

IS/IT Investment Evaluation and Benefits Realization Issues in Australia

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Information systems/information technology represents substantial financial investment for many organizations. It has been shown that IS/IT investments in many organizations are huge and increasing rapidly every year and yet there is still a lack of understanding of the impact of the proper IS/IT investment evaluation processes and practices in these organizations. Thus, a survey and an in-depth case study of these practices and processes in two large governmental departments with several major IS/IT projects was conducted. The key issues presented here in some detail are of interest to practitioners concerned with making decisions about project investment and realizing benefits, as well as researchers.

ACM Classification: H.0 (Information Systems – General)

1. INTRODUCTION

Information systems and information technology (IS/IT) is a large investment, with the average organization spending more than 4.2% of annual revenue on IT (Gormoloski, Grigg and Potter, 2001). In recent times, IS/IT managers have found it increasingly difficult to justify rising IS/IT expenditures (Counihan, Finnegan and Sammon, 2002) and are often under immense 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 (Ballantine, Galliers and Stray, 1999). This problem has become more complex as the nature of IS/IT investments and the benefits they can deliver have changed rapidly (Murphy and Simon, 2002). Moreover, the evaluation of these IS/IT investments requires multi-dimensional measures and is a complex tangle of financial, organizational, social, procedural and technical threads, many of which are currently either avoided or dealt with ineffectively (Cronk and Fitzgerald, 2002; Mirtidis and Serafeimidis, 1994). Given the complexity of the decisions and

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Manuscript received: 9 August 2004
Communicating Editor: John Grundy

the large expenditure involved, a better understanding of the basis and practice of IS/IT investment and evaluation in organizations is essential. The difficulties of evaluation and benefits realization processes are often the determining factors in the application of any formal methodology, and must be addressed if the processes are to be understood (Ballantine *et al.*, 1999).

1.1. IS/IT Investment Evaluation

Gaining business value from, and justifying current investment in information technology are often identified as the most critical but difficult management issues in Australia, UK and the US (Pervan, 1997). Yet, while IT is seen as a competitive weapon there is still a lack of understanding of the impact of the proper IT investment evaluation and benefits realization process (A.T. Kearney, 1990). The difficulties in measuring benefits and costs are often the cause for uncertainty about the expected benefits of IT investment and hence are the major constraints to IS/IT investments (Farbey, Land and Targett, 1992; Willcocks and Lester, 1997). According to Baker and Berenblum (1996), investment in IS/IT is one of the major factors determining the success or failure of organizations.

It is important for practitioners to be aware that IS/IT spending as a share of corporate capital budgets is expected to increase (Sechrest, 2003). This trend reflects the recognition of IS/IT transformation from an overhead expense to a strategic enterprise asset with value and benefits that will be felt over a long time and across different business areas (Sechrest, 2003). Globally, Gartner has estimated that total spending on IT will rise to \$2.53 trillion in 2006 (De Souza, Narisawa, Goodwin and Hazra, 2003). In Australia, the Federal Government invested heavily in IS/IT via key IT programs such as Networking the Nation (A\$77 million), Building on IT Strengths (A\$2.9 billion), and Backing Australia's Ability (A\$464 million) (ALIA, 2003). In addition, Gartner forecasts that the IS/IT spending in Asia-Pacific region will reach US\$289 billion in 2006 (De Souza *et al.*, 2003).

So, globally IS/IT spending by organizations is huge and increasing. However, senior managers not only need to evaluate their IS/IT investments in terms of business measures and productivity gains but also want to find out where and in what ways value has arisen in many areas of the organization.

There are many methodologies that can help to evaluate IS/IT investments. According to Andresen, Baldwin, Betts, Carter, Hamilton, Stokes and Thorpe (2000), there are at least 30 currently available IS/IT investment evaluation methodologies (e.g. SESAME (Willcocks, 1992), Return on Management (ROM) (Strassman, 1990), Information Economics Approach (Parker, Benson and Trainor, 1988), Kobler Unit Framework (Hochstrasser, 1994), Multi-object, Multi-criteria Methods (Farbey *et al.*, 1992), Value Analysis (Farbey *et al.*, 1992), Options Theory (Dos Santos, 1994)). According to a study carried out by Tallon, Kraemer and Gurbaxani (2000), organizations that make extensive use of IS/IT evaluation methodologies or measures had higher perceived payoffs from IS/IT. However, many of these methodologies are difficult and/or costly for organizations to implement and relatively little research has been carried out in Australia to establish how widespread these methodologies are and what perceived value they bring.

Despite the availability of many evaluation methodologies, and the increased spending on IT, many managers still do not understand the importance of the investment evaluation process (Willcocks and Lester, 1997). Consequently, the inability of many organizations to assimilate and apply IT both, inter- and intra-organizationally is resulting in missed opportunities and a lack of business value (van Grembergen and van Bruggen, 1998). The difficulties associated with determining the benefits and costs of IT are deemed to be the major constraint to investment justification (Enzweiler, 1996). The difficulty in evaluation centres on the fact that both benefits and

costs are difficult to quantify (Andresen *et al.*, 2000). Therefore, evaluation is often ignored or carried out inefficiently or ineffectively because it is deemed an elusive and complex process (Serafeimidis and Smithson, 2003).

For example, Dhillon and Backhouse (1996) have observed that a considerable amount of IT projects realize no net benefits at all. Sohal and Ng (1998) found that in large Australian organizations the potential of IS/IT has not been utilized to meet the competitive challenges due to inadequate and inappropriate appraisals/evaluation of the proposed IS/IT investment projects. Moreover, they reported that 45% of the responding organizations did not evaluate whether IS/IT systems were still consistent with business objectives and 59% did not determine whether expected benefits were being achieved.

Renkema (1998) revealed that around 70% of all IT investments are claimed to give no adequate return on investment. Another survey by PriceWaterhouseCoopers (2003) found that organizations achieved expected benefits only 25–75% of the time. Other studies have reported that 75% of large-scale systems do not function as intended or are not used (McGunagle, 1995). Failure to plan for and, derive the benefits from an IS/IT investment can have detrimental consequences on organizational performance.

Furthermore, the measurement of the business value of IS/IT investment has been the subject of considerable debate by many academics and practitioners and the term “productivity paradox” appears in studies that reveal static productivity and rising IS/IT expenditure (Brynjolfsson, 2003; Brynjolfsson and Hitt, 2003; Grover, Teng, Segar and Fiedler, 1998). Despite large investments in IS/IT over many years, it has been difficult to determine where the IS/IT benefits have actually occurred, if indeed there have been any. Some studies have suggested that IS/IT investment produces negligible benefits (e.g. Strassmann, 1997), while others report a positive relationship between organizational performance and IS/IT spending (e.g. Sircar, Turnbow and Bordoloi, 2000).

Some researchers (Hitt and Brynjolfsson, 1996; Rai, Patnayakuni and Patnayakuni, 1997) take the position that the confusion over IS/IT benefits is due to mis-measurement of outputs and inputs (inappropriate units of analysis), the difficulty of establishing the overall value of IS/IT, the choice of inappropriate methods of evaluation, lags in learning and adjustments, redistribution (IS/IT may be beneficial to individual firms but unproductive from the standpoint of the industry), confusion about terms such as expenses and revenue, and dissipation of profits, mismanagement by developers and users of IS/IT, and lack of effective IS/IT evaluation and benefits realization management practices.

A recent article entitled “IT Doesn’t Matter” has argued that IT has become a commodity because it has become widespread, as happened to other innovations such as engines and telephones (Carr, 2003). According to Carr (2003), IT has become the infrastructural technologies and therefore, are often subject to over-investment and may cause economic troubles such as the “Internet Bubble”. This paper has generated a lot of debate amongst IT researchers. However, Carr’s (2003) views on IT are not shared by most IT practitioners and academics who argue that IT still has a lot to offer in the future and can deliver competitive advantages to organizations (Broadbent, McGee, and McDonald, 2003; McFarlan and Nolan, 2003; Strassmann, 2003; Vandenbosch and Lyytinen, 2004).

More recent evidence suggests that many organizations simply got carried away with IS/IT and spent money unwisely in late 1990s (Farrell, 2003). According to a study by the McKinsey Global Institute, more successful organizations analyzed their economics carefully and spent on only those IS/IT applications that would deliver productivity gains, sequencing their investments carefully through a disciplined approach with innovative management practices (Farrell, 2003).

In summary, problems associated with IS/IT investment evaluation (Ballantine *et al*, 1999; Counihan *et al*, 2002; Cronk and Fitzgerald, 1999) include:

- Organizations often fail to identify relevant risks, costs, and benefits;
- Traditional financially oriented evaluation methods (e.g. ROI, NPV) can be problematic in measuring IS/IT investments and quantifying relevant benefits and costs;
- Working with new technology introduces higher levels of risk, which affects timing, costs and delivery deadlines;
- Organizations have failed to devote appropriate evaluation time and effort to IS/IT as well as to deal with the extended investment time frame; and
- It is very difficult to evaluate intangibles and make relationships between IS/IT and profitability explicit.

1.2. IS/IT Benefits Realization

IS/IT is just one enabler of process change (Grover *et al*, 1998) and it only enables or creates a capability to derive benefits. 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.” (Ward, Taylor, and Bond, 1996). Benefits realization and identification are also seen as a function of strategic information systems planning (Changchit, Joshi and Lederer, 1998). Benefits may be considered the effect of the changes or the difference between the current and proposed way that work is done (Ward and Griffiths, 1996). Things only get better when people start doing things differently.

While IS/IT investment evaluation is important, it is insufficient in terms of ensuring that the benefits identified and expected by organizations are realized and delivered (Ward and Griffiths, 1996). Assessing the effective delivery of benefits from these services is very difficult (Ward *et al*, 1996). Irani (2002) argue that IT cost identification, measurement and control remains a significant challenge for businesses. To overcome this problem, IT projects should be evaluated in the context of accumulated costs and benefits from related initiatives, not solely judged on single initiatives (Galliers, Swan, Newell and Robertson, 1996). To determine if the desired IT benefits have been achieved in practice, it is necessary to undertake an ex-post evaluation of benefits (Ward *et al*, 1996). Moreover, if no measurable effects can be identified other than the implementation of the technology itself, then it can be assumed that no benefits have been realized (Ward *et al*, 1996).

A survey by Seddon, Graeser and Willcocks (2002) indicates identifying and measuring benefits as the most difficult issue in evaluating IS/IT. In addition, a survey by CIE (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 IS/IT project failure.

While the search for benefit identification can contribute to the perceived success of an IS/IT investment, organizations have often found it difficult to evaluate them and as a result tend to use arbitrary values for assessing benefits. Few organizations have a benefits realization approach and, while much attention is paid to justifying investments, little effort is extended to ensuring that the benefits are realized (Ward *et al*, 1996). Some of the reasons for failure to monitor whether the projected benefits of IS/IT were being realized by organizations include:

- It is difficult to assess benefits after a project has been implemented as benefits are often experienced later (Murphy and Simon, 2002);
- Many organizations have poor IS/IT adoption practices (Fink, 1998);
- It is not necessary as the project was implemented according to plan (Norris, 1996);
- Many organizations tend to give very little attention to the intangible benefits when investment

decisions are made (Irani, 2002); and

- It is too costly to undertake the proper post-implementation reviews on benefits (Norris, 1996).

Some of the methodologies for realizing IS/IT investment benefits published in the literature are:

- Cranfield Process Model of Benefits Management (Ward *et al*, 1996);
- Active Benefit Realization (ABR) (Remenyi, Sherwood-Smith and White, 1997);
- DMR's Benefit Realization Model (Truax, 1997);
- Model of Benefits Identification (Changchit *et al*, 1998); and
- The IT Benefits Measurement Process (Andresen *et al*, 2000).

2. THE STUDY

This study investigated the process of IS/IT investment evaluation and benefits realization in large Australian organizations. The key objective of this study was to establish current Australian industry and government practices and norms in managing IS/IT benefits and evaluation.

This research adopts a pluralist approach (Figure 1). According to Mingers (2001), the results will be richer and more reliable if different research methods are combined together. According to Gable (1994), the use of multiple methods (triangulation) such as survey and case study increases the reliability of the data and the process of gathering it as well as serving to corroborate the data gathered from other sources. Exclusive reliance on one method may bias or distort the researcher's picture of the particular slice of reality the researcher is investigating (Burns, 1994). Although bias cannot be totally eradicated, it may be minimised by the use of such techniques as triangulation (Remenyi and Williams, 1996).

2.1. Survey

Firstly, a survey was conducted to establish current Australian industry and government practices and norms in managing IS/IT benefits and evaluation. This quantitative approach had 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 (Sekaran, 1984).

The aim of this survey was to investigate IS/IT investment evaluation and benefits management processes and practices in large Australian organizations. Specifically, the survey sought to:

1. determine how benefits from IS/IT investments are identified, evaluated, structured, delivered and realized by organizations;
2. determine what criteria and methodologies are used to evaluate as well as to realize appropriate and adequate benefits by organizations from their IS/IT investments; and
3. determine how organizations in Australia attempt to review and improve their current evaluation and benefits realization processes and practices from their IS/IT investments.

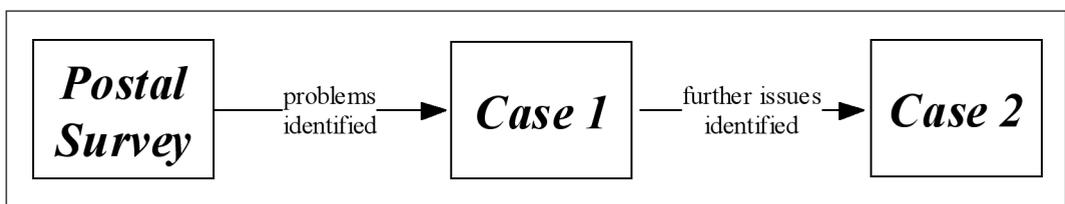


Figure 1: The research process

Questionnaires were sent to the chief information officers (CIOs) of the largest 500 Australian organizations by gross revenue. The structure of the questionnaire addressed many aspects of IS/IT benefits management and included Likert scale, nominal scale and open-ended questions. It was derived from earlier studies (mainly Ward *et al.*, 1996) and its validity and reliability derived from their acceptance in the literature. The survey elicited a total of 69 responses and a response rate of 13.8%. This response rate is comparable to other similar studies conducted in the last few years (e.g. 13% by Seddon *et al.* (2002) in their study of IS/IT investment evaluation of medium to large European and US firms, 14% by Sriram, Stump, and Banerjee (1997) in their study of IT investments in purchasing by US companies, 15.61% by Sohal and Ng (1998) in their study of the role of impact of IT in Australian business, and 10.8% by Laitinen (2002) in his study of performance measures in small Finnish technology companies).

Chi-squared Goodness of Fit tests, on industry sector, net revenue, and total number of employees, showed that the sample respondents were statistically similar (at the 1% significance level) to the target population. Moreover, late returns were compared with other responses received earlier in order to check for non-response bias. No significant differences were detected between the two samples. Therefore, the respondents can be considered representative of the population as a whole.

2.2. Case Study

Following analysis of the survey, in-depth case studies were carried out to evaluate and compare results from the survey, clarify doubts, ensure that the responses were properly understood by repeating or rephrasing the questions, and generally gain in-depth understanding of the issues arising from the survey. In other words, the aim was to further investigate the practice of IS/IT investment evaluation by large Australian organizations. Semi-structured interviews, observation, and document review were used to gain a deeper understanding of issues surrounding the current government practices and norms in managing IS/IT benefits and investments evaluation.

The two cases were chosen in order to focus efforts on theoretically useful cases (following the theoretical, non-random sampling strategy by Eisenhardt (1989)). Case studies were carried out in two large organizations involved in major IS/IT projects in the public sector. The first case was an immature organization in terms of IT while the second case was a more mature organization. In total, 18 interviews were conducted with 11 key participants from two Western Australian state government departments and seven key participant from the four major external IS/IT project contractors. The questions asked during the interview were related to the two departments' five major IS/IT project contracts, the contractual relationship between the two organizations and the contractors, IS/IT investment evaluation methodology deployed, benefits realization process used, and the management of the contract transition period. All interviews were taped and the transcripts were sent to the interviewees for validation. In cases where there were differences in opinion between participants, either follow-up interviews were conducted or emails were sent to clarify their positions. In many instances, interesting differences of opinion persisted.

Other data collected included some of the actual contract documents, planning documents and minutes of relevant meetings. More than 250 pages of transcripts were coded and analyzed. Qualitative content analysis (Miles and Huberman, 1994) was used to analyze the data from the case study. The analysis of the case study results was conducted in a cyclical manner and the results were checked by other experts in the field. Finally, the guidelines set out by Klein and Myers (1999) for conducting and evaluating interpretive field studies in information systems were also followed in an attempt to improve the quality of this research.

3. STUDY FINDINGS

Organizations in the manufacturing, public sector, financial services and mining sectors were the most heavily represented in the survey sample, though there was a reasonable coverage of all major industries. They were all large organizations in terms of net revenue and number of employees with about a half over A\$500m and 2000 employees. Their structure was mostly hierarchical (78%), centralized (60%) and divisional/functional (81%). An overwhelming majority of the responding CIOs came from an IS/IT background originally (78.3%) and have an average of 0.9 reporting levels between the CIO and the CEO.

The background information for the survey respondents is shown in Table 1 below.

Range	Percent (%)	Standard Deviation
(a) Industry sectors		N/A
Manufacturing	23.2	
Public Sector	13.0	
Financial Services	11.6	
Mining	11.6	
Construction	5.8	
Insurance	5.8	
Retailing or Distribution	5.8	
Other	23.2	
Total	100	
(b) Net revenue (A\$m)		1.03
<500	(=1) 55.6	
501–1000	(=2) 19.0	
1001–2000	(=3) 15.9	
2001 and above	(=4) 9.5	
Total	100	
(c) Total number of employees		1.02
<500	(=1) 24.6	
501–2000	(=2) 34.8	
2001–4000	(=3) 24.7	
4001 and above	(=4) 15.9	
Total	100	

Table 1: Background information of the responding organizations

The 18 participants involved in the case study were from two West Australian state departments. The case 1 organization was the central contact point for the West Australian Government agencies and suppliers on contracting matters. Its headquarters were located just next to the central business district (CBD), with 14 regional offices throughout Western Australia. The case 2 organization was responsible for providing an important public service within Western Australia. It had more than 6200 employees, with a structure comprising 4 regions, 15 districts and 160 offices. The mission of the case 2 organization was to create a more secure Western Australia by providing quality services.

Particularly in the case 1 organization, there was heavy involvement with outsourcing of projects on a contractual basis and so comments are made by participants often used the vocabulary of that environment (e.g. SLAs (service level agreements), RFTs (request for tenders) etc.). That said, in the case 2 organization external consultants had been employed to oversee the implementation of a benefits management approach and there was also some degree of outsourcing.

3.1 Perceptions of ‘benefits and value’

Several survey respondents mentioned explicitly that an IS/IT project was considered to be of benefits and value if either the proposed benefits were delivered or objectives were met. Many respondents indicated that they would make the conclusion through post-implementation reviews, meetings, or user feedback. In many cases the replies were the traditional project management value/benefits criteria of “working, on time, to budget.” However, neither reviews and user feedback nor delivered functionality was any guarantee of benefits delivery. This is consistent with the findings from Ward *et al* (1996).

Benefits and value were perceived and interpreted differently by participants in the case study organizations. For the case 1 organization, two out of the three IS/IT projects were generally seen by the participants as having benefits and value although the degree of benefits and value seems to be measured in the context of benchmarks set for it. However, none of the three major IS/IT projects’ documentation contained detailed descriptions about the benchmarks. Thus it was possible that the measurements that were utilized to evaluate performance and the benchmarks that were used to determine the benefits and value of the contracts could somehow be interpreted differently by various stakeholders since there was no pre-determined set of benchmarks. Other criteria often used by the participants to determine the benefits and value of a particular project were cost savings, fulfillment of contract conditions, and service delivery.

For the case 2 organization, several criteria for determining the benefits and value were put forward by participants. Customer satisfaction, achieving the external consultant’s projected revenue, bringing value/benefits to the organization, and meeting SLAs provisions were mentioned. Other criteria mentioned include technical competence to deliver what is required, risk factors, external consultants’ experience in a relevant area, and business continuity of the external consultants. Interestingly, both representatives from an external consultant stated achieving the projected revenue for themselves and satisfying customers as their only criteria for determining the benefits and value of their contracts with case 2 organization. This may indicate that the external consultant’s aim was to maximize the profit while maintaining a certain level of customer satisfaction. However, participants from the case 2 organization (as opposed to the external consultants) used different criteria for determining the benefits and value of the outsourcing contracts. Meeting the SLAs provisions, and pricing/cost were mentioned by three out of four participants from the case 2 organization.

3.2 Reasons for investing in IT

The most popular reason for justifying IT investment focused on the issue of cost reduction (Hinton and Kaye, 1996) as opposed to obtaining benefits or obtaining benefits that justified the costs. According to the survey respondents the top three reasons for IS/IT investments were cost/budgets, competitive advantage and process efficiency. Service quality and revenue and margin were also important benefits to consider. This indicates that these organizations were still under a lot of pressure to reduce IS/IT costs while attempting to address the problems of benefits realization.

Case 1 organization’s participants ranked cost saving, increased service level, and access to technical expertise as their top three motivations while case 2 organization’s participants had access

to technical expertise, cost saving, and government policy/concentrating on core functions as their top two reasons for outsourcing. The focus on cost saving could also partly explain why there was a contract mentality within the organizations undertaking IS/IT projects. Since there were almost no qualitative measures being used by the organizations, a focus on the SLAs by the respondents was inevitable. Although the participants from the survey and two case studies had not been able to agree on the reasons for undertaking major IS/IT projects, cost saving was the most commonly mentioned reason. This is consistent with prior surveys (eg. Willcocks, 1992; Ward *et al*, 1996) where cost saving is usually the first reason quoted for undertaking IS/IT projects.

Several reasons were also put forward by the case 2 organization's participants as the main motivation or objectives for IS/IT projects. Half of the participants cited cost saving as one of the main motivations for outsourcing. Government policy and concentrating on core functions were quoted by three participants each. Half of the external consultants interviewed cited access to the required technical expertise as one of case 2's reasons to outsource. Interestingly, two other external consultants did not know the main reason for the case 2 organization's IS/IT projects. On the other hand, all of case 2 organization's internal participants mentioned access to the required technical expertise as one of the main reasons for the organization to undertake its IS/IT functions.

3.3 Existence of measures

A benefits management approach implies that specific measures of success should be developed pre-project, so that these measures can be used for post-project review. It must also be conducted to ensure that the whole process is still appropriate to meet the business needs and that benefits have been obtained (Sriram *et al*, 1997). However, only 45% of survey respondents indicated that measures of success were often or always defined before project approval, and some 44.5% stated that measures of success were often or always defined after implementation or not at all.

3.4 Mismatch between actual and espoused use of formal IS/IT investment evaluation methodology

Most of the case study participants (14/18) and survey respondents (66%) claimed that a methodology or process was in place for investment evaluation. However, closer examination of the participants' responses reveals that there was a lack of formal IS/IT investment evaluation methodology or process used.

For the survey respondents, when asked about the specific methods/technique used to decide upon IS/IT investments, the traditional financially oriented evaluation techniques such as net present value (NPV) and cost/benefit analysis (CBA) were the most commonly mentioned techniques. Likewise, most of the participants from the case study organizations claimed formal IS/IT investment evaluation methodologies or processes were used for evaluating the IS/IT contracts. However, closer examination of the participants' responses and contract documents revealed otherwise (i.e. SLAs within the contracts). Measurements or evaluation instruments such as SLAs, monthly reports, standard contract management, standard project management methodology, and guidelines provided by state government were stated by some participants as the IS/IT investment evaluation methodology or process used for the IS/IT contracts. Other items mentioned by the participants included RFTs, requests for quotes (RFQs), requests for proposals (RFPs), and evaluation of RFTs. Most of these measurements were related to the contract terms or conditions specified in the SLAs within each contract and no formal IS/IT investment evaluation methodology, process, or technique (e.g. Information Economics) was mentioned. In reality only informal IS/IT investment evaluation processes were used.

For case studies, none of the participants mentioned any formal IS/IT investment evaluation process or methodology (e.g. Return on Management (Strassmann, 1990)). This may be partly due to the fact that none of the contract managers and coordinators interviewed had prior experience in managing the contracts. Instead, several participants mistakenly thought contract control and evaluation mechanisms specified within the SLAs (such as scorecards process, annual reviews, formal meetings, or benchmarking) constituted their IS/IT investment evaluation methodology or technique. Again, other items such as RFTs, RFQs, RFPs, SLAs, monthly reports, standard contract management, and state government guidelines were often cited by the participants as the formal IS/IT investment evaluation methodology or process. This may well be due to the fact that both case study organizations were unable to introduce a formal IS/IT investment evaluation methodology because they were required to follow the state government's outsourcing guidelines (MOPC, 2000).

This result is consistent with findings of others. For example, Ward *et al* (1996) found that 60% of survey respondents indicated that they had used a formal IS/IT investment evaluation methodology but only methods such as CBA and ROI were actually stated. Ballantine, Galliers, and Stray (1996) suggest that there is a lack of formal evaluation procedure within organizations. Taylor and Norris (1989), (in Norris, 1996) indicated in their UK survey that almost half of the responding organizations could not point to any kind of process for evaluating contribution or following up promises of benefits.

3.5 Appropriateness of measures used

Nevertheless, these traditional accounting-based measures (eg. ROI) as well as contract control and evaluation mechanisms or measurements (eg. SLAs) constituted an **informal** IS/IT investment evaluation process. Both the survey respondents and case study participants appeared to know that they required some sort of informal IS/IT investment evaluation process or technique to monitor the performance and progress of the contracts. Although these informal mechanisms or measurements cannot be used to totally replace a real and robust formal IS/IT investment evaluation methodology (such as Balanced Scorecard (Kaplan and Norton, 1992)), they were, however, able to help both case study organizations, for example, to evaluate and measure, to certain extent, the performance of their IS/IT contracts. These contract control and evaluation mechanisms or measurements are largely based on the guidelines set out by the standard state government contract process and purchasing guidelines (SSC, 1999). Both survey respondents and case study participants however, did not exhibit a good understanding of the IS/IT systems development process (in particular, investment evaluation process) and the importance of using a formal IS/IT investment evaluation methodology.

More significantly, traditional accounting-based measures do not assist in measuring how IS/IT adds net value to an organization (Willcocks, 1992). According to Shaw and Fairburst (1997), exclusive use of hard and quantitative approaches could miss important subtleties of performance or measurements. However, across the two case studies, all but one of the measures specified in the SLAs within all four IS/IT contracts were quantitative accounting based measures. This is probably because the quantitative measures were easier to use and define than the qualitative measures. However, without employing more qualitative measures (e.g., relationship, culture and leadership) and a formal IS/IT investment evaluation methodology or process, the use of quantitative or accounting based measures alone would not assist in full evaluation and monitoring of the performance and status of these contracts. This is because IS/IT evaluation is "a process, or group of parallel processes, which take place at different points in time or continuously, for searching and for making explicit, quantitatively or qualitatively, all the impacts of an IT project and the program

and strategy of which it is a part” (Farbey *et al*, 1999). Moreover, all participants seemed to have a SLAs mentality and the main objective for measuring or evaluating performance was just to fulfill the requirements under the SLAs within each contract. These measures specified within the SLAs appeared to be traditional accounting-based measures. Similarly, the methods mentioned by survey respondents were also largely traditional accounting-based techniques such as NPV, CBA and ROI.

The result here in a state government agency seems to echo the reports about inappropriate measurements and other problems with the Australian Federal Government’s IS/IT projects which had led to constant budget blowouts, dubious savings, and user dissatisfaction (Mitchell, 2000). Studies conducted by Willcocks, Lacity and Fitzgerald (1995) also suggest that inadequate measurement systems to monitor the contractor’s performance is one of the major areas of weakness in IS/IT projects.

3.6 Use of IS/IT benefits realization methodology

In the survey, most respondents adopted both IS/IT investment appraisal and benefits realization processes (81.8%). Yet, half of the respondents believed that their current project justification process failed to identify all available benefits for a project. Furthermore, in 26.2% of cases, the respondents openly admitted that their current process actually overstated the benefits in order to get approval. This seems to imply that the process itself placed more emphasis on getting project approval than on delivering proposed benefits. This could explain why formal IS/IT benefits realization methodologies are not used by organizations. However, whatever the reasons for overstating benefits, from a business user perspective the practice is likely to lead ultimately to a lack of confidence in the ability of IT to deliver what is promised. In addition, only 43% of the respondents claimed that their organization prepared a benefits delivery plan. Without such a plan, it is difficult to envisage how an organization might effectively realize business benefits.

Most participants in the case 1 organization readily admitted that there was no formal benefits realization methodology or process and had some problems with some of the major contractors. Those who indicated some process existed were actually referring to the contract control and evaluation mechanisms specified in the SLAs. However, no formal IS/IT benefits realization methodology, technique, or process was mentioned or specified by any of the participants or were they contained in any contract documents. Overall, the result from case 1 is consistent with the survey respondents and in UK (Ward *et al*, 1996). The adoption rates of a benefits realization methodology by large Australian and UK organizations were only 33% and 23%, respectively. The fact that few organizations have a benefits management methodology or process is not really surprising as more attention is usually paid to ways of justifying investments, with little effort being extended to ensuring that the benefits expected are realized (Ward and Griffiths, 1996).

On the other hand, every participant in the case 2 organization was aware that a formal IS/IT benefits realization methodology was being used for its IS/IT contracts and projects. One of the external consultant’s Benefits Realization Approach was used as an end-to-end process to assist case 2 in:

1. providing a rigorous process to select the right projects to implement;
2. placing responsibility and accountability at the appropriate level within the organization;
3. driving process re-engineering through changes in the organization;
4. ensuring benefits are realized; and
5. ensuring agreed re-investment of time savings applied as expected.

So clearly there is a range of practice with respect to using benefits realization methodologies.

3.7 The degree of understanding of benefits realization

There is a widespread concern among many researchers and academics that IS/IT investment does not deliver value (Jones and Hughes, 1999) and that senior business executives simply do not understand the concept of benefits realization (Remenyi, 2000). This is exactly what happened inside the case 1 organization. While half of participants admitted that there was no benefits realization methodology or process being used, the other half of the participants disagreed and stated that benchmarking, value added activities, budgetary process, or annual reviews were used for managing benefits for these outsourcing contracts. Almost all of these contract control and evaluation mechanisms were focused on costs, not benefits. Furthermore, none of the participants mentioned any formal IS/IT benefits realization process or methodology (such as Active Benefits Realization (Remenyi *et al.*, 1997)). These contract control and evaluation mechanisms had nothing to do with “the process of organizing and managing such that potential benefits arising from the use of IS/IT are actually realized” (Ward and Griffiths, 1996). Therefore, it appears that many case 1 participants had a problem of understanding the exact meaning and purpose of an IS/IT benefits realization methodology or process. A possible reason could be that all contract managers and coordinators had no experience in contract management before and so had probably not possessed the required knowledge or skill in implementing formal IS/IT investment evaluation and benefits realization methodologies or techniques.

On the other hand, an external consultant’s benefits realization methodology, Benefits Realization Approach, was introduced into the case 2 organization because there was a concern within the organization that IS/IT investments did not deliver value. Such a failure could have jeopardized the state government’s future funding for case 2 organization. In order to ensure that the IS/IT investments deliver the promised value and benefits as well as bring the focus back to case 2 organization’s main business, a large internal change program was initiated by the organization. Unlike its understanding of the IS/IT investment evaluation process, the case 2 organization had determined in the very beginning that a formal benefits realization methodology was needed. Since the case 2 organization had no technical expertise to undertake a large scale internal change program, it was important for the organization to search for a formal benefits realization methodology. As a result, the Benefits Realization Approach was chosen to assist case 2 organization to manage the change program as well as to realize the benefits from the IS/IT projects undertaken by the organization.

However, the success of such a methodology depends largely on the acceptance of the change program and understanding of the principles of the benefits realization by the users within the organization as a whole. Many within the organization had found the methodology to be very useful. The case 2 organization has tried to sell and educate the principle of the methodology to everyone within the organization. It was expected that almost all of its staff members would understand the benefits realization process in the not too distant future. At the same time, the case 2 organization was trying to minimize the user resistance while maintaining the pressure for them to comply with the change program. The Value Management Office (VMO) was set up not only to educate the users about the benefits realization methodology but also to minimize user resistance to the methodology. This clearly demonstrates the resolve by the organization to implement the methodology as well as to force, if necessary, users to accept the methodology.

In summary, the case 1 organization did not adopt a formal benefits realization methodology and therefore, did not understand the concept of benefits realization. In contrast, the case 2 organization had discovered, in the very beginning, the need for adopting a formal benefits realization methodology within the organization. This was followed by selection and implementation of a

Benefits Realization Approach. Furthermore, the case 2 organization had spent a lot of resources and effort to make sure that the organization, as a whole, understood and accepted the methodology. As mentioned previously, the case 2 organization is clearly in the minority on this issue.

3.8 Organizational maturity

Table 2 compares some characteristics of organizations with and without a BRM collected from the survey and case studies.

Issues	Survey		Case 1	Case 2
	No BRM	BRM	No BRM	BRM
• believed that the methodology (BRM) was effective in ensuring successful information systems	2.2%	38.1%	n/a	✓
• had prepared a benefits delivery plan	34.1%	60.0%	x	✓
• believed that their current process adequately quantified the relevant benefits	54.5%	90.9%	x	✓
• had a formal process to identify any further benefits after implementation	9.3%	36.4%	x	✓
• took action after implementation to realize the benefits identified after implementation	4.8%	68.2%	x	✓
• overstated the benefits in order to get approval	30.9%	18.2%	n/a	x
• felt that there was scope for significant improvement in their current approach to managing IS/IT benefits	69.0%	50.0%	✓	✓

Table 2: Comparisons between organizations with a BRM and without a BRM

As can be seen, those organizations which had benefits realization methodology (BRM) were more likely:

1. to have more confidence in the benefits realization practices and activities as well as in their effects to their organizations;
2. not to overstate the benefits in order to get approval for their IS/IT projects;
3. to have better understanding of the benefits realization concepts and undertake benefits realization activities within their organizations;
4. to have adopted formal or informal IS/IT investment evaluation methodology; and
5. not to have complicated contract management issues.

One interesting result from Table 2 is that 30.9% of the organizations without a benefits realization methodology (BRM) and only 18.2% of the organizations with a BRM overstated the benefits in order to get the projects approved. This seemed to imply that the organizations without a BRM placed more emphasis on getting project approval than those organizations which had a

BRM. Perhaps, organizations without a formal BRM were more desperate in justifying and getting project approval since they did not have a formal process (i.e. BRM) to back them up. It also may be that the processes within a benefits realization methodology had made it more difficult for organizations to overstate the benefits in order to get projects approval. Potentially, this is one of the major benefits for adopting a formal BRM.

From the above it can be concluded that organizations employing a benefits realization methodology (BRM) were more likely to:

1. use formal processes for their investment evaluation;
2. be more confident about what they do in their IS/IT activities;
3. have better integration of their IS/IT functions; and
4. manage their projects or contracts to achieve better results and with less problems.

These outcomes are often associated with higher levels of IS/IT maturity (Galliers and Sutherlands, 1991; Nolan, 1979) so it could be argued that use of a BRM is associated with more IT-mature organizations.

4. SUMMARY

IS/IT investment evaluation practice remains one of the most controversial and debated topics in the IS literature to date. However, most of the studies that have been undertaken to date in this area have been carried out in UK or the USA. Very little published work has been conducted in Australia and there is still a lot to be learned in the area about the processes and practices of IS/IT investment evaluation and benefits management in Australian organizations.

Some key findings from the survey and case studies were highlighted and discussed. The results show that many survey respondents and case study participants knew very little about the IS/IT investment evaluation and benefits realization concepts and practices. In most cases, both formal IS/IT investment evaluation and benefits realization methodologies were not adopted by organizations. The evaluation tended to be informal and quantitative in nature. The results also show that most organizations were not yet mature and even despite the adoption of a formal benefits realization methodology (BRM) some problems still remained. However, the results show that the use of a formal methodology in investment evaluation or in benefits realization, would lead to a better IS/IT outsourcing experience for organizations as well as better control over decisions and better attainment of benefits and more broadly can lead to a higher level of organizational maturity. The results are consistent with findings of other studies carried out in the US and Europe (eg. Ballantine *et al*, 1999; Ward *et al*, 1996; Willcocks, 1992). It is the hope of the authors that more studies in the practice of IS/IT investment evaluation will benefit other researchers in this field as well as the business community as a whole.

REFERENCES

- ALIA (2003): *Federal Budget 2002*, ALIA Publishing, <http://www.alia.org.au/publishing/budget.analysis/2002.html>. Accessed 20-January-2004.
- ANDRESEN, J., BALDWIN, A., BETTS, M., CARTER, C., HAMILTON, A., STOKES, E. and THORPE, T. (2000): A framework for measuring IT innovation benefits, *Electronic Journal of Information Technology in Construction*, 5: 57–72.
- A.T. KEARNEY (1990): *Breaking the barriers: IT effectiveness in Great Britain and Ireland – a Management Perspective*, A.T. Kearney Ltd, London.
- BAKER, R. and BERENBLUM, E. (1996): Aligning the IT audit strategy with the business strategy – strategies for survival in uncharted waters, *Australasian Regional Conference “State of Play” EDPAC*, Perth, 163–176.
- BALLANTINE, J.A., GALLIERS, R.D. and STRAY, S.J. (1996): Information systems/technology evaluation practices: Evidence from UK organizations, *Journal of Information Technology*, 11:129–141.

- BALLANTINE, J.A., GALLIERS, R.D. and STRAY, S.J. (1999): Information systems/technology evaluation practices: Evidence from UK organizations, In *Beyond the IT Productivity Paradox*. WILLCOCKS, L.P. and LESTER, S. (eds.) Chichester, UK: Wiley, 123–150.
- BROADBENT, M., MCGEE, K. and MCDONALD, M. (2003): *IT Success Requires Discipline and Innovation*, Gartner FirstTake, Gartner, 12 May, FT-20-0693.
- BRYNJOLFSSON, E. (2003): The IT productivity gap, *Optimize*, (July): 26–43.
- BRYNJOLFSSON, E. and HITT, L. M. (2003): Computing productivity: Firm-level evidence, *The Review of Economics and Statistics*, 85(4): 793–808.
- BURNS, R.B. (1994): *Introduction to Research Methods*, Longman Cheshire Pty Ltd, 2nd Ed. London.
- CARR, N. G. (2003): IT doesn't matter, *Harvard Business Review*, 8(1): 4–50.
- CHANGCHIT, C., JOSHI, K.D. and LEDERER, A.L. (1998): Process and reality in information systems benefit analysis. *Information Systems Journal*, 8:145–162.
- COUNIHAN, A., FINNEGAN, P. and SAMMON, D. (2002): Towards a framework for evaluating investments in data warehousing, *Information Systems Journal*, 12: 321–338.
- CRONK, M. C. and FITZGERALD, E. P. (1999): Understanding “IS business value”: derivation of dimensions, *Logistics Information Management*, 12(1/2): 40–49.
- CRONK, M. C. and FITZGERALD, E. P. (2002): Constructing a theory of ‘IS business value’ from the literature, *Electronic Journal of Business Research Methods*, 1(1): 11–17.
- DE SOUZA, R., NARISAWA, R., GOODWIN, R. and HAZRA, K. (2003): *IT Business Spending to Recover in Late 2003*, Gartner, 22 January.
- DHILLON, G. and BACKHOUSE, J. (1996): Risks in the use of information technology within organizations, *International Journal of Information Management*, 16(1): 65–74.
- DOS SANTOS, B.L. (1994): Assessing the value of strategic information technology investments, In *Information Management: The Evaluation of Information Systems Investments*, WILLCOCKS, L. (ed.), Chapman & Hall, London.
- EISENHARDT, K.M. (1989): Building theories from case study research, *Academy of Management Review*, 14(4): 532–550.
- ENZWEILER, A. J. (1996): Justifying the cost of client/server systems, *Management Accounting*, 78(3), September.
- FARBEY, B., LAND, F. and TARGETT, D. (1992): Evaluating investments in IT, *Journal of Information Technology*, 7: 109–122.
- FARBEY, B., 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.
- FARRELL, D. (2003): The real new economy, *Harvard Business Review*, 81(10): 104
- FINK, D. (1998): Guidelines for successful adoption of information technology in small and medium enterprises, *International Journal of Information Management*, 18(4): 243–253.
- GABLE, G. G. (1994): Integrating case study and survey research methods, an example in information systems, *European Journal of Information Systems*, 3(2): 112–126.
- 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.
- GALLIERS, B., SWAN, J., NEWELL, S. and ROBERTSON, M. (1996): The information challenge – Making your IT investment pay off, *Hot Topics*, 1(2), March. <http://www.wbs.warwick.ac.uk/HotTopics>. Accessed 14-October-2000.
- GORMOLSKI, B., GRIGG T. and POTTER, K. (2001): *2001 IT Staffing and Survey Results*, Report R-14-4158, Gartner 2001, 19th September, 2001.
- 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.
- HINTON, M. and KAYE, R. (1996): Investing in information technology: A lottery?, *Management Accounting*, November, 52–54.
- HITT, L.M. and BRYNJOLFSSON, E. (1996): Productivity, business profitability, and consumer surplus: Three different measures of information technology value, *MIS Quarterly*, 20(2): 121–142.
- HOCHSTRASSER, B. (1994): Justifying IT investments. In *Information Management: The Evaluation of Information Systems Investments*. WILLCOCKS, L. (ed.), Chapman & Hall, London.
- IRANI, Z. (2002): Information systems evaluation: Navigating through the problem domain, *Information and Management*, 40: 11–24.
- JONES, S. and HUGHES, J. (1999): IS value and investment appraisal: A case study of a local authority, *Electronic Journal of Information Systems Evaluation*, 2(1).
- KAPLAN, R. S. and NORTON, D. P. (1992): The balanced scorecard – Measures that drive performance, *Harvard Business Review*, Jan.–Feb., 71–79.
- KLEIN, H. K. and MYERS, M. D. (1999): A set of principles for conducting and evaluating interpretive field studies in information systems, *MIS Quarterly*, 23(1): 67–94.
- LAITINEN, E. K. (2002): A dynamic performance measurement system: Evidence from small Finnish technology companies, *Scandinavian Journal of Management*, 18: 65–99.

- MCFARLAN, F. W. and NOLAN, R. L. (2003): Does IT matter? An HBR debate: Web Exclusive, *Harvard Business Review*, (June): 5–6.
- MCGUNAGLE, G. P. (1995): Corporate banking: Making technology more effective, *Bank Management*, 71(6): 22–25.
- MILES, M.B. and HUBERMAN, A.M. (1994): *Qualitative Data Analysis: An Expanded Sourcebook*, Sage Publications, California.
- MINGERS, J. (2001): Combining IS research methods: Towards a pluralist methodology, *Information Systems Research*, 12(3): 240–258.
- MIRTIDIS, D. and SERAFEIMIDIS, V. (1994): Evaluating information technology investments in Greece, *Proceedings of the 1st European Conference on IT Investment Evaluation*, Henley, September, 167–177.
- MITCHELL, S. (2000): Audit report slams federal outsourcing, *The Australian Newspaper*, Tuesday, 12 September, 19–20.
- MOPC (2000): *Competitive Tendering and Contracting: Process Guidelines for Use by Agencies*, Ministry of Premier and Cabinet, Government of Western Australia, 3rd Ed., July.
- MURPHY, K. E. and SIMON, S. J. (2002): Intangible benefits valuation in ERP projects, *Information Systems Journal*, 12: 301–320.
- NOLAN, R. L. (1979): Managing the crises in data processing, *Harvard Business Review*, March–April, 115–126.
- NORRIS, G. D. (1996): Post-investment appraisal, In *Investing in Information Systems: Evaluation and Management*, WILLCOCKS, L. (ed.), Chapman & Hall, UK.
- PARKER, M.M., BENSON, R.J. and TRAINOR, H.E. (1988): *Information Economics*. Prentice Hall: London.
- PERVAN, G. (1997): Information systems management: An Australasian view of the key issues – 1996, *Australian Journal of Information Systems*, 5(1): 55–68.
- PRICEWATERHOUSECOOPERS (2003): Benefits realization online survey results survey, PricewaterhouseCoopers, <http://www.pwcglobal.com>. Accessed 20-February-2004.
- RAI, A., PATNAYAKUNI, R. and PATNAYAKUNI, N. (1997): Technology investment and business performance, *Communications of the ACM*, July, 40(7): 89–97.
- RENKEMA, T.J.W. (1998): The four P's revisited: Business value assessment of the infrastructure impact of IT Investment, *Journal of Information Technology*, 13: 181–190.
- REMENYI, D. (2000): The elusive nature of delivering benefits from IT investment, *Electronic Journal of Information Systems Evaluation*, 3(1).
- REMENYI, D., SHERWOOD-SMITH, M. and WHITE, T. (1997): *Achieving Maximum Value from Information Systems: A Process Approach*, John Wiley & Sons, Chichester, England.
- REMENYI, D. and WILLIAMS, B. (1996) The nature of research: Qualitative or quantitative, narrative or paradigmatic?, *Information Systems Journal*, 6: 131–146.
- 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.
- SERAFEIMIDIS, V. and SMITHSON, S. (2003): Information systems evaluation as an organisational institution – Experience from a case study, *Information Systems Journal*, 13(2): 251–274.
- SHAW, S. and FAIRBURST, D. (1997): Outsourcing the HR function – Personal threat or valuable opportunity? *Strategic Change*, 6: 459–468.
- SIRCAR, S., TURNBOW, J. L. and BORDOLOI, B. (2000): A framework for assessing the relationship between information technology investments and firm performance, *Journal Management Information Systems*, 16(4): 69–89.
- SOHAL, A.S. and NG L. (1998): The role and impact of information technology in Australian business, *Journal of Information Technology*, 13: 201–217.
- SRIRAM, V., STUMP, R. L., and BANERJEE, S. (1997): Information technology investments in purchasing: An empirical study of dimensions and antecedents, information and management, 33: 59–72.
- SSC (1999): *Managing Purchasing Conducted by Private Sector Providers*, State Supply Commission, Perth, Western Australia. http://www.ssc.wa.gov.au/pol_guide/policies/manage_purchase.html. Accessed 17-November-1999.
- STRASSMAN, P.A. (1990): *The Business Value of Computers*. The Information Economics Press: New Canaan.
- STRASSMANN, P. A. (1997): Will big spending on computers guarantee profitability? *Datamation*, 43(2), February.
- STRASSMANN, P. A. (2003): Does IT matter? An HBR debate: Web Exclusive, *Harvard Business Review*, (June):7-9.
- 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.
- TRUAX, J. (1997): *Investing With Benefits In Mind: Curing Investment Myopia*, The DMR White Paper, 1–6.
- VAN GREMBERGEN, W. and VAN BRUGGEN, R. (1998): Measuring and improving corporate information technology through the balanced scorecard, *Electronic Journal of Information Systems Evaluation*, 1(1).
- VANDENBOSCH, B. and LYYTINEN, K. (2004): Much ado about IT: A response to “the corrosion of IT advantage” by Nicholas G. Carr, *Journal of Business Strategy*, 25(6): 10–12.
- WARD, J. and GRIFFITHS, P. (1996): *Strategic Planning For Information Systems*. John Wiley & Sons Ltd, Chichester, 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., LACITY, M. and FITZGERALD, G. (1995): Information technology outsourcing in Europe and the USA: Assessment issues, *International Journal of Information Management*, 15(5) 333–351.
- WILLCOCKS, L. and LESTER, S. (1997): Assessing IT productivity: Any way out of the labyrinth?, In *Managing IT as a Strategic Resource*. WILLCOCKS L., FEENY, D.F. and ISLEI, G. (eds.).The McGraw-Hill Company, London.

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