

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

IS/IT Investment Evaluation Practices in Australia and Taiwan: A Comparative Study

Chad Lin and Helen Cripps

We-B Centre, School of Mgt Infor. Systems, Edith Cowan University, Perth, WA 6027, Australia, elin123au@yahoo.com.au

ABSTRACT

Information systems/information technology (IS/IT) investment evaluation has emerged as an important issue for managers in organizations around the world. The results show relatively high usage of IS/IT investment evaluation methodologies, and yet, these methodology were generally not used widely and effectively within the responding organizations. Most of these organizations were not yet fully mature in terms of their IT. The result has indicated that more mature organizations were able to utilize both investment evaluation (IEM) and benefits realization (BRM) methodologies more widely and effectively.

INTRODUCTION

Information systems/information technology (IS/IT) represents substantial financial investment for many organizations (Seddon et al., 2002). However, many senior 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 (Lin and Pervan, 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).

Therefore, there is a growing need to evaluate and improve the measurement of the benefits of IS/IT investments in organizations (Farbey et al., 1999). This is because the history of numerous failed and disappointing IS/IT investments in organizations has been widely documented (Willcocks and Lester, 1997). Having proper evaluation of the IS/IT investments and ensuring benefits expected from the investments are realized are very important to organizations.

Most of the studies on IS/IT investment evaluation and benefits realization that have been done to date have been carried out in Europe and US (e.g., Norris, 1996; Ward et al., 1996). Very little published work has been conducted in Australia and Taiwan. Thus, one significant aspect of this research is to compare and understand the current trends in the effective utilization and evaluation of IS/IT investments in Australia and Taiwan.

BACKGROUND

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). In Taiwan, the total IT spending in 2001 was US\$6.6 billion, up from US\$2.7 billion in 1993 (MAIT, 2002). 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).

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. (2002) 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 PricewaterhouseCoopers (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) have 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).

RESEARCH OBJECTIVES AND METHODOLOGIES

The purpose of this research was to obtain an overview of IS/IT investments and benefits management processes and practices in organizations in Australia and Taiwan. The research aims to provide new empirical evidence comparing Australia (a developed economy) and Taiwan (a newly industrialized economy) on their IS/IT investment evaluation and benefits realization practices. The survey approach was chosen as it has the advantage of being able to focus on problem solving and pursue a step-by-step logical, organized, and rigorous method to identify problems, gather data, analyze the data, and draw valid conclusions.

sions (Sekaran, 1984). The questionnaire was partly based on previously validated questionnaire used by Ward et al. (1996) in their UK study. Specifically, the survey sought to:

1. establish current practices and norms in managing IS/IT benefits and evaluation by organizations in Australia and Taiwan.
2. investigate the usage of the IS/IT investment evaluation and benefits realization methodologies or approaches by organizations in Australia and Taiwan.
3. compare the survey results between Australia and Taiwan.

The sample for the Australian study was obtained by mailing questionnaires in 2000-2001 to the IS/IT managers and CIOs of 450 organizations listed in BRW in 2000. Prior to determining the sample size for the survey, a pilot survey of IT managers/CIOs of 10 companies in Australia and Taiwan was conducted. Comments about the pilot questionnaire were all positive. The survey elicited a total of 68 responses and a response rate of 15.1%.

The sample in Taiwan was selected from a list published by a semi-governmental organization, the Institute for Information Industry (III 2003). Questionnaires were sent to 275 organizations in Taiwan in 2003 and 106 questionnaires were returned (a response rate of 38.5%).

Late returns were compared with other response received earlier in order to check for non-response bias. No significant differences were detected between two samples. Furthermore, a software package, SPSS, was deployed to analyze the quantitative data collected through the postal survey. A number of general descriptive methods and tools were used to summarize and analyze patterns in the responses of people in a sample.

THE SURVEY: FINDINGS AND DISCUSSION

Overall, the responding Australian organizations were large in revenue and number of employees, typical of the large corporate sector with large numbers from manufacturing, mining, financial services, and retails and services (Table 1), and they were large in revenue and number of employees. The Australian organizations were mostly hierarchical, and centralized with a divisional/functional structure.

On the other hand, most Taiwanese organizations were from manufacturing, retail and services (24.5) and information technology and electronics industries (Table 1). Half of the responding organizations had less than US\$10 million in net revenue and 250 employees. Moreover, the responding organizations were mostly flat (68.3%) and centralized (58.3%), with almost evenly divided between divisional/functional and cross-functional structure.

IS/IT Investment Evaluation and Benefits Realization Methodologies

Respondents were asked about adoption, usage and success with formal methodologies or processes for various IS/IT activities. The Australian results revealed a reasonably high adoption of methodology for IS/IT investment evaluation (65.7%), but less for IS/IT benefits realization

(32.8%). In addition, 17.4% of the respondents indicated that they did not have any of these methodologies, while the similar percentage of the respondents (15.9%) had all four methodologies. Therefore, overall, their use was found to be commonplace but by no means universal. In particular, a significant majority had a formal methodology or process for their IS/IT investment appraisal. On the other hand, the survey results in Taiwan also revealed a reasonably high adoption of methodologies for IS/IT investment evaluation (52.8%) and IS/IT benefits realization (52.8%). 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.

Of those that had methodologies, Australian respondents indicated that investment evaluation methodology (IEM) was widely used (selected 4 or 5 out of a five-point scale ranging from "not at all" to "extensively") in 54.5% of cases. Only 22.7% of those who had a benefits realization methodology (BRM) pointed out that it was widely used in their organizations. On the other hand, the Taiwanese respondents reported that the IEM and BRM were widely used in only 22.6% and 24.5% of cases, respectively.

In terms of effectiveness of those methodologies in ensuring successful information systems, 41.9% and 38.1%, respectively, of the Australian organizations pointed out that they were effective. Overall, the IS/IT investment evaluation methodology was not effective in ensuring successful information systems although it was widely used. Furthermore, IS/IT benefits realization methodology was neither widely used nor effective in ensuring successful information system. The figures for the Taiwanese organizations were 31.2%, and 29.2% for the IEM and BRM, respectively.

Of those who had an IS/IT benefits realization methodology, 81.8% of the Australian organizations also practiced a formal IS/IT investment evaluation methodology. The figure was a bit higher for the Taiwanese organizations. Of those who had an IS/IT benefits realization methodology, 92.9% of the Taiwanese organizations used a formal IS/IT investment evaluation methodology.

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. A great majority of the Australian respondents (87.7%) had a process ensuring that IS/IT projects were linked to business objectives. Only 64.2% of the Taiwanese respondents' IS/IT projects were linked to the business objectives. 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). Many Australian respondents (84.7%) indicated that they had included intangible benefits in their IS/IT project appraisal process. However, only half of the Taiwanese respondents (57.5%) indicated that they had included intangible benefits in their IS/IT project appraisal process.

Half of the Australian respondents (50%) believed that their current project justification process failed to identify all available benefits for a project. More (67.2%) believed that their current process was able to quantify the relevant benefits. Interestingly, in 26.2% of cases, the respondents openly admitted that their current process actually overstated the benefits in order to get approval. On the other hand, almost half of the Taiwanese respondents (46.2%) believed that their current project justification process failed to identify all available benefits for a project. However, more (62.3%) believed that their current process was able to quantify the relevant benefits. Interestingly, in 47.7% of

Table 1. Background Information of the Respondent Organizations

	Australia	Taiwan
Range	Percent	Percent
	(%)	(%)
(a) Industry sectors		
Manufacturing	23.2	54.7
Retails and Services	11.6	24.5
Information Technology & Electronics	0.7	15.2
Financial Services	11.6	1.9
Mining & Construction	17.4	0.4
Education	5.8	0.4
Utility	5.8	0.4
Other	23.9	2.5
Total	100	100

cases, the respondents openly admitted that their current process actually overstated the benefits in order to get approval. This seemed to imply that while benefits claimed were likely to be quantified and realized in practice, the process itself placed significant emphasis on getting project approval than on delivering on proposed benefits.

Of those Australian respondents that felt benefits were overstated, 75% conducted post-implementation reviews (PIRs), and 50% “often or always” targeted benefits delivery as part of the post-implementation review process. In contrast, of those that did not feel benefits were overstated to get approval and 84.6% “often or always” targeted benefits delivery as part of the post-implementation reviews process. Of those Taiwanese respondents that felt benefits were overstated, 72.7% targeted benefits delivery as part of the post-implementation review (PIR) process. In contrast, of those that did not feel benefits were overstated to get approval, only 38% targeted benefits delivery as part of the post-implementation reviews process.

Planning, Delivering, and Evaluating Benefits

Many Taiwanese respondents (60.4%) claimed that their organization prepared a benefits delivery plan. Without such a plan, it was difficult to envisage how an organization might effectively realize business benefits. Only 43% of the Australian respondents prepared a benefits delivery plan. However, these figures were higher than the survey conducted by Ward et al. (1996) where only 27% on the UK respondents had prepared a benefits delivery plan.

Over half of the Taiwanese respondents (65.1%) indicated that they had a formal process to ensure that the lessons learned from successful or unsuccessful implementations were transferred to future IS/IT projects. This figure is higher than their Australian counterparts (52.3%). These results are somewhat consistent with findings from Willcocks and Lester (1993) in which 44% of their respondents admitted not to have learned from their mistakes. However, 71% of the respondents from the survey conducted by Ward et al. (1996) admitted not to have learned from their mistakes. It was unclear whether those that did not learn from past implementations could ever improve their implementation processes. This is explained by Kumar (1990) who concludes that current practices may not provide the more important long term feedback improvement benefits of the evaluation process.

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).

Table 2 shows that the Australian respondents were generally more mature in terms of their IT than the Taiwanese respondents. The “average” Australian organizations were in stage 4 in most of the seven elements while the “average” Taiwanese organizations were in stages 3-4. These results also 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.

DISCUSSION AND CONCLUSIONS

As mentioned earlier, the paper seeks to provide new empirical evidence comparing Australia and Taiwan on their IS/IT investment evaluation and benefits realization practices. The result indicates that while the

usage of IEM by Taiwanese organizations is lower than the Australian organizations, the usage of BRM is quite high amongst the responding organizations in Taiwan. In addition, both methodologies were used more widely and effectively in Australian organizations than the Taiwanese organizations. This may be due to the fact that most of the Australian organizations surveyed were larger than their Taiwanese counterparts and therefore, had more resources to adopt both IEM and BRM more widely and effectively.

In addition, the Australian organizations had put more emphasis on making sure that their IS/IT projects were linked to organizational objectives than their Taiwanese counterparts (88% vs 64%). The Australian organizations were also more likely to evaluate intangible benefits than the Taiwanese organizations (85% vs 58%). It is also not surprising that the Australian organizations were less likely to overstate the benefits in order to get project approval than their Taiwanese counterparts (26% vs 48%).

Moreover, the Taiwanese respondents (60%) were more likely to prepared a benefits delivery plan than the Australian respondents (43%). This is probably due to the high usage of BRM by the Taiwanese organizations.

Furthermore, the surveys show that the Australian respondents were generally more mature in terms of their IT than the Taiwanese respondents. This may be due to the fact that most of the Australian organizations surveyed were larger than their Taiwanese counterparts since larger organizations are generally more mature. The result has also indicated that more mature organizations (Australian organizations) were able to adopt both investment evaluation (IEM) and benefits realization (BRM) methodologies more widely and effectively.

Finally, 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 in more countries to examine how IS/IT benefit realization and investment evaluation have changed and are being managed in light of new emerging e-commerce technologies.

REFERENCES

- 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.
- 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.
- 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.
- 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.
- Hochstrasser, B. and Griffiths, C. (1991) *Controlling IT Investment: Strategy and Management*, Chapman & Hall, London, 1st Ed.
- III (2003) *Institute for Information Industry (III)*, Source: [On-Line] <http://www.iii.org.tw>.
- Kumar, K. (1990) Post Implementation Evaluation of Computer-Based Information Systems: Current Practices, *Communications of the ACM*, 33(2), 203-212.
- Lin, C. and Pervan, G. (2003) The Practice of IS/IT Benefits Management in Large Australian Organizations, *Information and Management*, 41(1), 13-24.

Table 2. Results for Stages of Growth

Mean Stage (1-6 stages)	Strategy	Structure	System	Staff	Style	Skills	Super-ordinate goals
Australia	4.0	3.8	4.0	4.0	4.0	4.0	4.5
Taiwan	3.3	3.4	3.4	2.8	3.8	3.2	3.8

- 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.
- 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.
- Sechrest, L. (2003) CIO Update: Use Creative Cost Containment, *Gartner*, 1 October.
- 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.
- Sekaran, U. (1984) *Research Methods for Managers: A Skill-building Approach*, John Wiley & Sons, New York, USA.
- 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.
- 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.
- Willcocks, L. (1992) Evaluating Information Technology Investments: Research Findings and Reappraisal, *Journal of Information Systems*, 2, 243-268.
- 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.

0 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/proceeding-paper/investment-evaluation-practices-australia-taiwan/32546

Related Content

Application and Research of Interactive Design in the Creative Expression Process of Public Space

Yuelan Xu (2022). *International Journal of Information Technologies and Systems Approach* (pp. 1-13). www.irma-international.org/article/application-and-research-of-interactive-design-in-the-creative-expression-process-of-public-space/307028

Reasoning on vague ontologies using rough set theory

(). *International Journal of Rough Sets and Data Analysis* (pp. 0-0). www.irma-international.org/article//288522

Challenges to the Development of Information Infrastructures: A Synthesis of the Findings

(2012). *Perspectives and Implications for the Development of Information Infrastructures* (pp. 115-135). www.irma-international.org/chapter/challenges-development-information-infrastructures/66259

Exemplary Works on Information Systems Research

Michael E. Whitman and Amy B. Woszczynski (2004). *The Handbook of Information Systems Research* (pp. 1-14). www.irma-international.org/chapter/exemplary-works-information-systems-research/30339

Management of Large Balanced Scorecard Implementations: The Case of a Major Insurance Company

Peter Verleun, Egon Berghout, Maarten Looijen and Roel van Rijnback (2001). *Information Technology Evaluation Methods and Management* (pp. 231-239). www.irma-international.org/chapter/management-large-balanced-scorecard-implementations/23679