2004

A Survey on Evaluating and Realizing IS/IT Benefits in Taiwanese B2BEC Companies

Chad Lin
Edith Cowan University, elin123au@yahoo.com.au

Graham Pervan
Curtin University of Technology, pervang@cbs.curtin.edu.au

Koong H.C. Lin
Ming-Hsin University of Science and Technology, jodytsao@hotmail.com

A SURVEY ON EVALUATING AND REALIZING IS/IT BENEFITS IN TAIWANESE B2BEC COMPANIES

Lin, Chad, We-B Centre, School of Management Information Systems, Edith Cowan University, Australia. Email: elin123au@yahoo.com.au

Pervan, Graham, School of Information Systems, Curtin University of Technology, Australia. Email: pervang@cbs.curtin.edu.au

Lin, Koong H.-C., 3Hsiu-Yuan Tsao, Dept. of Information Management, Ming-Hsin University of Science & Technology, Taiwan. Email: koong000@ms39.hinet.net Email: jodytsao@hotmail.com

Abstract

A number of issues have emerged from the analysis of the data collected via a survey conducted in Taiwanese B2BEC companies. The results show relatively high usage of IS/IT investment evaluation and benefits realization methodologies, and yet, these methodologies were generally not used effectively within the responding organizations. Most of these organizations were not yet mature in terms of their IT. However, there was a clear association between level of IT maturity and both wide and effective use of methodologies for IS/IT investment evaluation and benefits management.

Keywords: IS/IT investment evaluation, IS/IT benefits realization, E-Commerce, B2B, IS/IT Management

1 INTRODUCTION

Information systems/information technology (hereafter referred to as IS/IT) investment may be described as any acquisition of software or hardware which is expected to expand or increase the business benefits of an organization's information systems and render long-term benefits (Willcocks 1994). IS/IT now represents substantial financial investment for many organizations (Seddon et al. 2002). Information systems and technology managers have found it increasingly difficult to justify rising IS/IT expenditures (Counihan et al. 2002). They are under increasing pressure to find a way to measure the contribution of their organizations' IS/IT investments to business performance, as well as to find reliable ways to ensure that the business benefits from IS/IT investments are actually realized (Love and Irani 2003). This problem has become more complex as the nature of IS/IT investments and the benefits they can deliver has evolved over time as IS/IT itself has changed rapidly (Willcocks 1992).

2 BACKGROUND

2.1 IS/IT Investment

In recent years, many senior managers have come to realize that it is increasingly difficult to justify the costs surrounding the purchase, development and other intangibles through the use of IS/IT (Murphy and Simon 2002). In fact, according to Hochstrasser and Griffiths (1991), few companies consistently state that IS/IT is indeed value for money. Globally, IS/IT spending as a share of corporate capital budgets continues to increase (Sechrest 2003). Gartner estimates that global IT spending will rise from US$2.04 trillion in 2001 to $2.53 trillion in 2006 (an increase of 4.4%) (De Souza et al. 2003).

Total spending on IT&T by Australian government organizations during 1999-2000 was an estimated A$4.3 billion or 5% of total government operating expenditure (ABS 2003). Spending in IS/IT can be attributed to increases in labor productivity in Australia (0.4% out of 2.4% between 1964/1965-1999/2000) (ABS 2002). In Taiwan, the total IT spending in 2001 was US$6.6 billion, up from US$2.7 billion in 1993 (MAIT, 2002). In Malaysia, IDC estimated that its IT spending in 2002 will increase by about 10% to US$2.4 billion from US$2.2 billion in 2001 (Lee 2003). Gartner forecasts that the IT spending in Asia-Pacific region will increase from US$203 billion to US$289 billion in 2006 (7.3% increase) (De Souza et al. 2003).

2.2 IS/IT Benefits Realization and Evaluation

While pre-investment appraisal and post-implementation review are important for evaluation purposes, they are still insufficient in terms of ensuring that the benefits required are realized and delivered to the organization (Ward and Griffiths, 1996). Assessing the effective delivery of useful benefits from these services to the business is very difficult (Remenyi and Whittaker 1996). A survey by Seddon et al. (2001) indicates identifying and measuring benefits as the most difficult issue in evaluating IS/IT. In addition, a survey by CIE (1990 in Norris 1996) found that vague statement of benefits, leading to an uncertain allocation of responsibility for managing their delivery, as the number one cause for project failure. Another survey by PricewaterhouseCoppers (2003) found that organizations achieved expected benefits only 25-75% of the time.

According to Ward et al. (1996, p215), the essence of benefits realization is "not to make good forecasts but to make them come true..... and IS/IT on its own does not deliver benefits." Benefits realization comprises of a range of management activities designed to ensure that an organization realized the benefits it plans to achieve from an IT investment (Farbey et al. 1999). Benefits may be

considered as the effect of the changes, i.e. management of changes - the difference between the current and proposed way that work is done (Ward and Griffiths 1996).

Similarly, Tallon et al. (2000) has found in their study that there was a clear indication of the benefits that flow from being able to compare the impacts of a specific IS/IT investment against a set of underlying objectives with the possibility of introducing corrective action (post-implementation review) if necessary. Earl (1992) has also taken the view that benefits are associated with business change and not the technology itself. Things only get better when people start doing things differently (Ward and Murray 1997).

2.3 Business-to-Business Electronic Commerce (B2BEC)

Business-to-business e-commerce is the part of the economy which deals with Internet-based or Internet-supported commercial activities between two or more different companies or parts of companies (Stehling and Moormann 2002). Specifically, the main characteristics of B2BEC include: externalities and exponential growth; critical mass; customer cohesion; content and category depth; broadening and deepening hub services; and disintermediation (Zeng et al. 2003). It remains a notable bright spot in the global economy, despite flatten spending on IT products and services reflected in most of the developed world during 2001/2002 (ITAA 2002). According to Domaracki (2001), it can lower the cost of entry and expand the market reach for a huge number and variety of business ventures. It creates an opportunity for B2B trade between companies (Domaracki 2001). B2B e-commerce forms the largest growth sector in terms of e-commerce and earn somewhere over 80% of the e-commerce revenues (Pires and Aisbett 2003). According to ITAA (2002), worldwide internet buyers numbered 142 million in 2001, up 40% from 2000 and global combined Business-to-Business (B2B) and Business-to-Consumer (B2C) e-commerce reached $633 billion in 2001, an increase of 79% from 2000. Forrester Research forecasts that both B2B and B2C will hit US$6.8 trillion in 2004, a big increase from US$43 billion in 1998 (Greenberg 2000). Forecasts for the dollar value of B2BEC in the US alone range between US$600 billion and 2.8 trillion for 2003 (Fensel et al. 2002).

The climate for B2BEC in Asia-Pacific is changing fast. According to the Gartner, B2BEC in the Asia-Pacific region will be worth $270 billion a year by 2003, about 20 percent of the world total (webMethods 2001). With government programs to enhance telecommunications infrastructure, Gartner forecasts that B2BEC in Asia will reach US$1 trillion by 2004 (Global Online 2000). According to IDC report, Australian B2B e-Commerce spending was valued at A$11.83 billion in 2001 (Pearce, 2002). IDC predicts that the B2BEC will grow at 70% annually and is likely to reach A$166.25 billion by 2006 (Pearce 2002). Other Asia Pacific's top B2BEC spenders for 2000 are: Korea (US$4.4 billion), Taiwan (US$4 billion) and New Zealand (US$2.6 billion) (Woodhead 2000). As mentioned above, transactions through B2BEC in the coming years will be growing rapidly and it will significantly become a main media to carry out electronic transactions.

The tremendous growth in B2BEC is expected to continue well into the foreseeable future. The main driver behind this growth is the commercialization of the Internet. Organizations large and small, governments (including Australia and Taiwan), and electronic commerce consultants are all interested in maximizing the business value of B2BEC. The innovative B2BEC as an Internet-based option provides a means of achieving the desired degree of interconnectivity without a huge investment and greater technical complexity (Chau and Jim 2002).

2.4 Emerging Challenges

As mentioned earlier, investments in IS/IT are often large in all sectors (including B2BEC). However, IS/IT investment evaluation and management efforts regularly run into difficulties of three generic types: (1) many organizations find themselves in a catch-22 situation. For competitive reasons they cannot afford not to invest in IS/IT, but economically they cannot find sufficient justification, and evaluation practice cannot provide enough underpinning, for making the investment (Willcocks and

Lester 1997); (2) as IS/IT infrastructure becomes an inextricable part of the organization's processes and structures, it becomes an increasingly difficult to separate out the impact of IS/IT from that of other assets and activities (Carlson and McNurlin 1992); and (3) there is widespread lack of understanding of information requirements as well as IS/IT as a major capital asset, despite the high levels of expenditure (Sechrest 2003).

Ballantine et al. (1999) identified a number of problems that are frequently encountered during evaluation practice. These include difficulty in identifying and subsequently quantifying relevant benefits and costs, and neglecting intangible benefits and costs. These problems in IS/IT evaluation are usually complex and therefore can affect the determination of the expected IS/IT benefits. These include: (1) the budgeting practice of many organizations often conceals full costs; (2) the traditional financially oriented evaluation techniques (i.e. ROI, NPV, PI, cost/benefits) can be problematic in measuring IS/IT investments; (3) many project managers overstate costs at the feasibility stage, with the express purpose of making sure that they could deliver within time and budget; (4) many organizations have failed to devote sufficient time and effort to IS/IT and (5) the lack of IS/IT planning and hence the failure to create a strategic climate in which IS/IT investment can be related to organizational direction can lead to measurement problems.

3 THE OBJECTIVES OF THE RESEARCH

Well known for its vibrant manufacturing sector, Taiwan is aggressively promoting information technology and e-commerce (Foster et al. 2000). The leadership of the electronic manufacturing industry, in particular, has actively embraced information technology (i.e. B2BEC), including recently the use of enterprise resource planning (ERP) software (Foster et al. 2000). Many of these businesses are SMEs and Taiwan's economy depends heavily on the performance of SMEs (Huang 1999) and therefore, enhancement of SMEs' competitiveness is always the major issue in Taiwan (Huang 1999). However, no research has been carried on the use of IS/IT investment evaluation and benefits realization methodologies by these organizations.

This research study follows an earlier Australian research study (Lin et al. 2000) and the objectives are:

1. To establish current practices and norms in managing IS/IT benefits and evaluation by B2BEC companies in Taiwan.
2. To investigate the usage of the IS/IT investment evaluation and benefits realization methodologies or approaches by B2BEC companies in Taiwan.
3. To investigate the IT maturity of the B2BEC companies in Taiwan.
4. To compare the results which will be collected in Taiwan with the data already collected and analyzed from a similar Australian survey (Lin and Pervan 2003) as well as results from other stuides (eg. Ward et al. (1996)). It would be interesting to compare the results collected in Taiwan in 2003 with the studies conducted in other Western countries such as the US, UK and Australia during 1990s.

4 RESEARCH SIGNIFICANCE

As evident from the discussion above, this research is of significance for a number of reasons. Firstly, IS/IT investments in organizations are huge and increasing rapidly each year (Ballantine et al., 1999). Forrester Research forecasts that both B2B and B2C worldwide will hit US$6.8 trillion in 2004 (Sanders and Temkin 2000). In particular, B2BEC spending will increase by 106% in Taiwan and 86% in Australia between 2000 and 2005 (IDC in Chien 2001).

Secondly, IS/IT investments evaluation is often the subject of heated debates amongst the researchers and practitioners over the realization of actual and expected benefits of such investments (Seddon et al. 2002). While organizations continue to invest heavily in IS/IT investments, research studies and

practitioner surveys report contradictory findings on the effect of the expenditures on organizational productivity (Grover et al. 1998).

Thirdly, there is still a lack of understanding of the impact of the proper IS/IT investments evaluation and benefits realization processes in most of the organizations (Lin and Pervan 2003). The problems and difficulties in measuring benefits and costs are often the main reason for uncertainty about the expected benefits of IS/IT investments and hence are the major constraints to IS/IT investments (Murphy and Simon 2002). Organizations (including B2B EC companies) seeking value for money in IS/IT investments have spent a lot of energy, time and money that has largely gone to waste (Simms 1997). Furthermore, assessing the effective delivery of useful benefits from the investments to the business is very difficult (Lin 2002). Therefore, evaluation is often ignored or carried out inefficiently or ineffectively because of its elusive and complex nature (Serafeimidis and Smithson 1996).

Fourthly, there is a growing need to evaluate and improve the measurement of the benefits of IS/IT investments in organizations (Farbey et al. 1999). Many academics, researchers and practitioners still argue that the record on measuring, choosing and controlling IS/IT investments by the senior managers has still not been impressive (Lin and Pervan 2003). This is because the history of numerous failed and disappointing IS/IT investments in organizations has been widely documented (Willcocks and Lester 1997). Therefore, having proper evaluation of the IS/IT investments and ensuring benefits expected from the investments are realized are very important to organizations such as B2BEC companies.

In addition to investigating the general Taiwanese organizations' IS/IT investment evaluation and benefits realization processes, there is also a need to look at B2BEC organizations since Taiwan, like several highly developed countries in the world (e.g. Japan and the US), has a vibrant electronic manufacturing industry which has actively embraced information technology (including B2BEC) (Foster et al. 2000). In this respect, the contribution of this research to the area of B2BEC in the context of IS/IT investment evaluation and benefits realization is also significant.

Finally, most of the studies on IS/IT investment evaluation and benefits realization that have been done to date have been carried out in UK, US or Australia (e.g. Lin and Pervan 2003, Norris 1996, Ward et al. 1996). Very little published work has been conducted in Taiwan. Thus, one significant aspect of this research is to better understand the current trends in the effective utilization of IS/IT in Taiwan. Therefore, this research attempts to address the issues which affect the ability of organizations to evaluate the IS/IT investment processes as well as to manage the potential benefits arising from the use of IS/IT.

5 RESEARCH METHODOLOGIES AND DESIGN

The purpose of this survey was to obtain an overview of IS/IT investments and benefits management processes and practices in Taiwanese companies involved in B2BEC activities. Specifically, the survey sought to: (1) determine how benefits from IS/IT investments are identified, evaluated, structured, delivered and realized by B2BEC organizations in Taiwan; (2) determine what criteria and methodologies are used to evaluate as well as to realize appropriate and adequate benefits by B2BEC organizations from their IS/IT investments; (3) determine how B2BEC organizations in Taiwan attempt to review and improve their current evaluation and benefits realization processes and practices from their IS/IT investments; and (4) determine the IT maturity of B2BEC organizations in Taiwan.

This survey, undertaken from June to September 2003, targeted Taiwanese companies involved in B2BEC activities. For the main survey, the organizations were selected from a list published by a semi-governmental organization, the Institute for Information Industry (III 2003). Questionnaires were sent to 275 B2BEC organizations in Taiwan in June 2003 and 106 questionnaires were returned (a response rate of 38.5%).

The questionnaire was largely based on previously validated questionnaires used by Ward et al. (1996)

in their UK study and Lin and Pervan (2003) in Australia. The original questionnaires were modified by the researchers by adding some questions regarding IS/IT outsourcing, IT maturity and B2BEC and deleting non-critical questions to keep the questionnaire of reasonable length.

Prior to determining the sample size for the survey, a pilot survey of IT managers/CIOs of 10 B2BEC companies was conducted. The response rate for this pilot study was 100% and comments about the questionnaire were all positive. Therefore, the questionnaire was not altered for the main survey.

Then this modified questionnaire, accompanied by a covering letter to explain briefly the purpose and aim of the survey and a reply-paid return envelope was sent to the IS/IT managers/CIOs of 275 Taiwanese companies involved in B2BEC activities (III 2003) in June, 2003.

SPSS was deployed to analyze the quantitative data collected through the survey. A number of general descriptive methods and tools were used to summarize and analyze patterns in the responses of people in a sample (de Vaus, 1991). Finally, One-Way ANOVA was used to test that several independent groups came from populations with the same mean. For example, it was used to test whether the organizational type was the same for responding organizations which had implemented two different methodologies.

Finally, the researchers tried to increase construct validity of the survey by: (1) minimizing the non-sampling errors by using a modified version of a questionnaire from Ward et al. (1996) and by conducting a pilot survey before mailing out the main survey; and (2) minimizing the sampling errors by making sure the data collected were analyzed properly and all records (including the actual questionnaires) were kept.

6 THE SURVEY: FINDINGS AND DISCUSSION

In the following discussion of results the percentages referred to normally represented the proportion of valid (answered) cases only and did not indicate missing values. Additionally, most of the information presented below was based on descriptive statistics, but some comparisons between groups were made using one-way ANOVA tests and correlation statistics.

The table below (Table 1) provides background information collected from the responding organizations for the postal survey.

Range		Percent (%)
(a) Industry sectors		
Manufacturing		54.7
Retails and Services		24.5
IC Designs and Semi-Conductor		9.5
Information Technology Services		3.8
Optics and Electronics		1.9
Financial Services		1.9
Transportation		1.9
Other		1.8
Total		**100**
(b) Net revenue (US$m)		
<1	(=1)	42.5
1-10	(=2)	10.0
11-100	(=3)	17.5
101-500	(=4)	20.0
501 and above	(=5)	10.0
Total		**100**
(c) Spending on B2BEC (US$m)		
<0.01	(=1)	64.0
0.02-0.49	(=2)	20.0
0.50-0.99	(=3)	12.0
1 and above	(=4)	4.0
		100
(d) Total number of employees		
<49	(=1)	29.3
50-249	(=2)	25.2
250-999	(=3)	17.2
1000-4999	(=4)	12.1
5000 and above	(=5)	16.2
Total		**100**

Table 1: Background information of the responding organizations

Most organizations were from manufacturing (54.7%), retail and services (24.5) and IC designs and semi-conductor (9.5%) industries, with others from information technology services (3.8%), optics and electronics (1.9%), financial services (1.9%), transportation (1.9%) and others (1.8%) sectors. In addition, the responding organizations were almost evenly divided between multinational and national. Half of the responding organizations had less than US$10 million in net revenue and 250 employees. Only 1% of responding organizations had spent more than US$1 million on B2BEC. Moreover, the responding organizations were mostly flat (68.3%) and centralized (58.3%), with almost evenly

divided between divisional/functional and cross-functional structure. The ANOVA revealed that net revenue did not significantly vary with firm size in terms of employee numbers, but significant differences were found between net revenue and the spending on B2BEC ($p < 0.00$).

6.1 IS/IT investment evaluation and benefits realization

Respondents were asked about adoption, usage and success with formal IS/IT investment evaluation (IEM) and benefits realization (BRM) methodologies or processes for various IS/IT activities and revealed a reasonably high adoption of methodologies for IS/IT investment evaluation (52.8%) and IS/IT benefits realization (52.8%). IS/IT investment evaluation methodology was most likely to be adopted by the IT services industry (75%), followed by manufacturing organizations (67.2%). On the other hand, IS/IT benefits realization methodology was most likely to be adopted by the transportation industry (100%), followed by IT services industry (75%), the manufacturing industry (67.2%), and IC designs and semi-conductor (60%).

The ANOVA revealed that organizations tend to adopt either both methodologies or none at all. However, this has also disclosed that 47.2% of responding failed to adopt an IS/IT investment evaluation methodology or an IS/IT benefits realization methodology. The result is interesting when compared with other studies carried out in Australia and the UK. A survey conducted on large organizations in the UK by Ward et al. (1996) indicated that 40% and 88% of the organizations failed to adopt an IS/IT investment evaluation methodology and IS/IT benefits realization methodology, respectively. Another study conducted in Australian large organizations found that 34.3% and 67.2% failed to use the methodologies (Lin and Pervan 2003). A more recent survey on Australian SMEs found that 32.3% of organizations failed to use any form of ex-ante evaluation method for evaluating their IT investments (Love et al. 2003). This indicates that while the usage of IEM by Taiwanese organizations is lower than organizations in Australia and the UK, the usage of BRM is quite high amongst the responding organizations in Taiwan. Therefore, overall, their use was found to be commonplace but by no means universal. In particular, the level of usage of IS/IT investment evaluation methodology and IS/IT benefits realization methodology by respondents were significantly correlated (p=0.849).

Of those that had methodologies, respondents indicated that investment evaluation methodology was widely used (selected 4 or 5 out of a five-point scale ranging from “not at all” to “extensively”) in only 22.6% of cases. The percentage is lower than the surveys conducted in large Australian organizations (54.5%) and in large UK organizations (36%).

Of those that had methodologies, respondents indicated that benefits realization methodology was widely used in only 24.5% of cases. This result is consistent with finding by Lin and Pervan (2003) in their large Australian organizations (22.7%). Overall, the frequencies of usage of IS/IT investment evaluation methodology and IS/IT benefits realization methodology by respondents were significantly correlated (p=0.862).

In terms of effectiveness of those methodologies in ensuring successful information systems, respondents who had methodologies indicated that investment evaluation and benefits realization were effective (4 or 5 out of a five-point scale) in only 31.2%, and 29.2% of cases, respectively. The level of effective use of IS/IT investment evaluation methodology was significantly correlated to the effective use of IS/IT benefits realization methodology (p=0.885).

Overall, the IS/IT investment evaluation and benefits realization methodologies were neither effective in ensuring successful information systems nor they were widely used. Moreover, the usage of these methodologies were not significantly correlated with the size of the organizations in terms of both the net revenue and employee size. However, an examination of these organizations revealed a significant correlation between the usage, the frequency of the usage and effective use of both IS/IT investment evaluation and benefits realization methodologies.

Of those who had an IS/IT benefits realization methodology, 92.9% also practiced a formal IS/IT

investment evaluation methodology. This is consistent with the survey by Lin and Pervan (2003) in which 81.8% of organizations which had a benefits realization methodology also used a IS/IT investment evaluation methodology. Ward et al. (1996) raised the question as to whether respondents' interpretation of IS/IT benefits realization methodology was aligned with the wider interpretation of benefits realization presented in this paper. For example, only 85.7% of those who had IS/IT benefits management methodology had a benefits delivery plan generated as part of it. The figure was a lot less (60%) in the survey by Lin and Pervan (2003). Therefore, it was possible that somewhat less respondents than was indicated by this survey had a benefits realization methodology in the sense of the definition presented in this research.

6.2 Identifying and structuring benefits

According to Mirani and Lederer (1993), alignment with stated organizational objectives has a key bearing on how investment is organized and conducted, and the priorities that are assigned to different IS/IT investment proposals. However, only 64.2% of respondents' IS/IT projects were linked to the business objectives (87.7% in Lin and Pervan (2003)). This should be a real concern for senior management as these IS/IT projects would not assist the organizations in achieving their strategic objectives. They would simply be a waste of organizational resources.

Intangible benefits are often critical to an organization's operation and efficiency (Norris 1996). However, they are usually omitted from evaluation studies, because they cannot be quantified or justified by traditional financial evaluation techniques (Apostolopoulos and Pramataris 1997). Just over half of the respondents (57.5%) indicated that they had included intangible benefits in their IS/IT project appraisal process.

6.3 IT Maturity

The respondents were also asked about where they thought their organizations stand in terms of its stage of growth for each of the seven elements as described in Galliers and Sutherland's Stage of Growth Model (1991) (see Appendix 1).

	S1	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**
Stage 1	17.9%	15.1%	20.0%	26.2%	6.6%	17.3%	10.4%
Stage 2	17.9%	13.2%	11.4%	15.5%	9.4%	9.6%	8.5%
Stage 3	13.2%	17.9%	18.1%	27.2%	17.0%	26.0%	15.1%
Stage 4	29.2%	35.8%	17.1%	1.0%	46.2%	34.6%	43.4%
Stage 5	7.5%	9.4%	18.1%	15.5%	4.7%	7.7%	3.8%
Stage 6	14.2%	8.5%	15.2%	10.7%	16.0%	4.8%	18.9%
Mean Stage (1-6 stages)	*3.3*	*3.4*	*3.4*	*2.8*	*3.8*	*3.2*	*3.8*

Table 2: Results for Stages of Growth

Table 2 shows for each element what percentage of organizations are in each stage. It shows that the "average" organizations are in stages 3-4 in most of the seven elements, but there was a significant variation. A correlation analysis showed that:

- the seven elements were significantly correlated with each other ($p < 0.01$).
- strategy, structure, systems and skills were correlated with number of employees.
- the seven elements were generally correlated with both wide and effective use of both IEM and BRM.

These results demonstrate a relationship between more mature organizations (i.e. higher stages on the seven elements) and the effective and wide use of both investment evaluation (IEM) and benefits realization (BRM) methodologies.

6.4 Degree of satisfaction with B2BEC

Only 28.6% of the respondents were satisfied with the use of B2BEC in their business while 40% indicated that B2BEC had enhanced the corporate image of their organizations. In terms of establishing stronger link with the sellers and buyers, 42.8% of respondents agreed. Less than half of the respondents (40%) stated that B2BEC has helped to reduce costs of information gathering and only 16.2% disagreed. When asked about the sales figure, 34.3% of the respondents indicated that B2BEC had helped them to increase sales in their organizations. Finally, only 31.4% indicated that B2BEC had increased their organization's market share.

7 FUTURE DIRECTION AND LIMITATION

Some limitations in the research need to be acknowledged. First, the inconsistent definitions of what constitutes an IS/IT investment evaluation or benefits realization between studies make research findings difficult to compare and generalize. While there has been a lot of research undertaken in the area of IT evaluation, there has been limited research undertaken in the area of IT benefits realization and, as a result, comparisons are difficult to undertake. Secondly, according to Sohal and Ng (1998), the views expressed in the questionnaire are of a single individual from the responding organization and only those interested in the research topic are likely to complete and return the questionnaire. Those replying may be more likely to carry out evaluation and be satisfied with their evaluation processes than the average non-respondent (Tull and Hawkins 1993). These limitations have been recognized by other researchers who have conducted similar research (Sohal and Ng 1998). Furthermore, our study took place at a particular point in time. Further research could be conducted to capture opinions of benefits realization and investment evaluation at various phases of an IS/IT projects life cycle and also in terms of their IT maturity. Alternatively, our study could be replicated in a few years time to examine how IS/IT benefit realization and investment evaluation have changed and are being managed in light of new emerging e-commerce technologies.

8 CONCLUSION

The results from this survey on Taiwanese B2BEC companies show relatively high usage of IS/IT investment evaluation and benefits realization methodologies. However, these methodologies were generally not used effectively within the responding organizations. Most of these organizations were not yet mature in terms of their IT. In addition, the results demonstrate an relationship between more mature organizations (i.e. higher stages on the seven elements) and the effective and wide use of both investment evaluation (IEM) and benefits realization (BRM) methodologies. Finally, most of the responding organizations were not completely satisfied with their B2BEC activities.

References

ABS (2002) Australian National Accounts: National Income, Expenditure and Product, Australian Bureau of Statistics, Cat. No. 5206.0.

ABS (2003) Government Use of Information Technology, Australia, Australian Bureau of Statistics, Canberra, Australia.

Apostolopoulos, T.K. and Pramataris, K.C. (1997) Information Technology Investment Evaluation: Investments in Telecommunication Infrastructure, International Journal of Information Management, 17(4), 287-296.

Ballantine, J.A., Galliers, R.D., and Stray, S.J. (1999) Information Systems/Technology Evaluation Practices: Evidence from UK Organizations, In Willcocks, L.P. and Lester, S. (eds.) Beyond the IT Productivity Paradox, Chichester, UK: Wiley, 123-150.

Carlson, W. and McNurlin, B. (1992) Basic Principles for Measuring IT Value, I/S Analyzer, October, 1-16.

Chau, P.Y.K. and Jim, C.C.F. (2002), "Adoption of Electronic Data Interchange in Small and Medium Sized Enterprises", Journal of Global Information Management, 10(4), .61-85.

Chien, J. (2201) The Evolving Role of Financial Institutions in B2B eCommerce, Financial Technology Forum 2001 – Taiwan, 17 July.

Counihan, A., Finnegan, P. and Sammon, D. (2002) Towards a Framework for Evaluating Investments in Data Warehousing, Information Systems Journal, 12, 321-338.

De Souza, R., Narisawa, R. Goodwin, R., and Hazra, K. (2003) IT Business Spending to Recover in Late 2003, Gartner, 22 January.

Domaracki, G. S. (2001) The Dynamics of B2B E-Commerce, AFP Exchange, July/August, 50-57.

Earl, M. J. (1992) Putting IT in Its Place: A Polemic for the Nineties, Journal of Information Technology, 7, 100-108.

Farbey, B., F. Land, F, and Targett, D. (1999). The Moving Staircase: Problems of Appraisal and Evaluation in a Turbulent Environment. Information Technology and People, 12(3), 238-252.

Fensel, D. Omelayenko, B. Ding, Y., Klein, M., Schulten, E., Botquin, G., Brown, M., Flett, A., and Dabiri, G. (2002) Intelligent Information Integration in B2B Electronic Commerce, Kluwer Academics Publishers, Boston.

Foster, W., Goodman, S. and Tan, Z. (2000) The Internet and E-Commerce in Greater South China (Taiwan, Hong Kong, Fujian, and Guangdon), The 10th Annual Internet Society Conference (ISOC 2000), Yokohama, Japan, 18-21 July.

Galliers, R. D. and Sutherland, A. R. (1991) Information Systems Management and Strategy Formulation: The 'Stages of Growth' Model Revisited, Journal of Information Systems, 1, 89-114.

Global Online (2000) Outsourcing May Be the Ticket for Taking Your E-Business Into Asia, Source: [On-Line] http://www.worldtrademag.com/CDA/ArticleInformation/Global_Online_Item/0,3509,16958,00.html.

Greenberg, P. A. (2000) B2B E-Commerce: The Quiet Giant, E-Commerce Times, Source: [On-Line] http://ecommercetimes.com.

Grover, V., Teng, J., Segar, A. H., and Fiedler, K. (1998) The Influence Of Information Technology Diffusion and Business Process Change On Perceived Productivity: The IS Executive's Perspective, Information and Management, 34, 141-159.

Hochstrasser, B. and Griffiths, C. (1991) Controlling IT Investment: Strategy and Management, Chapman & Hall, London, 1st Ed.

Huang, Y. (1999) For Small and Medium Enterprise, Western Decision Science Institute (WDSI 1999) 28th Annual Meeting.

III (2003) Institute for Information Industry (III), Source: [On-Line] http://www.iii.org.tw.

ITAA (2002) Digital Planet 2002: The Global Information Economy (Executive Summary), Source: [On-Line] http://www.witsa.org, March.

Lee, M. K. (2003) Malaysia: IT Spending Expected to Go Up 10%, Asia Computer Weekly Online, Source: [On-Line] http://www.asiacomputerweekly.com, 13 January.

Lin, C. (2002) An Investigation of the Process of IS/IT Investment Evaluation and Benefits Realisation in Large Australian Organisations, PhD Thesis, Curtin University of Technology, Perth, Western Australia, October, Source: [On-Line] http://adt.curtin.edu.au/theses/available/adt-WCU20030826.094151/.

Lin, C. and Pervan, G. (2003) The Practice of IS/IT Benefits Management in Large Australian Organizations, Information and Management, 41(1), 13-24.
Lin, C., Pervan, G., and McDermid, D. (2000) Research on IS/IT Investment Evaluation and Benefits Realization in Australia, Proceedings of the 11th International Conference of the Information Resources Management Association (IRMA 2000), Anchorage, Alaska, USA, 359-362, 21-24 May.
Love, P.E.D., and Irani, Z. (2003). Information Technology Evaluation and Benefits Management of SMEs in Construction. Information and Management (In Press)
Love, P.E.D., Irani, Z., Lin, C. and Standing, C. An Exploratory Study of IT Evaluation and Benefits Realization of SMEs in Australia, Journal of Information Technology. (under review)
MAIT (2002) Country Intelligence Report – Taiwan, Source: [On-Line] http://www.mait.com, 1, September.
Mirani, R. and Lederer, A.L. (1993) Making Promises: The Key Benefits of Proposed IS Systems, Journal of Systems Management, 44(10).
Murphy, K. E. and Simon, S. J. (2002) Intangible Benefits Valuation in ERP Projects, Information Systems Journal, 12, 301-320.
Norris, G. D. (1996) Post-Investment Appraisal, In Willcocks, L. (Ed.), Investing in Information Systems: Evaluation and Management, Ch9, Chapman & Hall, UK, 193-223.
Pearce, J. (2002) Australia's Rosy Outlook for B2B E-Commerce, ZDNet Australia, Source: [On-Line] http://www.zdnet.com.au/newstech/ebusiness/story/0,2000048590,20263951,00.htm
Pires, G. D. and Aisbett, J. (2003) The Relationship between Technology Adoption and Strategy in Business-to-Business Markets: The Case of E-Commerce, Industrial Marketing Management, 32, 291-300.
PricewaterhouseCoopers (2003) Benefits Realization Online Survey Results Survey, PricewaterhouseCoopers, Source: [Online] http://www.pwcglobal.com.
Remenyi, D. and Whittaker, L. (1996) The Evaluation of Business Process Re-engineering Projects, In Willcocks, L. (Ed.), Investing in information systems: evaluation and management, Ch7, Chapman & Hall, UK, 143-167.
Sanders, M R. and Temkin, B. D. (2000) Global eCommerce Approaches Hypergrowth, Forrester Research, Techstrategy, 18 April.
Sechrest, L. (2003) CIO Update: Use Creative Cost Containment, Gartner, 1 October.
Seddon, P., Graeser, V., and Willcocks, L. (2001) IT Evaluation Revisited: Plus ca Change….., Eighth European Conference on Information Technology Evaluation, Oriel College, Oxford, UK, 17-18 September, 1-18.
Seddon, P., Graeser, V., and Willcocks, L. (2002): Measuring Organizational IS Effectiveness: An Overview and Update of Senior Management Perspectives, The DATA BASE for Advances in Information Systems, 33(2), 11-28.
Serafeimidis, V. and Smithson, S. (1996) The Management of Change for Information Systems Evaluation Practice: Experience from a Case Study, International Journal of Information Management, 16(3), 205-217.
Simms, J. (1997) Evaluating IT: Where Cost-benefit Can Fail, Australian Accountant, May.
Sohal, A.S. and Ng L. (1998) The Role and Impact of Information Technology in Australian Business, Journal of Information Technology, 13, 201-217.
Stehling, F. and Moormann, J. (2002) Strategic Positioning of E-Commerce Business Models in the Portfolio of Corporate Banking, Proceedings of the 35th Hawaii International Conference on System Sciences 2002.
Tallon, P. P., Kraemer, K. L. and Gurbaxani, V. (2000) Executives' Perceptions of the Business Value of Information Technology: A Process-Oriented Approach, Journal of Management Information Systems, 16(4), 145-173.
Tull, D. S. and Hawkins, D. I. (1993) Marketing Research: Measurement and Method, Macmillan Publishing Company, 6th Ed., New York.
Ward, J. and Griffiths, P. (1996) Strategic Planning For Information Systems, John Wiley & Sons Ltd, Chichester, UK.

Ward, J. and Murray, P. (1997) Benefits Management: Best Practice Guidelines, ISRC-BM-97016, Information Systems Research Centre, Cranfield School of Management, Cranfield, UK.
Ward, J., Taylor, P. and Bond, P. (1996) Evaluation and Realization of IS/IT Benefits: An Empirical Study of Current Practice, European Journal of Information Systems, 4, 214-225.
webMethods (2001) Webmethods Aggresively Expands Presence In Asia Pacific, WebMethods Press Release, Source: [On-Line] http://www.webmethods.com.
Willcocks, L. (1992) Evaluating Information Technology Investments: Research Findings and Reappraisal, Journal of Information Systems, 2, 243-268.
Willcocks, L. (1994) Introduction: Of Capital Importance, In Willcocks, L. (Ed.), Information Management: The Evaluation of Information Systems Investments, Ch1, Chapman & Hall, London, 1-27.
Willcocks, L. and Lester, S. (1997) Assessing IT Productivity: Any Way Out of the Labyrinth?, In Willcocks, L., Feeny, D.F. & Islei, G. (Eds.), Managing IT as a Strategic Resource, Ch4, The McGraw-Hill Company, London, 64-93.
Woodhead, B. (2000) Oz Spends Up Big on B2B, AustralianTimber.com, Source: [On-Line] http://www.australiantimber.com/news.html
Zeng, Y. E., Wen, H. J., and Yen, D. C. (2003) Customer Relationship Management (CRM) in Business-to-business (B2B) E-commerce, Information Management & Computer Security, 11(1), 39-44.

Appendix 1: Stages of Growth Model

Stage	Description	Stage	Description
One	"Ad Hocracy"	Four	Democratic dialectic and cooperation
Two	Starting the foundations	Five	Entrepreneurial opportunity
Three	Centralised dictatorship	Six	Integrated harmonious relationships

Appendix 1.1: The six stages of the revised model (Source: Galliers and Sutherland (1991))

Strategy	Plan or course of action leading to the allocation of a firm's scarce resources, over time, to reach identified goals
Structure	Characterisation of the organisation chart
Systems	Procedural reports and routine processes such as meeting formats
Staff	Demographic description of important personnel categories within the firm
Style	Characterisation of how key managers behave in achieving the organisation's goals
Skills	Distinctive capabilities of key personnel or the firm as a whole
Superordinate goals	The significant meanings or guiding concepts that an organisation imbues in its members. They can also be described as the shared value or culture of the organisation.

Appendix 1.2: The Seven elements (Pascale & Athos (1981) in Galliers and Sutherland (1991))