

**A SURVEY OF CURRENT E-BUSINESS (E-GOVERNMENT)  
DEVELOPMENT PRACTICES IN AUSTRALIA**

**Don Kerr**

University of the Sunshine Coast  
E-mail: dkerr@usc.edu.au

**Kay Bryant**

Griffith University  
E-mail: k.bryant@griffith.edu.au

**ABSTRACT**

The Internet is a dynamic part of the business scene and there have been many examples of success and failures of e-commerce and e-business ventures. This research looks at the attitudes of top level executives (notably the Chief Information Officer) to e-commerce and the level of adoption of the various aspects of e-commerce by firms in Australia. To achieve this aim, a survey was administered asking questions about industries understanding of current e-business (e-government) practices. The object of the survey was to provide a benchmark of current practice across a wide range of industries. The results of this survey could have a major impact on academic curricula. The survey was sent to 671 Australian Businesses and was addressed to the Chief Information Officer. Only twenty four usable questionnaires were returned and while it is accepted that this is a limited sample, disturbing trends have appeared with respect to the lack of strategic planning for information technology use particularly in medium sized businesses in Australia. In addition, relationships between key factors associated with the business objectives for their ICT infrastructure and the benefits of the organisation's Extranet, Intranet and Internet initiatives were identified.

**INTRODUCTION**

In the last two decades of the 20th century, affordable and powerful computer hardware and software along with the advanced telecommunication technology have laid a solid foundation for the emergence and popularity of the Internet. Individuals as well as organisations have quickly adopted the Internet as a communication tool for data transmission and the provision of information and services. The Internet is fast, simple, and convenient without the limitation of distance and time. It is a dynamic part of the business scene and there have been many examples of success and failures of e-commerce and e-business ventures. In the past, the US has been leading the world in the use of the Internet for business activities. As such, much of the research conducted into e-commerce and e-business has been centred in the US, but it is timely for studies to be done in other parts of the world. This research looks at the attitudes of top level executives (the survey was addressed to the Chief Information Officer) to e-commerce and the level of adoption of the various

aspects of ecommerce by firms in Australia. The approach was to administer a survey asking questions about current e-business (e-government) practices. The object of the survey was to provide a benchmark of current practice by providing an overview of attitudes to the overall organisational goals of e-business and the methods and hardware infrastructure used by Australian firms across a range of industries.

This paper begins with an overview of the world's e-readiness and how organisations have adopted the Internet for business transactions. Next, the research that was undertaken is described. Findings are presented in the third section, where the extent and manner of organisational adoption of e-business is reported. The final section provides a discussion of these results.

### *Internet Usage*

Substantial proportions of individuals and organisations in developed countries are online or at least have Internet access. Current research conducted by the Economist Intelligence Unit on the e-readiness of the world's largest economies is published in its white paper (EIU, 2007). The definition of e-readiness used by the EIU is "that each country possesses an interconnected set of infrastructural, political, commercial, legal and social attributes that, when combined effectively, help the economy grow and government and society improve" (pg 2). In this report, EIU has made some changes to how it assesses e-readiness, with some consequential movements among the rankings. The EIU research shows the US holding its second place behind Denmark; a place it now shares with Sweden. Australia was ranked ninth out of 69 countries; one place down from the previous year but still one place ahead of the 2005 rankings. Nine of the top ten countries from the previous year still remain so although the rankings have changed. The net affect is that while e-readiness is progressing around the world, its achievement is becoming more complex. The EIU research has developed a score that relates to a country's e-commerce readiness. This score is out of 10 and is derived from six factors measuring social, political, economic and technological development. Nonetheless, the differential between the top 20 countries, with an average score of 8.4, and the bottom 20 countries, whose score is 4.1, is diminishing. Overall, the world's e-readiness is improving as many developing countries are committing significant resources to developing their digital economy.

The Department of Communications, Information Technology and the Arts present, in their 2005 report (DCITA, 2005), the situation in Australia. DCITA reports that 62% of households and 74% of all businesses had Internet access. Further, 25% of businesses had Web sites. Of those businesses that are online, 50% still used Dial-up connections while 41% used broadband and the remaining 9% used ISDN. With respect to broadband, the vast majority of business used either DSL (67%) or cable (28%) technologies. The entry level costs for broadband had increased marginally (less than 1%) from the previous year, while the entry level access for cable decreased by slightly more than 7%. The report went on to say that Australia remains one of the countries with the lowest entry level prices for broadband and cable access.

DCITA also reported on the online activities of all businesses within Australia. The majority of online businesses used the Internet to place orders for goods and services (42%); and lodge electronic payments (28%) and taxation forms (26%). Most small to medium enterprises (SMEs) are active in e-commerce/e-business activities. While the majority of these activities such as paying for (62%); receiving payments for (50%), and taking orders for (41%) goods and/or services increased from the previous year, placing orders for goods and/or services decreased slightly (53%). Internet banking remaining the most used activity (70%). The report contained an estimate for business Internet income of \$33 billion, which was \$8.7 billion up from the previous year. This total business income figure was equivalent to 2% of total business income for the surveyed firms

and 4% of Gross Domestic Product. These figures can be considered as a moderate achievement, however, they are well below the conservative forecasts of 15% of the late 1990s (Markham, 1998).

Neither the EIU report nor the DCITA report provides information on how e-business has been incorporated into organisations. The most significant challenge organisations are currently facing is how to incorporate information and Internet technologies into their business activities so that an overall improvement in effectiveness and efficiency is achieved, and so influence the strategic positioning of the organisation. This paper seeks to identify how organisations are incorporating e-business into their business activities and identify the resources used to achieve this. Further, this paper identifies the objectives behind the e-business initiatives and the benefits that are realised.

## THE LITERATURE

McKay and Marshall (2004) suggest that at a strategic level, a shared vision of purpose, goals and objectives is imperative, and that a strategic plan should be an ongoing activity that is essential to ensure effective ICT<sup>3</sup>/business alignment. This ICT/business alignment is essential for companies implementing any information system and this lack of alignment is a well recognised management problem within many companies (Roepke, Agarwal and Ferratt 2000).

The lack of alignment is also a major criticism of ICT and one of the major aspects that Nicolas Carr considered in relation to the failure of ICT to provide competitive advantage (Carr 2003). Carr defines ICT as an infrastructural technology in that it needs to be shared and cannot be used in isolation. In the early stages infrastructural technology is restricted and therefore provides the user some competitive advantage, however as the previously scarce resource becomes more available, it loses its competitive advantage and becomes ubiquitous and eventually a commodity that everyone has and hence offers little if any competitive advantage (much like electricity is provided as a service).

Another dimension to the business application of ecommerce is the level of risk and adaptation to change a company is willing to undertake. Hirschheim and Sabberwal (2001) suggest that organisations can be placed in one of three business stances. These stances are (1) Prospector, where the company takes a somewhat aggressive, entrepreneurial stance to their business dealings; or (2) Defender where the company establishes itself in a niche market and is usually resistant to change; or (3) Analyser, that is midway between the two having a cautious approach to risk but with a more entrepreneurial approach to business dealings than the defender stance. These different stances are applicable to this study and are used to categorise the survey results in the discussion section of this paper.

With respect to this study and implicit in the survey questions (appendix One) is Porter's competitive strategy five forces model (Porter 1985). This five forces model has been adapted by Gendron (2006) to look at the potential impact on web enablement. The five forces are:

- [1] Threat of new entrants
- [2] Industry competition and rivalry among existing companies
- [3] Suppliers and bargaining power
- [4] Buyers and bargaining power
- [5] Substitute products

---

<sup>3</sup> As is convention ICT (information and communication technology) and IT (information technology) are used interchangeably.

The survey instrument contained questions relating to all five forces and how these relate to responses is discussed in the discussion section of this paper.

### ***Other Studies***

Teo, Lin and Lia (2008) report on the e-procurement adoption levels in Singapore. They used a similar approach as this study, namely a survey questionnaire to determine the factors associated with adoption. Their findings revealed that the size of the firm, top management support, indirect benefits and the influence of business partners were significantly associated with adoption in a positive way.

In another study, Al-Qirim (2007) uses a regression approach similar to that used in this study to analyse adoption levels of ecommerce in New Zealand. This study showed that the innovativeness of the Chief Executive Officer had a major influence on many ecommerce technology adoptions within small enterprises (SME's) in New Zealand, while relative advantage and competition were significantly associated with more outward focused technologies such as Extranets. The study also found that pressure applied by suppliers was the only determinate for electronic data interchange (EDI) adoption amongst these SME's.

Both these studies looked at factors affecting adoption levels of ecommerce in their respective countries, they did not look at the existing use of the technology and the attitudes of top executives to the technology itself as is the case in this study.

## **METHODS**

An extensive eight-page questionnaire was developed to survey organisations about their e-business (and e-government) initiatives and development practices. The survey had ethics approval and respondents were assured that all information would be made anonymous and that only de-identified summary statistics would be reported. The survey was conducted in June and July 2007. The object of the survey was to provide a benchmark of current practice. The survey instrument was developed by California State University and contained five components (Tsai and Ching 2003). The first component sought information about organisational characteristics, how they classified their e-business goals and what objectives they wanted to achieve with their initiatives. The second component sought information on the key decision makers and other participants to the decision-making process. The ICT infrastructure was the focus of the third component of the instrument. The physical components that make up the ICT infrastructure were sought along with tools used for data mining and communications; the information management functions performed within the organisation and functions that were outsourced. The component also required the identification of areas impacted by the implementation of e-business initiatives. The fourth component focused on network usage, particularly the use of the Internet, extranets and intranets by the organisation. Information on the benefits realised from these initiatives and how performance or outcomes were measured were also sought. The final component asked for name and address details on the organisation as well as the name and title of the person completing the questionnaire. The final part of the component provided the respondent with a space where they could write any comments they believed were relevant to the study.

Questionnaires were sent to the top level information management staff, both in the private and public sectors, throughout the Australia. The list of organisations was obtained from a commercial company specializing in mailing lists. Ethical clearance was requested and obtained from the University before the questionnaires were sent out. The target population for the survey was the

chief information officer of state government offices, local government offices, and corporations through out Australia. A total of 671 questionnaires were sent out to organisations via the Australian Postal Service.

Data analyses were conducted on the data related to business objectives for ICT infrastructure and benefits of the organisation's Extranet, Intranet and Internet initiatives. The analyses involved descriptive statistics including correlations and regression analysis.

## RESULTS

The survey was divided into five components, namely, organisational characteristics, the personnel involved in decision making, the information infrastructure, network usage and contact details of participating organisations. This section in the paper provides details of responses to questions for all but the last component of the survey. Details on the participating organisations are not provided to maintain anonymity of the respondents. Unfortunately, only twenty-four valid responses were returned, resulting in a response rate of 3.58%.

### *Organisational Details*

The first four questions asked about organisational characteristics including, gross revenue, number of employees and whether the employees were involved in ICT or e-business development. The Australian Bureau of Statistics provides a classification scheme for organisations based on the number of employees: small - where the number of employees are below 20, medium - where the number of employees are between 21 and 200; and large - where the number of employees is above 200 (ABS, 2005, pg 11). Participating organisations were classified accordingly; however, only two categories were evident – medium-sized and large-sized. Table One shows the average of these variables across the two categories as well as the range of values. The gross revenue of the companies involved varied from \$3 million to \$500 million and the number of staff ranged from 30 to 2600. Annual gross revenue was not reported by two respondents and this may be due to concerns about privacy.

Characteristic	Medium-sized		Large-sized	
	Average	Range	Average	Range
Annual Gross Revenue (millions)	8.2	3 - 18	303.0	40 - 1500
Total Employees	50.8	0 - 83	1059.0	215 - 2600
IT Employees (percentage of total employees)	13.4	30 - 87	11.0	.01 - 70
E-business Employees (percentage of IT employees)	6.9	0 - 40	9.5	0 - 30
Number of participating organisations	9		15	

Table One - Characteristics of the participating organisations (\$AUD)

### *Descriptive statistics*

Responding organisations were split with respect to their business activities; half were involved in government at the state or local level; while the remaining organisations were involved in private

enterprise. The range of activities for those organisations involved in private enterprise included: health, energy retailing, manufacturing, printing, real estate, import and/or distribution, design, consulting, plant maintenance, and timber milling. The respondents were split equally based on whether they had a written three-year strategic technology plan or not.

When the respondents were asked to categorize their e-business goals as described by Ward and Peppard (2002, pg 42). They categorised systems in terms of their role in the organisation as shown below:

- Strategic – applications that are critical to achieving future business strategy
- Key operational – applications that the organisation currently depends on for success
- High potential – applications that might be important in achieving future business success
- Support – applications that are valuable but not critical to business success

The majority of respondents classified their systems as strategic (46%). Other classifications were high potential (25%), key operational (25%) and support systems (33%). Respondents were able to select more than one category. In classifying their e-business goals, seven of the large-sized organisations reported their application portfolios as being strategic, one as a combination of strategic and high potential, three as high potential only, three as support systems and two as key operation systems. The medium-sized organisations classified their e-business goals as strategic and key operational (four each), five as support systems and two as high potential. Of these, two respondents used more than one category to describe their e-business goals; one combined strategic with key operational and the other used all four categories. Medium-sized organisations tended to classify their e-business goals as being either key operational or support systems more often than large-sized organisations that used strategic and high potential categories more often. The final question in the organisational section related to the objectives for the ICT infrastructure. These are shown in Table Two. A Likert-type scale was used for the rating; from 1 - not important to 5 - very important. The final column in the table provides a comparative ranking of the objectives, from least (1) to most (9) important. The most important aspects were reliability, integrity, security, availability and user friendliness, while instantaneous response and portability were ranked least important.

Objectives	Average Rating	Relative Importance
Portability	2.9	1
Instantaneous Response	3.5	2
Adaptability	3.7	3
Flexibility	3.7	3
Scalability	3.7	3
Manageability	3.8	4
Manageability	3.8	4
Maintainability	3.9	5
Functionality	4.3	6
Availability	4.4	7
User-Friendly	4.4	7
Security	4.6	8
Integrity	4.6	8
Reliability	4.7	9

Table Two – Objectives for ICT infrastructure based on a 5 point Likert score (1 being least important to 5 most important).

### ***Personnel***

The second component of the questionnaire contained two questions designed to identify which personnel were involved in their organisation's e-business strategic planning. Respondents could select more than one option for both questions. The first question focused on the key management decision makers. Respondents named the Chief Executive officer as the primary decision maker (75.0%), followed by the Chief Financial officer (45.8%), and the Chief Information officer (12.5%). The second question focused on the key participants in the design and implementation aspects of their organisation's e-business strategic planning not including traditional system development personnel. The respondents named external ICT specialists (58.3%) and external business consultants (41.7%) as the main participants, followed by information security officers (29.2%) and legal consultants (16.7%).

### ***ICT infrastructure***

The third component of the questionnaire focused on the information technology infrastructure. Again, respondents could select more than one option in each question. The first question related to the physical components of the e-business infrastructure. There were three aspects to this question: hardware, software and database structure. One respondent did not provide any information on the hardware question and three others did not provide a response to the software or database structure elements. As these were technical questions using some industry jargon, the non ICT specialist respondents had difficulty in answering them and chose to leave them blank. The vast majority of hardware components were used by almost all respondents. Applications servers and database servers were used by all who responded, and backup servers and firewalls were used by 87.5% of respondents. Email servers (83.3%), Web servers (79.2%) and Routers/Switches (75%) were the next most used hardware components. Storage servers and printer servers were used by just over half of the respondents. Server support applications (62.5%) were the primary software components followed by Web server support applications (50%) and Middleware (16.7%). The relational database structure was selected by a majority of the respondents (91.7%) with the network database (66.7%) the second most common structure used. The Object-oriented structure was used by 16.7% while the hierarchical and other structures were each employed by 12.5% of the respondents.

The next two questions related to the use of data mining tools for e-business and the primary method of communication with their online customers. Most respondents employed data mining tools for combined customer/product/service purposes (62.5%). Email (58.3%) and Web pages (58.3%) were the primary forms of communications with online customers. Telephone (29.2%) and Call centres (8.3%) were the least selected options for communications with online customers.

Two questions focused on the types of information management functions undertaken within the organisation and which functions were outsourced. Responses to the questions are shown in Table Three. One respondent did not provide information on the types of information management functions undertaken. This particular survey response was completed by the general manager who indicated that "This survey used jargon not fully understood by someone not involved daily with IT", thus indicating that he may have had some confusion about the functions listed. While four respondents, two at the CEO level, one at the CIO level and another being the director of sales and marketing did not provide a response to the functions outsourced question. As all these respondents were top level executives and they were able to fill in all the other questions accurately, we consider this non response to indicate that none of the functions mentioned on the survey question were outsourced by those respective firms.

Content management, contingency management and security management were the three functions selected most often. Emerging technology management was selected by only three of the respondents. Outsourcing in one form or another was undertaken by most of the participating organisations. Traditional systems maintenance, system integration, and database management were outsourced most, while customer relationship management was not selected at all. E-business development was outsourced by 37.5% of respondents, while e-business maintenance was outsourced by only 25.0% of respondents.

Information management function performed	Percentage of respondents	Relative Importance
Content management	91.7	1
Contingency management	70.8	2
Security management	62.5	3
Customer relations	58.3	4
Inventory management	58.3	4
Documentation management	58.3	4
Vendor management	54.2	5
Performance management	50.0	6
Knowledge management	45.8	7
Development management	29.2	8
Integration management	20.8	9
Emerging technology management	12.5	10
Business functions outsourced	Percentage of respondents	Relative Importance
Traditional systems maintenance	62.5	1
System integration	58.3	2
Database management	41.7	3
E-business development	37.5	4
Off-the-shelf program evaluation	37.5	4
Systems evaluation	33.3	5
Network management	29.2	6
E-business maintenance	25.0	7
Data warehouse/data mining	20.8	8
E-mail system management	20.8	8
Contractor solicitations	16.7	9
Internal end user support	12.5	10
Call centre	8.3	11
Contractor management	8.3	11
Customer relationship management	0.0	-

Table 3: – The percentage who responded to each factor and their relative importance (rank) for information management functions performed within the organisation and business functions that have been outsourced. The most important having a relative importance ranking of 1.

The final question in this component of the survey questionnaire identified which areas were impacted by the implementation of e-business systems within the organisation. The main areas impacted were ICT infrastructure (75%), business processes (70.8%) and resources (70.8%).



Operation processes and Strategic Planning were selected by 54.2% and 50% of the respondents respectively, while management decisions (37.5%) was least affected by e-business initiatives.

### **Network Usage**

The fourth component of the questionnaire focused on network usage. There were five questions in this component. Respondents could select more than one option for the first three questions and the last one; while the fourth question required the respondent to rate the benefits of its e-business initiatives. The first question asked about the organisation's reasons for using the Internet. The responses are shown in Table Four.

Internet usage	Percentage of respondents	Relative Importance
E-mail	91.7	1
Web page presence	87.5	2
Business-to-consumer	65.5	3
Marketing and advertising	58.3	4
Business-to-business	41.7	5
E-government	37.5	6
E-education	25.0	7
Management driven	16.7	8
Customer-to-customer	12.5	9

Table Four – The percentage who responded to each factor and their relative importance (rank) for the factors associated with the reasons for Internet usage within organisations. The most important having a relative importance ranking of 1.

The goals associated with the organisation's use of Extranets were the focus of the next question. Table Five shows the responses. The most commonly selected goal by far was customer service and support, whereas production and inventory control between business partners was the least selected goal.

Extranet usage within the organisation	Percentage of respondents	Relative Importance
Customer service and support	75.0	1
Post electronic forms	45.8	2
Products/services catalogue information	41.7	3
Electronic funds transfer	37.5	4
Electronic data interchange	29.2	5
Portal	25.0	6
Marketing and advertising	25.0	6
Collaboration between business partners	16.7	7
Sales	16.7	7
Publish information among business partners	12.5	8
Production and inventory control between business partners	0.0	-

Table Five – The percentage who responded to each factor and their relative importance (rank) for the factors of goals of the organisation's use of Extranets. The most important having a relative importance ranking of 1.

The next question related to the objectives associated with the organisation's use of Intranets. Table Six shows the responses. The Intranet was primarily used to broadcast information. Software distribution and management and inbound logistic systems were the least selected objectives of the intranet.

Intranet usage within the organisation	Percentage of respondents	Relative Importance
Broadcast information	79.2	1
Post electronic forms	62.5	2
Education and training	54.2	3
Document management	54.2	3
Team collaboration	41.7	4
Inbound logistic system	20.8	5
Software distribution and management	8.3	6

Table Six – The percentage who responded to each factor and their relative importance (rank) for the factors of objectives of the organisation's use of Intranets. The most important having a relative importance ranking of 1.

The fourth question required the respondents to rate the importance of the benefits realised from their Extranet, Intranet and Internet initiatives. A Likert-type scale was used for to rate the benefits; from 1 - not important to 5 - very important. The final column in the table provides a comparative raking of the benefits, from least (1) to most (11) important. Table Seven provides the results. The most important benefits were increased productivity, efficiency, enhanced communications and increased sales and marketing efforts. The least important benefits were supply chain coordination, competitive advantage and industry leadership.

Objectives	Average Rating	Relative Importance
Supply chain coordination	2.22	1
Competitive advantage	2.72	2
Industry leader	2.91	3
Customer retention/loyalty	2.95	4
Increased profitability	3.18	5
Cost reduction	3.32	6
Better decision making abilities	3.55	7
Customer satisfaction	4.00	8
Enhanced communication	4.09	9
Increased Sales and marketing efforts	4.09	9
Efficiency	4.13	10
Increased productivity	4.22	11

Table Seven– The percentage who responded to each factor and their relative importance (rank) for the factors of benefits realised by the organisation's use of Extranets, Intranets or the Internet

The final question focused on how the organisations measured the performance or outcomes of their e-business initiatives. Productivity was selected by the majority of respondents (66.7%), while Profit and Cost was selected least; 20.5% and 25 % respectively. One respondent indicated that this could not be measured by them.

#### *Further Analysis – business objectives for ICT infrastructure*

Correlations and regression analysis were undertaken with respect to the business objectives of the information technology infrastructure. The correlation matrix is shown in Table Eight. Strong correlations are evident for adaptability against flexibility and scalability, indicating the obvious conclusion that more scalable, flexible systems are considered more adaptable. Other strong correlations were for manageability against functionality and maintainability, again indicating that systems with better functionality as well as being able to be maintained more easily were more manageable. A strong negative correlation was identified between systems integrity and portability. The more portable a system was, the more concern was expressed about the overall integrity of the system. There was also a strong positive correlation between integrity and reliability with more reliable systems being judged as more sound. Another significant correlation was between user friendliness and security with a strong positive correlation indicating that secure systems were thought to be more user friendly (Table Eight). Perhaps this is not so surprising when we consider that the survey was completed by CIO's who would have a vested interest in having secure systems. The final significant correlation was a negative one between instant response and maintainability, indicating that the process of systems maintenance may be a contributing factor to slower response times.

Business Objectives	Adaptability	Availability	Flexibility	Functionality	Manageability	Maintainability	Instant Response
Adaptability	1						
Availability	.308	1					
Flexibility	.827**	.240	1				
Functionality	.280	-.117	.171	1			
Manageability	.156	.120	.115	.441*	1		
Maintainability	.211	-.080	.405*	.372	.546**	1	
Instant Response	.011	.049	-.249	.199	-.171	-.449*	1
Integrity	.031	.291	.038	-.041	.012	-.073	-.075
Portability	.263	-.039	.110	.275	.119	-.013	-.028
Reliability	-.004	.388	-.005	.141	-.055	.171	-.296
Scalability	.444*	.108	.383	.423*	.115	.106	.276
Security	-.288	-.169	-.348	.133	-.354	-.273	.328
User-Friendly	-.023	-.089	-.103	.031	-.372	-.091	.056
Num IT Emp	-.139	.216	-.166	-.224	-.271	-.249	.272
Gross Rev \$m	-.056	.265	-.023	-.129	.095	-.041	.224

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

Table Eight – Correlation Matrix for Business Objectives for ICT Infrastructure

Business Objectives	Integrity	Portability	Reliability	Scalability	Security	User Friendly	Num IT Emp	Gross Rev \$m
Adaptability								
Availability								
Flexibility								
Functionality								
Manageability								
Maintainability								
Instant Response								
Integrity	1							
Portability	-.482*	1						
Reliability	.549**	-.241	1					
Scalability	-.163	.214	-.005	1				
Security	.159	-.260	.046	-.273	1			
User-Friendly	-.061	-.297	.319	-.103	.541**	1		
Num IT Emp	.082	-.218	.171	.364	.031	-.061	1	
Gross Rev \$m	.002	-.119	-.097	.058	-.347	-.159	.032	1

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

Table Eight – Correlation Matrix for Business Objectives for ICT Infrastructure cont.

Regression analyses were conducted on these data in an attempt to determine causal relationships. A total of six statistically significant regression equations ( $p < 0.05$ ) were obtained from the dependent variables adaptability, flexibility, functionality, manageability, maintainability, integrity and scalability (Table Nine). These regression equations indicated the following aspects. Regression equation one indicates that around 70 percent of the variation associated with adaptability within ICT infrastructure can be explained by flexibility and scalability. Regression model number two in the same table has the highest coefficient of determination ( $R^2$ ) and suggests that nearly 74 percent of the variation associated with flexibility can be explained by adaptability and maintainability. Regression equation three indicates that around 33 percent of the variation associated with the ICT infrastructure business objective functionality is explained by manageability and scalability. Similarly with regression model four in Table Nine, functionality and maintainability can explain around 36 percent of the variation associated with being able to manage the ICT infrastructure (manageability).

Maintainability was strongly correlated with three variables, namely flexibility, manageability and instant response. However, flexibility was dropped from the regression model as it did not show a significant relationship at the 95% level. In regression model five, around 43 percent of the variability associated with maintainability can be explained by manageability and instant response. The sixth regression equation in Table Nine indicates that just over 43 percent of the variation associated with integrity can be explained by portability and reliability. Finally, regression model seven indicates that about 29 percent of the variability associated with scalability can be explained by adaptability and functionality.

Regression	Std Coefficients	Sig.	R-Square	.F	Sig.
Model for Dependent Variable: Adaptability (regression model one)					
(Constant)		.532	.703	25.805	.000
Flexibility	.770	.000			
Scalability	.149	.259			
Model for Dependent Variable: Flexibility (regression model two)					
(Constant)		.416	.739	29.722	.000
Adaptability	.776	.000			
Maintainability	.241	.047			
Model for Dependent Variable: Functionality (regression model three)					
(Constant)		.054	.335	5.298	.014
Manageability	.398	.037			
Scalability	.377	.047			
Model for Dependent Variable: Manageability (regression model four)					
(Constant)		.459	.364	6.001	.009
Functionality	.277	.155			
Maintainability	.443	.028			
Model for Dependent Variable: Maintainability (regression model five)					
(Constant)		.002	.428	7.870	.003
Manageability	.483	.009			
Instant Response	-.367	.040			
Model for Dependent Variable: Integrity (regression model six)					
(Constant)		.032	.431	7.960	.003
Portability	-.371	.040			
Reliability	.459	.113			
Model for Dependent Variable: Scalability (regression model seven)					
(Constant)		.244	.294	4.370	.026
Adaptability	.353	.079			
Functionality	.324	.105			

Table Nine– Regressions on Business Objectives for ICT Infrastructure

These results suggest that the most important aspects associated with the business objectives for ICT infrastructure are considered to be adaptability, flexibility, functionality, maintainability, manageability, integrity and scalability. It is interesting to note that security is not considered a major concern with respect to any of the profit or productivity factors but was significantly correlated with user friendliness. This indicates (at least with this sample) that secure systems have to be user friendly and that a lack in this area should be of concern to management.

#### ***Further Analysis – benefits of the organisation’s Extranet, Intranet and Internet initiatives***

Correlations and regression analysis were undertaken with respect to benefits of the organisation’s Extranet, Intranet and Internet initiatives. The correlation matrix is shown in Table Ten. Significant correlations were again strongly positive with increased productivity being associated with efficiency and increased sales and marketing efforts. Increased profitability was strongly

correlated with competitive advantage, industry leadership, supply chain coordination, customer retention and loyalty and increased sales and marketing efforts (Table Ten).

Benefits	Increased Productivity	Increased Profitability	Efficiency	Competitive Advantage	Industry Leader	Supply Chain Coordination	Cust. Satisfaction
Increased Productivity	1						
Increased Profitability	.136	1					
Efficiency	.465*	-.068	1				
Competitive Advantage	.200	.869**	.182	1			
Industry Leader	.085	.434*	.383	.644**	1		
Supply Chain Coordination	.169	.695**	.219	.688**	.596**	1	
Customer Satisfaction	.279	.122	.656**	.224	.311	.111	1
Customer Retention/Loyalty	.110	.538**	.473*	.646**	.468*	.561**	.423*
Cost Reduction	-.062	.404	.329	.416*	.504*	.467*	.135
Enhanced Communication	.294	-.082	.627**	-.110	.039	.117	.470*
Better Decision Making	.305	.127	.547**	.424*	.425*	.193	.545**
Increased Sales & Mkt Efforts	.489*	.731**	.224	.754**	.302	.591**	.300
Num IT Emp	-.068	-.280	.289	-.177	.057	-.272	.179
Gross Rev \$m	-.225	.017	.133	.109	.087	.160	-.112
Benefits	Customer Retention /Loyalty	Cost Reduction	Enhanced Communication	Better Decision Making	Increased Sales & Mkt Efforts	Num IT Emp	Gross Rev \$m
Increased Productivity							
Increased Profitability							
Efficiency							
Competitive Advantage							
Industry Leader							
Supply Chain Coordination							
Customer Satisfaction							
Customer Retention/Loyalty	1						
Cost Reduction	.403	1					
Enhanced Communication	.170	.187	1				
Better Decision Making	.427*	.063	.214	1			
Increased Sales & Mkt Efforts	.697**	.086	.065	.394	1		
Num IT Emp	-.016	.147	.217	.170	-.354	1	
Gross Rev \$m	.365	.050	-.070	.032	.075	.032	1

\*\* Correlation is significant at the 0.01 level (2-tailed). \* Correlation is significant at the 0.05 level (2-tailed).

Table Ten – Correlation Matrix for Benefits Realised from Extranet, Intranet or Internet Initiatives  
cont.

Regression analyses were conducted on these data in the same way as in the previous section. While there were several variables correlated with the dependent variables, many did not have statistically significant partial regression coefficients ( $p < 0.05$ ) and as such were dropped from the regression model. A total of ten statistically significant regression equations ( $p < 0.05$ ) were obtained. These were from the dependent variables of increased productivity; increased profitability; efficiency; competitive advantage, industry leader, supply chain coordination, customer retention / loyalty; and increased sales and marketing efforts. While a number of variables were significantly correlated with each of the dependent variables, only those producing a significant relationship in the regression model are shown in Table Eleven.

The regression equations indicated the following aspects. Regression equation one indicates that around 37 percent of the variation associated with productivity can be explained by efficiency and increased sales and marketing efforts. Regression equation two indicates that around 82 percent of the variation associated with increased profitability is explained by competitive advantage, industry leadership and supply chain coordination. Increased profitability is also highly correlated with increased sales and marketing efforts. With regression model three in Table Eleven around 60 percent of the variability associated with efficiency can be explained by customer loyalty, enhanced communications and increased productivity. Independent of this regression model, efficiency is also highly correlated with customer satisfaction.

The dependent variable competitive advantage has two distinct regression equations associated with it. The first regression equation, model four A in Table Eleven, shows the highest coefficient of determination and indicates that 89 percent of the variability associated with competitive advantage can be explained by increased profitability, industry leadership and better decision making. In the second equation (model four B), just over 57 percent of the variability associated with competitive advantage is explained by supply chain coordination and customer retention and loyalty. Regression model number five has a coefficient of determination of 56 percent indicating that 56 percent of the variability associated with industry leadership is associated with increased profitability, competitive advantage and cost reductions. The sixth regression equation shows that 59 percent of the variation in supply chain coordination is explained by increased profitability and industry leader. Supply chain coordination also has a significant relationship with competitive advantage distinct from the regression model. Customer retention/loyalty has two separate regression equations. The first (model seven A), shows that over 59 percent of its variation is explained by efficiency and increased sales and marketing efforts. The second equation (model seven B), indicates that nearly 50 percent of its variability is explained by competitive advantage and customer satisfaction. Finally, regression model six eight indicates that about 80 percent of the variability associated with increased sales and marketing efforts can be explained by increased productivity, increased profitability and customer retention/loyalty. In addition to this regression model, increased sales and marketing efforts is also significantly correlated with competitive advantage.

These results suggest that the most important aspects associated with the benefits associated with the organisation's use of Extranets, Intranets and the Internet are considered to be increased productivity; increased profitability; efficiency; competitive advantage; industry leader; supply chain coordination; customer retention and loyalty; and increased sales and marketing efforts. No significant regression equations were found for customer satisfaction, cost reduction, enhanced communications, and better decision making.

Regression	Std Coefficients	Sig.	R-Square	.F	Sig.
Model for Dependent Variable: Increased Productivity (regression model one)					
(Constant)		.024	.373	6.244	.007
Efficiency	.375	.047			
Increased Sales & Marketing Efforts	.406	.033			
Model for Dependent Variable: Increased Profitability (regression model two)					
(Constant)		.002	.818	29.874	.000
Competitive Advantage	.870	.000			
Industry Leader	-.285	.040			
Supply Chain Coordination	.266	.066			
Model for Dependent Variable: Efficiency (regression model three)					
(Constant)		.271	.605	10.199	.000
Increased Productivity	.284	.068			
Customer Retention / Loyalty	.360	.020			
Enhanced Communication	.482	.004			
Model for Dependent Variable: Competitive Advantage (regression model four A)					
(Constant)		.001	.889	53.283	.000
Increased Profitability	.743	.000			
Industry Leader	.222	.024			
Better Decision Making	.235	.010			
Model for Dependent Variable: Competitive Advantage (regression model four B)					
(Constant)		.919	.571	13.994	.000
Supply Chain Coordination	.475	.012			
Customer Retention / Loyalty	.379	.040			
Model for Dependent Variable: Industry Leader (regression model five)					
(Constant)		.004	.565	8.646	.001
Increased Profitability	-.681	.040			
Competitive Advantage	.950	.006			
Cost Reduction	.415	.063			
Model for Dependent Variable: Supply chain coordination (regression model six)					
(Constant)		.842	.590	15.082	.001
Increased Profitability	.537	.002			
Industry Leader	.363	.029			
Model for Dependent Variable: Customer retention / loyalty (regression model seven A)					
(Constant)		.280	.591	15.200	.000
Efficiency	.334	.030			
Increased Sales & Marketing Efforts	.622	.000			
Model for Dependent Variable: Customer retention / loyalty (regression model seven B)					
(Constant)		.803	.498	10.434	.001
Competitive Advantage	.580	.001			
Customer Satisfaction	.293	.078			
Model for Dependent Variable: Increased sales and marketing efforts (regression model eight)					
(Constant)		.002	.807	27.963	.000
Increased Productivity	.382	.001			
Increased Profitability	.460	.001			
Customer Retention / Loyalty	.407	.002			

Table Eleven – Regressions on Benefits Realised from Extranet, Intranet or Internet Initiatives



## DISCUSSION

This section provides a discussion of the results presented in the previous section. Of the responding organisations, 15 were classified as large and 9 as medium. All of the large-sized organisations had some dedicated ICT staff and all but one had staff working on their e-business development. Eight of the medium-sized organisations had ICT staff and four of these had e-business development staff. Having written three-year strategic technology plans were reported for 66.7 percent (n=10) of the large-sized organisations and 22.2 percent (n=2) of the medium-sized organisations.

It is surprising that while all of the large-sized organisations employ ICT staff and have staff working on their e-business development (with one exception) that they do not all have strategic technology plans. Further, while medium-sized organisations all but one have dedicated ICT staff, only two have a written strategic technology plan. In addition, when the dataset is divided into organisations with less than 300 employees, only two out of 13 have a written strategic ICT plan. This appears inconsistent with organisations with over 300 employees that typically had written ICT plans. There was one exception here; the organisation with the highest number of employees did not report having a written strategic ICT plan.

As indicated by McKay and Marshall (2004), a strategic plan should be an ongoing activity that is essential for IT/business alignment. The importance of strategic ICT plans needs to be stressed to Australian companies and it appears from this research that many medium to large organisations need to think about planning the implementation of their ICT resources at a strategic level. The literature is specific in the recommendation that strategic plans are essential for effective management of ICT resources and it appears that further education and research is needed to encourage Australian businesses to seriously consider how their ICT resources should be allocated.

The research appears to confirm Carr's contention that ICT is treated as an infrastructural technology (at least by many Australian companies) and that in many cases business is guilty of assuming that the opportunities for gaining competitive advantage will be available indefinitely and without the necessary planning. The fundamental concern with Carr's thesis is that if ICT is treated as an infrastructural technology, the promises of competitive advantage will not flow through; in other words, just because a company has the technology, it doesn't mean that it will benefit from it unless it has a well thought out plan that will ensure ICT is used to its maximum competitive advantage and not just as a commodity. It is our contention that a strategic ICT plan should be completed if for no other reason than to ensure that ICT is not treated as an infrastructural technology that provides nothing more than a communication technology or service with no real scope for developing competitive advantage.

The authors believe that ICT is more than simply an infrastructural technology, unlike the railway and electricity examples outlined by Carr (2003); ICT doesn't just work by plugging an appliance in or running a locomotive along a railway line. Other important human factors need to be considered and while these same factors were of concern with the introduction of railways and electricity, the technology was far less complex. For example, the improvements in decision making that accrue from the use of decision support systems are far more abstract and intangible than the use of an electrical appliance, facilitated through plugging into an electrical circuit. The development of an ICT strategic plan is an essential aspect in ensuring that the technology can deliver the promised strategic and competitive advantage that has been promised by much of the information systems literature. If Australian businesses wish to remain competitive in world markets, they need to adopt world's best practice with respect to e-business strategies. This research has highlighted various

gaps with some companies not undertaking very basic planning activities such as developing a strategic ICT plan.

In the area of application portfolios, the majority of large organisations were classed as strategic, inferring that the applications were critical to achieving future business success. The mix of application portfolios can allow some categorisation of business approaches with this research indicating that the majority of large companies have a prospector stance (Hirschheim and Sabberwal 2001) to their business dealings (n=7). With only a few (n=3) having a conservative, defender stance as indicated by their categorisation of their portfolio as support. The remainder (n=5) appear to have the analyser stance to their business dealings. Smaller companies appear to be more conservative with the majority appearing to sway towards the Defender stance with the majority (n=5) categorising their application portfolios as supporting (valuable but not critical to business success). These categories of business stances are interesting in that it appears that larger firms are prepared to take greater risks than smaller companies. This stands to reason as larger firms could have deeper pockets thereby being able to take more risks.

Decision making tended to be undertaken by the chief executive officer, the chief financial officer and the chief information officer. There was no evident pattern across the two categories of organisations and this appears to be consistent with the cavalier approach to ICT resources outlined above; that is, a lack of a strategic ICT plan and a prospector stance to business dealings. The respondent companies appeared to be more concerned with the technical aspects of implementation with low ratings given to management decisions with respect to areas impacted by implementing e-business within the organisation. This technical slant is consistent with the authors' experience with ICT departments in organisations; that is, ICT departments in many companies have a great deal of say in the way e-business initiatives are handled, while management has less of a say, mainly because they are not fully aware of the capabilities of the technology and do not have a clear understanding of what is possible.

Nonetheless, there is recognition that there is a very strong relationship with competitive advantage being associated with increased profitability, being an industry leader and better decision making as described by Gendron (2006). The results shown in this study suggest that in relation to Porter five forces model, while Australian businesses do relate to industry competition and rivalry among existing companies (industry leadership) and the threat of new entrants, suppliers and buyers and bargaining power (increased profitability), they also consider better decision making as an important aspect. Perhaps better decision making relates to all five strategies, in any case the relationship between these factors is quite strong and is indicative of genuine concern about competitive advantage and profitability, leadership and better decision making in Australia.

The strong relationships between adaptability and flexibility, scalability and maintainability may seem somewhat obvious; however, it is good that they have been confirmed through this study. The other strong relationship relating to management is increased profitability being explained by competitive advantage, industry leadership and supply chain coordination. Competitive advantage and industry leadership are obvious, but supply chain coordination is noteworthy in that it suggests these organisations place a great deal of importance on effective supply chain management. The connection between competitive advantage and effective supply chain management is well established (Mason-Jones and Towill 1997) and it appears that managers in these Australian organisations are fully aware of the implications and value of supply chain coordination and competitive advantage.

The Singapore study (Lin and Lia 2008) had a similar result to this study with respect to firm size with larger firms significantly associated with a greater uptake of ecommerce activities; however no mention was made of the need for a strategic technology plan. It was mentioned that top management support was a vital aspect of ecommerce adoption and it may be implicit that a strategic plan is considered part of the process of gaining top management support. Another interesting aspect of the factors influencing the decision to adopt ecommerce technology was the influence of business partners. This indicates a very reactive approach to adoption and is indicative of a defender stance with respect to application portfolios. This is similar to the 5 smaller companies in our study.

The New Zealand research (Al-Qirim 2007) used a regression approach and this is similar to the approach used in this study. The main finding of the New Zealand study was the strong role that the CEO has in the adoption of ecommerce technologies. However a significant factor in the adoption of the technology was again the influence of suppliers (business partners). It should be noted that the New Zealand study only looked at small to medium enterprises.

## **CONCLUSION**

It is hoped that this research can provide a benchmark for future investigations into e-business in Australia; however an obvious limitation of this research is the small response rate and subsequent small sample size. Future studies will need to obtain a significantly larger portion of Australian businesses by being much better resourced and have strategies that allow for follow up letters to be sent to respondents.

The apparent cavalier approach to ICT planning in the organisations that did respond to the survey is of concern to Australia's future with respect to an effective and world class e-business environment. This research suggests that Australian companies need to understand the need and value in developing strategic ICT plans, especially in medium-sized firms. The ICT departments still appear to have a great deal of say in e-business implementations and there still appears to be a lack of IT/business alignment in this cross-section of Australian organisations. Despite this, it appears that managers are aware of the importance of competitive advantage and can link it with the profitability of the business, industry leadership and supply chain coordination. This indicates a degree of awareness of the requirement to be competitive in a global marketplace. It appears that more research should be done to help Australian businesses link these expressed needs with the requirements for a strategic plan for ICT infrastructure development.

The implications of this study on university curricula are manifold with the need to provide students with skills to enable them to implement relevant business principles when analysing ecommerce requirements. The fact that very few companies had a business and technology plan and that many seemed to think that the benefits will come if they only implement the technology indicates a very naïve approach to the use of ecommerce and the strategic benefits it may bring. A stronger focus on the business benefits of a strategic analysis of ecommerce and the teaching of the tools needed for this endeavour will result in students that are highly sought after by employers.

## REFERENCES

- Al-Qirim N. (2007) The adoption of eCommerce communications and applications technologies in small businesses in New Zealand *Electronic Commerce Research and Applications* 6 pp. 462-473.
- Australian Bureau of Statistics, (2005), Information Paper: A Statistical View of Counts of Businesses in Australia. Australian Bureau of Statistics, Commonwealth of Australia.
- DCITA, (2005) "Current State of Play - November, 2005", Department of Communications, Information Technology and the Arts, Commonwealth of Australia. Date accessed: 13/05/2007. URL: [http://www.dcita.gov.au/\\_\\_data/assets/pdf\\_file/33120/Current\\_State\\_of\\_Play\\_-\\_November\\_2005.pdf](http://www.dcita.gov.au/__data/assets/pdf_file/33120/Current_State_of_Play_-_November_2005.pdf).
- Carr, N., (2003) IT Doesn't Matter, *Harvard Business Review* 81:2; 41-49.
- EIU, (2007) White paper, "The 2007 e-Readiness Rankings: Raising the Bar", Economist Intelligence Unit, London. Date accessed: 23/05/2007. URL: [http://a330.g.akamai.net/7/330/25828/20070420205432/graphics.eiu.com/files/ad\\_pdfs/2007Ereadiness\\_Ranking\\_WP.pdf](http://a330.g.akamai.net/7/330/25828/20070420205432/graphics.eiu.com/files/ad_pdfs/2007Ereadiness_Ranking_WP.pdf).
- Gendron (2006) Creating the new e-business company: innovative strategies for real-world applications Thomson Higher Education, Ohio USA.
- Hirschheim, R., and Sabberwal, R. (2001) "Detours in the Path Toward Strategic Information Systems Alignment", *California Management Review*, 44:1; 87-108.
- Markham, J.E. (1998) *The Future of Shopping: Traditional Patterns and Net Effects*. London, England: Macmillian Publishing.
- Mason-Jones, R. and Towill, D.R. Information enrichment: designing the supply chain for competitive advantage *Supply Chain Management: An International Journal* Volume 2 Number 4 pp. 137-148
- McKay, J., and Marshall, P. (2004) *Strategic Management of e-Business*. Milton, QLD: John Wiley & Sons Australia, Ltd.
- Porter, M.E. (1985) "Competitive Advantage", The Free Press, New York, 1985.
- Roepke R., Agarwal, R. and Ferratt T.W. (2000) Aligning the IT Human Resource with Business Vision: The Leadership Initiative at 3M, *MIS Quarterly*, Vol. 24, No. 2. pp. 327-353
- Teoa TSH, Lina S and Laib K (2009) Adopters and non-adopters of e-procurement in Singapore: An empirical study *Omega* 37 pp.972 - 987
- Tsai, N. and R. Ching (2003) "Current Information Technology Infrastructure for E-business," Proceeding of 2003 International Conference on Electronic Business, December, 2003.
- Ward J and Peppard J. (2002) *Strategic Planning for Information Systems*. 3<sup>rd</sup> Edition. Chichester, UK: John Wiley & Sons.

**Appendix – The survey Instrument**

**A SURVEY OF CURRENT E-BUSINESS (E-GOVERNMENT) DEVELOPMENT PRACTICES**

Description. The objective of this survey is to gain a better understanding of current e-business (or e-government) practices. This survey will allow us to see what changes have occurred in this information age. The results may have a major impact on academic curricula throughout the country.

Confidentiality. Your responses will be kept confidential, and your identity recorded anonymously.

**I. ORGANISATION**

What is the approximate annual gross revenue of your organisation? \_\_\_\_\_ [1-1]  
 Approximately how many employees work in your organisation? \_\_\_\_\_ [1-2]  
 Of those employees, approximately what percentage work in information technology (IT)? \_\_\_\_\_% [1-3]  
 Of those in IT, approximately what percentage work on e-business (or e-government) development?  
 \_\_\_\_\_% 1-4]

Indicate the primary business activity of your company. \_\_\_\_\_ [1-5]

Does your company have a written three-year strategic technology plan?

Yes [1-6-1]  No [1-6-2]

From these categories, how would you classify your e-business (or e-government) goals?

High Potential System [1-7-1]

Strategic System [1-7-2]

Key Operational System [1-7-3]

Support System [1-7-4]

On a scale of 1 to 5, with 5 being the most important and 1 being the least important, please rate the following e-business (or e-government) objectives for your IT infrastructure.

Objectives		Not Important				Very Important
Adaptability	[1-8-1]	1	2	3	4	5
Availability	[1-8-2]	1	2	3	4	5
Flexibility	[1-8-3]	1	2	3	4	5
Functionality	[1-8-4]	1	2	3	4	5
Manageability	[1-8-5]	1	2	3	4	5
Maintainability	[1-8-6]	1	2	3	4	5
Instantaneous Response	[1-8-7]	1	2	3	4	5
Integrity	[1-8-8]	1	2	3	4	5
Portability	[1-8-9]	1	2	3	4	5
Reliability	[1-8-10]	1	2	3	4	5
Scalability	[1-8-11]	1	2	3	4	5
Security	[1-8-12]	1	2	3	4	5
User-Friendly	[1-8-13]	1	2	3	4	5

**II. PERSONNEL**

For the strategic planning of your organisation’s e-business (or e-government) processes, who are the key management decision makers? (Please check all that apply.)

- Chief Executive Officer [2-1-1]
- Chief Financial Officer [2-1-2]
- Chief Security Officer [2-1-3]
- Information Security Officer [2-1-4]
- Privacy Officer [2-1-5]
- Other (please specify) [2-1-6] \_\_\_\_\_

For the design and implementation of your organisation's e-business (or e-government) processes, other than traditional system development personnel, who are the key participants? (Please check all that apply.)

Legal Consultant	[2-2-1]	<input type="checkbox"/>
Information Security Officer	[2-2-2]	<input type="checkbox"/>
Sociologist	[2-2-3]	<input type="checkbox"/>
Psychologist	[2-2-4]	<input type="checkbox"/>
External IT Specialist	[2-2-5]	<input type="checkbox"/>
External Business Consultants	[2-2-6]	<input type="checkbox"/>

### III. IT INFRASTRUCTURE

For your e-business (or e-government) initiatives, what are the physical components that make up your IT infrastructure? (Please check all that apply.)

<u>Hardware</u>		
Application Server(s)	[3-1-1]	<input type="checkbox"/>
Database Server(s)	[3-1-2]	<input type="checkbox"/>
E-mail Server(s)	[3-1-3]	<input type="checkbox"/>
Backup Server(s)	[3-1-4]	<input type="checkbox"/>
Printer Server(s)	[3-1-5]	<input type="checkbox"/>
Storage Server(s)	[3-1-6]	<input type="checkbox"/>
Firewall(s)	[3-1-7]	<input type="checkbox"/>
Routers/Switches	[3-1-8]	<input type="checkbox"/>
Web Server(s)	[3-1-9]	<input type="checkbox"/>
<u>Software</u>		
Server support applications	[3-2-1]	<input type="checkbox"/>
Middleware	[3-2-2]	<input type="checkbox"/>
Web server support applications	[3-2-3]	<input type="checkbox"/>
<u>Database Structure</u>		
Relational	[3-3-1]	<input type="checkbox"/>
Network	[3-3-2]	<input type="checkbox"/>
Hierarchical	[3-3-3]	<input type="checkbox"/>
Object-Oriented	[3-3-4]	<input type="checkbox"/>
Other	[3-3-5]	<input type="checkbox"/>

What is the purpose of utilizing data mining tools for e-business (or e-government)? (Please check all that apply.)

Customer Focus	[3-4-1]	<input type="checkbox"/>
Product Focus	[3-4-2]	<input type="checkbox"/>
Service Oriented	[3-4-3]	<input type="checkbox"/>
Customer/Product/Service	[3-4-4]	<input type="checkbox"/>
None	[3-4-5]	<input type="checkbox"/>

What is the main form of communication with your online customers?

Call Centre	[3-5-1]	<input type="checkbox"/>
E-Mail	[3-5-2]	<input type="checkbox"/>
Telephone	[3-5-3]	<input type="checkbox"/>
Web Page	[3-5-4]	<input type="checkbox"/>
None	[3-5-5]	<input type="checkbox"/>

Does your organisation perform the following information management functions? (Please check all that apply.)

Content management	[3-6-1]	<input type="checkbox"/>
Contingency management	[3-6-2]	<input type="checkbox"/>
Customer relations	[3-6-3]	<input type="checkbox"/>
Knowledge management	[3-6-4]	<input type="checkbox"/>
Development management	[3-6-5]	<input type="checkbox"/>
Documentation management	[3-6-6]	<input type="checkbox"/>
Emerging technology management	[3-6-7]	<input type="checkbox"/>

Inventory management	[3-6-8]	<input type="checkbox"/>
Integration management	[3-6-9]	<input type="checkbox"/>
Performance management	[3-6-10]	<input type="checkbox"/>
Security management	[3-6-11]	<input type="checkbox"/>
Vendor management	[3-6-12]	<input type="checkbox"/>

Does your organisation outsource the following functions? (Please check all that apply.)

Traditional systems development		
Traditional systems maintenance	[3-7-1]	<input type="checkbox"/>
Off-the-shelf program evaluation	[3-7-2]	<input type="checkbox"/>
Systems evaluation	[3-7-3]	<input type="checkbox"/>
System integration	[3-7-4]	<input type="checkbox"/>
Contractor solicitations	[3-7-5]	<input type="checkbox"/>
Contractor management	[3-7-6]	<input type="checkbox"/>
Call centre	[3-7-7]	<input type="checkbox"/>
Customer relationship management	[3-7-8]	<input type="checkbox"/>
E-business development	[3-7-9]	<input type="checkbox"/>
E-business maintenance	[3-7-10]	<input type="checkbox"/>
E-mail system management	[3-7-11]	<input type="checkbox"/>
Database management	[3-7-12]	<input type="checkbox"/>
Data warehouse/data mining	[3-7-13]	<input type="checkbox"/>
Network management	[3-7-14]	<input type="checkbox"/>
Internal end user support	[3-7-15]	<input type="checkbox"/>

Of the following areas, which ones are impacted by implementing e-business (or e-government) on your organisation? (Please check all that apply.)

Strategic planning	[3-8-1]	<input type="checkbox"/>
Management decisions	[3-8-2]	<input type="checkbox"/>
IT infrastructure	[3-8-3]	<input type="checkbox"/>
Operation processes	[3-8-4]	<input type="checkbox"/>
Business processes	[3-8-5]	<input type="checkbox"/>
Resources	[3-8-6]	<input type="checkbox"/>

#### IV. NETWORK USAGE

Please indicate the reason(s) for Internet usage within your organisation. (Please check all that apply.)

Web page presence	[4-1-1]	<input type="checkbox"/>
Marketing and advertising	[4-1-2]	<input type="checkbox"/>
Business-to-business	[4-1-3]	<input type="checkbox"/>
Business-to-consumer	[4-1-4]	<input type="checkbox"/>
Customer-to-customer	[4-1-5]	<input type="checkbox"/>
E-education	[4-1-6]	<input type="checkbox"/>
E-government	[4-1-7]	<input type="checkbox"/>
E-mail	[4-1-8]	<input type="checkbox"/>
Management driven	[4-1-9]	<input type="checkbox"/>

Please indicate the goal(s) of the organisation's utilization of an Extranet. (Please check all that apply.)

Customer service and support	[4-2-1]	<input type="checkbox"/>
Products/services catalog information	[4-2-2]	<input type="checkbox"/>
Publish information among business partners	[4-2-3]	<input type="checkbox"/>
Post electronic forms	[4-2-4]	<input type="checkbox"/>
Collaboration between business partners	[4-2-5]	<input type="checkbox"/>
Production and inventory control between business partners	[4-2-6]	<input type="checkbox"/>
Electronic data interchange	[4-2-7]	<input type="checkbox"/>
Electronic funds transfer	[4-2-8]	<input type="checkbox"/>
Portal	[4-2-9]	<input type="checkbox"/>
Sales	[4-2-10]	<input type="checkbox"/>

[4-2-11]

Please indicate the objectives(s) of the organisation's utilization of an Intranet. (Please check all that apply.)

Marketing and advertising	[4-3-1]	<input type="checkbox"/>
Inbound logistic system	[4-3-2]	<input type="checkbox"/>
Education and training	[4-3-3]	<input type="checkbox"/>
Broadcast information	[4-3-4]	<input type="checkbox"/>
Post electronic forms	[4-3-5]	<input type="checkbox"/>
Team collaboration	[4-3-6]	<input type="checkbox"/>
Software distribution and management	[4-3-7]	<input type="checkbox"/>
Document management		

On a scale of 1 to 5, with 5 being the most important and 1 being of least importance, please rate the following benefits your organisation realizes from its Extranet, Intranet, or Internet initiatives.

Objectives		Not Important			Very Important	
Increased productivity	[4-4-1]	1	2	3	4	5
Increased profitability	[4-4-2]	1	2	3	4	5
Efficiency	[4-4-3]	1	2	3	4	5
Competitive advantage	[4-4-4]	1	2	3	4	5
Industry leader	[4-4-5]	1	2	3	4	5
Supply chain coordination	[4-4-6]	1	2	3	4	5
Customer satisfaction	[4-4-7]	1	2	3	4	5
Customer retention/loyalty	[4-4-8]	1	2	3	4	5
Cost reduction	[4-4-9]	1	2	3	4	5
Enhanced communication	[4-4-10]	1	2	3	4	5
Better decision making abilities	[4-4-11]	1	2	3	4	5
Increased Sales and marketing efforts	[4-4-12]	1	2	3	4	5

How does your organisation measure the performance or outcome of its e-business (or e-government) initiatives?

Profit [4-5-1]       Cost [4-5-2]       Productivity [4-5-3]

V. PARTICIPANT

Name of Organisation: \_\_\_\_\_ [5-1]

Name of Department: \_\_\_\_\_ [5-2]

Address: \_\_\_\_\_ [5-3]

Name of Person Completing the Survey: \_\_\_\_\_ [5-4]

Title of Person Completing the Survey: \_\_\_\_\_ [5-5]

Check here if you would like a copy of the preliminary results.

Thank you for your participation!  
Your comments are greatly appreciated. [5-6]