

# The Short Term Intention of Managers to Adopt Internet Commerce After the Tech Wreck: Directions for Research

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## Abstract

*Electronic commerce has been greeted with much excitement in both the research and wider community over its relatively short lifetime. While many authors have promoted electronic commerce, the “tech wreck” of early 2000 saw a sudden drop in ecommerce uptake. Only a limited amount of research has examined the reasons for the adoption of this technology.*

*This study examines the reasons for commercial technology adoption and applies them to the adoption of internet commerce by Australian companies. The study establishes a set of business reasons for technology adoption, being the desire to gain a competitive advantage, desire to remove a competitive disadvantage, improve communication, reduce organisational costs, improve functionality and a possible bandwagon effect. The study finds that internet commerce adoption may be associated with attempts to attain a competitive advantage, to improve communication. As with many internet commerce adopters, there is evidence of institutional bandwagon effects.*

## Introduction

A number of technological innovations have caught the attention of businesses in the past. The IS research community has accordingly afforded much coverage to these technologies, including the microcomputer (Olson 1982), MRP, ERP and enterprise systems (Cooper and Zmud 1990), telecommunications systems (Kriebel and Strong 1984). Ein-Dor and Segev (1993) and Swanson (1994) offer excellent discussion of the progression of these technologies in commercial environments.

Electronic and internet commerce is one technology that came to prominence in the research and popular literature in the mid to late 1990s. Many firms adopted the technology either to supplement existing operations or as a business approach in its own right. Internet technology could ostensibly change the way organisations communicate with customers and the wider community, allowing organisations to establish customer loyalty by facilitating one-on-one communication (Gonsalves et al. 1999) and alleviating the geographical limitations of conventional commerce (Teo et al. 1998 and Adamic and Huberman 2000). Garfinkel and Spafford (1997) argue that the adoption of internet technologies can lower communication costs, which may improve customer loyalty, allowing these firms to garner higher profits from repeat customers. Soaring stock prices were one indicator of the “New Economy” phenomenon (Jahnke 2001).

Despite popular advocacy of the technology, many such “dotcom” firms failed, notably towards the end of 2000 (Sivy 2001). Authors in the popular literature propose a number of reasons for this, including the use of fashionable but fickle business approaches (McCausland 2002), poor business models (Sivy 2001), unreliable customer bases (McCausland 2002), unworkable debt management (Lindsay 2002), and a lack of proven product or product

management skills (Arensman 2002). The lack of financial revenue or viable business models did not seem to deter new adopters: in the words of Sivy (2001:106),

*“The most flamboyant was the dotcom debacle. Bewitched by the Internet, venture capitalists, banks and ordinary investors were prepared to put money into almost any online business that attracted lots of customers. Dotcom shares traded almost entirely on the strength of revenue trends rather than earnings. Most dotcoms, in fact, had no earnings.”*

While authors such as Hitchin (2002) have offered lessons for business from this tumultuous period, there has been little published empirical research into how contemporary adopters are dealing with internet technology. Undoubtedly, many may be soured on the topic, however the research community stands to learn much from these events. An analysis of internet commerce, despite its immaturity, using concepts and theories derived in more traditional systems literature may assist researchers in contextualising the technology. This approach may assist researchers in understanding the idiosyncrasies of the technology now that much of the original market hype has evaporated. Importantly, researchers can see whether the reasons for technology adoption still apply under adverse technology conditions.

This poses an interesting opportunity for IS researchers. First, it offers a chance to re-evaluate the extant research literature on the reasons for IT adoption under conditions of technological adversity. Second, it has the potential to provide some insight into why firms might persist in adopting a technology once it is ostensibly no longer fashionable to do so. This study has two main objectives. First, to develop a conceptual model based on the potential reasons for technology adoption. Second, to apply this model to the adoption of electronic commerce. This study aims to address three fundamental research questions:

1. *What are the management reasons for technology adoption?*
2. *Do the reasons for technology adoption apply under conditions of adversity?*
3. *Why are Australian firms adopting internet commerce?*

This paper is structured as follows. The next section briefly discusses electronic commerce, mentioning some of the challenges of conducting research in the area. This is followed by a discussion of the analysis of technology adoption reasons in the IS literature. The paper then develops a conceptual model for this study, and details the research hypotheses. The following section discusses the research method. The results and discussion are then presented. The paper concludes with a discussion of limitations and areas for future research.

## **Electronic Commerce and Internet Commerce**

The term ‘electronic commerce’ has been applied to a number of electronic applications and technologies within business domains. Zwass (1996) chooses to categorise electronic commerce into three separate areas: consumer-oriented commerce, business-to-business commerce, and intra-organisational business. Schneider and Perry (2000) focus on the activities that comprise electronic commerce such as electronic funds transfer and Electronic Data Interchange (EDI in addition to the promotion, sale, and development of products, supplier relationship maintenance and investigation of potential markets).

The area of electronic commerce that will be examined in this study is internet commerce. Poon and Swatman (1999 p. 21) derive their definition of internet commerce from Zwass (1996): “the sharing of business information, maintaining business relationships, and conducting business transactions by means of Internet-based technology”. As the definition applied in this study concerns the use of the Internet for commercial transactions, electronic commerce will now be referred to as internet commerce.

## **The Reasons for Information Technology Adoption**

The research literature proposes numerous reasons for technology adoption. Swanson (1994), Tornatzky and Klein (1982), and Downs and Mohr (1976) all argue that researchers have often been confused between the strong order *reasons* for adoption, and the *facilitators* of adoption. While the facilitators or secondary considerations of adoption are of considerable interest, they are beyond the scope of this study.

### **Gain a Competitive Advantage**

Porter and Millar (1985) argue that information technology creates competitive advantage by offering adopters “new ways to outperform their rivals”, allowing companies to provide superior goods and services to those of their competitors. Bakos and Treacy (1986) and Earl (1987) similarly asserts that information technology can be applied in a strategic fashion to obtain a competitive advantage as a strategic weapon.

Increasingly, competitive advantage has become associated with “innovators” or “first-movers” (Norton and Bass 1987) and there may be limitations to the competitive advantage that can be derived from a given technology if much of the market has already adopted it. Fichman and Kemerer (1997) argue that “followers”, “imitators” or subsequent adopters of an object-oriented systems approach may be subject to serious disadvantages if they fail to adopt early in the technology life cycle.

This leads to the following research propositions:

*Proposition 1: Organisations adopt internet commerce to gain a competitive advantage.*

*H1<sup>a</sup>: Organisations wanted to be the first in their market to adopt.*

*H1<sup>b</sup>: Organisations adopt internet commerce to be a “first mover”.*

### **Reduction of Competitive Disadvantage**

Swanson (1994) argues that while firms may adopt a technology in an attempt to gain a competitive advantage, they may also adopt the technology in an attempt to remove a competitive *disadvantage*. Teo et al. (1998) observe that the business adoption of the Internet in Singapore is an attempt to access larger markets and subsequently create an advantage over geographically limited competitors, while at the same time reducing some of the competitive pressure from other firms.

This leads to the following research propositions:

*Proposition 2: Organisations adopt internet commerce to remove a competitive disadvantage.*

*H2<sup>a</sup>: Organisations believed internet commerce would reduce an advantage held by competitors.*

*H2<sup>b</sup>: Organisations adopt internet commerce to counter an existing competitive threat.*

### **Value Chain Management**

Porter and Millar (1985) argue that information technology affects every point in an organisation’s value chain, including internal and external linkages. Sakkas et al. (1999) argue that information technology tools facilitate information sharing throughout an organisation’s value chain and the development of more complex and efficient business structures. Chatfield and Bjorn-Andersen (1997) argue that the adoption of technology by Japan Airlines allowed the organisation to improve their competitive position by improving the benefits derived from their value chain. Chatfield and Bjorn-Andersen contend the adoption of inter-organisational

systems (IOS) will have significant impacts upon value chain management as well as the relationships within the value chain. Lee (1998) argues that the lower cost of the Internet and the larger user base would encourage organisations to adopt Internet based methods of inter-business communication and supply chain management. Johnston and Mak (2000) argue that the Internet can facilitate universal electronic compliance among a community of trading partners that may be diverse in their levels of sophistication. They argue that the Internet overcomes some of the limitations of other communication technologies such as Electronic Data Interchange (EDI).

These ideas lead to the following research proposition:

*Proposition 3: Organisations adopt internet commerce to improve value chain communication.*

*H3<sup>a</sup>: Organisations adopt internet commerce to improve communication with their customers*

*H3<sup>b</sup>: Organisations adopt internet commerce to improve communication with their suppliers*

*H3<sup>c</sup>: Organisations adopt internet commerce to improve communication with their shareholders*

*H3<sup>d</sup>: Organisations adopt internet commerce to improve communication with their competitors*

### **Reduce Costs**

The IS literature frequently associates the adoption of technology with reduced costs. Earl (1989) argues that IT adoption can contribute to the reduction of organisational costs in their attempts to establish a cost leadership strategy. Chircu and Kauffman (2000), and Coltman et al. (2001) concur. Tan and Teo (1998) find lower operational costs to be a significant contributor in Internet adoption. Igbaria et al. (1996) argue that Decision Support System (DSS) adoption has contributed to both time and money savings for the Westland Co-operative Dairy Company Limited.

Kelley (1994) found adopting a technology allows organisations to make significant efficiency gains by reducing resource costs. Porter and Millar (1985) argue that technology allows an organisation to deliver a product or service with greater levels of information support, and hence a product that is more effective for customers. Scudder and Kucic (1991) argue that the adoption of technology and the associated cost reduction and service quality improvements can be classified as productivity gains. Hitt and Brynjolfsson (1996) and Devaraj and Kohli (2000) found a positive relationship between technology adoption and organisational productivity.

This leads to the following research proposition:

*Proposition 4: Organisations adopt internet commerce to reduce organisational costs.*

*H4<sup>a</sup>: Organisations adopt internet commerce to reduce overall organisational costs*

*H4<sup>b</sup>: Organisations adopt internet commerce to reduce cost of recruiting staff*

*H4<sup>c</sup>: Organisations adopt internet commerce to reduce the cost of marketing their product range*

*H4<sup>d</sup>: Organisations adopt internet commerce to reduce the cost of marketing their service range*

## **Improve Functionality**

Norton and Bass (1987) argue that that new technologies allow the development of new products that were not previously feasible. Birch and Young (1997) argue that Internet adoption throughout the financial sector will require continuously rapid product innovation and service delivery so that an organisation can maintain a competitive advantage over market competitors. McGrath et al. (1996) argue that organisations will be able to develop competencies that they could not perform before the innovation attempt, including new ways of applying resources or the use of alternative production routines. The adoption of an innovation and the development of new competencies will facilitate the development and implementation of new products and services, and improve resource functionality (Sethi and King 1994).

This leads to the following research proposition:

*Proposition 5: Organisations adopt internet commerce to improve functionality*

*H5: Organisations adopt internet commerce to develop new functionality for existing resources.*

## **Research Method**

The research literature provides many methods for investigating a particular area of interest. More prominent methods include field experiments, case studies, and mail surveys. While each of these approaches may be applicable in certain circumstances, it is necessary to apply a research method that is most appropriate for the research area under investigation (Dillman 1978, Galliers 1992).

This study investigates the relationship between firm managers and information technology across a geographically disparate region. Further, a holistic view of electronic commerce was sought (Avison and Fitzgerald 1995). This suggested that the survey approach would be most suitable. The survey instrument is well suited for obtaining expeditious insights into particular, situations, views and practices at a particular point in time while also allowing the researcher to examine a substantial number of research variables (Galliers 1992).

## **Population Definition and Analysis**

Several requirements were placed on the population of businesses. First, the organisation had to be of a purely public nature and listed on the Australian Stock Exchange (ASX). Bretschneider and Wittmer (1993) and Yetton (1994) present evidence that governmental organisations have idiosyncratic characteristics, especially with regard to their structure and operation. Further, the inclusion of organisations that publicly released operating information beyond that derived through survey implementation would facilitate greater exploration of internet commerce. A list of all currently listed companies was obtained from the ASX website.

The second requirement was that the firm had to have adopted electronic commerce. The initial step was to search through the company's annual reports to see if they listed an Internet address for the firm. If an address was not found, the next step was to first search the ASX company listings database and then the Yahoo and Altavista Internet search engines. In both cases, the organisation's name and ticker code were typed in the search box, and results reviewed. No domain limitations were imposed, so as to catch those Australian companies that maintained top level domains outside of the ".au" suffix. A number of organisations were found to have Internet addresses that were incorrect or directed the researcher to a website that did not exist.

The third requirement was that the firm had to be Australian-owned. Foreign companies were excluded so as to reduce possible geographical biases in the research. This screening involved searching through the organisations' websites for a mailing address. If a mailing address was not found, the ASX database was again examined for company details. In all cases, the Head Office was selected for correspondence. The mailing addresses were then checked to ensure they were Australian. Where an organisation was found to have its Head Office outside of Australia, it was removed from the population.

The final population consisted of Australian non-governmental organisations that had adopted internet commerce, yielding a set of 588 companies. All population members were included in the sample.

### **Instrument Development**

The content and structure of survey questions is critical to the success of the study (Fowler 1988). This was borne in mind in three ways. First, the literature was searched for existing questions that had previously been used with success. Where a survey instrument could not be found, new questions were derived and pre-tested.

Second, in order to capture the effects of implementation lag (Brynjolfsson 1993 and Kettinger et al. 1994), a short term and long term time period was established for each of the operational variables. These were assigned 12 Months and 1-5 Years so as to ensure respondents took into account the same time frames. Dillman (1978) supports this method, arguing that definitive time periods should be included in survey questions.

Third, further questions were added to the survey instrument to allow more extensive analysis and research to be conducted at a later date. Dillman (1978) associates poor response rates with longer surveys, despite evidence from Herberlein and Baumgartner (1978) to the contrary. The survey instrument was limited to three pages in order to provide a balance between capturing a rich data set and providing little imposition as possible on the respondent.

### **Instrument Pre-testing**

Survey instrument pre-testing is important in mail surveys because the researcher does not have the support of interviews to provide reports on defects and other instrument limitations (Dillman 1978). Grover et al. (1993) argue that the pre-testing of a survey allows the survey to be further refined and thus create a more usable and reliable instrument.

The final survey saw three major stages of pre-testing. First, the instrument was presented to senior faculty staff members. The critical areas that were addressed in this analysis concerned survey length, question structure and the use of jargon items. The second version of the survey was presented to two local companies whose operations are globally oriented. Critical analysis was received regarding industry jargon, the ordering of questions in the survey, and some ambiguity regarding internet commerce.

### **Instrument Administration**

There is substantial literature concerning survey implementation. Kephart and Bressler (1958) argue that cash inducements may be applied in order to improve response rates. Dillman (1972) advocates the use of cover letters, outlining the survey's purpose, printed with letterheads, and the use of multiple colours to provide contrast, and also endorses reassuring respondents of their anonymity. Miller (1991) and Berenson and Levine (1993) argue that offering respondents a reward for survey completion may improve response rates. These arguments were considered in the administration of the survey.

The survey was sent to businesses in an envelope bearing the university seal. The envelope contained a copy of the survey, a reply paid envelope, a cover letter and a consent form. Each reply paid envelope was numbered so that respondents could be checked off upon receipt. The cover letter bore the official university letterhead and was signed by a senior member of staff in blue pen, as advocated by Dillman (1972). Respondents were directed to include a business card if they wished to receive a copy of the final report.

## **Results**

After four weeks, survey responses slowed. One hundred and twelve responses to the survey were received by that time, yielding a response rate of 19%. Five survey envelopes were returned empty and three respondents declined to participate in the survey, leaving 104 responses to be included in the dataset. Two missing data items were coded with the mean value for each particular item (Cohen and Cohen 1983). Analysis across industry groups revealed considerable consistency in proportional representation and showed that no industry was significantly under or over represented.

Response bias analysis was also conducted, under the advice of Fuller (1974). One method of examining non-response bias is to compare the responses of earlier respondents to those of later respondents on the basis that later respondents may have similar characteristics to those that did not respond at all (Filion 1975, Grover et al. 1993). Respondents were split about the mean response date and the Pearson Chi-Square test was used to analyse response dates. These results suggested that there was little, if any, bias in responses.

Cronbach Alpha coefficient analysis calculated using five Likert Scale variables (as advised by Srinivasan 1985 and Doll 1985) yielded an Alpha of 0.900, suggesting high internal reliability. However, it should be noted that the Cronbach Alpha coefficient is not necessarily an accurate indicator of instrument reliability. Anastasi (1961) argues that test reliability depends on whether the respondent interpreted the question as intended and then responded accordingly. The ability to measure this through statistical analysis of responses is somewhat limited.

## **Descriptive Statistics**

Table 1 provides the main summary statistics of the responding group. The largest sector represented in the respondent population is Gold, followed by Miscellaneous Industrials and then Oil and Gas, Entrepreneurial Investors, and Investment and Financial Services. The ASX classification systems includes companies that are classified into Solid Fuels, Chemicals, and Engineering. These organisations comprise a small percentage of both the ASX and original sample populations; the impact of non-response from these organisations is believed to be minimal.

Brancheau and Wetherbe (1990) found the age of an organisation is positively associated with technology adoption. An examination of responses indicates that organisations of a variety of ages are adopting internet commerce. Substantial numbers of respondents can be found in both the young and more mature age categories. This may indicate internet commerce is not limited to organisations of a particular age, consistent with Goode and Stevens (2000) or measures of size consistent with Goode (2001).

Table 1: Respondent Demographics

<b>Demographic</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Industry</b>		
Miscellaneous Industrials	18	18.00
Gold	13	13.00
Other Metals	9	9.00
Oil and Gas	7	7.00
Entrepreneurial Investment	7	7.00
Investment and Financial Services	7	7.00
Retail	6	6.00
Media	6	6.00
Miscellaneous Services	6	6.00
Diversified Industrials	5	5.00
Diversified Resources	3	3.00
Banking and Financial Services	3	3.00
Building Materials	2	2.00
Developers and Contractors	1	1.00
Alcohol and Tobacco	1	1.00
Food and Household	1	1.00
Paper and Packaging	1	1.00
Transport Services	1	1.00
Insurance	1	1.00
Property Trusts	1	1.00
Tourism and Leisure	1	1.00
<b>Age of Company</b>		
0 – 2 years	10	10.00
3 – 5 years	13	13.00
6 – 9 years	14	14.00
10 – 15 years	14	14.00
15 – 19 years	11	11.00
20 – 24 years	4	4.00
25 – 39 years	9	9.00
40 – 50 years	1	1.00
51 – 99 years	9	9.00
100 years or more	15	15.00

Number of Employees		
0 – 9	21	21.00
10 – 24	13	13.00
25 – 49	8	8.00
50 – 99	11	11.00
100 – 199	7	7.00
200 – 299	4	4.00
300 – 399	7	7.00
400 – 499	1	1.00
500 – 999	3	3.00
1,000 – 1,499	7	7.00
1,500 – 1,999	3	3.00
2,000 – 2,499	2	2.00
2,500 – 2,999	1	1.00
3,000 – 4,999	6	6.00
5,000 – 9,999	4	4.00
10,000 or more	1	1.00
No Response	1	1.00

  

Role of Respondent		
IS/IT Manager	31	31.00
Manager	23	23.00
Director	10	10.00
Company Secretary	6	6.00
CIO	5	5.00
Accountant	4	4.00
Administrator	4	4.00
CTO	4	4.00
Financial Controller	4	4.00
CEO	2	2.00
Other	7	7.00

Table 2 provides descriptive statistics for respondent website applications. The most common website function was promotional and marketing, though servicing existing customers and sales also constituted important activities. Many respondents noted their website performed more than one fundamental activity. This indicates that the implementation of internet commerce can take many forms, consistent with Applegate et al. (1996). The limited number of organisations offering sales or purchasing facilities is consistent with Liu et al. (1997) who found that just over a quarter of Fortune 500 companies provided such facilities.

Table 2: Website Function

Demographic	Frequency	Percentage
Fundamental Activity(s) of Website†		
Distribute Pricing Information	17	8.21
Obtain Customer Information	15	7.25
Service Existing Customers	36	17.39
Promotional/Marketing Tool	85	41.06
Sales	27	13.04

Shareholders <sup>†</sup>	27	13.04
Number of Fundamental Activities per Website		
0 <sup>‡</sup>	2	2.00
1	43	43.00
2	29	29.00
3	7	7.00
4	10	10.00
5	9	9.00

<sup>†</sup> Percentages shown are those of all fundamental activities, and not percentages of respondents.

<sup>‡</sup> A number of respondents entered this into the “Other” field.

<sup>‡‡</sup> One respondent described the values as “Financial Services”. The other failed to give details.

## Hypothesis Testing

The Chi-Square test of proportions was used to examine proportional significance, after the advice of Frank and Althoen (1994). Two conditions must be satisfied before the hypothesis can be accepted. First, the proportional representations must indicate a statistically significant number of companies expecting a particular change in their business conditions and, second, the direction of significance must be equivalent to that of the hypothesis.

Table 3: Hypothesis Testing using Chi Square Analysis

Hypothesis	Factor	Variable	Chi-Square	Asymp. Sig	Result
H1a	Competitive Advantage	ADVANT	4.000	.046	Accepted
H1b	First mover advantage	FIRSTMOV	36.962	.000	Rejected
H2a	Remove competitive disadvantage	DISAD	31.360	.000	Rejected
H2b	Counter a competitive threat	THREAT	100.038	.000	Rejected
H3a	Customer communication	CUSBIN	.346	.556	Rejected
H3b	Supplier communication	SUPBIN	49.846	.000	Rejected
H3c	Shareholder communication	SHABIN	3.846	.051	Rejected
H3d	Competitor communication	COMBIN	32.346	.000	Rejected
H4a	Overall organisation costs	COSORG	34.615	.000	Rejected
H4b	Recruiting staff costs	COSREC	77.885	.000	Rejected
H4c	Marketing service range costs	COSSERV	49.846	.000	Rejected
H4d	Marketing product range costs	COSMARK	32.346	.000	Rejected
H5	New functionality	NEWFUNC	4.000	.046	Rejected

## Discussion

### Competitive Advantage

The results indicate that Australian companies expect to gain an advantage over their competitors from technology adoption, consistent with Porter and Millar (1985) and Earl (1987). Anecdotal evidence provides an insight into the nature of this advantage. One respondent noted, “Our ‘clicks and mortar’ approach will give us an advantage over the virtual retailer”. Another respondent argued, “Our web page should develop over time to give further service and added value to the shareholders and hopefully provide a better service to our shareholders than other competing companies in our industry”. This highlights the

transient nature of advantages that may be derived, a view supported by Kettinger et al. (1994).

Interestingly, firms coincidentally do not perceive any first mover advantage in their acquisition. It appears that respondent firms, whether consciously or otherwise, hence perceive some difference between first mover advantages and other types of competitive advantage. It is possible, then, that respondent firms have seen a reduction in benefits arising from first mover advantage due to the ecommerce “tech wreck”. This issue remains unresolved.

### **Competitive Disadvantage**

The results indicate that Australian companies do not expect to reduce the competitive disadvantage in the marketplace. This finding is contrary to Swanson (1994) and Teo et al. (1998), who argue that organisations may adopt a technology to reduce a competitive disadvantage.

Fichman and Kemerer (1997) support this explanation, associating the removal of a competitive disadvantage with “followers” in the adoption process. The results from H1 appear to strengthen this interpretation. Anecdotal evidence further supports this. One respondent noted they could only effectively remove a competitive disadvantage if their technology were better than that of their competitors. Another respondent also provided an insight into the transient nature of the benefits they expected to derive: “Over time competition will increase and most advantages held by competitors will be reduced”.

### **Communication**

The results indicate that, after the “tech wreck”, managers do not expect to improve communication through internet commerce adoption. This result contradicts theory proposed by Swanson (1994) and Earl (1989). External communication with competitors, shareholders and suppliers, and internal communication were not supported. This role of internet commerce may be indicative of a shortage of communication to shareholders and customers previously. Another consideration is the possible shortage of previous communication channels to customers and shareholders, as opposed to the previously established methods involving regulators, suppliers and internal communication channels.

### **Costs**

The results suggest that managers do not expect to reduce operating costs from internet commerce adoption. This result is contrary to literature arguments that organisations can gain significant efficiency and effectiveness advantages from the adoption of technology. Consistent with this finding, Tan and Teo (1998) found lower operational costs to be a significant contributor to Singaporean organisations adopting the Internet.

One possible explanation for this cost reduction result may be related to the inability of organisations to quantify adoption costs, consistent with Schneider and Perry (2000). In particular, the high rate of technology change means that organisations will be limited in their ability to quantify adoption, conversion and integration costs in terms of future expenditure. Stylianou et al. (1996) discuss similar issues with regard to corporate mergers and acquisitions, while Robbins and Stylianou (1999) discuss the impacts of post-merger acquisition on information systems capabilities.

### **New Functionality**

The results indicate that managers do not expect to improve functionality through internet commerce adoption. This result conflicts with theory presented by Norton and Bass (1987)

who argue that technology adoption allows organisations to garner increased functionality from existing resources. The principal activities of the organisation may cause this divergence from theory.

A substantial number of respondents are based in industrial and extractive sectors of the economy. These organisations may receive limited increases in functionality from the adoption of internet commerce, as their products and output are prominently larger material items such as steel, oil and gas or minerals. Manufacturing and industrials comprised 50% of respondents, which may limit the expectation of organisations when adopting internet commerce, consistent with Bretschneider and Wittmer (1993) and Premkumar and King (1994). Additional analysis examining improved functionality with respect to industry classification: the result was insignificant at the five percent level.

## **Conclusions**

### **Findings**

This study aimed to address three fundamental research questions:

#### *1. What are the management reasons for technology adoption?*

Literature analysis provided six principal non-exclusive management reasons for technology adoption. These included gaining a competitive advantage, removing a competitive disadvantage, improvements in communication with the value-chain network, improvements in productivity, increased functionality, and the institutional bandwagon effect. All of these reasons have received substantial support and application in the published Information Systems research literature.

#### *2. Do the reasons for commercial technology adoption apply under conditions of adversity?*

Despite much extant evidence supporting these reasons for technology adoption in the literature, the results of this study are not in accord with this, at least not with respect to internet commerce. It appears as though, under adversity, the desire to acquire a competitive advantage is the strongest reason for adoption. It is possible that immediately after the tech wreck upheaval, managers were unable to clearly describe what they required from their ecommerce adoption. Managers appeared to understand that they did not seek any first mover advantage, however their needs beyond this were unclear.

#### *3. Why are Australian firms adopting internet commerce?*

The main management reasons for adopting electronic commerce are to create a competitive advantage. There was also evidence of a bandwagon effect still present despite the “tech wreck”.

### **Limitations**

The results are subject to a number of limitations. First, this study was conducted once, the results would be more robust if the study were repeated. Second, the adoption of internet commerce was only examined over a brief time period. The reasons found for technology adoption may be symptomatic of the time from which the results are drawn, replication of this study would strengthen results. Only a limited number of Australian publicly listed companies were examined. Additionally, Australian companies may idiosyncratically adopt technology for as yet undiscovered reasons. Application of this study to another population would enhance the ability to generalise the results presented in this study.

A third area of limitation concerns the reasonably low response rate. Some sample members may have been dissatisfied with their internet commerce implementations, or electronic commerce in general, and were hence reluctant to reply. If only successful respondents

replied, the predictive power of these results may be reduced. Additionally, the use of non-parametric statistical tests may marginally reduce the strength of statistical inference that can be drawn from this study (Newbold 1991).

### **Further Research**

This study provides the foundations for several areas of further research. These include refinement of the methods applied in the study, further investigation into internet commerce, the development of expectations to realised events, further research into alternative electronic commerce technologies, further application of financial variables in correlation with technologies, and an application of similar constructs and ideas to other technologies.

This study provided an exploratory investigation into the compelling reasons for technology adoption. However, further refinement of the variables is required so that greater understanding of their implications can be developed. Further refining of the variables applied in this study will not only provide a greater understanding of both internet commerce characteristics and business oriented technology adoption considerations, but also provide an added insight into technology adoption that is not addressed directly by previously established theories.

This study has examined the expectations that were prevalent in the adoption of internet commerce. Further research that studies the realisations would provide greater insight into internet commerce. Such a study would also facilitate comparison to the results derived in this study. These studies would promote understanding of the reasons for technology adoption and the impact that technology has on organisations. This would assist business in their decision to adopt technologies and allow greater benefits to be derived from internet commerce adoption.

This study has provided some further insight into the relationships between organisations and electronic commerce, the differences in these technologies and their subsequent impacts upon organisations create a fertile ground for further research. Further research into other electronic commerce technologies can only promote greater understanding of the relationship between organisations and technology.

### **Research Contribution**

This study makes two main contributions to Information Systems research. First this study has investigated a very immature technology that has received scant investigation thus far. Second the approach taken in this study is one that examines business-derived motives for technology adoption, another area of Information Systems that has received limited attention.

The Information Systems discipline is constantly developing as new technologies emerge. The advent of internet commerce and other electronic commerce media has caused great enthusiasm and interest from research and other communities. The immaturity of the technology has limited the amount of research that has been conducted into such a technology. This study applied traditional Information Systems theory to provide an initial investigation into internet commerce. The approach will facilitate greater understanding of internet commerce, and also promote improved refinement of the more traditional theoretical concepts that were applied. This study also promotes an understanding of where internet commerce may reside in the classification of information systems.

Application of similar instruments to other technologies will allow researchers to gain greater understanding of business motivations for adopting technology. A greater understanding of the business motivations will allow researchers and practitioners to not only understand organisational processes but to assist in the development and implementation of business oriented technologies.

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