

A Survey of IS/IT Investment Evaluation Practices in Australia: Some Preliminary Results

by

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ABSTRACT

In modern organizations a large portion of senior management's time is now being spent on finding ways to measure the contribution of their organizations' IS/IT investments to business performance. 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. At the same time, the issue of expected and actual benefits realized from IS/IT investments has also generated a significant amount of debate in the IS/IT literature amongst researchers and practitioners, though most of the published research comes from the USA and UK. This study has addressed that issue through a survey of the CIOs of Australia's largest 500 organisations. The results indicate that a variety of formal IS/IT investment evaluation processes and techniques are used, costs and budgets are of great concern, there is a strong emphasis on cost reduction and other benefits, and a reasonable level of confidence in the delivery of these benefits. Most organizations used a formal methodology or process for IS/IT investment evaluation, and financially based evaluation techniques such as NPV and ROI which, though not perfect, often do try to incorporate intangible benefits into the process. These and other results are presented in the paper, and suggestions for further work included.

Keywords

IT Investment; IT Evaluation; IT Benefits Realization; Measurement of IT Effectiveness

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 (Willcocks, 1992a). Information systems and technology managers have found it increasingly difficult to justify rising IS/IT expenditures (Silk, 1990; Willcocks, 1994). 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 (e.g. Willcocks and Lester, 1997). This problem has become more complex as the nature of IS/IT investments and the benefits they can deliver have evolved over time as IS/IT itself has changed rapidly (Willcocks, 1992a).

According to Symons and Walsham (1988), the potential use of IT as a competitive weapon has become a popular slogan. However, there is still a lack of understanding of the impact of the proper IT investment evaluation and benefits realization process. In consequence, the capacity of many organizations to assimilate and apply IT falls far behind the available opportunities. Therefore, it is not difficult to see that the measurement of the business value of IT investment has been the subject of considerable debate by many academics and practitioners (e.g. Ballantine et al., 1996; Hitt and Brynjolfsson, 1996). The difficulties in measuring benefits and costs are often the cause for the uncertainty about the expected benefits of IT investment and hence are the major constraint to IS/IT investments (Renkema and Berghout, 1997). Hence, evaluation is often ignored or carried out inefficiently or ineffectively because of its elusive and complex nature (Serafeimidis and Smithson, 1996).

Recently, the issues of gaining business value from, and justifying current investment in, information technology have been identified as the most critical but difficult management issue in Australia, UK and the US (Pervan, 1998). According to Baker and Berenblum (1996), investment in IT is one of the major factors determining the success or failure of organizations. As a result, organizations are becoming increasingly competitive in seeking to implement the effective use of IT (Dober, 1994). However, recent research also indicates that IT managers may not be paying as much attention to the measurement of the organization's IT investment as their CEOs (Pervan, 1998), resulting in difficulties in explaining the "productivity paradox" within their organizations.

Productivity Paradox

According to Hochstrasser and Griffiths (1991), companies often report that large-scale IS/IT deployment has resulted in replacing old problems with new problems, and that, overall, introducing IS/IT can be a huge disappointment since unexpected difficulties and failures are regularly encountered and expected business benefits are frequently not realized. To add to this difficulty, the determination of IS/IT investment and returns is also problematic because of the lack of consensus in defining and measuring such investment (Mahmood and Mann, 1993). Therefore, it is not surprising to see that the term "productivity paradox" is gaining increasing notoriety as several studies point toward fairly static productivity and rising IS/IT expenditure (e.g. Brynjolfsson, 1993; Rai et al., 1997). This is the notion that 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 (Willcocks and Lester, 1997). Research on these benefits is contradictory with some studies suggesting that IS/IT investment produces negligible benefits (e.g. Strassmann, 1997) and others reporting that there appears to be some sort of positive relationship between organizations' performance and IS/IT spending (Dewan and Kraemer, 1998).

IS/IT Investment Evaluation: Recent Research

Despite the fact that a number of studies have found contradictory evidence as to whether the benefits have materialized from IS/IT, organizations continue to invest large amounts of money in IS/IT equipment and related technologies (Willcocks, 1994). In recent years, many senior managers have come to realize that it is increasingly difficult to justify the costs surrounding the purchase, development and use of IS/IT (Fitzgerald, 1998). In fact, according to Hochstrasser and Griffiths (1991), few companies consistently state that IS/IT is indeed value for money.

Globally, it has been estimated that computer and telecommunications investments now amount to half or more of most large companies' annual capital expenditures (Willcocks and Lester, 1997). The expenditure on IS/IT investments by UK and US organizations is also large and rising. According to Willcocks (1992a), UK company expenditure on IS/IT exceeded a total of £10 billion per year, equivalent to an average of 1.2% annual turnover. In Australia, the Federal Government announced that, starting in 1998, it would commit \$1.2A billion over five years to boost the effective use of IS/IT in the business and investment industry (Mitchell, 1998). The worldwide spending on IS/IT in 1996 was estimated to be around \$1.076US trillion (Strassmann, 1997).

Amid all these IS/IT expenditure increases, several research studies have suggested that at least 20% of the IS/IT expenditure is wasted, and that between 30-40% of IS/IT projects realize no net benefits (Dhillon and Backhouse, 1996). Investigation into the benefits of IS/IT projects have regularly shown that, 60% of the time, IS/IT projects are either discontinued or provide benefits at levels well below those expected (Hochstrasser, 1993).

EMERGING PROBLEMS/CHALLENGES

Ballantine et al. (1996) 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. This seems to confirm the results by the study carried out by Willcocks (1992a; 1992b). 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 such as return on investment (ROI), discounted cash flow/internal rate of return (DCF/IRR), net present value (NPV), profitability index (PI), cost/benefit, payback period, and present worth 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 or appropriate evaluation time and effort to IS/IT given that it represents a major capital asset in many organizations; 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 also lead to measurement problems during the IS/IT investments evaluation process.

RESEARCH SIGNIFICANCE

Clearly there is a need for more empirical research in this area as more and more organizations are demanding greater value from their IS/IT investment (Sohal and Ng, 1998). Some of the reasons why it is important to conduct more research in the process of IS/IT investment evaluation in Australian organizations include:

- IS/IT investments in organizations are substantial and increasing (Ballantine et al., 1996);
- IS/IT investment evaluation is often the subject of heated debates amongst researchers and practitioners over the realization of actual and expected benefits of such investments (Hochstrasser, 1990);
- There is still a lack of understanding of the impact of IS/IT investments evaluation and benefits realization processes in most organizations (Symons and Walsham, 1988);
- There is a growing need to evaluate and improve measurement of the benefits of IS/IT investments in organizations (Rai et al., 1997); and
- Gaining business value from and justifying current IS/IT investments are often identified as the most critical but difficult management issues in Australia, UK and the US (Pervan, 1998).

Most of the studies that have been conducted to date have been carried out in UK or the USA. Very little published work has been conducted in Australia. Thus one significant aspect of this research was to better understand the current trends in the effective utilization of IS/IT in Australia.

IS/IT managers in large Australian organizations face a range of decisions concerning levels and types of their investments in IS/IT. For example, amongst other things, decisions must be reached on:

- investment in hardware (e.g. computers and telecommunications equipment);
- investment in software (e.g. in-house versus software package procurement);
- achieving alignment of IS/IT investment with business strategies;
- prioritization of IS/IT projects; and
- the overall process of evaluation and realization of benefits during IS/IT projects.

Given the complexity of the decisions and the large expenditure involved, better understanding of the basis and practice of IS/IT investment and evaluation in large Australian 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 (Symons and Walsham, 1988). According to Sohal and Ng (1998), their research findings in large Australian organizations suggest that, among other things, 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 are disturbed by the fact that 45% of the responding organizations do not evaluate whether IS/IT systems are still consistent with business objectives and 59% do not determine whether expected benefits are being achieved. Therefore, this research has attempted 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.

Thus, there is a need to conduct more research on the process of IS/IT investment evaluation in Australian organizations. The key objectives of this study were *to establish current Australian industry and government practices and norms in evaluating IS/IT investments*. Given the significance (in amount invested and impact on the economy), this study has focused on large organizations, but it is planned that this will later be extended to small and medium sized enterprises.

RESEARCH APPROACH

To satisfy the above objective, the survey method was considered an appropriate mechanism for gathering this type of information. According to Burns (1994), the main advantages of undertaking a survey include:

- (1) it is less expensive than most other methods;
- (2) it is useful when the instructions and questions asked are simple;
- (3) each respondent receives identical questions, phrased in exactly the same way;
- (4) errors resulting from recording responses by interviewers are reduced;
- (5) respondents are free to answer at their own pace;
- (6) fear and embarrassment, which may result from direct contact, are avoided;
- (7) the problem of non-contact with the respondent is , as well as subjects in more diverse locations, than is practical with interviews;
- (8) it can guarantee confidentiality and may, therefore, elicit more truthful responses; and
- (9) personal appearance, mood or conduct of the interviewer is not present when the questionnaire is completed.

A survey was conducted in which topics investigated included IS/IT investment evaluation methodology, benefits management methodology, benefits structures and identification, benefits realization planning, and benefits delivery processes. The aim of the full survey was to investigate many aspects of IS/IT investments evaluation and benefits management processes and practices in large Australian organizations. Specifically, the survey sought to:

- (a) determine how benefits from IS/IT investments are identified, evaluated, structured, delivered and realized by organizations;
- (b) 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

(c) determine how organizations in Australia attempt to review and improve their current evaluation and benefits realization processes and practices from their IS/IT investments.

The focus of this paper is on the IS/IT investment evaluation part of that survey. The initial survey, undertaken from June to August 1999, focuses on Australia's largest organizations. A list of chief information officers (CIOs) of the largest 500 organizations by gross revenue was prepared and used in the initial survey. The structure of the questionnaire addresses many aspects of IS/IT investment evaluation and is partly based on an earlier survey conducted by Ward et al. (1996) in the UK. The instrument incorporates a variety of aspects of the three aims above and is not included here because of space limitations.

SURVEY RESULTS

At the end of the first of two mailouts, a total of 35 completed questionnaires were received, giving a net response rate of 7%. This low response rate did not come as a surprise given that postal survey has often been plagued by response rate problems (Oppenheim, 1992). Moreover, the CIOs of the largest 500 Australian companies are often some of the busiest people around and, therefore, simply had little time or interest to complete and return the questionnaire. Furthermore, several organizations sent back their questionnaires and indicated that their corporate policy did not allow them to participate in this survey. A second mail-out elicited a further 34 responses for a total of 69 questionnaires and a response rate of 13.8%. Most of the information presented below is based on descriptive statistics but some comparisons between groups were made using one-way ANOVA tests and correlation statistics.

Background Information

A wide range of industry sectors (20) was represented by those that responded. Just over three-quarters of total respondents (75.4%) were from the following eight industry sectors: manufacturing (23.2%), financial services (11.6%), mining (11.6%), education (5.8%), construction (5.8%), insurance (5.8%), retailing/distribution (5.8%), and utility (5.8%). The average size of these organizations in terms of net revenue was about A\$921.6m, ranging from A\$50m to A\$8000m. This was made up of 17.5% of A\$50-250m, 38.1% of A\$251-500m, 19% of A\$501-1000m, 15.9% of A\$1001-2000m, and 9.5% of A\$2001-8000m. In terms of the number of employees, responding organizations employed between 30 and 35000 persons, with an average of 2914 employees. This was made of 24.6% of 30-500 employees, 34.8% of 501-2000 employees, 24.7% of 2001-4000 employees, and 15.9% of 4001-35000 employees. Just over half of the respondents (51.5%) indicated their organizations were multinationals while the remainder were national organizations. Overall, the responding organizations were large in revenue and number of employees, typical of the large corporate sector with large numbers from manufacturing, financial services and mining, and almost evenly divided between multinational and national.

An overwhelming majority of the responding CIOs came from an IS/IT background originally (78.3%). More than half (59.7%) indicated that there was one reporting level between the CIO and the chief executive officer (CEO), while 23.9% of the respondents said that there was a direct link. Overall, the respondents mostly came from an IS/IT background, and have an average of 0.9 reporting levels between the CIO and the CEO.

The CIOs were asked whether their organizational structure was hierarchical or flat, centralized or decentralized, and divisional-functional or cross-functional. Some 78.4% described their organizations as having hierarchical structure while only 21.6% were

described as having flat structure. A majority of the respondent organizations were centralized (60%) against 40% decentralized. In addition, the majority of the respondents (81%) indicated a divisional/functional structure with 19% cross-functional. Overall, the organizations were mostly hierarchical and centralized with a divisional/functional structure.

In the last year, an average of 16.3 IS/IT projects under A\$1 million were implemented by these organizations, 2.4 projects in the A\$1-10 million range, and 1.2 projects over A\$10 million. The average number of projects that the respondents' organizations were planning to implement in the next 12 months was: 16.6 under A\$1 million, 3.1 in the A\$1-10 million range, and 0.7 over A\$10 million. Overall, the figures for the number of projects that were and would be implemented for the past and next 12 months were very similar and are consistent with the findings in Ward et al. (1996).

IT outsourcing has been carried out by many organizations. A number of reasons are often presented, but reducing the cost of future IT capital investment is usually the first one quoted (Willcocks et al., 1992a). Most respondents (75.8%) of this survey indicated that they had outsourced at least some part of the organization's IT functions. On average, the proportions of different IS/IT functions outsourced was 49.1% of systems development, 39.4% of telecommunication/networking, 27.4% of user support, 21.4% of operation, 18.2% of project management, and 3.2% of IS/IT planning. Hierarchically structured organizations outsourced significantly less (at the 5% level) of their IT operations (12.7% vs 57.5%), project management (11.6% vs 43.3%) and systems development (45.5% vs 76.7%) than flat organizations, indicating that flatter organizations have less need to directly control a great deal of their IS/IT activity. All outsourced activities showed a negative correlation between the percentage of outsourcing and organizational size (in revenue and number of employees), perhaps indicating that larger organizations already obtain substantial economies of scale (and

so cost savings) because of their size and so feel less pressure to outsource (although it could be argued that outsourcing itself makes an organization smaller, at least in number of employees!).

The CIOs were asked to indicate perceptions of the role of IS/IT applications in the organization. 82.1% disagreed with the statement that IS/IT provided only a support role which was not critical to everyday operations. Almost all respondents (a) indicated that IS/IT provided key operational processes which were essential to everyday operations (98.4%), (b) agreed that IS/IT was of strategic importance to the organization (88.9%), and (c) agreed that IS/IT is used to develop processes which may become important in the future (86.4%). Interestingly, those who did not perceive IS/IT to be of strategic importance had a much higher proportion of outsourcing (62% vs 26%). Overall, however, the respondents saw IS/IT applications as having key operational, strategic, and high potential (future) roles and that the role of IS/IT was more than just as a support mechanism.

IS/IT Investment Evaluation Issues

Cost and budgets, Y2K, and staff retention and training were ranked as the three most serious issues currently concerning the IS/IT managers. Overall, costs and budgets was mentioned most frequently and seen as a very important issue, reflecting the continued drive for value for money from IS/IT. Against this continued pressure to reduce IS/IT costs, perhaps it is time to address seriously the benefits side of the value for money equation. Ward et al. (1996) also found costs and budgets as one of the top three issues concerning UK managers. On the other hand, Y2K was ranked as the single most important issue in the great majority of cases, indicating a panic rush to fix the bug by many organizations before the year 2000. However, despite the focus of this survey, “IT benefits and value” ranked much lower (equal 7th), as was

also found in an earlier Australian survey where CEOs placed much more emphasis on evaluating IT investments than CIOs (Pervan, 1998).

The CIOs were asked to provide their views of what benefits senior managers perceived to be provided by IS/IT. The most frequently cited benefits were competitive advantage, process efficiency and satisfying information needs. Cost savings was perceived to be a further major benefit, with improved systems applications, productivity and business needs, also ranking highly. These results are largely consistent with findings from Ward et al. (1996) which have listed cost savings, improved management information, and process efficiency as some of their major current perceived IS/IT benefits.

Cost reduction is usually seen as the most popular reason for justifying IT (Hinton and Kaye, 1996). It was also seen as the most important driver in this study, followed by competitive advantage. Process efficiency and improved service quality were also seen as the major drivers. This is largely consistent with the findings by Ward et al. (1996) which has also listed improved process efficiency as being the major current benefits as well as the major drivers for IS/IT investments.

Cost savings was agreed as the most important benefit to consider when planning IS/IT projects by the respondents. Service quality, and revenue and margin were also important benefits to consider. Competitive advantage and process efficiency were seen by the respondents to be the further benefits to consider before planning IS/IT projects. This indicates that the organizations were still under a lot of pressure to reduce IS/IT costs while attempting to address the problems of benefits realization.

Most respondents showed a high level of confidence that IS/IT was actually delivering these benefits to their organizations, with 23.9% indicating a very high level of confidence while no

respondent indicated no confidence at all. The average confidence level was 3.9 (on a five-point scale ranging from “not at all” to “very”). Some of the most quoted reasons for this high level of confidence were feedback from users and reviews within the organization, as well as through some sort of measured results. Further analysis revealed a significant negative correlation between confidence level and organizational size, perhaps suggesting the difficulties that larger organizations face in deriving these benefits (leading to less confidence by the CIO in their delivery). Further questioning revealed a number of issues that might undermine confidence. These included the selection of wrong projects, lack of formal approaches, and inability to achieve the intended cost savings. In many cases the success criteria of project delivery was determined through reviews, meetings or user feedback. In other cases project delivery “on time, working, to budget” was quoted, rather than measured benefits as a result of changes within the business. This is consistent with the findings from Ward et al. (1996).

Respondents were asked about adoption, usage and success with formal methodologies or processes for various IS/IT activities and revealed a reasonably high adoption of methodologies for systems development (49.3%), project management (43.3%), and IS/IT investment appraisal (65.7%), but less for IS/IT benefits management (32.8%). In addition, 17.4% of the respondents indicated that they did not have methodologies for any of these activities, while 15.9% had formal methodologies for all four activities. So, 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.

An examination of those organizations that did use a formal IS/IT investment appraisal process revealed a quite significant level of usage, averaging 3.73 (on a scale from 1 “not at all” to 5 “extensively”). Level of usage was significantly correlated with organizational size

(in terms of net revenue), perhaps indicating larger organizations (with more IS/IT investment) found a greater incentive to use formal IS/IT investment appraisal processes than smaller organizations. Further, most of these organizations considered their use of these processes successful, averaging 3.42 (on the same 1-5 scale) and 86% rating the success 3 or higher. Level of usage and success were very significantly correlated (0.824), indicating greater success seems to come with greater usage of these processes.

Much of the literature suggests that most organizations use traditional financially-oriented evaluation techniques although these techniques are not always an appropriate way to evaluate IS/IT projects (Irani et al., 1997; Willcocks and Lester, 1993). Likewise, the traditional financially-oriented evaluation techniques such as net present value (NPV) and cost/benefit analysis (CBA) were still the most commonly mentioned appraisal techniques by the respondents of this survey for deciding upon IS/IT investments¹. Return on investment (ROI) was another popular technique. Many responding organizations employed more than one technique or method (58%) and just over half of the respondents (54%) mentioned formally recognized techniques such as payback, internal rate of return (IRR), CBA, ROI, NPV, or discounted cash flow. These results are generally consistent with findings by Ballantine and Stray (1998) and Ward et al. (1996). Ballantine and Stray (1998) have indicated in their UK study that the most popular project appraisal techniques employed by their survey organizations are CBA (72%), payback (60%), ROI (43%), IRR (24%), and NPV (24%). Moreover, Ward et al. (1996) have listed ROI and CBA as the most commonly mentioned appraisal techniques. However, less than 50% of their survey respondents mentioned any of the recognized techniques. Finally, in their survey of CIMA members,

¹ Survey respondents did not distinguish between general methods such as cost-benefit analysis (CBA) and specific techniques used within them such as NPV, ROI, IRR, etc. and the results are presented in the terms provided by the respondents.

Hinton and Kaye (1996) found that 60% of decision-makers employ more than one technique to evaluate their IS/IT investments. The CIOs in this survey seem to be consistent with these other reports.

In terms of appropriateness, the majority of the respondents (76.6%) rated their methods and techniques for deciding upon IS/IT investments as less than “very appropriate”. This finding is consistent with the finding from Ward et al. (1996) in which their survey indicates 82% of the respondents rated their methods and techniques as less than very appropriate. This is not really surprising as problems with these traditional financially oriented evaluation methods are that they largely exclude the significant problem of risk as well as costs and benefits that may be difficult to quantify (Brown, 1994; Willcocks, 1989). According to Serafeimidis and Smithson (1994), there is simply no widely accepted methodology that is relevant in all cases. There is also evidence that, whether traditional financially oriented evaluation methods are widespread or not, the results are often ignored (McGolpin, 1991 in Whiting et al., 1996). However, the average rating of appropriateness was 3.81 on a 1-5 scale, indicating reasonable satisfaction with these techniques despite their limitations.

Of those respondents who felt that the methods and techniques used by their organizations as less than very appropriate, many problems were put forward. Common problems with the methods and techniques were that the respondents: (1) were unable to select the right projects; (2) did not have formal approaches; and (3) could not achieve the intended cost savings. However, very few respondents pointed out the problems of identification and quantification of relevant benefits and costs, frequently mentioned in the literature (Ballantine et al., 1996; Malitoris, 1990). Some interesting comments mentioned by the respondents included that there were no problems at all. Several respondents felt that incorrect decisions were made as the results of these problems. Other consequences of these problems mentioned by other

respondents were that wrong projects were often selected and goals were consistently not achieved.

Issues of Identifying and Structuring Benefits

Intangible benefits are often critical to an organization's operation and efficiency (Norris, 1996). However, they are usually omitted from many evaluation studies on the basis that they cannot be quantified in traditional financial evaluation techniques (Apostolopoulos and Pramataris, 1997). Many respondents of this survey (84.7%) indicated that they had included intangible benefits in their IS/IT project appraisal process. However, of those who did consider intangible benefits, only 32.1% "often or always" took steps to review these benefits at a later stage. Similarly, only 31.8% of the respondents often or always regarded intangible benefits as a major success criterion. These results on project appraisal techniques and their appropriateness confirm the findings of previous researchers in this area, including Ballantine et al. (1994), Farbey et al. (1992), and Willcocks and Lester (1991).

According to Mirani and Lederer (1993), alignment with stated organizational objectives has a key bearing on how investment is organized and conducted, and what priorities are assigned to different IS/IT investment proposals. In this survey, a great majority of the respondents (87.7%) had a process ensuring that IS/IT projects were linked to business objectives. Of those who had this process, committee processes, business planning processes or business alignment activities were most generally used by respondents to help ensure that IS/IT projects were linked to business objectives.

More than three-quarters of the respondents (79.7%) stated that IT management was "often or always" responsible for preparing and submitting the justification for approval. However, only half of the respondents (50%) believed that business management was "often or always"

responsible for preparing and submitting the justification for approval. This indicates that IT management, not business management, was usually responsible for preparing and submitting the justification for approval.

Half of the respondents (50%) believed that their current project justification process failed to identify all available benefits for a project. More than half of the respondents (67.2%) believed that their current process was able to adequately 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. This seemed to imply that while benefits claimed were likely to be quantified and realized in practice, the process itself placed more emphasis on getting project approval than on delivering any proposed benefits.

Of those respondents that felt benefits were overstated, 75% conducted post-implementation reviews, 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, 77.1% conducted post-implementation reviews, and 84.6% often or always targeted benefits delivery as part of the post-implementation reviews process. Those who did “overstate” were almost equally likely to conduct post-implementation reviews but a lot less likely to target benefits delivery as part of the of the post-implementation review process, perhaps to avoid embarrassment! Another possible explanation is that for many organizations the primary objective of a post-implementation review is not project improvement but to formally close out the IS/IT project (Kumar, 1990). According to Ward et al. (1996), 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.

Just over half of the respondents (51.5%) believed that, in general, the achievable benefits could often or always change during implementation so that new benefits were identified, while only 21.5% of the respondents believed that the achievable benefits could often or always change so that benefits claimed became unachievable.

A survey conducted by Sutherland (1994) showed that 62% of the CIOs use pilot studies to evaluate the benefits of an IS/IT investment. Some 86% of the organizations in a survey carried out by Willcocks and Lester (1993) also included pilot studies among their methods. In our Australian survey, 80.6% of the respondents conducted pilot studies when implementing IS/IT. Of these, 70.6% stated that one of the objectives of these studies was often or always the evaluation of technology. Having an objective of understanding the benefits available was less popular (53%), as was demonstrating how benefits might be realized (52%). Although many respondents saw evaluating technology as one of the objectives of their pilot studies, an overall implication was that the purpose in carrying out pilot studies when implementing IS/IT was not always clear, and in the majority of cases the primary purpose did not appear to be to obtain a better understanding of potential benefits or how to realize them. The results are consistent with findings from Ward et al. (1996) who claim a better understanding of potential benefits and realization of benefits is often not the primary purpose of a pilot study.

CONCLUSIONS

The limitations of this Australian survey include (a) a fairly low response rate of 13.8%, (b) a focus on large organizations which may differ in their IT needs and behaviours from small and medium-sized enterprises (SMEs), and (c) a focus on the views of the CIOs only (which may differ from CEO and other business managers in the organizations). In our defence it may be argued that the response rate may still be considered reasonable from the CIOs of the largest organizations in the country, though the focus on CIOs of large organizations is an issue which must be addressed in future research. Another limitation of this paper is its emphasis on the IS/IT investment appraisal process and the identification and measurement of tangible and intangible benefits, without examining the process of managing these benefits. As indicated earlier, the latter has been studied and has not been reported here because of space limitations but will be reported elsewhere.

In summary, a variety of formal IS/IT investment evaluation processes and techniques are used, costs and budgets are of great concern, though evaluation itself was not among the very top issues. There is a strong emphasis on cost reduction and other benefits, and a reasonable level of confidence in the delivery of these benefits. Most organizations used a formal methodology or process for IS/IT investment evaluation. Many respondents considered their formal financially-based evaluation techniques (such as NPV and ROI) were not perfect, though they did try to incorporate intangible benefits into the process (often without reviewing them in post-implementation, unfortunately). The majority of respondents made use of pilot studies as part of their investment appraisal process.

Despite large investments in IS/IT over many years, it has been difficult for organizations to determine where IS/IT benefits have actually occurred, if indeed there have been any. IS/IT

investment evaluation practice remains as one of the most controversial and debated topics in the IS literature to date. However, as mentioned earlier, most of the studies that have been done to date in this area have been carried out in the UK or the USA. Very little published work has been conducted in Australia. There is still a lot to be learned in the area of the processes and practices of IS/IT investment evaluation and benefits management in Australian organizations. This study has attempted to address these issues and is part of a wider program of research which includes further surveys on this and related issues, and on key case studies of 'best practice' of these processes.

Further work is planned and in progress on this topic and the authors welcome all comments, questions, ideas and expressions of interest from practitioners. If you would like to be involved in any aspect of our research program in IS/IT Investment Evaluation and Benefits Management, please contact Professor Graham Pervan.

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