Virtual SME Networks: Pathways towards Online Collaboration
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The Internet and portability of technologies are changing the way we are doing business. Electronic business and commerce (e-commerce) platforms purportedly provide companies of all sizes with opportunities for economies of scale, process efficiencies and mechanisms for electronic advertising, retailing, trading and transaction. Australian small and medium size enterprises (SME) have, however, been reluctant to embrace information and communication technologies (ICT) and e-commerce because they fail to see the value of such tools. While SME are still coming to terms with core ICT adoption and strategic e-commerce directions, individual SME connectivity and e-commerce adoption inertia has been upstaged by collaborative network trends. Competitive advantage is becoming embedded in collaboration, networking and (virtual) clustering. This paper discusses the pathways towards online collaboration that address both industry or network needs and the capabilities, needs and attitudes of individual SME.

In line with global trends, the influence of the Internet has spread considerably throughout Australian households. According to the Australian Bureau of Statistics (ABS), between 1998 and 2000 the number of households with Internet access jumped from roughly one in every eight, to one in every three households (or 4 million households). Furthermore, it has been forecast that by the end of 2001 every second household in Australia would have home Internet access (ABS, 2000a). A recent study affirmed that around 52 percent of Australian households were now connected to the Internet (NOIE, 2002).

The ratio of businesses with a web presence has also grown rapidly, rising from a mere six percent in 1997-98 to 22 percent in 2001 (ABS, 2002). For example, on 30 June 2001 virtually every large Australian business (those employing 100 or more persons) used computers (100%) or had access to the Internet (99%), while 81% had a Web presence. Ausregistry, which runs the Australian domain names or web site address registrations, reported a three percent increase in new domain names, formerly estimated at 220,000, after new website registration regulations took effect on July 1, 2002 (Mackenzie, 2002). The rapid diffusion rate of information and communication technologies (ICT) in Australia, indicate that business uptake figures will have risen considerably in 2003.

E-commerce is defined in this paper as “technology-mediated exchanges between parties (individuals, organisations, or both) as well as the electronically based intra- or interorganizational (sic) activities that facilitate such exchanges” (Rayport & Jaworski, 2001, p3). E-commerce has been called the Information Revolution, synonymous what the railroad was to the Industrial Revolution (Drucker, 1999). While still in its infancy, e-commerce developments have taken off on a global scale. Business-to-Consumer (B2C) e-commerce conducted via the Internet is projected to have a significant impact on global and national economies. It is estimated to be in the hundred of billions of US dollars globally, although the value of B2C e-commerce is still insignificant in
terms of the total output, e.g., Gross Domestic Product (GDP), employment and trade, of many national economies (NOIE, 2002). Even more so than B2C, Business-to-Business (B2B) e-commerce has significant economic potential, especially in terms of greater profitability due to decreased production costs and increased product supply efficiencies (The Allen Consulting Group, 2002).

The 2001 Science, Technology and Industry scorecard (OECD, 2001a) ranks Australia as having 80-90 percent Internet penetration in businesses with ten or more employees. If the scorecard is correct, then Australia can expect accelerated e-commerce market development and growth. Earlier key findings of a major Australian e-commerce research initiative by the National Office for the Information Economy (NOIE, 2000a) confirm that e-commerce will bring substantial net benefits to Australia’s economy. Internet-based commerce in Australia is predicted to grow from US$5 billion in 2001 to US$7.8 billion in 2005 (New South Wales Business Investment Division, 2002).

Web-based business can clearly be an extremely attractive option for firms. By building a platform for sustained efficiency gains, the net benefits of e-commerce for any industry and business have the potential to be considerable. Australian states and regions that have industry sectors offering products and services rather than commodity export activities are expected to enjoy efficiency gains (NOIE 2000a). Such gains would be brought about by industries that make the most use of e-commerce. Industry sectors that are most likely to expand into the e-commerce arena are expected to be those that offer products and services that are amenable to e-commerce. These sectors include information technology, tourism, entertainment, banking and finance. Growth is expected to come predominantly from B2B activities with larger companies extending e-business operations, government scaling-up e-procurement activity and increased e-business participation by small and medium size enterprises (SME) (NOIE, 2000b).

The evolution of B2B e-marketplaces reflects the Internet’s steady maturation. As a business entry point, e-marketplaces can perform a number of functionalities, ranging from advanced personalisation, to supply chain management, electronic data interchange, workplace integration, and customer relationship management (CRM). Connectivity has boosted conventional reasons for inter-firm networking and clustering, e.g., creating critical mass, as it facilitates the knowledge-based infrastructure network imperative for today’s competitive advantage (Porter, 1998). The technology-enabled landscape provides the capacity for firms to collaborate with former competitors and potentially achieve “competitive co-evolution, enhanced by digital platform features” (Ordanini & Pol, 2001, p.282). B2B marketplaces tend to create value in generating lower prices for buyers and streamlining buyer and supply chain operations. To date, most B2B transactions in Australia involve large corporate industries and business-to-government (B2G) transactions, e.g., the Tasmanian Logistics Online project processes 11,000 consignment transactions per month on behalf of the Tasmanian transport sector (Henderson, 2002).

Considering B2B volume and revenue statistics alone is, however, likely to create an uneven picture of the spread and significance of Australia’s Information Economy (The Allen Consulting Group, 2001). Although B2C type transactions appear to have fallen out of favour with Internet analysts and investors after the demise of many ‘dot com’ companies (The Allen Consulting Group, 2002), it is important not to overlook B2C impact on the Australian economy. Especially in terms of B2C portal technology uptake by Australian SME, which make up 96 percent of all business enterprises in the private non-agricultural sector (ABS, 2000b).
There are still relatively few Australian B2B marketplaces for small firms, since value creation through online clustering does not yet appear to be a core objective for Australian, largely service sector-based SME. This is not to say that there are no initiatives to foster SME online clustering. The Commonwealth Government, for one, is actively encouraging online SME clustering through its Information Technology Online (ITOL) program. ITOL was designed to accelerate the national adoption of B2B e-commerce solutions and be "a catalyst for SME industry groups to come together to solve common business problems on an industry-wide basis, rather than working individually and developing multiple solutions and, in some cases, duplicating outcomes" (NOIE, 1999, online). ITOL provides seed funding for a broad range of activities, including portal and industry network development.

ICT and Australian SME.

One might think that the rapid development of the Internet as a communication, marketing and transaction channel would appeal to SME, but to date Australian SME have displayed reticence towards adoption of networked technologies. Despite the anticipated growth in online activity, e-commerce uptake among Australian SME has remained slow (NOIE 2002). Australian SME, defined as less than 20 employees in small firms, and less than 100 employees in medium size enterprises, appear to identify much less with the Internet than larger companies and hence have a lower rate of participation (The Allen Consulting Group, 2001). In contrast to large companies, SME and micro businesses (those employing fewer than 5 persons) had a notably lower level of ICT adoption; 79% used computers, 64% had access to the Internet and only 14% had a Web presence (ABS, 2002).

Adoption of e-commerce -- referred to here in terms of connection, electronic data exchange and transaction capability via the Internet -- and networked technologies by SME is directly related to the size and nature of SME and largely depends on their perception of affordability and opportunity for their business (OECD, 1998). Although over sixty percent of Australian SME -- many of which are regionally based -- now have Internet connectivity (The Allen Consulting Group, 2001), there are still substantial issues related to the uptake of e-commerce by Australian SME. As a result, small firms have not been adopting e-commerce with the same speed their larger counterparts do (Van Beveren & Thompson, 2002).

For many SME the Internet is still a new product. Awareness, adoption and implementation of e-commerce technologies, access to electronic markets, acquisition of technology skills and knowledge, firms’ abilities to control electronic market entry and exit terms have been identified as common e-commerce barriers facing SME around the world (OECD, 2001b). Australian research into the adoption of networked technologies has indicated that Australian SME not only hesitate to invest their precious time and money in a rapidly changing e-commerce economy, they also perceive innovation policies as pertaining to large firms and are hence suspicious of e-commerce regulations (NOIE, 2000a). Apart from fear of competitors’ use of the Internet and uncontrolled growth, many small Australian firms lack technology skills and a strategic sense of how to move forward (NOIE, 2000b). The relatively higher cost of access to rural telecommunications networks, unreliable service and lack of bandwidth in regional and rural areas have also proven to be significant ICT and e-commerce uptake barriers (Opticon Australia, 2001). Australian research also cites lack of human resources to manage web-related tasks, lack of relevant skills and lack of partnership programs as the main e-commerce uptake deterrents for manufacturers (Van Beveren & Thompson, 2002). The latter is of interest considering that Australian SME tend to be individualistic in nature and past partnership program initiatives have not always proven successful (Braun, 2002).
From all these studies, it may be deducted that Australian SME have vastly differing requirements from large companies in relation to e-commerce adoption. So far the major communication application of the Internet that has been adopted by Australian SME is email (Skillsnet Association Cooperative, 2001; Van Beveren & Thompson, 2002; Braun 2003), which is in line with ICT adoption by SME studies in other countries (Walczuch, Van Braven, & Lundgren, 2000).

Joining the e-commerce market as a sole trader, let alone becoming part of an inter-firm network or B2B virtual cluster stakeholder is likely to entail an enormous conceptual leap into the future for many SME managers. Ghoshal et al (2000) describe the process of adopting e-commerce and moving up the value chain as a steep learning curve (Goshal, Bartlett, & Moran, 1999). Earl (2000) posits that becoming an e-business is an evolutionary process entailing six phases: (1) external and (2) internal communications phases; (3) e-commerce strategy phase; (4) e-business processes phase; (5) e-enterprise operational phase; and, finally, (6) adoption of a dynamic e-business model or transformation phase. Once the e-business transformation steps are completed and the business has successfully negotiated the journey of becoming an e-business, e-business has become the norm and the ‘e’ can be dropped out of e-business (Earl, 2000).

The latter framework applies to large companies, but may be useful to consider in e-business adoption processes for small firms and networks. Earl’s model also stresses the need for continuous learning and change to help identify evolving e-business issues such as the integration of new technologies and online value creation.

Partnership programs, such as the ITOL program (NOIE, 1999); which are intended to foster SME aggregation and collaboration for competitive advantage, appear to ignore general SME uptake barriers. As a result, as a recent analysis of the ITOL program revealed, the majority of funded projects tended to be temporal exchange relationships within networks that ceased to exist once funding dried up (More & McGrath, 2003).

Fostering Online Collaboration
All signs point to network formation needing to be sustained by more than political rhetoric and one-off funding. Indeed, given the barriers identified vis-à-vis ICT and e-commerce adoption, a collaborative network culture would need to be fostered.

Figure 1 considers a number of steps towards the fostering of such a (virtual) network culture. These steps are designed to move SME away from atomistic and competitive-exclusive behaviour towards a co-petition (Brandenburger & Nalebuff, 1996) or competitive-inclusive culture.

<table>
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<th>Steps</th>
<th>SME Needs</th>
<th>Suggested Actions</th>
<th>Potential Outcomes</th>
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<td>1</td>
<td>Reduction of isolation</td>
<td>Support to reduce ICT fear &amp; resource issues</td>
<td>Willingness to take virtual cluster plunge</td>
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<td>2</td>
<td>Communication and tailored education</td>
<td>ICT &amp; e-commerce understanding and skills</td>
<td>ICT competence and awareness of networked opportunities</td>
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<td>3</td>
<td>Adoption of networked technologies</td>
<td>Sustained external funding</td>
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<td>4</td>
<td>Networking via industry &amp; regional associations</td>
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<td>5</td>
<td>Trust</td>
<td>Fostering of cooperative culture in collaborative learning contexts</td>
<td>Increased network relationships &amp; competitive advantage</td>
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Figure 1 – Network building steps
In courting SME to participate in new communication channels such as a web portal, the network will need to have appeal for SME. SME tend to think individualistically and with their hip pocket and will need a clear understanding of “what’s in it for me”. Merely providing a platform or espousing rhetoric that the portal will become the primary network structure for SME communication and e-business capability means little when the stakeholders do not see the value proposition and hence remain disinterested in using the portal structure as a communications and transactions vehicle.

SME will likely have varying levels of digital literacy and lack understanding of the potential strength of interactive communication across business and customer strata and clustering benefits. Awareness, confidence and competence in e-business plays a significant role vis-à-vis e-business platform adoption, but it will be some time before SME are ready to drop the ‘e’ out of e-business and consider e-commerce part of their daily business routines (Earl, 2000). We have known for some time that e-commerce novices need substantial encouragement and support to make them willing to take the e-business plunge, but it is especially the soft innovation issues, such as awareness, capacity and resource building they need help with (Simpson, 2002). For many SME, ICT is a language they do not understand and e-commerce a product for which they have no use. SME hence need considerable encouragement to move into, get comfortable and take mental, physical and virtual possession of the ICT domain.

One way towards ICT adoption is generating understanding for these issues through regional relationship building. Regional bodies such as industry associations are ideally placed to play a facilitating role in creating SME awareness through appealing e-business opportunities. When adequately resourced, industry bodies could not only take a hands-on interest in their own industry, regional or local business portal, but also use upstream and downstream supply channels to disseminate a better understanding of ICT in general and portal-centric strategies in particular. For SME initial ICT value lies in the debunking of ICT jargon, cutting connectivity cost, gaining online visibility and obtaining e-commerce skills. By offering skills development through linkages with local networks and regional training institutions - local industry leaders or associations would be in a better position to inspire trust in their new media leadership.

In the context of emerging technologies and related knowledge-economy business models, linking stakeholders in dynamic clusters is believed to enhance competition and regional innovation (OECD, 1999). However, European studies on SME positioning in the new economy (Cooke and Wills 1999; Fariselli et al 1999) demonstrate that SME networking is contingent on favourable economic climates, e.g. government-sponsored external networks, with such institutional factors directly affecting the relationships amongst different economic actors. Australian government bodies have certainly shown support for industry-based ICT clustering. But while network building and collaboration are considered the cornerstones of the new economy, political rhetoric needs to be supported by sustained external funding.

Since Australian SME are not naturally prone to collaboration, SME will need sound reasons to build social or bridging capital between them and have reasons to be united in a virtual environment. SME isolation may be reflected in weak ties across myriad disconnected networks supported by the cultural norm within an industry or region, which may negatively impact on virtual clustering. A systemically embedded culture of competition and autonomy may also prevent virtual clustering from taking place. Again industry and local associations can take a leadership role in overcoming SME isolation and competition by enabling information flows.
towards horizontal and vertical supply and value chain building. SME complementarities and value creation are not always apparent or naturally established, but rather need to effectively be created by matching infrastructure with local attributes and SME profiles.

Mapping and coordination of complementary assets of the supply or service chain have the potential to uncover SME clustering interest. Once value chains are established market differentiation can be created through content, transaction and e-governance aggregation (Amit & Zott, 2001). In the case of SME, a one-size-fits-all recipe for a successful transition to virtual clustering would be unrealistic. Cluster solutions need to suit local needs, which may mean that a regional digital value chain model is an aggregation of local value chains that have achieved market individuation through sub-regional differentiation based on local attributes and information flows. In other words, a niche cluster analysis is required that pays heed to local nuances (Morgan, 2001).

Information flow requires interaction, engagement and repeated face-to-face socialisation (Nonaka, Toyama, & Nagata, 2000). Socialisation in turn reduces uncertainty, increases social capital and promotes trust (Adler & Kwon, 2002; Gulati, 1995). But building social capital requires time and commitment, which cannot be accomplished overnight. Not all SME will have the capacity or interest to network. If there are weak ties between the SME in the industry or local domain, poor communication channels may be preserved and the ICT or portal adoption process may be politicised. Hence, a first logical step towards improved communications within the cluster would be to incorporate and adequately resource information and learning flows that involve breaking down SME communication barriers and build trust. Trust accumulates over time and is achieved by actors showing commitment to the relationship (Giddens, 1994). Trust is also said to reduce fear of opportunistic behaviour and improve collective learning (Gulati, 1995).

Increased face-to-face communication is bound to augment SME rapport and positively influence parochial and competitive biases. In due course, such rapport would likely be conducive to establishing virtual proximity and enhancing (ICT-based) information flows. It would, however, be remiss to think that attaining virtual proximity could replace face-to-face interaction altogether (Morgan, 2001). As Brown and Duguid (2000) have rightly argued, rich social networks cannot be formed by ICT alone. The context in which information is embedded is as important as the information itself. Too often, however, we think of context only as a spatial setting or local backdrop against which communication is taking place, rather than viewing it as a complex, interwoven social system (Harris, 1998).

**Conclusion**

To foster an inclusive cluster culture for SME, an appropriate balance needs to be struck between autonomy and competition. There are some encouraging examples on successful virtual collaboration in the agriculture and tourism sectors (Insights, June 2002). In one farmer-driven agricultural cluster competitive advantage is being created through social cohesion, the exchange of information, farmer learning and, perhaps above all, a shared vision, drive and passion (Lowe & Berrisford, 2002). In Daylesford, Victoria, a collaborative e-commerce gateway was successfully adopted as an additional destination sales channel and supply chain booking service (Multimedia Victoria, 2002).

From these examples we can learn that the structure and culture of the network and the manner in which the linkages between SME are formed and maintained are critical. SME that still hesitate to join a virtual network will require an understanding of how competitive advantage is created as well as tangible economic rewards to willingly participate virtual clustering, e.g., ICT skills, access to
valuable industry knowledge, enhanced market visibility, global positioning and strategic leverage in the knowledge economy.

These steps are but an initial approach to reach a level of technological comfort; identify SME motivations for collaboration; and establish trust between SME towards collective action and aggregation in digital value chains. There are many questions still to be answered, such as what other elements contribute to and sustain the strategic and cultural fit within a virtual SME environment. The successful cooperation within an online SME community may simply revolve around a single focus: the positioning of a top quality product or be more complex in terms of supporting entire digital manufacturing or service sector value chains. Either way, two elements appear to be crucial to successful collaboration, namely communication and trust.

References


