With government help, small and medium enterprises (SMEs) can become more actively involved in e-commerce.

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Fostering E-Commerce Among Australian SMEs

Various journals, newspapers, and government and organization reports have published research papers and projects about e-commerce. Some of this information addresses purely technical issues, some deals with policy issues, and some discusses enterprise strategies. Large organizations have launched many successful applications and built complex information systems to conduct Web-based business transactions. Through advanced information systems, these large enterprises successfully implemented their e-commerce strategies and enhanced their revenue growth. Because of these successful cases, e-commerce, especially in the late 1990s, activated the modern economy. New business models arose (J. Gordijn and H. Akkermans, “Designing and Evaluating E-business Models,” IEEE Intelligent Systems, July-Aug. 2001, pp. 11-17), and traditional markets—whether commercial, governmental, or educational—transitioned to e-markets.

During this transition, large organizations used resources (such as technology, personnel, and money) to conduct e-commerce procurement. But small and medium enterprises (SMEs) were and remain at a disadvantage. Traditionally, it was large organizations that implemented electronic data interchange (EDI) because SMEs could not afford to maintain their own EDI systems (David Whiteley, E-Commerce: Strategy, Technologies and Applications, McGraw-Hill, 2000).

With the help of Internet technologies such as HTTP (Hypertext Transport Protocol) and XML (Extensible Markup Language), these SMEs can develop a place in the e-commerce environment.

E-COMMERCE IN AUSTRALIAN SMES

It is difficult to accurately assess the overall global market for SME-related e-commerce. However, we do know that Australia has more than 1 million SMEs; they are vitally important to Australia’s economic prosperity. Thus, in September 2001 the government announced a $6.5 million initiative to accelerate SMEs’ adoption of e-commerce to facilitate online access to government purchasing within two years (“E-Commerce for Small Business,” http://www.noie.gov.au/publications/media_releases/archive/2001/Sept2001/sme_ecom.htm).

Helping these SMEs efficiently build their e-commerce systems has become a high priority of Australia’s government and IT/IS researchers. To find solutions to Australian SMEs’ e-commerce concerns, we conducted research using Citysearch (http://www.citysearch.com.au), an online business directory, in early 2002. We selected 10 cities/areas to research—Adelaide, Brisbane, Cairns, Canberra, Gold Coast, Melbourne, Perth, Sydney, Tasmania, and Townsville—and studied industry sectors that include many SMEs. The 14 sectors we examined were building contractors, chemists-pharmaceuticals, auto parts recyclers, taxation consultants, motor mechanics and repairers, driving schools, florists-retail, restaurants, motels, newsagents, liquor stores/retailers, furniture moving and storage companies, real estate agents, and doctors (medical or clinics).
Many people feel that SMEs in large metropolitan areas use e-commerce more than those in regional or remote areas because metropolitan areas have a better telecommunications infrastructure. From Figure 1, however, we find that type of profession has more importance in determining SME technology use than the size of the city. For example, only 1 percent of building contractors in Sydney use the Web, while 6 percent of building contractors in Townsville use the Web. This would appear to indicate that small cities have better Internet use than large cities. But 18 percent of real estate agents in Sydney use the Web, while 5 percent of real estate agents in Townsville use the Web. This tends to indicate that large cities have better Internet use than small cities. So Internet use does not necessarily depend on city size.

As Figure 2 shows, in these 14 sectors, only real estate agents, florist-retail, furniture moving and storage, and motels can reach an average of 10 percent or higher in Internet use. These results show that Australian SMEs are not actively participating in e-commerce. To prove our Citysearch-based results, we used a similar method to analyze the Australian yellow pages (http://www.yellowpages.com.au). This analysis showed results similar to those we obtained from Citysearch.

**CONCERNS ABOUT THE SMES**

To find out why so many SMEs do not appear to participate in e-commerce, we conducted a small telephone survey. In this survey, we randomly chose 100 SMEs—each employing more than five employees but less than 199 employees—from each sector. These SMEs were from among those studied using Citysearch. We asked two questions: “Does your company have computing capacities and facilities for accessing the Internet?” and “What concerns you most about e-commerce?”

Every company surveyed responded “yes” to the first question. This result does not surprise us because approximately 67 percent of households in Australia either own or lease a PC, and 52 percent of Australian households have an Internet connection, according to an April 2002 study by the Australian National Office for the Information Economy (“The Current State of Play: Australia’s Scorecard,” Nat’l Office for the Information Economy, (http://www.exporting.gov.au/projects/framework/Progress/ie_stats/CSOP_April2002/CSOP_April2002.pdf). This study shows that Australia’s information infrastructure can definitely support these SMEs in using online e-commerce.

The answers to the second question were quite different. We gave survey respondents a choice of five answers to this question: the benefit, security, the bandwidth of infrastructure, employee knowledge, and other. Forty-five percent of respondents were concerned about the benefit; 26 percent, security; 15 percent, infrastructure; and 12 percent, employee knowledge. Just 2 percent of respondents had other concerns.
So according to our survey, SMEs are primarily concerned because they do not see themselves benefiting from the implementation of online applications. Even worse, several thought that launching online applications would increase expenditures, an especially prevalent concern because some SMEs lost money in the dot-com crash. As a result, many SMEs lost interest in having Web sites that conduct business transactions. Instead of facilitating online transactions, more SMEs are interested in using Web pages to simply provide information for customers and business partners.

Regarding security, several SMEs we talked to worried about security vulnerabilities such as theft of sensitive data, sabotage of online viruses and malwares, denial of service, etc, in having their business online. To avoid these vulnerabilities, they choose to either delay or drop the development of online systems.

SMEs concerned with bandwidth mentioned the telecommunications infrastructure: They were unsure of whether their computers could run online transactions through traditional telephone lines.

The fourth concern involves whether the SMEs’ existing employees had the knowledge to conduct online business. These SMEs did not want to spend much money training employees to acquire the necessary skills.

Among our selected 100 SMEs, two expressed no interest at all in online business and did not regard it as part of their future plan.

CHALLENGING SMES’ CONCERNS

Indeed, these SMEs are at a disadvantage in competing with larger companies, especially in absorbing new technologies to improve business. But they can still find a place in the e-commerce environment.

Increasing e-commerce benefits

To increase e-commerce benefits for SMEs, governments—federal, state, and local—should implement an overall framework and strategic plan for online business infrastructure. They should also sponsor various independent agents to help SMEs develop and host their own Web sites. For example, governments can subsidize agents such as Citysearch and yellow page listings. Through these agents, SMEs can obtain inexpensive or even free Web sites. This idea is similar to that employed in developing the Internet, which depended on funding from the US Department of Defense and the US National Science Foundation, before it became fully commercialized. After most SMEs become effective online players, governments can gradually withdraw subsidies. At that time, the ongoing cost of online transactions will drop significantly because of the many participants. Nonparticipating SMEs will become isolated from other e-commerce players and perhaps become more willing to invest in e-commerce as a result.

In addition, SMEs must overcome the psychological barriers generated by the dot-com crashes. They must come to realize that many significant inventions have taken significant time to progress from birth to widespread use. For example, electricity and the telephone were invented hundreds of years ago, but only in recent decades have experienced worldwide use. Although the Internet started as Arpanet in 1969, it only became widely used in the mid-1990s.

Establishing a security mechanism

Placing a high priority on e-commerce security legislation is another way for government to foster e-commerce. Helpful legislation could reassure SMEs that conducting business online is as safe as doing it the traditional way.

Governments should also help establish organizations to take charge of these security issues. For example, organizations (perhaps government-appointed agents) should manage cryptological keys. They should also give organizations such as the Australian post office the authority to publish keys and authenticate the real identity of those using its key to conduct business transactions.

Users already conduct many Web-based transactions. All the security breaches related to online transactions are no worse than for traditional e-commerce, such as that driven by EDI or performed using electronic funds transfer from a point of sale.

Various security technologies ensure secure transactions through the Internet. Most of these security technologies already use 128-bits or larger encryption keys. At this level of encryption, it is extremely difficult to crack encrypted
WEB

information. If the government would publicize this information, it would perhaps allay the security concerns of SMEs.

Managing the telecommunications infrastructure

Telecommunications facilities are the most important parts of e-commerce. Hence, the evolution of telecommunications can drive changes in e-commerce. With any rapid progress in telecommunications, e-commerce upgrades into new phases. In the initial stage of e-commerce, enterprises used limited telecommunication capacity to conduct business. Telephone voice transmission was adequate to monitor business activities; faxing became a way to order goods, accelerating certain business transactions.

Although several standards arose to facilitate e-commerce, none were completely satisfactory. For example, EDI is historically an important application in e-commerce (http://www.w3.org/Protocols/), but most SMEs could not afford its cost and technical complexity.

The real e-commerce revolution came from data communications, especially via the Internet. Since the early 1990s, the Internet has led to commercialization. Year by year, commercial traffic over the Internet grows exponentially. Although the current networking market faces sluggish or even declining growth, the Internet has definitely become a vital infrastructure for the future economy.

How do enterprises interact with the telecommunications infrastructure to build e-commerce systems? Physically any e-commerce system consists of two parts—internal and access networks—that must work with the Internet.

Internal network. An internal network typically includes PCs, servers, and a LAN (local area network). Sometimes an internal network consists of just one or a few computers. For a large company, an internal network is more complex, including thousands of computers and many LANs and backbone networks. An internal network’s function is typically core to all business activity and responsible for company-internal information flow and resource management.

In e-commerce, however, an internal network becomes a product provider when a Web server, for example, publishes a product catalog and service information. With the help of an access network (described next), outside customers can reach these products, as permitted by the internal network’s own security policy.

Access network. An access network is a bridge between an internal network and the Internet, normally supplying connection services. It negotiates with an internal network to decide how an enterprise connects to the Internet and what resources outside users can view. Some large companies operate their own access network. However, most SMEs do not directly operate their access networks. Instead, they typically buy services from Internet service providers or other agents that operate access networks. Thus, access networks become the Internet gateways for many SMEs.

Improving employees’ skills

The success of e-commerce does depend on employees having adequate computer skills, something SME employees sometimes lack. To alleviate this problem, SMEs might employ intelligent terminals rather than PCs. Such devices offer simple interfaces that work with plug-and-play applications; they work well for employees who are not computer savvy.

Governments can also sponsor public information—via TV and newspapers—that introduces people to general knowledge about Web-based technologies and usage. It’s also possible for host stations, which are responsible for supplying online free training materials or courses on behalf of governments or communities, to train SME employees. Governments can also encourage this practice through subsidies. If SMEs and public agencies take such actions, the computer skills of SME employees do not need to hinder progress toward e-commerce.

Although Australian SMEs are not very active in e-commerce, they have a promising future in this area and could become excellent players in the e-economy.

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