IDEA GROUP PUBLISHING

701 E. Chocolate Avenue, Suite 200, Hershey PA 17033, USA
Tel: 717/533-8845; Fax 717/533-8661; URL-http://www.idea-group.com

ITP5231

This paper appears in *Managing Modern Organizations Through Information Technology*, Proceedings of the 2005 Information Resources Management Association International Conference, edited by Mehdi Khosrow-Pour.

Adoption of IT and E-Commerce Tools in the Business Sector in South Africa and Australia: A Comparison

V.S. Venkatesan
Graduate School of Management, University of Western Australia, 35 Stirling HIghway,
Crawley 6009 WA, Australia, vvenkate@ecel.uwa.edu.au

Kevin Johnston
Dept of Info. Systems, University of Cape Town, Private Bag, Rondebosch 7701, South Africa, kjohnston@commerce.uct.ac.za

ABSTRACT

Despite digital divide, use of computers, the Internet and other information technology (IT) tools is steadily increasing in developed countries such as Australia. However, following the collapse of *dot com* ventures, businesses are now taking a more conservative approach to e-commerce. Small and Medium Businesses (SMEs) dominate the business scene in several OECD economies and research evidence suggests that the adoption of e-commerce by SMEs is low. Benchmarking studies in Western Australia have shown that Internet connectivity does not automatically translate into adoption of e-commerce. In comparison, much less is known about the adoption of IT by businesses in South Africa (SA), a country where IT usage in the general population is low. This research attempted to benchmark the use of IT in the Western Cape area of South Africa and compared the results with earlier studies undertaken in Western Australia. Due to operational reasons, the methodology of the South African study was somewhat different. The results and limitations are discussed.

INTRODUCTION

Use of Information Technology (IT) tools among businesses and in the general population is steadily increasing in affluent countries (OECD 1999; WMRC 2001). With a computer penetration of more than 50% in the general population (ABS 2004) Australia is considered to be a leader in the adoption of IT. Australian businesses have one of the highest rates of computer usage and Internet connectivity (NOIE 2000; Venkatesan and Fink 2001; Venkatesan, Fink et al. 2001), ahead of European nations and the UK. Australia also compares favorably with other countries in terms of Internet connectivity of consumers and price of Internet access. Despite the successful use of IT and e-commerce (Turberg & Nickerson, 2003), businesses, large and small, are taking a cautious approach to IT, largely because of flawed Y2K disaster predictions, unrealistic e-commerce growth projections and the collapse of large *dot com* enterprises. After being described as the panacea of the business world, e-commerce is now acknowledged as another practical business tool.

In developing countries such South Africa (SA), the adoption and use of IT tools vary widely and reliable data is often not available. Generally, socioeconomic factors, poor communication infrastructure and high cost of computers limit the use of IT in the society. The digital divide within a country (Foreshaw 2000; Hoffman, Novak et al. 2000; Veronica 2000) and between countries (ILO 2001) is well documented. For example, Malaysia has adopted IT on a wide scale whereas the use of IT in the general population in SA is low (Kangas, 2003). However, this general picture may not accurately reflect the status in business sector as the use of IT in businesses is largely driven by business and market needs. Two earlier studies had benchmarked the use of IT among businesses in Western Australia (Venkatesan, Fink et al. 2001; Venkatesan and Fink 2002). The absence of such a benchmark in SA and the need to compare the country's performance with established benchmarks in a developed country prompted this study.

IT ADOPTION – A GENERAL OVERVIEW

The term 'IT adoption' can have a broad interpretation ranging from the use of computers for basic activities such as word processing to advanced use for on-line e-commerce activities and electronic fund transfers. Thus, one needs to be more specific in describing the level of IT activities in a business or organization such as the use of computers, the Internet or the Web page. It is now well recognized that e-commerce is an evolutionary process and any business or organization goes through several stages of adopting e-commerce starting from the use of static web page and progressing to on-line activities (Tapscott 1998). It is also known that not all businesses go through to final stages of e-commerce.

Small and Medium Enterprise (SME) sector plays a vital role in the economies of several OECD and developing countries (Chetcuti 1998; Flynn, Heidi et al. 1998) and adoption of e-commerce activities by SMEs is critical to the overall success of e-commerce. However, research studies have shown that that the use of Internet for e-commerce is indeed small in Australia (Akkeren and Cavaye 2000) and elsewhere. Further, as the West Australian studies cited earlier have demonstrated, being connected to the Internet or having a Web page does not mean that a business is engaged in any form of e-commerce.

SOUTH AFRICAN ECONOMY

Driven by globalization, the business sector in South Africa is undergoing transformation and the use of IT is increasing (Abedian, 2004). Like many other OECD economies, the services sector is dominant in the SA economy and contributes almost 50% of employment (Abedian, 2004). Examining trends and issues in South African industries, Du Plessis (2000) observed that IT spending patterns in SA businesses were a function of the industry and its primary business. Such IT budgets were also set to increase between 2001 and 2002 for roughly 80% of SA companies with PC's.

RESEARCH METHODOLOGY

The questionnaire, adapted from the Australian study, was emailed to over 800 businesses in the Western Cape Province of South Africa. The sample was drawn from the membership of the Western Cape Chamber

of Commerce. Over 50 paper copies were mailed to small businesses that did not have email facilities. Respondents were asked to complete and return the questionnaire back by email, mail or fax. The level of adoption of IT and the frequency of several IT related activities were measured using a five-point scale. In addition, demographic data on businesses and business owners/managers was collected. Key differences between the two studies were in the administration of the survey and the target population. The Australian study used a mail survey and targeted randomly chosen small/medium businesses whereas the South African survey was largely done through email and targeted members of the Western Cape Chamber of Commerce.

RESULTS

In all, eighty-two businesses responded to the South African survey. Compared to the Australian study (24%), the response rate for the SA survey was low (10%).

Sample Characteristics

Majority of the SA respondents were owners/managers of their business/ organization. A large proportion of owners/managers were middle aged with only a few being 'under 25' or 'over 60'. About 60% of the SA respondents had university or college education.

Using South African Government's (1995) classification, 16.5% of the responding SA businesses were micro in size, another 20% fell under the category of small businesses, about 30% were medium sized (employing <200 people) and the rest (about a third) were large businesses (>200 employees). In comparison, over 60% of the Australian businesses were micro in size (<5 employees) and about 13% had more than 20 employees. The maximum number of employees was 90[1].

Clearly, in terms of employee numbers, the SA businesses were larger in size compared to their Australian counterparts. However, any inference based on employee numbers alone should be treated with caution. Other factors such as level of automation and business practices such as sub-contracting should be considered. In both surveys, a dominant service sector was noticeable. About a third of the respondent SA businesses were IT related. This is in contrast to the Australian study that had much lower proportion of IT related businesses. However, this higher % could be due to the email survey that was used in the South African study. Consequently, it may not truly reflect the uptake of computers and IT in the general business population but may reflect the upper end of computer and Internet usage.

In both studies, majority of responding businesses operated locally and only a small proportion operated in the international markets. Businesses used a mixture of marketing channels to transact business, 'face to face' being the most used. In comparison, business done through Internet was less. None of the responding firms used the Internet exclusively to sell their products.

A cross tabulation between the size of business with the use of different marketing channels did not reveal any relationship. One would assume that micro and small businesses, because of their low level of presence on the web, would have used the Internet as a marketing channel to a lesser extent compared to large businesses. This was not evident in the results.

Use of Computers and the Internet

- Computer usage was quite high amongst Australian businesses (>80%). However, its use was predominantly (85%) for accounting and administration. Results in South Africa were similar.
- Majority of businesses in the Australian sample had just one computer. The systems were not worked and were managed by the owners themselves. In comparison, about 3/4th of the South African businesses surveyed had 5 computers or more, the systems were networked and were managed by IT professionals, this suggesting that several medium to large businesses had responded to the survey.
- Over 80% of the SA respondents were personally very comfortable in using computers and the Internet. Probably, many of these respondents were professional managers, were a lot more IT savvy and used their computers more compared to Australian respondents.
- In terms of Internet connectivity, less than 50% of Australian businesses used the Internet regularly. About a quarter of businesses surveyed did not have an Internet connection. Over 60% had an email address indicating a moderate level of adoption of email.
- In both countries, most business was done over the counter or through phone or fax. More than 85% of the responding Australian businesses did not transact any business over the Internet. The remaining 15% generated 10% or less of their business over the Internet. In line with this finding, word of mouth emerged as the best medium for generating new customers (49%). In comparison, about a third of the responding SA businesses sold less than 25% of their products or services through the Internet. None used the Internet exclusively to sell their products.

Use of Internet for Different Business Activities

Businesses were asked to indicate the frequency of Internet usage for specific business activities. This was then compared with the use of conventional technologies. Results are given in Table 1. These results were then compared to similar usage in Australia.

- Majority of businesses (55%) appeared to use the Internet mainly for information gathering. Only a small proportion used the Internet to receive or place orders (19% and 12%). The results were similar in the Australian study. About 28% (50% in Australian study) of SA businesses never received orders through the Internet and 22% (66% in Australia) never placed orders on the Internet. This suggests a degree of reluctance on the part of businesses to engage in B2B online activities.
- Conventional technologies and tools such as phone and fax still found wide use in businesses. Compared to <20% who placed or received orders on the Internet regularly, 50% of these businesses used the phone or fax for similar purposes.
- Use of email to correspond with clients among the SA sample was significantly higher than Australian Businesses.

These results suggest that the use of Internet is still at a low level among SA businesses. While businesses surfed the net to access information, and used email frequently to communicate, sophisticated use of the net for e-commerce and on-line advertising was much less. Businesses used conventional phone and fax for transacting business much more than

Table 1. Use of Internet/Conventional Technologies for Different Business Activities in South African Businesses

Business activity	1-Never %	2 %	3 %	4 %	5–Most of the time %	Missing %
Pay bills / do banking over Internet	36.59	17.07	7.32	10.98	23.17	4.88
Receive orders over the Internet	28.05	30.49	18.29	10.98	8.54	3.66
Place orders with suppliers over the Internet	21.95	39.02	21.95	6.10	6.10	4.88
Surf the net to look for general information	3.66	15.85	19.51	32.93	24.39	3.66
Customers come to you after seeing your website	23.17	36.59	17.07	10.98	7.32	4.88
Take orders from customers over phone	14.63	15.85	13.41	25.61	24.39	6.10
Order your supplies over phone	7.32	14.63	17.07	28.05	26.83	6.10
Pay bills / do banking over the Phone	12.20	12.20	10.98	17.07	41.46	6.10
Use email to correspond with customers	3.66	3.66	9.76	15.85	63.41	3.66
Keep a database of clients	6.10	0.00	8.54	17.07	64.63	3.66
Use a static web page of the business	20.73	13.41	19.51	13.41	28.05	4.88

web based tools. SA businesses appeared to use the Internet more and appeared to have a higher level of IT adoption compared to their Australian counterparts. However, we attribute it more to the size and nature of businesses. Because of the sample bias, the results presented in Table 1 should be taken as the upper limit of IT adoption among SA businesses.

IT Use and Knowledge of Respondents

Using a five point scale ranging from 'Poor' to 'Excellent', respondents were asked to rate their level of knowledge in specific areas of computer and Internet usage, such as overall knowledge, basic word processing, advanced word processing and so on. In line with general expectations, the level of knowledge with advanced aspects of word processing and spreadsheet was less compared to basic word processing and spreadsheet that are routinely used in businesses. Level of knowledge with Internet and email was also found to be high. In comparison, knowledge of other advanced tools such as web page design was less, which is understandable given that such tools are technical in nature and are used more by specialists. A similar trend was noticed in Australia also. The level of knowledge appeared to be driven by the needs of the business. Businesses had a high level of need to use basic IT tools such as word processing, spreadsheets, accounting software and email. Advanced tools such as advanced word processing, spreadsheets were used to a much lesser extent. Use of other technical tools such as Web Page design was also low. Compared to the use of email, Internet surfing or downloading from the Internet were less.

Usefulness of Computers/Internet in Businesses of Respondents

As to the usefulness of Internet in their business, about 60% of the SA respondents found it very useful, about 17% found it somewhat useful and another 13% found it not at all useful. Less than 10% found no need to use Internet in their business. Normally, one would assume that large businesses will use the Internet more and hence will find it more useful compared to small or micro businesses. However, a cross tabulation and Chi square test did not show any significant relationship between 'size of business' (micro, small, medium and large) and 'usefulness of Internet' in the sample (Chi square 5.715; p=0.768). Compared to this, in the West Australian study, about 10% found it very useful, 50% somewhat useful and the remaining 40% did not find it useful at all.

Understanding and Intentions Regarding E-Commerce

Do businesses really understand the meaning of e-commerce and what are their intentions for the future? To examine this, businesses were asked specific questions. Around 80% of the responding SA businesses (40% in Australia) had a web page. Many SA businesses found a web page to be technically challenging and expensive. Apart from the high cost associated with web page maintenance, keeping the web content current, changing it to respond to market needs and the lack of expertise were seen as major challenges.

In both samples, almost all the responding businesses had a good idea about e-commerce. Though the articulation of the concept varied from business to business, the fundamental understanding was evident. When questioned about their intention to adopt e-commerce in future, almost a third of the SA businesses mentioned that they were already using e-commerce in their business and another 40% were planning to move into e-commerce.

Ability to reach wider geographical markets, 24x7 access, convenience, cost effectiveness and efficiency were seen by respondents as major drivers in the adoption of e-commerce. In contrast, costs associated with development and maintenance of an e-commerce system, time constraints, complexity of systems, the need to keep face to face contact with clients, security of the system, readiness of clients and the general public to adopt e-commerce, non-uniformity in the systems and dependence on IT people were seen as major inhibitors. Some businesses were also of the view that the IT systems were still complex, were not user friendly and there were major infrastructure limitations. User readiness was also mentioned as a key factor. From a user perspective, a cultural change was needed.

Does the Intention to Move into E-Commerce Depend on the Size of the Business?

It can be argued that, with a limited market exposure and reach, SMEs are less likely to adopt e-commerce compared to large businesses. Further, cost, knowledge and technology could impose further constraints on e-commerce adoption. The survey results appeared to suggest that this could be so. For the purpose of analysis, the categories 'small' and 'medium' were combined and the size of business was cross tabulated with intention to adopt e-commerce. A Chi-square value of 9.74 (reject at 0.05 level; Chi square critical = 9.488, df=4, alpha=0.05) suggested that at the 95% level, there is evidence of a relationship between size of the business and the intention to go into e-commerce. The larger the firm, the more likely they are to go into e-commerce.

CONCLUSION

Responding businesses in the South African sample were predominantly medium and large businesses whereas the Australian sample was made up of small and medium sized businesses with very few large businesses. Both samples had a dominant service sector.

In Australia, IT penetration in the general population is much higher compared to SA. However, respondent businesses in South Africa had more computers and employed more IT specialists compared to what was seen in the Australian survey. Such a discrepancy could be explained by the difference in the size of the businesses surveyed.

In both samples, the use of e-commerce was at a low level. The use of Internet to 'place orders' or 'receive orders' was low. Businesses appeared to use the net predominantly to search for information. The research did not find any significant statistical relationship between the 'size of business' and 'usefulness of Internet'.

Use of the Internet for on-line advertising was limited, despite 80% of the responding businesses having a web page. The research suggested a relationship between the size of the business and the intention to adopt e-commerce, with micro and small businesses less likely to adopt and use e-commerce than larger businesses.

Though some differences in on-line activities between e-commerce enabled businesses and others were noticed, a definitive conclusion could not be drawn because the level of activities were low in all categories. Further, such a difference could be due to other non-IT business parameters. For example, the use of phone and fax to receive or place orders, a completely non-IT based activity, also showed a variation.

LIMITATIONS OF THE STUDY

Majority of businesses in the West Australian study were micro, small or medium in size with very few large businesses. In contrast, the target population in South Africa was drawn from the membership of the Chamber of Commerce and, consequently, the businesses were large in size in terms of employee numbers. The Australian survey was done through mail whereas the South African study used an email survey to collect data. Thus, the South African survey was biased in favor of large businesses that were conversant with computers and the Internet and excluded small and medium businesses that did not use the Internet. The biased nature of the South African sample imposed a limitation on the generalisability of results to the whole business population of South Africa and the differing nature of the samples in the two countries made direct comparison of results difficult. Generally, IT and E-commerce adoption varies widely among businesses. Because of the sample bias, the South African results appeared to reflect IT usage at the upper end of the spectrum.

REFERENCES

Abedian I (2004), "Beyond Budget 2004: Job Creation & Poverty Alleviation in SA: What should we be doing?" Institute for Justice and Reconciliation Symposium on 10 March 2004 at GSB

ABS (2004), 8153.0 Internet Activity, Australia, Canberra, Australian Bureau of Statistics.

Akkeren, JV & Cavaye, ALM (2000), Factors affecting the adoption of E-commerce technologies by small business in Australia - an empirical study. ICSB Conference.

Du Plessis B (2000), BMI-T report Reveals Strong Growth in the Financial Services Industry. BMI Technology Group (IDC), (Available at www.bmi-t.co.za/site_011001/Pressoffice/financialservices.htm, Accessed 18 November 2001).

Flynn J, Heidi D, et al. (1998), Startups to the Rescue - Throughout the Continent, small companies are where the action is. Business Week - Industrial / Technology Edition: 50.

Foreshaw J (2000), Regions miss out as IT keeps to big cities. The Australian. Melbourne: 46.

Hoffman DL, Novak TP, Schlosser AE, (2000), "The Evolution of the Digital Divide: How Gaps in Internet Access may Impact Electronic Commerce." Journal of Computer Mediated Communication 5(3).

ILO (2001), Digital divide is wide and getting wider - Vast swathes of the globe are "technologically disconnected". Geneva, International Labour Organisation.

Kangas K (ed) (2003), Business Strategies for Information Technology Management, IRM Press, Hershey, ISBN 1-931777-45-4

NOIE (2000), The Current State of Play - July 2000. Canberra: 1-49.

OECD (1999), Main Trends towards Knowledge Based Economies, OECD. 2004.

South African Government (1995), White Paper on National Strategy for the Development and Promotion of Small Business in South Africa, (Available at www.info.gov.za/whitepaper/1995/smallbus.htm Accessed 25 May 2004)

Tapscott D (1998), Blueprint to the Digital Economy, McGraw-Hill.

Turberg S & Nickerson RC, (2003), An assessment of European E-Commerce Systems, Ninth Americas Conference on Information Systems 2003, Tampa, Florida

Venkatesan VS & Fink D, (2001), Joondalup Region Business Audit. Perth, Small and Medium Enterprise Research Centre, Edith Cowan University: 162.

Venkatesan VS & Fink D, (2002), Adoption of Internet technologies and e-commerce by Small and Medium Enterprises (SMEs) in Western Australia. 13th IRMA International Conference, Seattle, Washington USA, Ideas Publishing Group.

Venkatesan VS, Fink D, Martinus I, (2001), Moving into New Economy: Strategies for SMEs in the Wangara Industrial Park. City of Wanneroo, Small and Medium Enterprise Research Centre, Edith Cowan University: 170 Pages.

Veronica CS (2000), More aggressive APEC action sought to bridge Digital Divide. Business World (Philippines): 1-.

WMRC (2001), Global E-Government Survey. London, World Market Research Centre.