (Rullani 2001).

These networks are less able to transfer diffuse, tacit knowledge and collective learning between members, and are less flexible to changed conditions.
Cluster vs Networks Summary

Industrial Clusters are:

- Organic and close geographically
- contain local networks
- are linked together by interpersonal and inter-firm networks to other clusters and business ecosystems
- not a network.

Conversely, networks are:

- not clusters, but
- have the ability to span the globe and connect people and clusters

Case Study Example for Collaborative Education

Management Strategy Workshop Primes UK Technology Companies for Venture Capital Success

At Microsoft Research, Cambridge, Agitavi’s highly regarded Software Business Management Course gives UK technology companies valuable insights into attracting venture capital funding.

December 7, 2006 – UK technology companies involved in the East of England Development Agency’s Running the Gauntlet investment competition were this week given valuable advice on attracting venture capital when they attended Agitavi Research Corporation’s Software Business Management Course (SBMC).

The SBMC workshop was delivered by the Centre of Entrepreneurial Learning at Judge Business School, Cambridge University, and was held at Microsoft Research, Cambridge, as part of Microsoft’s support for the Running the Gauntlet initiative.

Delivered around the world since 2003, the SBMC has been developed by Agitavi to help independent software vendors (ISVs) maximise their growth potential and reduce their operating risk by employing robust, best-practice management strategies.
With a specific focus on venture capital issues, the Cambridge SBMC workshop provided attendees with valuable insights around how to better position their go-to-market strategies and business plans for effective execution and how to best attract further funding.

Those attending the interactive workshop gave it an overall evaluation of 4.3 out of 5.0 (86%) and said they valued the opportunity to build relationships with other attending technology companies, which could lead to future collaboration in the market.

Agitavi Research Corporation specializes in providing business research, corporate learning, and management consulting services to meet the needs of the global ICT industry. It has partnered with Microsoft on research and training initiatives since 2003.

More information on *Running the Gauntlet* is available at: [www.runningthegauntlet.com](http://www.runningthegauntlet.com)

Information on the Centre of Entrepreneurial Learning at Judge Business School, Cambridge can be found at: [www.entrepreneurs.jbs.cam.ac.uk](http://www.entrepreneurs.jbs.cam.ac.uk)
Collaborative Toolkit References


VOSTER 2003, Business and Organisaitonal References Models for Virtual Organisations, Hermann Loh, VOSTER Project.

Literature Review on Clusters and Collaboration.

The following Literature review is has been prepared by Mr. Malcolm Fraser (Agitavi Research) and Dr Stephen Kelly (Southern Cross University).

All reference and bibliographies have been included in the appendix. For any errors or omissions please contact: editor@agitavi.net.

Review of Literature

This literature review has been undertaken to provide a backdrop or 'framing' to research (Creswell 2003) focusing on industrial clusters and collaboration in the ICT sector.

The review first addresses the role of technology as a driver of economic productivity, outlines the phenomena of disruptive innovation and globalization, which create the strategic imperative for inter-firm collaboration.

It then examines the responses of economies, firms and individuals to these phenomena, namely delocalization, internationalization and industrial clusters.
Finally, it reviews the impacts of relational networks on a firm’s capabilities to be competitive in the international marketplace.
Technology: A Driver of Economic Productivity?

While improvements could be made in the areas of product market competition, business taxation, infrastructure provision, labor markets, innovation and human capital formation (OECD 2005), one area which has been shown to increase aggregate productivity in an economy is the existence of an ICT-producing sector, and the widespread use of ICT by other industries or the ICT-using sectors (OECD 2002).

“The use of ICT could have several impacts on productivity. For example, it might help more productive firms gain market share. In addition, the use of ICT may help firms expand their product range, customize the services offered, or respond better to client demand; in short, to innovate. Moreover, ICT may help reduce inefficiency in the use of capital and labor, e.g. by reducing inventories. All these effects might lead to higher productivity growth. Investment in ICT might also have benefits going beyond those accruing to investors in ICT. For instance, the diffusion of ICT may help establish networks, which produce greater benefits (the so-called spill-over effects) the more customers or firms are connected to the network.” (OECD 2002)

ICT also has another fundamental impact on nations. Various network and communications technologies allow nations firms to connect to the world and:

- cope with the fragmentation of world markets caused by the dramatic increase in globalization and value chain delocalization; and
- assist in the internationalization of a nation’s products and services via integration and knowledge transfer with the global supply chains of delocalized MNCs.

As such, ICT is a product and enabler of innovation, a means of communication and integration with global value systems, and a driver of aggregate productivity increase for nations.

ICT and the Productivity of a Nation

In recent years there has been a sustained effort by the OECD, and other researchers (Jorgenson 2001), to break aggregate productivity growth down into its
sectoral contributions, so that for a particular economy, changes in aggregate productivity growth can be attributed to their respective sources: the ICT-producing sectors, the ICT-using sectors, and to other sectors (OECD 2002). This is driven by the evidence (both empirical and anecdotal) that increased ‘production’ of ICTs contributes to output, employment, and export earnings, while ICT ‘use’ increases productivity, competitiveness, and growth. For example, ICT use in manufacturing, property and business services and construction has had the most effect on aggregate productivity performance, while the ICT-producing services sector (i.e. hardware manufacturing) has had a smaller role in aggregate productivity growth over the 1990s (OECD 2004).

It should also be noted that the presence of an ICT-producing sector is not a precondition to capturing the benefits of ICTs (OECD 2002). As such, some nations may not have to have a very large ICT-producing sector for ICT to contribute to aggregate productivity growth (OECD 2002). However, the presence of an ICT-producing sector, either within the country (OECD 2002) or in close neighboring countries (Qiang, Pitt and Ayers 2003), does accelerate the ‘spill-over’ effects of technology use.

**Focus on Industry Verticals, not Horizontals**

Dynamic markets demand that firms face the paradox of functioning efficiently today while positioning for tomorrow (Paap & Katz 2004). From the perspective of strategy, that means identifying current and future customer needs and positioning the firm accordingly. Unfortunately, few firms appear to manage this dualism effectively, with large and small firms frequently getting locked into supplying a particular technology or introducing spurious new technologies, irrespective of the nature of change in the competitive environment or client needs. The frequent result of this myopia is business failure or diminished competitiveness.

For ICT firms, the difficulty in knowing what is coming next can be particularly overwhelming given the pace of change in their market. In response, firms frequently seek to keep up-to-date with multiple technologies and service diverse markets as a hedge against disruptive innovation that could threaten the existence of any one market or product line. However, this approach is arguably the opposite...
of what they should do, as it diminishes their knowledge of selected target markets and arguably undermines business performance.

An alternative approach is to focus on customer needs and to treat technology as a means rather than an end, an approach which may appear obvious but in practice is difficult. It requires a strategy that involves the selection of target markets and the development of extensive networks that embody weak and strong ties, which help small firms identify opportunities, secure resources and gain legitimacy (Elfring & Hulsink 2003; Kelly 2000).

In other words, it involves a change from a horizontal technology focus to an industry vertical focus.

**Disruptive Innovation**

Disruptive innovations have been characterized as “innovations that involve significant new technologies, require considerable change in consumption patterns and are perceived as offering substantially enhanced benefits” (Sandberg & Hansen 2004).

It is a concept that has been intrinsically linked to technology since being introduced into the management lexicon by Christensen (1997), even though Christensen himself has stated that in most cases technology is only the infrastructure that facilitates a new business model (anonymous 2001). Therefore, disruptive innovation needs to be looked upon as much more than technology alone. It needs to be considered as a phenomenon that is derived from and drives businesses, markets and economies.

Disruptive innovation should also be recognized as not merely a contemporary construct determined by modern technology. Rather, it reflects a process first described as *creative destruction* by Schumpeter (1934) in his book *The Theory of Economic Development*, which describes the entrepreneur as being responsible for innovative new goods, new methods of production, new markets for existing products and new forms of organization. Similar themes were also evident in his 1950 book, *Capitalism, Socialism and Democracy*. 
Looked at from this broader perspective, the difficulties confronted by small firms seeking to see what is next is self evident. How can they possibly monitor innovations with any effectiveness and, more to the point, how can they possibly pick which ones will endure? It is a problem amplified for small ICT companies who are continually confronted by new products and technologies that often emerge in global markets to which they have limited access.

Arguably, building a business in such an environment is hit-and-miss. However, pro-activeness and access to lead markets from which firms learn have been identified as partial solutions (Sandberg 2002; Sandberg & Hansen 2004). This is notable in the context of a discussion on strategy, given that pro-activeness has been characterized as a dynamic phenomena where firms verify and redefine the manner in which they interact with their environment (Larson, Bussom & Vicars 1986). This is a process that fits with contemporary views of the firm as necessarily being a complex adaptive system, and learning as a process that should be considered from a systems dynamics paradigm.

It should be noted that this concept of pro-activeness is also far from new, with Miles and Snow (1978) having described three successful organizational types (prospectors, analyzers and defenders) and one unsuccessful type (reactors). Under this typology prospectors were seen as having the capability to find and exploit new products and market opportunities and were further characterized as searching widely for opportunities and creating broad rather than intensive plans.

Again, in the context of discussion on strategy and collaboration, the development of broad plans is notable as it suggests greater flexibility and adaptiveness and, by extension, a perspective consistent with a view of the firm as a complex adaptive system.

The role of learning in this type of firm is also indicated by their search for opportunities, which by definition should bring them into contact with lead markets. Therefore Miles and Snow (1978) provide some indications as to how firms become pro-active – or in their terminology prospectors – while it is recognized that the nature of markets and competition evident when their study was initially undertaken was not characterized by the hyper-competition, globalization and compressed
product lifecycles confronting many firms in contemporary markets and ICT firms in particular.

For further insight into what pro-activeness means in a practical sense and how firms access lead markets, the relational network literature provides a significant and rich base, with networks being widely recognized “as an integral part of the explanation for entrepreneurial success” (Elfring & Hulsink 2003, p. 409).

This is evident in the work of Achrol (1997), offering a perspective ostensibly shared by Spekman (1996), that classic vertically integrated, multidivisional organizations are being replaced by “...new forms of network organization consisting of large numbers of functionally specialized firms tied together in cooperative exchange relationships” (p. 56). It is a view that also reflects Thorelli’s (1986, p. 38) argument that the “entire economy may be viewed as a network of organizations with a vast hierarchy of subordinate, criss-crossing networks” and that of Hakansson and Snehota (1995, p. 20) who state that “a relationship between two companies does not depend solely on the two parties involved in the relationship but what is going on in a number of other relationships”.

In the context of small- and medium-sized firms, the perceived value derived from networks is also widely promulgated as typified in the argument that:

“The institutional and social network in which the business service SME is embedded provides the basis through which it gathers information, mobilizes new partners and gains access to expertise, financial resources and client contacts. The partners in the network build dependency on resources controlled by others in the network, positioning themselves to make future use of these resources” (O’Farrell & Wood 1999, p. 139).10

10 Notably, it is a perspective evident, although substantively contrary to the resource dependence view (Pfeffer, & Salancik 1978), in which firms and individuals are perceived to seek power by reducing their dependence on other actors, while increasing the dependence of other actors on them.
The implications of an institutional and social network view when considered within the context of the preceding discussion are that not only must a firm within a network logically and necessarily operate as a complex adaptive system, it must also benefit from the relationships that are generated.

In particular, the benefits should include: greater prospects for identifying opportunities and threats; enhanced access to resources; and superior legitimacy in selected markets (Elfring & Hulsink 2003; Kelly 2004). That is, networks can be the vehicle through which pro-activeness (prospecting) and access to lead markets can be generated and, importantly, a means by which firms are better positioned to identify and respond to potentially disruptive innovations.

This being said, the customer remains the crucial member of any network and arguably should take precedence in any set of relationships. Customers remain the greatest source of information and an understanding of their needs and the ability of an innovation to fulfill those needs more effectively than existing products or services is critical. However, too often firms fail to focus on the current and changing needs of their customers and focus instead on technologies (Paap & Katz 2004). Of course the contradiction in this statement is that customers do not always know what their needs will be and as a result firms must sometimes take a lead and create markets and demonstrate benefits if innovative products and services are to succeed.

As such, a focus on horizontal ICT-producing sectors would appear to have less importance or impact on economic growth via productivity increase, than a focus on vertical ICT-user sectors, which incorporate the customer within their institutional and social networks.
Globalisation

The phenomenon that is termed globalization is a complex, much debated (even reviled) and multidisciplinary beast that may have been around since the early migrations of man across the globe.

“Globalization refers to a multidimensional set of social processes that create, multiply, stretch and intensify worldwide social interdependencies and exchanges while at the same time foster in people a growing awareness of deepening connections between the local and the distant.” (Steger 2003)

Using this definition it can be proposed that past history such as Christopher Columbus discovering the Americas, and its subsequent impact on world views and trade, was a form of globalization. However, for the purposes of this research the topic will be treated in the contemporary context of 1970 to today (Steger 2003) with particular focus on how globalization impacts on the social and economic constructs of firms and their interactions with markets.

In A Very Short Introduction to Globalization, Steger (2003) proposed a view that globalization is rather more complex than just a “more advanced form of internationalization” (Prentice Hall 2004). Rather, globalization has four distinct qualities or characteristics, being:

“Globalization involves the creation and multiplication of existing social networks and activities that increasingly overcomes traditional political, economic, cultural and geographical boundaries”.

“Globalization is reflected in the expansion and the stretching of social relations, activities and interdependencies.”

“Globalization involves intensification and acceleration of social exchanges and activities.”

“The creation, expansion and intensification of these social interconnections and interdependencies do not merely occur on an objective, material level....but are reinforced on a daily basis, (where) persistent experiences of global interdependence
gradually changes people’s individual and collective identities, and thus dramatically impacts the way that they act in the world”, e.g. the world of post 9/11.

Using these characteristics it is proposed that within the context of research around international collaboration by nations ICT firms, globalization can be considered as an environment where ICT significantly impacts:

**Distance** – Where firms and individuals increasingly interact without regard to distance.

**Global and Local Coexistence** – Where things local (social, economic and political) are increasingly shaped by events far away, e.g. the ‘local’ and ‘global’ form endpoints of a spatial continuum that imply each other (Steger 2003).

**Interconnection** – Where the number and the rate of change of connections between firms and individuals are increasing on a daily basis, i.e. the institutional and social networks are constantly evolving.

**Interdependency** – Where markets, value chains, firms and individuals are increasingly becoming interdependent (via interconnection).

**Distance**

For nations, one of the single most important aspects of the Information Age is the ‘death of distance’ (Cairncross 1995). In particular, the use of ICT plays a key role in the transfer of knowledge to and from global markets and innovators, and eases the integration processes between nations and foreign firms.

In addition, as ICT products such as software and intellectual property can be transmitted at the speed of light from one location to another, nations firms can compete in global markets. This also means that offshore firms can compete on a domestic market just as effectively.

**Global and Local Coexistence**

Therefore, in the context of ICT-producing and ICT-using sectors in nations, the supply-and-demand equation is based in both a global and local context. Thus, nations ICT-producing firms (both large and small) must develop strategies for global
execution; to remain focused on the domestic market alone means to focus on the short term. For smaller nations firms operating on the global stage, this requires specific strategies that can help to develop links and credibility in global markets during the early stages of development, as the absolute size of the nations domestic market means that ICT firms are ‘born global’ or have a limited life.

This credibility can be achieved either via collaboration with large MNCs, or by establishing residence inside a “geographic concentration of interconnected companies and institutions in a particular field” (Porter 1998), i.e. an industrial cluster. These industrial clusters allow firms to take advantage of a number of factors that have a positive effect on competitiveness and internationalization efforts (Zyglidopoulos, DeMartino & Reid 2003).

These activities and connections with MNCs and industrial clusters by nations firms are the means by which they become tightly bound to global events and connections. As such, nations firms can be ‘interconnected’ with markets and firms globally.

**Interconnection**

With the dramatic increase in telecommunications and the Internet in the last 30 years, people are now able to connect with individuals literally anytime and anywhere in the world. This explosion of the world-wide web, mobile devices, pervasive computing and new network technologies has greatly amplified human connections and cooperation, where (socially and technologically) ‘networked’ groups, or communities, of people now exhibit many of the features of what scientists call a complex adaptive system.

These systems of social networks illustrate that on the one hand the world is highly ‘clustered’ and on the other, a person can still reach anyone at all in only a few steps (Watts 2003), e.g. the Six Degrees of Separation, or Small-World paradigms (Milgram 1967).

These social networks are “emergent, highly connected with intricate inter-relationships, self-organizing and simple on the micro level but create effects that appear complex and unpredictable on the macro level; plus, they tend to evolve through rapid collaboration or feedback loops” (Rheingold 2003).
The impact of this connectedness of people via globalization and technology has significant ramifications for inter-firm collaboration, as a firm can be viewed as a collection of individuals focused on a particular outcome, i.e. revenue generation, which interacts with other firms comprised of groups of individuals. Therefore, the primary determinant of success in today’s markets may be relationships between individuals, rather than contractual relationships between firms.

This leads to the prospect of aggregate economic productivity being a result of individuals within a firm interacting via weak ties with other individuals in other organizations, to form larger systems of economic behavior, i.e. value chains and economies. Hence, aggregate productivity and real income growth in the 21st century may be determined by individuals operating in a complex web of relationships.

**Interdependency**

As these interconnected collaborations between individuals take place, either face-to-face or virtually, deepening interdependent economic activities result, which leads to the creation of institutional and social networks that enhance value-added activity. These economic activities typically centre on a supply chain or value system, and in the context of globalization is it useful to review the evolution of the interdependent global supply chain.

“A supply chain is a collection of interdependent steps that, when followed, accomplish a certain objective such as meeting customer requirements.” (Kalakota & Whinston 1997)

In the early industry age, interdependent steps of the value chain were undertaken by single firms or by multidivisional corporations that spanned the entire value chain, i.e. the Fordist model, from steel mills to car distribution, and were housed under ‘one roof’ (equity structures).

However, as the impacts of global competition started to make their mark (e.g. Japanese car exports to the US) these multidivisional firms sought first to sub-contract work to third parties outside the equity structures to reduce costs, then to out-source entire business processes to emerging markets that could offer productivity efficiency.
Thus began the evolution from the multidivisional firm operating in a small number of geographic markets, to the multinational firm operating across many countries – the transnational corporation. These firms have evolved to the point where they can no longer be thought of as ‘country-based’ organizations, but now must be considered as global firms with internal economies greater than that of the Gross Domestic Product (GDP) of some countries, e.g. Denmark’s GDP of US$174 billion or the sales of General Motors amounting to US$176 billion.

Finally, as the MNCs seek to continue to improve productivity and/or expand market share, they drive the process of ‘delocalizing’ entire value chains, thus increasing the number and reach of “networks of connected and interdependent organizations mutually and co-operatively working together to control, manage and improve the flow of materials and information from suppliers to end user” (Aitken 1999).

**Delocalisation – A Fragmented Global Market**

In response to the globalization of world markets, plummeting telecommunication costs and the digitization of some paper-based business processes (Farrell 2004), many firms are now seeking either increased productivity or access to emerging markets through the processes of delocalization, such as off-shoring, out-sourcing and on-shoring.

Where, in the past, a firm ‘relocated’ whole production processes by shutting down operations in one location and opening the same operations in another location, delocalization involves moving components of the firm and/or its production processes outside its operations. This can occur either in the same geographic territory in the case of out-sourcing to an on-shore location (on-shoring), or to foreign soils in the case of off-shoring. In all cases the firm’s operations or production components are sourced from ‘outside’ the firm.

Delocalization reflects the patterns of relocation that go back to the middle Ages. However, this phenomenon is now accelerated, and can be broken up geographically through the use of new and cheaper forms of ICT, which enable global communications and synchronization of processes between firms, e.g. cars
manufactured in one location, based on thousands of components supplied by hundreds of external third-party suppliers.

These technologies also have greatly intensified worldwide competitive pressures. Because of this global competitiveness, firms are seeking to gain comparative advantage by either delocalizing production processes or by increasing market share via entrepreneurial delocalization through the establishment of collaborations with foreign firms, or via establishment of their own operations in other locations.

**Productivity Delocalization** is generally being undertaken by MNCs focusing on changing the supply chain (Schiavone 2003). This drives inter-firm collaboration around global, decentralized and decoupled supply chains where each node of the value creation process is self contained, self directed and in many cases external to the equity structure of the MNC.

In fact, recent studies document that this 'fragmented' production represents the fastest growing segment of direct investment flows by MNCs (Plasschaert 2005).

It should also be noted that these fragmented production processes are more often virtualized around a particular MNC or vendor and as such represent ‘communities of supply’ rather than collections of individual firms. To this end, it has been suggested that in today’s globalised markets, competition is between supply communities, rather than between individual firms (Katz, Pagell & Bloodgood 2003).

**Entrepreneurial Delocalization** (Schiavone 2003) on the other hand is undertaken by both MNCs and SMEs alike. Where productivity delocalization changes the supply chain and drives inter-firm collaboration with a focus on partner selection (Schiavone 2003), entrepreneurial delocalization focuses on the "start up of new businesses and ventures in foreign(er) developing countries" (Schiavone 2003), i.e. new emerging markets.

An example of ICT entrepreneurial delocalization is the mobile firms of Nokia and Ericsson establishing R&D centers in key US wireless locations to bring their R&D teams closer to the pools of large local demand, i.e. the emerging wireless markets of the US.
These offshore collaborative activities, which are driven by the need or desire to internationalize the firm, are initiated via the creation and management of both formal and informal relationship networks (Kelly 2003) and are supported by the existence of collaborative ‘breeding environments’ (Camarinha-Matos & Afsarmanesh 2004) such as industrial districts/clusters (Rosenfeld et al. 2002, Bathelt et al. 2002, Schiavone 2003) and trade associations.

Within these breeding environments, entrepreneurial delocalization is driven principally by relationships between territories, rather than the relationship between firms, which is the focus of productivity delocalization (Schiavone 2003).

This brings into play the central role of industrial districts or ‘clusters’ that not only provide these inter-territory relationships, but have the advantage of being able to multiply the frequency and opportunities of experience by linking different locations, firms and cultures (Rullani 2001) into the globalised and delocalized mêlée of today’s business reality.
**Industrial Districts/Industrial Clusters**

Defining a cluster is not easy. However, some key elements from numerous descriptions of clusters suggest they are, by nature: (i) usually concentrated in small geographic locations that facilitate close face-to-face communications between the constituents of the cluster; (ii) centered on a particular industry vertical, with close links to related or complementary product, service and research organizations; and (iii) tightly integrated and networked across social, economic and knowledge perspectives. It is also self evident that for a cluster to be effective collaboration must occur.

**Key Success Components**

The literature indicates that there are a number of key success components (KSCs) for ICT clusters that fall under three categories: **core cluster characteristics**; emerging **innovation**; and **globalization**. Arguably, a combination of all three is required if industrial clusters are to form, grow and adapt in dynamic world markets.

The following is a list of the components of the core cluster characteristics category, which are discussed before the remaining two categories (innovation and globalization) are considered.

**Core Cluster Characteristics**

The following reviews and discusses the core clusters success characteristics:

**Large Pillar Firms** – Silicon Valley had Fairchild Semiconductors (Saxenian 1994), Cambridge had Acorn Computers (Athreye 2001), Oulu, Finland has Nokia (Richards 2001), and Christchurch has Tait Electronics. All of these firms were central to the beginnings of their respective clusters and from their rank and file came the genesis for the myriad of start-ups and support firms that continued to grow around them. All of these firms are also examples of local firms becoming global players that built the necessary scale to recruit and develop talent, create local funding and attract the attention of complementary firms in neighboring segments (Richards 2001).
Other researchers (Bathelt et al. 2002; Dearlove 2001) also support the important role of these ‘pillar’ companies in the establishment of clusters. In the case of the Scandinavian Wireless Cluster, Dearlove (2001) proposes that companies such as Nokia and Ericsson are not products of the Scandinavian clusters; rather, they were established before the mobile/wireless cluster was formed.

Thus, it is proposed that a fundamental success component in the development of any cluster is the presence of large pillar firms focusing on the emerging technologies and supported by a strong local market (Richards 2001). Whether they are the initial companies of the new cluster, or established companies in a different market that reposition into the emerging industry vertical (e.g. Nokia from rubber to mobile technologies), the result is the same.

**Local Demand** – Before a company can execute on a global basis, it must be able to ‘interact’ with local demand. This interaction provides the basis for translating technical innovation into commercial success and it is often easier to interact with demand if it is local (Richards 2001). Using the New Zealand’s example, Tait Electronics was supported by the large local demand for radio-based communications due to geographic distances in a largely agrarian economy.

In the Nordic wireless cluster the initial success of both Ericsson and Nokia was boosted by the European Union decision to standardize the vendor agnostic mobile standard of GSM. This gave them access to and interaction with the large and growing demand pools of the GSM wireless market in Europe in the 1990s and drove widespread local deployment of wireless technology in Europe (Richards 2001).

This continued in-depth interaction by large firms with the local market provides the basis for continued product innovation and creates a ‘virtuous cycle’ of funding, innovation and global marketplace success that characterizes a mature cluster (Richards 2001, Andersen & Teubal 1999).

An antithesis to this impact of local demand is the Cambridge cluster and Acorn Computers. Starting with strong local (UK) demand for personal computers, Acorn and the Cambridge cluster grew dramatically, but then slowed and declined due to reduced local demand through an atrophied industrial base (UK) and poor standards of living (Saxenian 1988). All of these factors eventually lead to the Cambridge
computer cluster being swamped by larger US-based PC companies exporting from their strong local markets in the US (Athreye 2001).

**Key Agents, Social Networks and Local Company Linkages** – Across all cluster research a strong link has been found between the emergence of successful clusters and the activities of a few entrepreneurs and industry ‘personalities’. Typically these individuals came from the large pillar firms at the heart of the cluster, or from various research or academic institutions closely connected with these firms via educational and consulting activities.

In the 1986 study of the Cambridge cluster by Segal, Quince and Wicksteed, approximately two-thirds of the hi-tech businesses (244 out of a known 355 firms) were interconnected, with an overwhelmingly large proportion of founders of new firms coming from local firms (Athreye 2001). Walshok et al. (2002) also noted that one of three critical success factors seen in a study of the San Diego hi-technology cluster was the character and extent of ‘catalytic’ business and financial networks, with the individuals in these networks being responsible for starting up new ventures, providing advice and mentoring to other company owners and creating venture capital funds (Athreye 2001, Saxenian 1994). Notably, these individuals are generally few in number but are highly visible to the large majority of cluster stakeholders and are a catalyst for regional powerhouses (Dearlove 2001).

**Regional Specialization** – This combination of large firms, local demand and catalytic networks of key agents operating within a geographic territory gives rise to regional specialization. This is significant to the role of central government in cluster development as the goal of cluster strategy is not to have communities compete for the same types of clusters, e.g. an electronics cluster in Canterbury, Wellington and Auckland. Rather, it is to determine which clusters make sense for which communities (or regions) (Rosenfeld et al. 2002).

**Academic Linkages** – Another core success factor in these regional clusters is the presence of close linkages between academic institutions and successful cluster firms. However, it should be noted that it is the research activities and specialized educational programmes designed to meet the needs of the local cluster that have
the most impact, rather than links to general University administrations and standard degree programmes (Saxenian 1994).

For example, in the Cambridge cluster there was a prominent growth of industry-university linkages and in particular the involvement of Cambridge College alumni and the establishment of specific research centers or institutions (Athreye 2001). These linkages also provided frequent interaction between Cambridge University and local firms via collaborative projects and University staff acting as consultants to local firms (Athreye 2001).

Silicon Valley also benefited from close ties between local industry and Stanford University and the University of California at Berkley, both of which developed industry-focused training programmes and research collaboration.

In contrast, Boston’s Route 128 electronics cluster and Massachusetts Institute of Technology (MIT) were much slower to develop programmes of these types, resulting in both Stanford and Berkley training close to twice as many doctoral degrees students as MIT by the mid 1970s (Saxenian 1994).

**Sophisticated Workforce** – This tight integration between regional specialization, its training and educational requirements and a responsive academic institution gives rise to the organic growth of a deep and highly skilled local workforce.

In the case of the San Diego hi-technology cluster, one of three critical success factors was the breadth and depth of the advanced skills and knowledge of the human capital (Walshok et al. 2002). Numerous studies have demonstrated that technology-based businesses do well in states (regions) with education systems that stress science and engineering at all levels, resulting in a strong and technologically sophisticated workforce (Sommers 2003). An important consideration in the development of this sophisticated workforce is the availability of customized and specialized education and training that produces and upgrades skills and knowledge (Rosenfeld et al. 2002).

This requires that academics integrate into the catalytic networks of company founders and business builders within the cluster and become intimately involved with both the large pillar firms, as well as the myriad of cluster start-ups. As in the case of Silicon Valley, the success of these large firms also created both the funding
and local skilled labor (technical and managerial) for the emergence of entrepreneurial culture and start-ups (Richards 2001).

**Management Skills** – nations-based research such as the ICT Taskforce report and *Firm Foundations: A Study of nations Business Practices and Performance* (Knuckey & Johnston 2002), point to the lack of both management and commercialization skills within the ICT sector. In the ICT Taskforce report, lack of management and internationalization skills was identified as a key roadblock to growth in the nations economy, while Knuckey and Johnston (2002) proposed that the focus of nations firms is short-to-medium term, which appears to be related to the scale of most enterprises and the reliance on one or a few people to both lead and manage the business.

In contrast, Nokia’s success in the wireless space attests to their possessing significant managerial experience and global networks (from their rubber production operations), which may have provided a more stable base with which to enter the new wireless market. They had the managerial talent required to grow Nokia into a successful business on world markets by successfully executing old-fashioned firm-building and business unit strategy, focusing on emergent markets and allocating resources necessary to become global leaders in their chosen space (Richards 2001).

**‘Buzz’** – Ultimately the concentration in a geographic region of all these core success factors (large pillar firm presence, local demand, key agents/social networks, local company linkages, regional specialization, local academic linkages, sophisticated workforce and management skills) leads to the development of ‘industrial atmosphere’ (Marshall 1927), or ‘buzz’ (Bathelt 2002), defined as being something that is ‘in the air’, limited to the people within a particular region or place. Buzz, and its existence, have been proposed as a major contributor to cluster growth and success, and by its very nature, is regionally based not national. Indeed, it is the cluster environment that creates the buzz. To quote Bathelt (2002):

“Buzz refers to the information and information ecology created by face-to-face contacts, co-presence and co-location of people and firms within the same industry and place or region ... The nature of buzz is spontaneous and fluid, as co-presence within the same economic and social context generates manifold opportunities for
personal meetings and communications … It is argued that the coexistence of high levels of 'buzz' and the many pipelines may provide firms located in outward looking and lively clusters with a string of particular advantages not available to outsiders …”

**Innovation**

The continued success of industrial clusters is closely coupled with emerging technologies, start-up firms and the presence of cutting-edge research facilities and top educational institutions that provide a basis for innovation (Dearlove 2001). Numerous studies have demonstrated that technology-based businesses do well in regions with dynamic research programmes yielding commercialisable technology ideas (Sommers 2003) and as these industry clusters continue to grow the role of the research institutions will deepen and broaden to encompass workforce development and training as well as technology transfer (Walshok et al. 2002).

As proposed in ‘Local Demand’ above, the close interaction with local markets can drive a ‘virtuous cycle’ of funding and innovation. For example, one of Nokia’s key strengths has been the ability to rapidly turn technological progress into rapid product innovation – and in particular products that are met with immediate and widespread consumer adoption (Richards 2001).

However, in the case of nations, innovation and its supporting R&D processes appear to be less emphasized as a strategy (Knuckey & Johnston 2002). This may be due to the large number of smaller (less sophisticated) firms in the markets, or the result of limited local demand for the products produced due to the absolute size of the some nation’s marketplace. In either case it is the close linkage between emerging technologies, local demand and tight integration between individual firms and research facilities, or members of social networks connected with the research institution, e.g. Alumni from Cambridge Colleges (Athreye 2001), which drive firms to more sophisticated innovation processes.

**Emerging Technology and Standards** - The existence of a new technology or standards can also have dramatic effects on the sustained growth and adaptability of a cluster, as it can thrive by focusing on niches that are not covered by leaders (Richards 2001). The establishment of new technologies can be driven by policy
initiatives of central governments and this should be considered when formulating strategies for the development of ICT clusters. For example, the European Union used public policy to define standards (GSM) that produced European winners of Nokia and Ericsson in 3G technologies (Richards 2001).

However, public policy alone cannot produce standards or clusters. As Richards (2001) points out the critical point of the GSM standard that produced the Scandinavian success was the presence of multiple competitors and the fact that the GSM standard was not defined with the technological bets of any particular incumbent in mind (Richards 2001). This position of policy also points towards a success component of implementing an industry niche focus to obtain differentiation, rather than a broad ICT grouping. In the nations case we should carefully consider the respective ‘niche’ plays of our regions (i.e. electronics in Christchurch, creative in Wellington) before establishing any broad-based ICT cluster in Auckland.

**Venture Capital** - The combination of vertical industry mass, strong local demand, knowledge linkages to local research facilities and strong catalytic social networks due to very close geographic proximity, creates a gravity around the cluster that continues to attract more industry organizations, associated input suppliers (such as venture capital and support services organizations) and skilled workers to a geographic region.

Numerous studies have demonstrated that technology-based businesses do well in states (regions) with a history of entrepreneurialism and financial capacity to support technology start-ups (Sommers 2003).

In the case of Silicon Valley, many of the initial entrepreneurs from Fairchild and Intel went on to set up specific venture capital funds within the cluster (Saxenian 1994). A notable feature of the Cambridge cluster was the involvement of employees from Cambridge firms, and sometimes entrepreneurs from earlier generations in managing venture capital funds that have flowed into Cambridge (Athreye 2001).
Globalisation

While trends towards globalization of industries and companies might appear to reduce the importance and distinctiveness of (sub-national) regions, a tendency towards localization of certain industries and economic activities appears to do exactly the opposite (Enright & Roberts 2001). The ICT industry in particular is impacted by these changes as product can be transmitted around the globe at literally the speed of light.

Therefore, unless nations firms compete in the world markets, they will face competition from the world and due to the absolute size of the nations markets, this focus must be in niche vertical market applications that show strong local demand and innovation. As proposed by Porter, “paradoxically, the enduring competitive advantage in a global economy lies increasingly in local things - knowledge, relationships, and motivation that distant rivals cannot match”.

India and Ireland have had mixed success – on the one hand building strong services and localization capabilities yet on the other hand less successful in building globally branded firms capable of capturing significant producer rents (revenues) (Richards 2001). Similarly, Cambridge did not ‘globalize’ to the same degree as Silicon Valley, due to the inability of Cambridge firms to capture global markets in any one product or technology space because of their inability to cope with competition from the US (which had a strong local demand) and also a lack of good marketing and management skills (Athreye 2001).

Global Pipelines

In their work on a community college approach to cluster-based workforce development, Rosenfeld et al. (2002) suggested that one of the key principles underlying successful cluster programmes is to act collaboratively and connect externally.

Bathelt et al. (2002) also argued that the coexistence of high levels of ‘buzz’ and many pipelines may provide firms located in outward looking and lively clusters with a string of particular advantages not available to outsiders. These ‘global pipelines’ between the regional cluster and other relevant hot spots around the globe (Bathelt
et al. 2002) provide the means of speeding up the process of turning new technological innovations into competitive products (Richards 2001).

Owen-Smith and Powell (2002) use the term 'pipeline' to refer to the channel used in distant interactions. They have shown in the case of the Boston biotechnology industry that access to new knowledge does not just result from local and regional interaction but is often acquired through strategic partnerships and inter-regional and international reach. Boston’s biotechnology firms are thus not only embedded in regional innovation networks but also in social networks that are not defined geographically (Bathelt et al. 2002).

These global connections between firms and individuals from a particular cluster also have a feedback benefit to the cluster as a whole as the more developed the pipelines between clusters and distant sites of knowledge become, the higher the levels of local buzz, benefiting all firms in the local cluster. This is why a firm will learn more if its neighboring firms in the cluster are globally well connected instead of being more inward looking and insular in their orientation (Bathelt et al. 2002). These global pipelines are impacted significantly by the functionality of collaboration and communication technologies, suggesting the rising impact of translocal networks in both assisting and competing with regional clusters.

**Clustering Policies and Programmes**

In their work on cluster formation in the New Silicon Valley, Bresnahan et al. (2002) proposed that the forces underlying the emergence of a cluster differ from those needed to ensure its continued growth. They suggested that while increasing returns and external effects can keep a cluster going, the initial spark is more difficult to obtain and more risky to pursue and requires significant efforts by the ‘pioneers’ of the cluster to promote organizational and technological capabilities of various sorts and create new firms and institutions.

Andersen and Teubal (1999) also suggested that there are key differences in requirements between Cluster Creation or Emergence, Cluster Operation and Cluster Reconfiguration and propose that continued success of a cluster is also dependent on its ability to ‘reconfigure’ or restructure itself based on response to environmental
factors and competition. This requires not only initiatives from the initial innovators and entrepreneurs (advanced firms), but also effort from the wider cluster firms and supporting suppliers and service providers. Despite strong capabilities these advanced firms cannot complete their (cluster) restructuring without the help of a technology infrastructure (housed in a newly created technology centre). Therefore, these advanced firms will put pressure on government for help to plan the creation of such a centre (Andersen & Teubal 1999).

An alternative to the concept of a technology centre is that of the endogenous emergence of a key sector, which may emerge from vertical disintegration and innovation (which exploits an innovation from an advanced firm), and which in turn is stimulated by the generic nature of the new technologies (Andersen & Teubal 1999).

Therefore, when reviewing which industries should be considered by a local or central government for cluster facilitation, research should be undertaken on the basis of local demand, which larger pillar firms are already present and the strength of the catalytic networks of industry personalities and entrepreneurs. This may require more refined market segmentation within a region to obtain an appropriate differentiation, or vertical industry mass, e.g. multimedia and creative digital arts in Wellington and electronics/software operating systems in Canterbury. By creating an appropriate differentiation, these clusters of firms can develop knowledge far beyond the reach of any single member of that group and create a demand for specialized services and support (Bathelt et al. 2002).

Considering the rising importance of both local catalytic and translocal networks it is proposed that cluster programmes should be focused on providing the ‘glue’ that connects advanced firms, start ups, wider cluster firms and supporting suppliers and service providers with R&D centers. They should also provide specific ‘processes’ for linking academic institutions into these firms to better understand any skill shortages and training requirements. This process should be highly responsive and focused on measurable outcomes that benefit the wider regional cluster, not just specific firms or institutions. Hiscocks (2004) also refers to this linking process and uses the term ‘join-up-ed-ness’ to describe Cambridge Enterprises’ role and strategy in the Cambridge cluster.
However, cluster policies should include more explicit institutional components than network creation policies and changes in the systems of governance of non-business institutions and organizations. Neither incentives nor new institutions can, at first glance, be dispensed with; the role of incentives is not to promote a particular activity but rather to learn about such an activity (Andersen & Teubal 1999).

**Clustering and Collaboration in the ICT sector**

A cluster is a territorial contiguity, which facilitates interaction and exchanges across interconnected companies and institutions in a particular field and supports the processes of collective learning and flexible adjustment to changing market conditions. In contrast, geographic-independent networks (translocal networks) must build collaboration processes, communication systems and assurance systems to link companies together (Rullani 2001). By this very dependence on technology, translocal networks lose some of the ability to provide the solid foundation for innovation and stability in dynamic markets that is created by constant face-to-face contacts, co-presence and co-location of people and firms within the same territory (Bathelt et al. 2002).

However, as the richness of these ‘collaboration’ technologies increases, global competition between clusters and networks will also increase, as translocal networks have the advantage of being able to multiply the frequency and opportunities of experience by linking different locations and cultures (Rullani 2001).

The ramifications for nations are significant, as it is the clusters of small-to-medium ICT that provide a basis for world-class innovation, but it may be the establishment of translocal networks with other relevant groups globally that will provide a means to overcome the challenges of the ‘tyranny of distance’ prevalent in the nations situation.

To establish these collaborative networks (breeding grounds for collaborative forms of doing business) globally will require two fundamental and very significant critical success factors to be present in nations ICT firms:

- the creation and management of **relational networks**; and
- both the desire and capability for **internationalization**.
Relational Networks and Internationalisation

Porter (1990) suggested that:

"... a company must adopt a global approach to strategy. It must sell its product worldwide, under its own brand name, through international marketing channels it controls. A truly global approach may even require the company to locate production or R&D facilities in other nations to take advantage of lower wage rates, to gain or improve market access, or to take advantage of foreign technology."

Conversely, Hennessey (1995) argued that:

"...to survive in the coming global battles for market dominance, companies have to become increasingly bolder and more creative in their strategic choices. Long gone are the days when entry was restricted to exporting, licensing, foreign manufacturing and joint ventures. New concepts, such as global alliances, have become common and international firms have to include acquisitions, venture capital financing and complex government partnerships as integral elements in strategy configurations."

(p. 327)

Hennessey’s observations are indicative of a significant change in perspective that is influencing business. A purely competitive orientation is now widely questioned by those who suggest that networks, strategic alliances and the development of long-term and stable relationships are the key components of successful competitiveness in domestic and global markets (Buttery 1992; Coote 1993; Hudson 1993; Rowbotham 1991; Johnston 1995; Lehtinen 1995; Koch 1995; Styles 1995; Perry 1995).

The effect such a difference in perspective can have on the formation of marketing strategies is captured in table 8, with a competitive orientation equating to the column titled ‘organization perspective’, and the columns titled ‘distribution perspective’ and ‘social system perspective’ representing more collaborative orientations.

Various authors who have looked at the strategic orientation of SMEs competing in global markets have come to conclusions that support aspects of the model provided in table 8. For example, Axinn (1994) suggested that for firms to succeed in global
markets, they must have a long-term focus and believe in and act on continuous learning, while Haar (1995) suggested that firms must have a long-term strategic focus if they are to compete in export markets. In similar terms, Styles (1995) suggested that for firms to enter export markets successfully they must first develop relationships, while Ramashan (1994) suggested that SMEs use indirect means of exporting to overcome internal and external limitations.
Table 8: Relationship forms across marketing perspectives (Sweeney’s Marketing Perspective)

<table>
<thead>
<tr>
<th>Organization Perspective</th>
<th>Distribution Perspective</th>
<th>Social System Perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>View of trade relationships</td>
<td>Competitively paradigm (zero-sum)</td>
<td>Interactive paradigm (win-win)</td>
</tr>
<tr>
<td>Space of relationship</td>
<td>Competitive independent market</td>
<td>Various forms of contract</td>
</tr>
<tr>
<td>Marketing strategy</td>
<td>Four or five P’s competition (classical marketing)</td>
<td>Marketing strategies continuum (relationship and IMP relational marketing)</td>
</tr>
<tr>
<td>Long-term and complex value-adding strategies</td>
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Others who have compared relationship marketing and transaction (classical) marketing have also concluded that the former offers greater insight when consideration is being made of how SMEs enter and compete within foreign markets (Lehtinen 1995; Styles 1995; Wei 1995).

In the following review of the literature, the internal and external influences that affect SMEs in global markets is firstly examined, before networking and relationship marketing, which both represent a shift to a collaborative orientation, are discussed. As will become evident, these concepts offer an effective framework for understanding foreign market entry and sustained competitiveness by SMEs.
Internal and External Factors that Restrict SME Internationalisation

The literature indicates that firm-specific (internal) factors do have significant effects on the propensity of SMEs to export. Factors identified as significant include:

Attitudes and Values - these have been shown to be aligned to the export intentions of SME principals, with positive attitudes toward exporting being aligned with strong intentions to export and negative attitudes being reflected in weak export intentions. However, this link does not appear to extend to export activity (Jaffe 1994; Axinn 1995; Gray 1995; Ali 1991; Barker 1992; Sit 1989; Erramilli 1993).

Perceptions of Risk – these have also been shown to affect export intentions, with perceptions that export activity is relatively risky adversely affecting export intentions while lower perceptions of risk are reflected in stronger export intentions. Again, however, there is no identified link between risk perceptions and export activity (Cavusgil & Nevin 1981; Roux 1987; Roux & Simpson 1981; Brown & Yau 1995).

Continuous Learning (as an inherent part of the organisation’s culture) – this has been shown to be a precursor to successfully entering and sustaining a competitive position in international markets (Axinn 1995).

Managerial and Marketing Commitment and Skills – these have been shown to affect SME success in international markets, with a dearth of skills and/or commitment limiting success (Barker 1992; Hair 1995; Sit 1989).

Availability and Commitment of Resources (including financial resources) – this has been shown to affect SME success in international markets, with financial resources having the most significant influence (Moini 1992; O’Rourke 1989; Erramilli 1993).

Adjustment of Organisational Structure and Planning – these have been shown to be a necessary precursor to SME success in international markets (Walters 1990; Bijmolt et al. 1994).
Availability and Use of Information – this has been shown to influence the ability of SMEs to compete effectively in international markets (O’Rourke 1989; Moini 1992).

What is evident is that no single internal factor determines SME success in international markets. Rather, each factor will have varying degrees of influence, depending upon the nature of the firm, its markets and the products or services offered. This interrelationship has been shown in three models designed to determine export success: Bijmolt et al. 1994; Brown and Yau 1995; and Aaby and Slater 1984. Equally, external factors appear to impact upon SMEs seeking to compete in international markets. Expanding trade and commercial movements, differences in language and culture, the distribution of wealth between developed and developing nations, the level of industry protection and multilateral, regional and bilateral trade policies, are key macro issues that directly affect the ability of SMEs seeking to enter and compete within global markets. SMEs operating in international markets must manage such dynamic influences as best they can, minimizing negative impacts and taking full advantage of those that may be of benefit to the firm. Noticeably, it is the policies of both home and host governments and economic conditions that have received most attention from researchers (Sammuels 1992; Haar 1995; Moini 1992; Sit 1989; Culpan 1989, Business Council of Australia 1992; Scott 1994).

Networking

As exporters seek to enter and maintain a competitive position in foreign markets they must have as a primary goal the attainment of comprehensive knowledge on the international markets they are targeting, requiring access to relevant, reliable and timely information. However, it is unlikely that such information will be obtained from direct competitors or firms with insufficient experience in the targeted market. For many businesses, the most effective form of information dissemination comes from export networks: “networks established with businesses in a wide range of industries, though with some commonality of product, purpose, or geographical target” (Arnull, Hine & Howard 1995). For a small business, such networks provide a level of information and in some cases where the network is 'hard' rather than 'soft'
(formal versus informal), economies of scope. However, few authors offer us a definitive explanation of how cooperation among firms works.

The Norwegian Industrial and Regional Development Fund address this issue in their publication, 'Business Network Manual: a tool for developing business cooperation' (1995). The report identifies four different types of 'corporate cooperation', defined as:

"...long term, expedient arrangements between separate but related profit centers, which give participants the opportunity to achieve or maintain competitive advantages in relation to competitors outside the ranks of said corporate cooperation" (page 20).

The four forms are defined and illustrated as:

**Strategic Alliance:** goal-oriented cooperation between two or more businesses involving a mutual exchange of resources and/or concerted efforts to resolve problems, based on formal agreements, co-opting and minority stake investments - in conjunctional form.

**Joint Venture:** goal-oriented cooperation among two or more businesses for the mutual exploitation of resources and shared approaches to tasks, which is organized into a separate organization owned and controlled jointly by the parties.

**Business Network:** based on a joint venture and strategic alliance.

**Relational Network:** an open system of business activities that work together on a mutual exchange of resources and common solutions to problems based on a network of strategic alliances, joint ventures and informal relationships.

Fulop (1995) also provides us with a typology of networks, suggesting that:

"...the forms of networking or strategic alliances that are receiving much attention today are those which are generally defined as strategic alliances and include the following:

   i) supplier networks or vertical inter-firm cooperation; and

   ii) high technology networks or horizontal inter-firm cooperation" (page iv).
The two network forms described above deal with what is termed 'primary networks' in Porter's approach and mainly involve enhancing value chain relationships and competitive advantages (Sharpe 1993). Strategic alliances based on vertical inter-firm cooperation typically occur between local suppliers in components, machinery and services areas of manufacturing, who support the value chain activities of large companies, usually original equipment manufacturers (Fulop 1995). Strategic alliances based on horizontal forms of cooperation are usually based on high technology firms, particularly in embryonic industries (Buttery & Buttery 1994; Clegg et al. 1994; Grabner 1993).

'Secondary forms' of networking have also been used by firms for many years and include activities such as joint purchasing, sharing R&D costs, sharing premises, preferred supplier and dealer arrangements, joint tendering, etc. (Lorange & Roos 1991; Fulop et al. 1995). These types of alliances involve large and small firms and some industry sectors have all types of networks (Buttery & Buttery 1994).

However, the literature on networks in their various forms is still emerging and because of the early developmental stages of this literature, there are still many deficiencies. As Fulop (1995) states:

"...allowances are not usually made for such things as the different development stages of networks, their product mixes or intra sector or inter sector dimensions, regional and metropolitan differences and a host of other independent variables that need to be considered" (page viii).

**Relationship Marketing**

Ballantyne (1993, cited in Styles 1995) defined relationship marketing as the process of creating, developing and sustaining stable links in the supply chain to facilitate value exchanges between the parties involved, while Lehtinen and Mittila (1994) further add to the conceptual view of relationship marketing by suggesting that the essence of relationship marketing is the creation of various types of bonds (e.g. social or psychological) between actors, which facilitate a series of ongoing exchange transactions.

Additionally, Christopher et al. (1991) suggested that:
"...marketing has been traditionally about getting customers. Relationship marketing addresses the twin concerns – getting and keeping customers." (page vi)

Christopher et al. also suggested that:

- "Relationship marketing strategies are concerned with a broader scope of external 'market' relationships, which include suppliers, business referral and 'influence' sources.
- Relationship marketing focuses on the internal (staff) relationships critical to the success of (external) marketing plans. 'Internal marketing' aims to achieve continuous improvement in marketing performance.
- Improving marketing performance ultimately requires a resolution (or realignment) of the competing interests of customers, staff and shareholders, by changing the way managers 'manage' the activities of the business.” (page vii)

Furthermore, Christopher et al. depict relationship marketing as focused on bringing together customer service, quality and marketing while arguing that transaction marketing strategies have failed to align these key aspects of organizational activity.

Considering the role of relationship marketing in determining the strategic orientation of the firm, its adoption must also influence the way a firm enters and aims to compete in foreign markets. Styles (1994), in a study focused on the relationship between an exporter and its foreign distributor suggested that:

"...the relational view of exporting has two key implications for the practice of export marketing which contrast sharply with the neo-classical approach. First, it affects the way decisions are made. Theorists within the neo-classical paradigm (e.g. Root 1987; Kotler 1994) state that firms make rationally optimizing export decisions based on the comprehensive collection and analysis of market research and other data. The decision to export is followed by the decision on which market (country) to enter and the marketing mix to be employed. The internal organization that will handle the market is then appointed and the marketing plan executed, which includes the choice of distributor. Under the relational perspective however, export marketing is driven by the sequential development of relationships. Therefore, the
decision to export may in fact be prompted by interactions with potential distributors rather than an abstract analytical decision. The selection of the country and potential distributors follows and marketing mix decisions are then made as a result of interactions with the distributor and other key network members in the export market.”

Equally, other researchers suggest that strategic alliances and other forms of network and the development of long-term and stable relationships are the key components of SME competitiveness in domestic and global markets (Buttery 1992; Coote 1993; Giloy 1993; Hudson 1993; Rowbotham 1991; Johnston 1995; Koch 1995; Lehtinen 1995; Styles 1995; Wei 1995; Perry 1995). Each author suggests that when foreign market entry is being considered by SMEs, relationship marketing provides us with an appropriate framework for understanding the behavior of these firms.

**Conclusions Regarding Collaboration and Internationalization**

It can generally be concluded that SMEs and, by extension, small- and medium-sized ICT companies enter and sustain a competitive position in foreign markets by developing informal relationships and relational networks – that is through various forms of collaboration.

The first conclusion, identifying informal relationships as a strategic approach to market entry and a sustained competitive advantage, is based upon research findings identifying three types of relationship. These were labeled informal/indirect relationships, informal/direct relationships and formalized business relationships. The definitions applied to these three forms of relationship are:

- **Informal/Indirect Relationships**: the relationship is informal and has no direct consequences on the business activities of either party. However, there may be an exchange of information, ideas and views, which may be generally beneficial to either party. Such relationships are most beneficial to the firm when they are formed with associated businesses, key individuals in a given market or ‘experts’ that may be of benefit to the firm.
• **Informal/Direct Relationships:** the relationship is informal, but has a direct consequence on the business activities of each party. They are often characterised by hand-shake deals. There will be an exchange of information, mutual use of facilities and market-oriented activities, which directly benefit each party’s business. Such relationships can be formed with associated businesses, key individuals in a given market or ‘experts’ that may be of benefit to the firm.

• **Formalised Business Relationships:** the relationship has been formalised and has a direct consequence on the business activities of each party. Such relationships are characterised by written and often extensive agreements where resources, knowledge and funding is pooled or allocated, which directly benefits each party’s business.

These findings are best illustrated by Figure 6 developed by Kelly (2000). In essence, Figure 6 indicates:

• a time continuum through which SMEs establish a competitive position in export markets;

• an inverse relationship between the perceived difficulty in exporting and knowledge derived from learning;

• an increasing percentage of firm sales going to export markets as firms establish a competitive position; and

• the establishment of informal relationships and relational networks by SMEs to both enter and sustain a competitive position in foreign markets.

The implications are significant and indicate that SMEs need to incorporate into their strategic planning a considered approach to the development and management of relationships and networks as primary competitive tools. They also indicate that policy-makers must facilitate the development of relationships and networks through the support of such practices as:

• international trade exhibitions;

• greater access to market information that will support the identification of potential international ‘partners’; and
• tax incentives for market research, the establishment of personal, face-to-face contacts and the establishment of synergistic export-oriented networks.
Market entry and sustained competitiveness.

Perceived difficulty in exporting

motivation for SME

positive attitude toward export intentions

establishment of informal and formal relationships and relational networks

market entry and sustained competitive position based on relationship marketing tactics, the maintenance of informal and formal relationships

Knowledge derived from learning

Level of resistance to SMEs entering and competing in export markets:

significant

smaller
Practical Conclusions from the Literature

Inter-firm collaboration is now recognized to be a primary driver of competitiveness and performance, where the rise of interconnected and interdependent networks act as complex adaptive systems giving rise to the fundamental requirement to collaborate. However, the process of establishing and maintaining strong and fruitful collaboration between firms is not well understood and as a result most attempts to manufacture such associations fail.

The primary cause of failure is that facilitators perceive collaboration from a technical and/or mechanistic perspective. They examine how competencies and capabilities can be transferred between firms before trust and commitment, key determinants of strong and positive bonds between individuals and groups, are created. In essence the human dimension is seen as peripheral rather than central.

To facilitate collaboration, trust and commitment must be developed first. That means that individuals and groups need to be given opportunities to meet for extended periods and for interaction and dialogue to be facilitated. As part of this process individuals need to be encouraged to spell out the values that underpin their business, their goals and aspirations and the competencies and capabilities they have and need. Only through such interaction and dialogue can potential collaborators come to an understanding of each other.

From these ‘human’ interactions, scope is created for firms to examine the opportunities for collaboration in a more structured format. At this second stage firms need to undertake a critical evaluation of their firm, extending their own understanding of the competencies and capabilities they have and need. This check list can then be used as a basis for firms to compare comparative strengths and weaknesses and therefore begin the process of identifying specific areas where collaboration will be mutually beneficial. This is the third stage.

The process from here on is iterative. From an understanding of each firm and key individuals at the human level, tactical collaboration can be undertaken as a trial. Subsequently, as understanding between collaborators is enhanced, trust and commitment will deepen, leading to deep pocket alliances that facilitate strategic alliances. This can be viewed as the fourth stage and will often require one-on-one coaching.

A programme to facilitate collaboration is therefore a four-step process. Initially interaction between major stakeholders is organized and a format provided that
facilitates discussion pertaining to them and their organization. This is semi-structured and facilitation is needed as a means by which interaction and dialogue is enhanced and not stifled. The second stage involves an in-depth self analysis, which is provided as a structured format and which results in firms identifying their strengths and weaknesses as reflected in their competencies and capabilities. The third stage involves a comparison of this needs analysis, with firms sharing and comparing their self critique. Again this needs to be a semi-structured process, with facilitators assisting firms to identify areas where collaboration may be mutually beneficial. The final stage is very much a coaching stage where firms are supported in their endeavors to set up specific collaboration by trained facilitators who work one-on-one with firms. The extent of coaching required will be dependent on the experience and skills of the collaborators.
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