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ELECTRONIC COMMERCE ADOPTION IN AUSTRALIA AND NEW ZEALAND

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ABSTRACT

This paper presents the findings of research relating to electronic commerce adoption in the Asia-Pacific region (particularly in Australia and New Zealand). A survey questionnaire was used to gather opinions about the current status of electronic commerce in Australian and New Zealand organizations. The joint mail/web survey was conducted between September 1998 and February 1999. The focus of the survey was to investigate potential benefits of electronic commerce, potential barriers and risks in electronic commerce, and expectations regarding evolution of electronic commerce. The findings were compared with data from similar research carried out in Europe around the same time. Based upon the findings of the survey, recommendations for increasing the adoption rate of electronic commerce are presented.

Keywords: ***Electronic commerce, Potential barriers, Potential benefits, and Inter-organizational-relationships***

1.0 INTRODUCTION

According to Forrester Research (1999) [1], business-to-business electronic commerce market in the United States was worth US$131 billion in 1999, is projected to reach US$1.5 trillion by 2003. While, in the past, EDI was the dominant business-to-business inter-organizational application, companies are now beginning to implement Internet electronic commerce that could dramatically alter trading partner relationships [2, 3]. In a fast changing competitive environment, this transition is likely to lead to lower costs and seamless global connectivity. Many researchers identify competitive pressure to be an important determinant of EDI adoption and implementation [4, 5, 6]. However, increasing use of EDI has led to electronic partnerships between buyers and suppliers.

Moreover, it is becoming commonly accepted that by reaching customers through the Internet, firms can implement more effective target marketing and relationship building strategies with lower overheads [7]. Indeed, electronic commerce can create economic value for buyers, sellers, market-intermediaries and for the society at large [8].

The above considerations led to the 1999, KPMG and Norlan Norton Institute (NNI) survey 'Electronic Commerce - The Future is Here!', which was carried out in Australia and New Zealand. The purpose of the survey was to determine views of senior businesses and IT executives about electronic commerce usage, benefits and barriers relating to electronic commerce adoption. The survey not only included business-to-business electronic commerce, but also business-to-consumer electronic commerce and business-to-government electronic commerce.

2.0 RESEARCH METHOD

The survey sample consisted of more than 1000 Australian and New Zealand organizations. Respondents participating in the survey came from a wide range of organizations operating in Australia and New Zealand. Discussions relating to the design and pilot testing of the questionnaire took place in July and August 1998. As a result of the pilot test, the questionnaire was modified to include an examination of factors that may affect electronic commerce adoption. These factors include perceived potential benefits, barriers to electronic commerce, and existence of prior trading partner relationships, including trust and security mechanisms such as standards and trading partner agreements.

The survey questionnaire was mailed to 1000 companies in Australia and New Zealand in September 1998. Two hundred and eighty-nine completed questionnaires were received in October 1998 for an initial response rate of

28.9%. However, through e-mail, a number of organizations requested for an extension of the survey return deadline. Consequently, a second round of the survey was carried out through a secure web site. The extension contributed another twenty responses.

Of the 309 responses, 146 were from Australia and 163 from New Zealand. The project team met and analyzed the findings using both quantitative and qualitative approaches. A quantitative data set was used for statistical analysis, and comments from respondents led to pattern matching and explanation building. While all team members in the whole project team had access to the survey questionnaires received from the respondents, only two KPMG, NNI consultants were put in charge of data analysis. The rest of the team participated in the analysis of the findings including an interpretation of the respondent's comments and an investigation of possible reasons for the findings. This led to the design of a draft report that was later refined during a one and half-hour teleconference interview with team members from Melbourne, Adelaide, Sydney, Wellington and Auckland. The author actively participated in all stages of the research process.

- **Respondent Profile**

Electronic Commerce is said to contribute to a 'death of distance' thereby leading to globalization. First, it is important to assess the geographical reach of the responding organizations. Thirty-five percent of the respondent organizations indicated they had a global reach, while 31% reported a national reach, 21% a regional reach and 13% a local reach. Second, the nature of industry is likely to affect its propensity for adopting new ways of doing business. The two largest specific industry categories that participated in this survey were the manufacturing/distribution (28%) and the government services (13%).

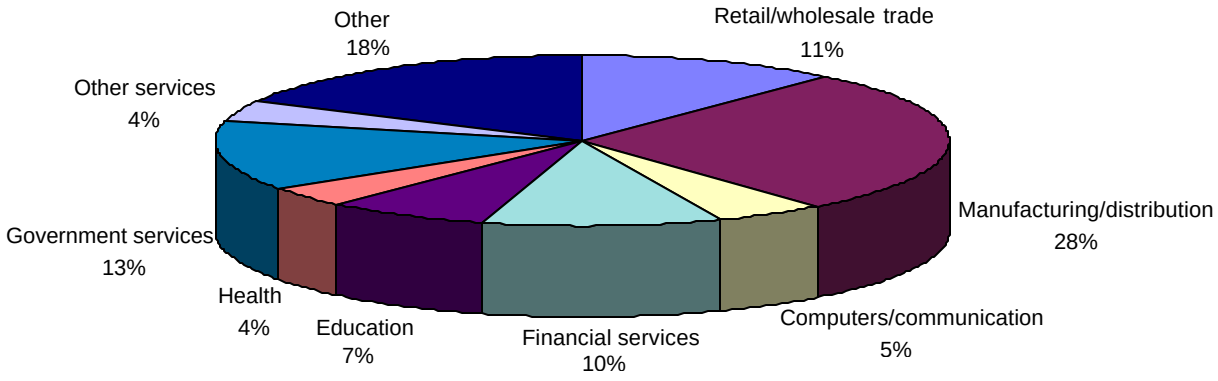

Fig. 1: Respondent by industry demographics

The pie chart (Fig. 1) provides a full breakdown of respondents by industry. Finally, the size of an organization may be an indicator of the resources it can bring to bear on the adoption of a new way of doing business, and the level of potential inertia facing the business. The majority of the organizations surveyed (40%) had 100-500 full-time (or equivalent) employees. Nineteen percent had less than 100 employees, 14% had between 500-1000 full-time employees, 11% had between 1000 and 2000, 9% between 2000 and 5000 employees and 6% had over 5000 full-time employees.

3.0 KEY FINDINGS

The findings indicate that organizations within the Asia-Pacific region are beginning to be aware of electronic commerce, and for organizations that were brave enough to overcome the perceived and real challenges, this exciting new business tool offers genuine gains in both profitability and productivity, which are already being achieved.

- ***Industry Presence***

The computer and communication industry showed the most aggressive stance and are reaping the greatest gains from electronic commerce. Furthermore, of the 309 companies in Australia and New Zealand surveyed, the

educational and financial services sectors were also involved in significant adoption of electronic commerce technologies.

- ***Types of Electronic Commerce Applications Adopted***

Four percent of the respondents have implemented smart cards, 6% kiosks, 9% automated teller machine technology, and 16% Interactive Voice Response (IVR). Similarly, only 17% of the respondents are currently implementing certification authority technology.

- ***Volume of Electronic Commerce Transactions***

In 1997, 1.5 billion electronic transactions occurred in Australia and were worth $16 trillion. In August 1998, there were 21,000 distinct New Zealand organizations connected to the Internet. By the end of 1998, most of the top 1000 businesses in Australia had an online presence. The largest proportion of respondents (33%) indicated they had between 1,000 and 10,000 electronic transactions per annum. Thirty percent had up to 1,000 transactions per annum, 20% had between 10,000 and 100,000 transactions, 10% had between 100,000 and 500,000 transactions, and 7% had over 500,000 transactions per annum. More than half of the respondents indicated that their transaction value was over one million dollars per annum.

The report emphasized that despite the overall advance, much of the activity related to electronic commerce implementation remains in the *'talking stage'*. Most organizations have also realized the importance of implementing electronic commerce as in *'must do'* and whether their adoption will be profitable or will not depend on how they implemented it.

3.1 Potential Benefits vs Achieved Benefits

The survey examined respondents' perception of benefits from electronic commerce and their assessment of how well they have been able to attain these benefits. As shown in Fig. 2, respondents believed that electronic commerce was important for improving customer service, improving company's image, optimizing supply chain and improving productivity, products/service quality and cost. On the other hand, the data showed that expected benefits from adopting electronic commerce technologies and actual benefits achieved have proven somewhat disappointing for many organizations.

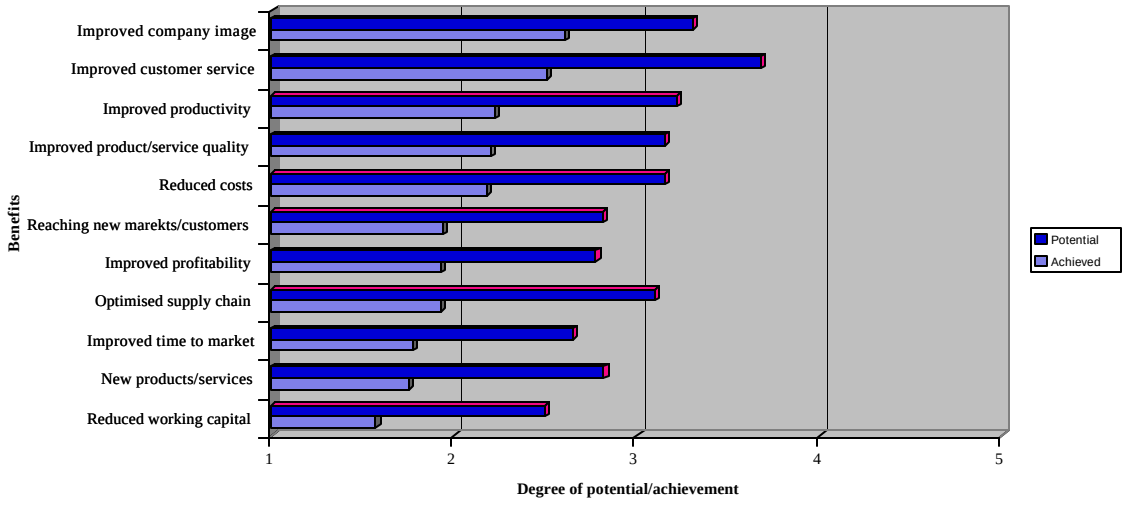

Fig. 2: Potential benefits vs achieved benefits from electronic commerce

Electronic commerce adoption suggests the importance of *'electronic partnerships'*.

In fact, electronic commerce unlike other types of IT innovations cannot be adopted and used unilaterally. Firms that are motivated to use electronic commerce must either find similarly motivated trading partners, or persuade and/or coerce their existing trading partners to adopt electronic commerce. This leads to interdependencies between

organizations that arise from sharing electronic commerce technologies. Moreover, previous research in EDI adoption suggests that these interdependencies led to an imbalance of power between smaller suppliers and their more powerful buyers [9]. Therefore, this clearly indicates that it is difficult to quantify the costs and benefits in electronic commerce usage due to sharing of technologies.

Similarly, much of the failure to *'live up to expectations'* is due to the perception that gains from electronic commerce will be easy to achieve. It is assumed that benefits will be achievable within an overly optimistic time frame that may also be due to inappropriate metrics being applied to measure the success of a venture.

In order to achieve potential benefits, organizations should follow characteristics of leaders that include, being smaller and more focused on business benefits in electronic commerce. Furthermore, organizations should give electronic commerce higher importance in their business strategies, by having an aggressive cost focus, higher and more specific expectations from technology. Hence, organizations will be able to demonstrate higher levels of integration of electronic commerce.

3.2 Potential Barriers and Risks

Respondents reported the perceived lack of security, as one of the main barriers to the adoption of electronic commerce technologies as shown in Fig. 3. Based on the findings, this perception was even more remarkable as solutions for managing security need to be implemented in order to increase electronic commerce adoption.

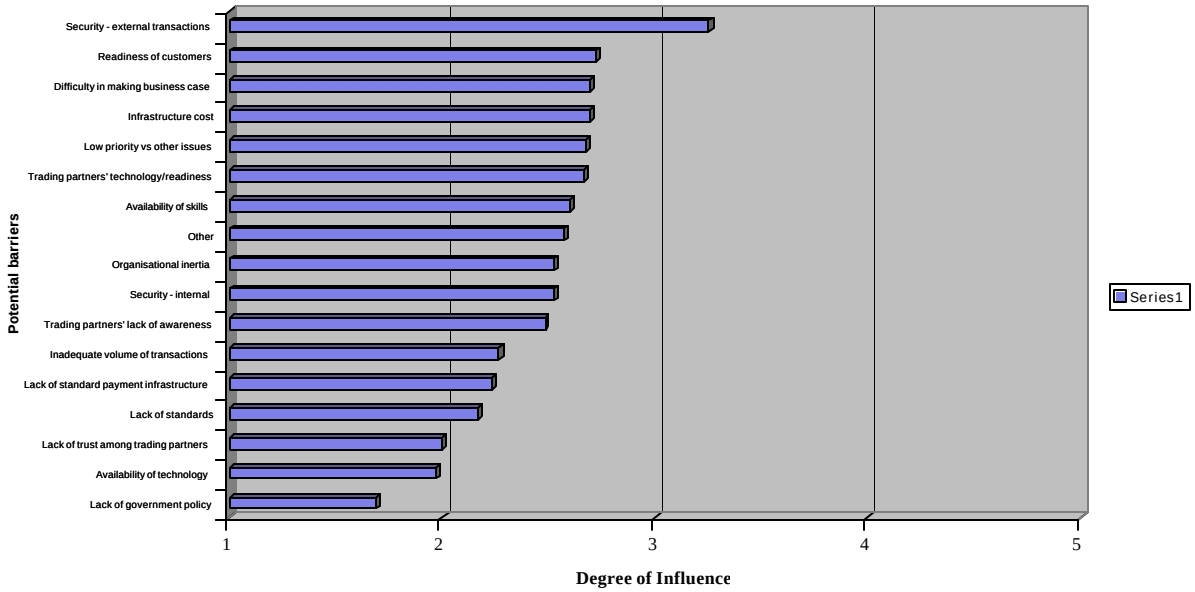

Fig. 3: Potential barriers to adoption of electronic commerce

Surprisingly, environmental determinants had little influence on respondents' electronic commerce strategic intent. Some of the reasons for the discomfort around security may be explained by ways in which most organizations have developed their key trading partner relationships over time. The highest-ranked element for establishing trust between organizations, their customers and suppliers is the existence of a long history of trading partner trust. This, coupled with a relatively low importance ranking for formal agreements between trading partners as a mechanism for establishing trust, means that organizations have not adjusted to the mindset required to effectively establish trust in electronic trading. It seems that while early adoption of these new business tools in Australia and New Zealand lags behind United States and possibly Europe, the actual barriers to their widespread acceptance and use are more perceived than real.

In order to overcome these barriers, organizations should choose their trading partners and skills carefully, and start with a need based strategy, rather than a technology based solution, as not all solutions meet the requirements of trading partners. Furthermore, organizations should aim to develop an electronic commerce strategy that complements the corporate strategy.

3.3 Comparisons between Europe and Australia/New Zealand (ANZ)

On the security front, the findings claimed that 'while nearly half (43%) of Australia and New Zealand respondents indicated that security is one of the factors that had a high degree of influence on whether they moved into electronic commerce', only 25% of the European respondents in a similar survey indicated that this was a high influence issue [10]. Locally, those still wary about security cited identification and authentication high on the agenda, along with the need to implement firewalls. Refer to Fig. 4 for comparison of the findings between Europe and Australia/New Zealand.

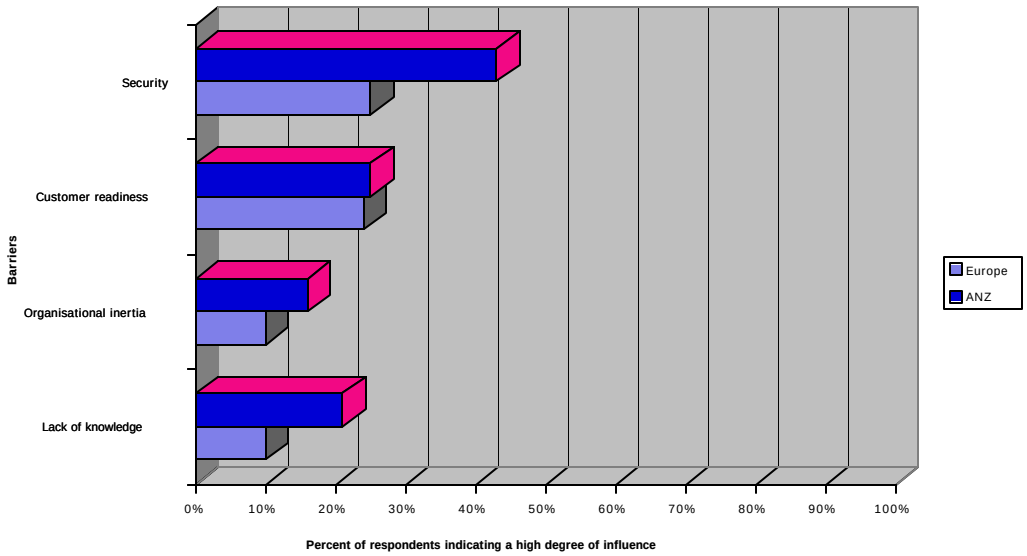

Fig. 4: Perceived barriers between Europe and ANZ

Customer readiness falls behind security by one percentage point and is comparable between Europe and Australia/New Zealand. In comparison with European results, Australia/New Zealand still appears to be running security-scared, despite technology solutions being made available and legislation pending.

Of equal concern is the real uncertainty and lack of motivation to implement electronic commerce activities. Survey results indicated that organizational inertia is 5% higher in Australia/New Zealand than in Europe, with more than one in five (21%) of the Trans Tasman companies interviewed indicating the lack of knowledge to implement electronic commerce into their businesses.

3.4 Characteristics of Electronic Commerce Leaders

Two groups, known as leaders and followers, were identified from the survey results. They include organizations that had achieved profit or productivity gains from electronic commerce implementation and those that had not. The leaders and followers displayed distinct sets of characteristics in terms of electronic commerce adoption, implementation and integration shown in Fig. 5. With regard to electronic commerce, *'leaders'* are those for whom 'very good' or 'excellent' achievement of profitability and improvement benefits have occurred through electronic commerce (or, in the case of non-profit organizations, 'excellent' achievement of productivity and improvement benefits). The following characteristics of leaders help to describe actions that *'followers'* might want to take in order to catch up and compete effectively with electronic commerce.

Leaders are more likely to achieve potential benefits than followers. Leaders tend to:

- be smaller and more focused on business benefits in electronic commerce;
- be more likely to be in the financial services and computer technology industries;
- have an aggressive cost focus;
- give electronic commerce higher importance in their business strategies;
- have higher, and more specific expectations from technology;
- be less likely to see barriers and better able to minimize those that may exist;
- demonstrate higher levels of integration of electronic commerce across the board;
- be more likely to have implemented EFT, EDI, Intranet and Extranet already; and
- be far more likely to be conducting marketing, Public Relations and advertising via the Internet.

Fig. 5: Characteristics of leaders

4.0 RECOMMENDATIONS AND LESSONS LEARNT

The United States is generally acknowledged as the leader in electronic commerce activity, with much of the most aggressive usage and most of the early profitable usage emanating from that country. European constituency is in turn playing to catch-up with the United States.

Hence, the critical success factors required for implementing electronic commerce in organizations can thus be summarized as follows:

- start with a need-based strategy rather than a technology-based solution, as not all solutions meet requirements and business processes of a trading partner, as some segments will not use the Web;
- develop an electronic commerce strategy which complements the corporate strategy;
- aggregate the disparate investments in electronic commerce that are likely to be found in any organization;
- avoid layering costs onto the current distribution network and look for substitution between channels;
- choose trading partners and their skills carefully;
- integrate across the entire organization in order to achieve large efficiency gains;
- transparent implementation and changing process is important both in terms of acceptance of the change and achieving expected efficiency gains;
- distinguish between striving to win new markets or customers and gaining cost savings from process improvements; and
- develop a benefits register and measure achievements against it.

4.1 The Future of Electronic Commerce in Australia and New Zealand

The future of electronic commerce in Australia and New Zealand looks optimistic, with significant plans being made for increased activity and implementation in the region. The Australian government has acknowledged the opportunities of electronic commerce and is working with all Australian states and territories to coordinate efforts to reduce barriers to its adoption. The findings suggest that electronic commerce is now reaching a critical mass and, while a number of elements continue to restrict its development, many of these, including the old security scare, are now being overcome.

Of all the industries surveyed, computers and communication showed the most aggressive stance and are reaping the greatest gains from electronic commerce. This is not surprising, given the internal knowledge base, existing technology infrastructure, vested interest in promoting the channel and predisposition of existing clients to employ

technology in business transactions. The education and financial service sectors also displayed significant early adoption of electronic commerce technologies.

Furthermore, the findings indicate that New Zealand organizations are:

- more likely to have national (vs. regional) reach,
- smaller,
- less likely to have taken action to integrate electronic commerce,
- less likely to have Intranet,
- more likely to have Electronic Funds Transfer /Point of Sale,
- less likely to do Public Relations or marketing via the Internet, and
- likely to have a stronger trust relationship with suppliers and customers.

4.2 Australia and New Zealand in the Year 2000

Significant plans are afoot for implementation of electronic commerce technologies and significant growth is expected in communication technologies, including company WWW sites, with 22% of respondents indicating they intend to implement web sites within 2000. In the same time frame, 25% intend to implement Intranet, 27% Extranet, 20% firewalls, 19% Electronic Data Interchange (EDI) and 15% certification/digital signatures.

At an industry level, a significant amount of activity is planned across all sectors surveyed. Ubiquitous are plans in the financial sector, with 43% of this group indicating they intend to implement Extranet technologies, 31% Intranet and Digital Signatures, and 26% Interactive Voice Response. Education also has significant implementation plans, for instance 30% of this group intend to implement Extranet, 22% Intranet and 24% an Electronic Kiosk. Health indicates a lot of activity with 44%, and 42% respectively planning to implement Intranet and Extranet technologies. In addition, 33% are planning a company web site, and firewalls, and 30% foresee using digital signatures.

5.0 SUMMARY AND CONCLUSION

Most of the businesses surveyed have been engaged in some form of electronic commerce for some years now. Even though the greatest hype over the latest technology, 'Internet' is to bring electronic commerce to the fore, centers around its potential as a means of buying and selling these functions have been done electronically for years. For example, order taking via EDI, call centers and even fax, was quite prominent. Even more common was the transmission and receipt of payment via Electronic-Funds-Transfer (EFT). What was new includes functions such as marketing, publishing, public relations, advertising or marketresearch until the emergence of the Internet.

The survey paved the way to the development of a complete and comprehensive theoretical framework, which examines electronic commerce adoption via in depth case studies.

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BIOGRAPHY

Pauline Ratnasingam obtained her Honours degree in Information Systems from Monash University in 1996. Currently she is an Assistant Professor in the School of Business Administration, The University of Vermont, Burlington, Vermont. Her PhD dissertation examined 'The Importance of Inter-Organizational-Trust in Electronic Commerce Participation'. Her research interests include Information Security, Electronic Data Interchange, Electronic Commerce Organizational Behavior and Trust. She has published several articles related to this area in national, international conferences and refereed journals. She is also an Associate member of the Association of Information Systems (AIS) and a member of Tradegate Australia Pty Ltd formerly known as Electronic Commerce Australia (ECA).