Small Firms, their Customers and the Value of Strategic Alliances and Networks to Innovation

Dr. Tim Mazzarol
Centre for Entrepreneurial Management &
Innovation, GSM
University of Western Australia
mazzarol@gsm.uwa.edu.au

Abstract

This study examines the strategic network behaviour of small firms with particular focus on the role of leading customers in driving performance and adding value. Drawing on a survey of small firms in high technology and innovation intensive industry sectors, the study examined the value these firms placed on different types of strategic alliance from a financial benefit perspective. The most valuable relationships were viewed as those involving working with customers to develop new products and innovation ideas. These findings highlight the key role that customers play in the innovation and performance of small firms. They suggest that attention be given to the customer-firm interface in future industry innovation support schemes.

Keywords: *Small Business, Entrepreneurship, Innovation, Strategic Alliances, Networks.*

The Importance of the Customer to Innovation

The possession of a strong market orientation that enables a firm to closely monitor and respond to the needs of customers has been recognised as a key element in the successful development of innovation (Quinn, 1985). Successful innovators establish strategic partnerships within their industry supply chain, developing close relationships with lead customers and key suppliers, as

well as third-party "resource network" partners such as banks, venture capital suppliers and providers of new technology (Holmlund & Tornroos, 1997).

While all customers are important, the "lead customer" is the most significant. Lead customers are defined as those that are dominant in their industry and generally have above average levels of competitiveness. Such customers are frequently demanding and push their suppliers to enhanced levels of performance. Lead customers assist the innovation process by demanding high standards and continuous improvements in both product differentiation and cost reduction via process enhancements. They also keep the innovator firm informed of new market trends and frequently serve as development partners, generating ideas for innovations and assisting in their eventual implementation (AMC, 1994). A similar relationship can be developed with "key suppliers" or those suppliers that provide a critical level of components to the firm.

Miller (2001) argues in favour of closely engaging with customers and suppliers to examine needs and possibilities in what has been described as a Fourth Generation (4G) spiral process for innovation (Miller & Morris, 1999). Within business networks the interaction between the supplier firm and its lead customers can lead to this type of innovation and diffusion process. Collaboration over identifying new products or processes can be achieved if such customer-supplier relationships are carefully leveraged.

Japanese Keiretsu organisations, for example, have traditionally developed strong network partners between their lead customers, key suppliers and third-party resource networks. Compared with their American and other "Anglo" business counterparts, the Japanese tend to maintain very close relationships between suppliers and manufacturers with engineers from supplier firms engaging from an early stage in the development of new products. A common approach sees engineers from the supplier firms working within the R&D departments of the prime manufacturer (focal firm) as "guests" or even on a permanent basis. Relationships among

the Japanese Keiretsu member firms are traditionally long-term and based more on trust and reputation than price (Echeverri-Carroll, 1999).

The importance of this level of partnering for organisational innovation is the role it plays in enhancing knowledge flow between the network partners. Lead customers, particularly those located within international markets, are an important source of information and ideas for new product or market opportunities. Research undertaken with Western Australian firms supports this view. As shown in this paper the development of strategic alliances with lead customers is a critical element in the success of small firms in high innovation oriented industries.

Three Layers of Network Relationships

Strategic network relationships operate on three broad levels or layers (Holmlund & Tornroos, 1997). The first of these is that of the production network layer, which consists of the vertical supply-chain relationships flowing through a particular business activity system. Critical to this are the key suppliers and lead customers that make up the production network in which the firm operates. Key suppliers are those firms that offer critical inputs to the firm and who would degrade the firm's competitiveness if they allowed their own quality or efficiency to degrade. Lead customers are typically dominant in their own industries and have above average levels of competitiveness. They assist the firm to benchmark its quality to the highest levels, and consistently drive up performance standards. Due to the dominance they have in their own industry, lead customers offer firms access to new markets and increased sales. Lead customers also serve as a source of new ideas and often collaborate with their suppliers to foster innovation (AMC, 1994).

In addition to the production layer, the strategic network also consists of the resource network layer and the social network layer (Holmlund & Tornroos, 1997). The first of these comprises those actors that control various resources necessary for the production process to take place. Typical actors within a resource network are financial institutions (e.g. banks, venture capital

firms), insurance providers, transport, storage and communications industries, education and training institutions. It can also include research centres or even firms in other industries that can provide complimentary goods and services or transfers of technology (e.g. packaging technology). The third layer is that of the social interaction that takes place between personnel from the firms within the network. Social interaction can be both formal and informal in nature and has been found to be an important source of innovation due to the sharing of knowledge that takes place (Hogberg & Edvinsson, 1998).

Interpersonal communication between individuals within the social network layer, particularly at an informal level, has been identified as a major source of innovation (Senker & Faulkner, 1996). It is important for individuals to move away from their traditional circles homophilous groupings, where relationships are usually strong but knowledge exchange is isomorphic (similar), into new circles hetrophilous groupings (Steward & Conway, 1996). Within these latter groupings social relationships are not as strong, but new ideas and tacit knowledge can be exchanged via social interaction (Nonaka & Takeuchi, 1995). Individuals seek to enter into new knowledge exchange relationships by choice and by doing so reshape their perceptions and develop new mental models frequently resulting in innovation (March & Olsen, 1988). From the firm's perspective the development of knowledge networks, both within the organisational boundaries and across the strategic network via the social layer, is one of the most important long-term challenges for management (Seufert, von Krogh & Bach, 1999).

Small Firms and Strategic Networks

Small, independently owner-managed firms exist within a network of actors consisting of customers, suppliers, financial institutions, government agencies, local authorities, employees, other firms and stakeholders (Jennings & Beaver, 1997). The owner-managers of small firms can leverage such networks to secure resources that they do not possess within their own organisation with resulting competitive advantages (Ostgaard & Birley 1994).

The strategic alliances that form the basis of the networks within which small firms operate can range from loose affiliations with limited commitments and relatively little allocation of resources, to tight associations marked by amalgamation. Such alliances can take place with customers and suppliers, or with other organisations including firms in other industries (Jarrett, 1998).

Independently owner-operated small firms are usually dependent on the managerial competencies of their owner-managers for success, and their networking behaviour is frequently the result of a process of formal or informal social interaction between the owner and others (Donckels & Lambrecht, 1997). Key factors influencing network formation among small firms are the owner-manager's propensity to engage in social networking, the strength of ties that are formed in such networks and the social prestige attached to membership of the network. Such things as the age and education of the owner-manager, the size of their firm and the industry within which they operate can influence these primary motivation factors. What a network does (its purpose) may be more important than how large it is (BarNir & Smith, 2002).

Small firms that enter into networks are likely to do so as a result of their owner-manager's perception that they offer one or all of three key functions. The first of these is their capacity to create new value for the firm by assisting in the development of new products or markets, accessing new technologies or enhancing quality. Second, they may help to build existing business capability by accessing financial resources, knowledge and skills, or sourcing physical capital or information. Finally, the network may serve to help the firm defend its market position though joint promotion, the establishment of barriers to new market entrants or protection against substitutes (Jarrett, 1998).

Previous research into the development of alliances and networks among small firms in Australia suggests that owner-managers view networks as source of sharing ideas and resources, but understand the concept poorly. Networking also appears to be more prevalent among service

firms than manufacturers. Major barriers to the formation of networks are the perception by the owner-manager that they would lose their independence or suffer a leakage of commercially valuable ideas. The owners of newer, less established firms were more likely to hold such concerns than older, more established companies (Dean, Holmes & Smith, 1997).

Alliances within networks for small firms can be both formal and informal and can take place with customers, suppliers and third party network actors such as other firms in the industry, research centres, education and training or financial institutions. Given the importance of the owner-manager in the decision to form an alliance, it is within the social network layer that attention needs to be given in seeking to understand the networking of small firms. A personal network – whether formal or informal in nature – is a valuable source of knowledge and ideas for the owner-manager and can assist them in making strategic decisions (Hogberg & Edvinsson, 1998).

Common causes of network failure include the attempt by a large focal firm to appropriate the resources of other network partners, or an attempt to interfere too much in the operations of their suppliers or distributors. A lack of trust or poor communication between network members can also lead to fatal damage to the alliance. Finally, if the network actors become overly specialized and narrow in their focus, they can lose their ability to innovate and the alliance may see its competitiveness reduced over the long-term (Miles & Snow, 1992).

Sampling and Methodology

A sample of 113 firms was drawn from three surveys undertaken within the information and communications technologies (ICT), ship and boat building, offshore oil and gas, and defence technologies sectors. Sixty-one percent of firms were small (less than 20 employees), with 34 percent being medium-sized enterprises (21-200 employees) and only 5 percent being large. The majority of firms (69%) had less than AUD$5 million in annual turnover. Fifty-five percent of these firms were engaged in export, with the average having commenced exporting around ten

years earlier. Forty-five percent of firms indicated that they had a formal or well-defined process to carry ideas through to commercial implementation. Of these, 60 percent considered that this formal innovation process had been effective.

Firms were selected from government and industry databases and sent a questionnaire that examined their strategic networking behaviour and approach to innovation. Questionnaires were mailed to the senior manager or Chief Executive Officer (CEO) of each firm with a covering letter explaining the purpose of the study and enlisting their participation in the study. All responses were gathered on an anonymous and confidential basis.

A measure of how innovative these firms were is gauged by the finding that an average of 18 percent of their annual turn over was spent on innovation and R&D. To put these findings into context, an examination of the gross expenditure on R&D within Australia and other OECD countries within businesses during the 1990s found that the average was between 1.5 and 3 percent (AMC, 1994). Further, a research study of innovation within European industry found investment in R&D comprised about 20 percent of total expenditure among firms and comprised between 0.3 and 3 percent of total sales turnover (Evangelista, Sandven, Sirilli & Smith, 1998). Investment levels of 18 percent of gross turnover found among the firms in this sample suggest a high level of innovation intensity.

Partnering with Lead Customers

Seventy-nine percent of these firms had worked closely with their lead customers to develop or improve products and services, and their relationship with these customers had significantly strengthened over the past three years, becoming more “partnership-like” and less “arms-length”. Face-to-face contact between lead customers and senior managers from these firms was rated as the most important means of communication that the firm could undertake. Direct contact between lead customers and senior managers from these firms took place frequently with at least 60 percent meeting monthly. It should be noted that most of these firms were engaged in

exporting and the majority of lead customers were located overseas or interstate, requiring senior managers to travel regularly to hold such meetings.

The majority (62%) had formal agreements with customers at the local or state level. Such agreements were found among only 43 percent of firms at the national level and 34 percent of firms at the international level. A similar pattern emerged for these firms and their suppliers. Fifty-eight percent of the firms had formal agreements with local suppliers, 55 percent had formal agreements with national suppliers and 24 percent had formal agreements at the international level.

The nature of these alliances varied in intensity and nature with the most common joint initiatives and alliances relating to product development and marketing. Table 1 shows the proportion of such alliances that these firms had maintained over the previous 2-3 years. It can be seen that while many of the firms had national and international linkages, the most common were still taking place at the local level. As shown in Table 1, up to half the firms were engaged in product development and marketing and promotion activities with locally-based customers and suppliers.

Table 1: Joint Initiatives and Alliances by type over previous 2-3 years

Type of initiative	*Local level*	*National level*	*International level*
Product development	48%	33%	32%
Marketing/promotion	41%	35%	31%
Product research	35%	32%	25%
Production	25%	16%	17%
Process R&D	22%	14%	16%
Export distribution	13%	10%	20%
Venture capital raising	10%	7%	10%

Local production networks (LPN) have been identified as playing a key role in the enhancement of industrial clusters that strengthen the competitive advantage of local industries (Porter, 2000). Well-established local networks that unite firms' supply chains and production networks for

enhanced efficiency and productivity at the production network layer are frequently concentrated around focal firms. Such firms are usually large in size and serve as lead customers for smaller supplier firms. The focal firm serves as a strategic centre and generates opportunities for small firms by serving as a lead customer and a generator of innovation within the strategic network that surrounds them (Lorenzoni & Baden-Fuller, 1995).

Value of Alliances

The firms were asked to indicate what they considered to be the value (as measured in financial benefits) of various types of alliance. Table 2 shows the findings from this set of questions. It can be seen that the most valuable type of linkage or alliance (in the opinion of the firms) was those that they held with their lead customers. This was followed by those that they had with key suppliers.

Table 2: Financial Benefit of Linkages

Type of Linkage or Alliance	*Valuable or Extremely valuable*	*Mean*	*Std. Deviation*
Working with lead customers	86%	4.22	.993
Working with key suppliers	60%	3.51	1.245
Joint marketing financial benefits	45%	3.09	1.258
Government support benefits	46%	3.01	1.497
Access to technology benefits	29%	2.83	1.229
Joint product development financial benefits	33%	2.82	1.338
Joint research financial benefits	27%	2.66	1.272
Joint distribution financial benefits	28%	2.54	1.239
Joint production financial benefits	15%	2.22	1.223

As noted earlier, the strong relationship that a small firm can develop within its production network with its customers and suppliers is likely to yield strong benefits in the form of enhanced business, increased sales and the opportunity to secure market growth through the identification of innovation in products and services.

Factor Analysis

An exploratory factor analysis was used to examine the items presented in Table 2. This used a principal components analysis with varimax rotation to generate a simple structure for subsequent interpretation. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy for the nine items was 0.80, with a Barlett's test of sphericity significant at the 0.005 level, suggesting that the data was suitable for factor analysis. Two factors were generated with eigenvalues greater than 1 after 3 iterations that explained 54 percent of the variance in the model. Six items loaded onto the first construct with factor scores ranging from 0.80 to 0.49. The other three items loaded onto the second construct with factor scores ranging from 0.78 to 0.53. These factor loadings suggested that the model was fairly robust (Stewart, 1981). Subsequent analysis of the reliability of these scales using Cronbach's alpha (Cronbach, 1951), found the first construct to have an alpha score of 0.79 and the second an alpha score of 0.54, suggesting that they were a relatively good measure of these dimensions. Table 3 shows the results of this analysis.

As shown in Table 3 the first construct was comprised of six items relating to the financial benefits to the firm of linkages that resulted in joint product development, joint research, joint production, access to technology, government support and joint marketing. These items deal with the type of activities usually associated with collaborative R&D and frequently occur within the resource network rather than the production network. They are essentially about securing access to additional resources (e.g. production capacity, marketing reach, technology, funding) that the small firm typically lacks. By contrast the second construct was comprised of the three items

relating to lead customers or key suppliers or joint distribution of existing products. These activities are all mostly focused on the production network layer. For this reason the first construct was titled "*Resource Network Benefits*", and the second "*Production Network Benefits*".

Of these two constructs the most important (as measured by the firms) was *Production Network Benefits*, with a mean rating score of 3.42 on a five-point scale, as compared to *Resource Network Benefits* with a mean rating score of 2.77.

Table 3: Factor Analysis

	Component	
	Factor 1	Factor 2
	Resource network benefits	
Joint product development financial benefits	.802	
Joint research financial benefits	.773	
Joint production financial benefits	.724	
Access to technology benefits	.673	
Government support benefits	.668	
Joint marketing financial benefits	.494	
		Production network benefits
Working with Lead customer financial benefits		.782
Working with Key supplier financial benefits		.743
Joint distribution financial benefits	.517	.533
Eigenvalues	3.578	1.306
% of variance explained	39.75	14.52
Cronbach alpha	0.79	0.54

Discussion

These findings suggest that the value of alliances and networks to small firms is viewed by their CEOs' as predominately weighted toward the production network and in particular the customer or lead customer, as opposed to the resource network and the kind of third party network support actors that might participate in joint R&D or product development (e.g. universities). It was notable that 73 percent of firms surveyed considered the Commonwealth Scientific and Industrial Research Organisation (CSIRO) to be of little importance to their innovation process, with just over half (52%) of firms holding similar views toward universities. Realistically the interaction between such high-level research centres as the CSIRO and universities, and SME may never be high for more than a small proportion. Small firms are often disadvantaged in relation to collaboration with publicly funded research centres. Although the Australian Research Council (ARC) "Linkage" grants program seeks to support collaborative research involving SME, the need for the industry partner to commit matching funds and also the heavy time commitment of key personnel can serve as a disadvantage. Further, the cycle-time from initial research to full commercialisation can take years rather than months, and many SME need faster product development cycles.

These findings highlight the central importance to the small firm of the customer and the role the lead customer plays in driving innovation. The most important function of the lead customer was to drive performance with 73 percent of firms agreeing that this was a key role their customers played. Another role for the lead customer was serving as a market opinion leader. Sixty-nine percent of firms agreed that this was a key role for their lead customers to play within their production network. This supports the findings of Jarrett (1998) who suggested that small firms use strategic alliances and networks either to secure market opportunities or defend market position.

It suggests that small firms are less likely to engage in developing their resource networks and investing in more complex collaborative relationships focusing on R&D. Publicly funded research centres (e.g. universities or CSIRO) may not be easy partners for small firms seeking to develop innovation as they cannot offer direct market benefits as can customers. However, small firms must consider the need to also widen their resource networks and secure support through collaborative partnerships, with resource actors such as universities or government agencies (via support schemes). Through such resource networks these firms can frequently undertake more advanced innovations.

Conclusions and Policy Implications

The small firms sector is viewed as important to the successful development of Australia's economy and federal and state government funding is being directed toward assisting such firms to enhance their innovation outcomes. As this study suggests, the focus for most SME is on their production networks, particularly their customers rather than their resource networks. This is unsurprising from the perspective of the SME, but suggests that innovation support schemes for small firms should be more carefully targeted at the production network layer rather than the resource network. It is at the point of interface between the small firm and its lead customers that attention should be given. Assisting SME to find high quality lead customers, particularly international ones, and strengthening their relationships with such customers and key suppliers through enhanced quality management and business development processes should be high priorities for both entrepreneurs and government support schemes.

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