

A Study of Planning and Implementation Stages in Electronic Commerce Adoption and Evaluation: The Case of Australian SMEs

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ABSTRACT

This research examines and explores the electronic commerce adoption and evaluation issues and practices of Australian SMEs during the planning and implementation stages. The results indicated that most SMEs failed to link their objectives for e-commerce adoption with their organizational goals as well as to involve users during the planning stage. In addition, pre-project justification process and change management were often not properly carried out. Although it was found that almost all senior executives and managers were committed to the IT investments in e-commerce during the implementation stage, most of these organizations did not manage user resistance effectively. Moreover, it was also disappointing to see that most SMEs failed to conduct IT investment evaluation processes during the implementation stage. Finally, no formal IT benefits realization methodology was carried out in any of the SMEs interviewed.

Key Words: Benefits Realization, IT Adoption, IT Evaluation, Planning Stages, SMEs

INTRODUCTION

The adoption of electronic commerce (e-commerce) offers a significant opportunity for organizations to access potential global customers and suppliers via the Internet. It is driving current online growth from an estimated 4% of total world economy in 2003 to an anticipated 30% by 2010 (Timmers, 1999). Some of the major benefits of e-commerce are: expanded marketplaces, potential cost reductions, productivity improvements, customization of products and services, 24 hour trading and information exchange and management (du Plessis and Boon, 2004; McIvor and Humphreys, 2004). This expansion of e-commerce has led to growing research into the impact of new IT investments (Raisinghani et al., 2005).

SMEs account for over 95% of organizations and 60-70% of employment and generate a large share of new jobs in OECD economies (OECD, 2000). In Australia, SMEs make up 96% of the private non-agricultural sector (AUSE.NET, 2000) and as such their successful involvement within the information economy is seen as being vital to business survival in Australia (Martin and Matlay, 2001).

However, it still seems that many SMEs are failing to achieve the levels of e-commerce abilities required to benefit from IT investments in e-commerce (Chau, 2004). This is often due to difficulties in adoption and evaluation of IT investments in e-commerce. In particular, the problems and difficulties in measuring benefits and costs are often the main reason for uncertainty about the expected benefits of IS/IT investments and hence are the major constraints to IT investments in e-commerce (Love et al., 2005). Most of the studies on IT investment evaluation and benefits realization that have been done to-date have been carried out in large organizations (e.g. Lin et al., 2005a; Ward et al., 1996). Very little research has been published relation to SMEs in Australia. Therefore, this paper describes research findings from a study conducted to examine and explore the e-commerce adoption and evaluation experiences of Australian SMEs during the planning and implementation stages.

LITERATURE REVIEW

IT Investment Evaluation and Benefits Realization

The evaluation of IT investments is a complex tangle of financial, organizational, social, procedural and technical threads, many of which are currently either avoided or dealt with ineffectively (Willcocks and Lester, 1997). Often IT projects fail to deliver

what is expected of them because most organizations focus on implementing the technology without the adoption of the tools necessary to help to track and measure the IT projects (Hilam and Edwards, 2001).

The pay-offs from implementing IT are often uncontrollable (Dempsey et al., 1999). For example, a survey by PriceWaterhouseCoopers (2003) found that organizations achieved expected pay-offs only 25-75% of the time. In addition, the major benefits organizations can gain from e-commerce investments are inherently qualitative (i.e. customer satisfaction and systems efficiency) and cannot be easily assessed beforehand and calculated in monetary terms (Giaglis et al., 1999). The problem becomes more evident as IT is used to link the supply chain or to change the structure of industries, and costs and benefits have to be tracked across functional and organizational boundaries (Marshall and McKay, 2002). This is because the less precisely bounded environment of e-commerce technology adds more complexity to the IT measurement problem as this type of investment is physically distributed between suppliers and customers (Straub et al., 2002).

Recent research on IT investments in e-commerce initiatives by Australian organizations by Marshall and McKay (2002) indicate that nearly half of the respondents had no measures of success and most did not carry out post-implementation reviews for their investments. Some of the major problems associated with IT investment evaluation include the failure by most organizations to measure their IT investments, the neglect by organizations to devote appropriate evaluation time and effort to IT investments; the use of inappropriate traditionally financially oriented evaluation methods (e.g. NPV) by many organizations to measure their IT investments, the difficulty in measuring e-commerce technology, and the difficulty in evaluating intangibles (Lin and Pervan, 2003; Lin et al., 2005b; Straub et al., 2002).

To-date the research has delivered contradictory findings on the effect of the e-commerce expenditures on organizational productivity (Thatcher and Pingry, 2004). Therefore, it is not difficult to see that the measurement of the business value of IT investment in e-commerce has been the subject of considerable debate by many academics and practitioners (Sugumaran and Arogyaswamy, 2004). Although some IT productivity studies have produced inconclusive and negative results, or the interpretation of results may depend on many factors (e.g. mismeasurement of outputs and inputs, the difficulty of establishing the overall value of IS/IT, the choice of inappropriate methods of evaluation, and lags in learning and adjustments) (e.g. Stratopoulos and Dehning,

2000), a number of researchers have indicated that IT spending in e-commerce is directly related to organizational performance (e.g. Brynjolfsson and Hitt, 2003) with effective leverage and evaluation of IT investments in e-commerce resulting in improved organizational performance (Melville et al., 2004).

Evaluation of E-Commerce Investment in SMEs

Despite the competitive advantages offered by e-commerce, SMEs are reluctant to adopt e-commerce which may be partly due to difficulties in identifying and measuring costs, benefits and risks associated with their IT adoption and investments (Marshall and McKay, 2002). There is also some evidence that the adoption of e-commerce by SMEs has directly or indirectly motivated further IT investments such as Internet and e-commerce initiatives (Marshall and McKay, 2002). According to Lee and Runge (2001), SMEs that evaluate their IT adoption and investments are better able to exploit the Internet's potential for their organization, and thus create short-term competitive advantages.

Considering its importance very few recent studies of IT evaluation by SMEs have been published. Most of the studies indicate that a lack of strategy for evaluation as well as limited access to capital resources as the two inhibitors for SMEs to undertake IT investment evaluation (e.g. Hiram Edwards, 2001 (in UK); Hudson et al., 2001 (in UK); Love et al., 2005 (in Australia)). Research conducted by Latinen (2002) in Finland argues that employee motivation, customer satisfaction and organizational financial position should be considered in the evaluation processes for SMEs. However, some research indicates that most SMEs rely on ad hoc evaluation approach (eg. Simple ROI, gut feeling) and hence, not surprisingly, most SMEs were not satisfied with their evaluation practices (Jensen, 2003 (in Australia); Marshall and McKay, 2002 (in Australia)). According to Marshall and McKay (2002), there was virtually no proactive management of IT benefits realization by SMEs. With such a diversity of views suggested by the research further research needs to be undertaken into the evaluation practices of e-commerce adoption for SMEs (Daniel and Wilson, 2002).

SMEs are still lagging behind larger organizations in the adoption and evaluation of e-commerce despite the benefits it offers. SMEs experience a number of difficulties in their adoption and evaluation of e-commerce as a result of their limited financial, technical and managerial resources. Considering the complexity of the decisions and the large expenditure required for SMEs to engage in e-commerce projects a better

understanding of the adoption and evaluation practices of IT investment in e-commerce in Australian SMEs will assist them in their involvement in e-commerce.

Adoption of IT Investments in E-Commerce

Previous research has focused on a wide range of aspects specific to SMEs and their adoption of e-commerce (Korchak and Rodman, 2001). For example, several studies had been conducted to examine the determinants and inhibitors for IT adoption in SMEs in several countries (eg. Enterprise Ireland (2004) in Ireland, Buhalis and Deimezi (2003) in Greece, Levy and Powell (2003) in UK, and Locke and Cave (2002) in New Zealand).

The many levels of e-commerce adoption have been examined and strategies for increasing adoption developed (Levy and Powell, 2003). In order to minimize the problems in adopting e-commerce, a number of adoption issues in SMEs have been identified which include a lack of organizational goals, technical expertise and experience, user involvement, top management commitment or awareness of e-commerce opportunities, telecommunications infrastructure, customer demand for online services, e-commerce usage and evaluation practices (Daniel et al. 2002; Korchak and Rodman, 2001; Lawson et al., 2003).

The literature review suggests that there are three distinct stages in the adoption of e-commerce: planning, implementation and post implementation reviews (e.g. Dailey, 1998; Tarafdar and Roy, 2003). This study looks at two of these stages – the planning and implementation stages. Figure 1 shows a framework for examining the e-commerce adoption and evaluation experiences of Australian SMEs during the planning and implementation stages. Both stages consist of key issues and practices that are related to the organizational adoption and evaluation processes. The key issues for the organizational adoption practices include e-commerce adoption objectives and user involvements for the planning stage, and top management commitment and user resistance management for the implementation stage. On the other hand, organizational evaluation involves pre-project justification and change management in the planning stage, and the use of investment evaluation and benefits realization methodologies in the implementation stage.

	Planning Stage	Implementation Stage
Adoption	Adoption Objectives User Involvements	Top Management Commitment User Resistance Management
Evaluation	Pre-project Justification Change Management	Investment Evaluation Benefits Realization

Figure 1 Stage Framework for exploring e-commerce adoption and evaluation processes (adapted from Dailey (1998) and Tarafdar and Roy (2003))

RESEARCH OBJECTIVES AND METHODOLOGIES

This paper presents the preliminary findings of a study conducted with the main purpose of addressing the following two research objectives:

1. to identify the key issues faced by Australian SMEs in their adoption of IT investments in e-commerce during the planning and implementation stages; and
2. to determine the current evaluation practices by Australian SMEs adopting IT investments in e-commerce during the planning and implementation stages.

Case studies utilizing semi-structured interviews, observation, and document review were employed for this research. Multiple sources of data were used to address the ethical need to increase the reliability and validity of the research processes (Yin, 1994). According to Remenyi and Williams (1996), case study is one of the most frequently used research methods in information systems research. For this paper, the authors have used the Australian definition of SMEs as employing less than 200 people (ABS, 2003).

After having reviewed the literature on IT adoption and evaluation in SMEs, a series of exploratory semi-structured interviews were conducted in Australia with senior managers and key personnel from several organizations to gain an overview of their IT adoption issues and the evaluation practices of their IT and e-commerce investments.

Twenty interviews were carried out within 10 organizations in Australia that were involved in IT investments in e-commerce. Two interviews per organization, with at least one general manager/CEO and one IT manager or IT specialist from each organization. The industries represented in the following cases: travel (3 SMEs), hotel (2 SMEs), service industry (3 SMEs), and housing industry (2 SMEs). The organizations interviewed were deliberately chosen in order to focus efforts on theoretically useful cases (following the theoretical, non-random sampling strategy by Eisenhardt (1989)). This was done to examine different levels of evaluation practices by these chosen organizations.

In addition to the use of semi-structured interviews and observation data collection techniques, the researcher examined relevant documents (e.g. annual reports, project reports) that were collected from the participating organizations. These documents provided some useful means of corroborating data from the other sources (e.g. observation and interview data) and expanded on details in order to eliminate or minimize the weakness of human memory when dealing with history. Furthermore, qualitative content analysis by Miles and Huberman (1994) was used to analyze the data from the case studies. 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 by minimizing some of the case study's main weaknesses mentioned above (e.g. human subjectivity and inexperienced researcher).

RESEARCH FINDINGS AND DISCUSSIONS

A number of key issues and results emerged from the analysis of the text data which are presented below in some detail. Some of the results listed below were consistent with the findings in the literature while others were not. The results were presented from the perspectives of adoption and evaluation processes in relation to the planning and implementation stages.

E-Commerce Adoption Process – Planning Stage

Objectives of e-commerce adoption

There appeared to be a lack of obvious linkage between the expected outcomes of the e-commerce projects adoption and organizational goals. According to Mirani and

Lederer (1993), alignment with stated organizational goals has a key bearing on how investment is organized and conducted, and the priorities that are assigned to different IT investment proposals. Objectives for adopting the e-commerce systems by organizations varied greatly. The objectives mentioned by most organizations were basically those benefits that were expected to be delivered by the e-commerce systems. They were all related to the improved custom services, cost savings and time savings. As previously suggested by studies conducted in other countries (e.g. Enterprise Ireland, 2004 in Ireland; Levy et al., 2001 in UK; Locke and Cave, 2002 in New Zealand), many SMEs simply failed to establish a linkage between the reasons for adopting an e-commerce system and their organizational goals. These systems were often installed without linking the benefits to their organizational goals. For example, the owner of a service chain said: "The system is not a critical part of our business and it is just an add-on sort of thing to our business. It works sometimes and it does not work some other times. We can still function as it is without the system if it is down. It is just more inconvenience. That's all."

User involvements

The relevant literature has stressed that there is a direct relationship between users involvement and system success (Lin and Shao, 2000). However, the adoption and use of the e-commerce systems by the Australian SMEs interviewed were generally forced upon the employees by the senior management. Many stakeholders and users within the organizations interviewed said they were not extensively consulted beforehand and were not involved in the designing and adoption of these systems. For example, when asked about her involvement of the eCRM project, one account manager said: "*I am really not involved in the initial adoption of the system.....I am not very knowledgeable about the system. The best person to speak to is probably our sales manager.....our IT person is responsible for implementing the system. I am responsible for maintaining the system as an account manager.*" It is surprising that the account manager was responsible for maintaining the system but was not involved in the adoption and implementation of the project. Those organizations which kept the users and customers in the dark would tend to have low usage for their systems. Furthermore, many benefits expected from the adoption of these systems were mainly tailored for the customers and the senior managers.

E-Commerce Adoption Process – Implementation Stage

Top management commitment

Obtaining top management commitment throughout the implementation stage was found to be critical to the success of the IT investments in e-commerce (Power, 2004). Most organizations interviewed indicated that their senior executives had provided sufficient management leadership as well as obtained necessary organizational commitment towards the implementation of IT investments in e-commerce. Most senior executives were very enthusiastic about their IT investments in e-commerce during the implementation stage. For example, one senior manager from the service industry said: “We have invested a lot of money in the e-commerce systems and I think these systems will allow us to gain some competitive advantage and increase our revenue.....”

User resistance management

It appeared that most organizations’ top management was not aware that there was some dissatisfaction and resistance among their employees or users regarding the implementation of some of their IT investments in e-commerce. No obvious user resistance management plan was put in place by most organizations interviewed. Therefore, it was not surprising that to find that employees’ reaction about adopting these systems was not taken into account by these organizations. For example, one supervisor of a hotel said: “But I have to say that I still prefer the old system. I am accustomed to the old system.” However, when asked about whether there was resistance about using the system the senior executive of the hotel said: “Yes, I think the system is very successful and all staff are happy with the system.” Although most senior managers knew good user resistance management was a critical part of successful adoption of any IT investments in e-commerce, it appeared that there was significant resistance by users during the implementation of these systems. Very few organizations had taken steps to alleviate user resistance during the implementation stage by, for example, involving users in the planning stage, as mentioned by Lin and Shao (2000). Many users and even customers complained about not being consulted and informed about the IT investments in e-commerce adoption and implementation.

E-commerce Evaluation Process – Planning Stage

Pre-project justification

Many organizations interviewed did not carry out pre-project justification processes.

Only half of the organizations interviewed had some sort of justification process. Those which did carry out had very basic form of justification processes such as assessment of the vendor's demo or simple cost/benefit analysis. The most mentioned reasons given by these organizations were they just relied on their intuition and gut feeling, the adoption of similar IT investments in e-commerce by their competitors or because they trusted the vendors. When asked about their pre-project justification processes, one project manager from the service industry said: *"One of the reasons is that this is the company we trust."* It was not surprising that the project was stopped pending further evaluation and investigation, halfway through the implementation stage because it was not carried out well in the planning stage. This is consistent with research findings where the difficulties and uncertainties associated with IT investment evaluation forced senior executives to rely on gut feeling or intuition when making IT investment decisions (Bardhan et al., 2004). According to Bardhan et al. (2004) and Serafeimidis and Smithson (2003), intuition or gut feeling does not provide a systematic evaluation and justification for IT investments.

Change management

According to Chan and Swatman (2003), the most crucial part in the change management process involves the diffusion and acceptance of the system, and this decides whether the initiatives are successful. However, according to the interview data, very few organizations had taken steps to manage the changes. Many employees and users complained about not being consulted and informed about the e-commerce implementation and they were unhappy about being forced to adopt the new e-commerce system. When asked about the consultation given about the new IT investments in e-commerce, one coordinator of customer services from the service industry commented: "I think from what we have seen there is a lot of information required to input into the system to make it work. I cannot see how staff are going to see it as a positive.....At the moment it sounds just so easy.....You don't know how much time it is taking you and how mandatory fields you actually have to complete to make it successful." Moreover, they hoped that senior management would spend more time getting user requirements and making smoother the required cultural changes, instead of telling them that they just had to get used to the new e-commerce systems. Those organizations which had more successful implementation of IT investments in e-commerce were those ones which had managed the changes better. For example, one organization interviewed had successfully

implemented its e-commerce system by informing users about the forthcoming changes and by involving users early in the process.

E-commerce Evaluation Process – Implementation Stage

IT investment evaluation process

Evaluation for any electronic commerce initiatives is difficult and requires much more rigorous evaluation process (Straub et al., 2002). However, only 3 out of 10 organizations interviewed had carried out some sort of evaluation processes (ie. KPI analysis, qualitative analysis). The other organizations were simply relied on their senior management's impressions or gut feeling/intuition. When asked about the evaluation process, one senior manager from the travel industry admitted that there was no formal evaluation process and said: "I guess the system has been tried and proven over and over again for a long period of time..... The accounting department is actively monitoring the whole situation to see if the system is working ok, I meant, in terms of number of sales." Most organizations indicated that either they did not have the capability and resources to do so or they did not know they had no evaluation process. While almost all of the senior managers interviewed thought it would be worthwhile to do it, most of them simply did not do it or relied on their intuition. In addition, many interviewees simply said they did not know who was responsible for evaluation or said it was others who should be doing it.

IT benefits realization process

All participants readily admitted that there was no formal benefits realization methodology or process within their organizations which is consistent with previous Australian SMEs research (Jensen 2003; Mashall and McKay, 2002). Those who indicated some process existed were actually referring to the informal evaluation mechanisms such as KPIs. No formal IT benefits realization methodology such as the Cranfield Process Model of Benefit Management (Ward et al., 1996), technique, or process was mentioned or specified by any of the participants or in any available documents. Overall, the result is consistent with other research whereby IT benefits realization process was not adopted by most organizations (eg. Lin and Pervan, 2003; Ward et al., 1996; Willcocks and Lester, 1997). The fact that no organizations had a benefits management methodology or process is not really surprising as much attention is paid to ways of justifying investments, with little effort being extended to ensuring that the benefits expected are realized (Ward et al., 1996).

CONCLUSIONS, IMPLICATIONS AND LIMITATIONS

This research has been conducted to investigate the issues and practices surrounding the adoption and evaluation of IT investments in e-commerce by Australian SMEs (Figure 1). The results showed that most SMEs failed to link their objectives for e-commerce adoption with their organizational goals and to involve users during the planning stage. Additionally, pre-project justification process and change management were often not carried out by these SMEs to assess the needs and feasibility of these IT investments in e-commerce. During the implementation stage, it was found that almost all senior executives were supportive and committed to the IT investments in e-commerce. However, it was interesting to see that it appeared that most senior executives of the Australian SMEs interviewed were not aware that there was a need to manage user resistance as there was significant dissatisfaction and resistance among their employees or users regarding the adoption of these e-commerce investments. It was interesting to see that employee's reactions about implementing the system was not taken into account by senior executives in these organizations.

Moreover, it was disappointing to see that less than one-third of the organizations interviewed had carried out some sort of evaluation processes during the implementation stage. No formal IT benefits realization methodology, technique, or process was mentioned or specified by any of the interview participants or in any contract documents. The results here are really a cause for concern as successful e-commerce projects require that organizations allocate sufficient organizational resources for improving business processes, continuously evaluating e-commerce initiatives, and ensuring that expected benefits are delivered. Despite the fact that most senior executives were committed to the adoption of their IT investments in e-commerce, the other key issues or practices had been neglected by Australian SMEs.

Furthermore, the justification, change management, evaluation, benefits realization processes were not properly conducted as well. According to Ward et al. (1996), the evaluation and benefits realization mechanisms can expedite the organizational learning process and help make e-commerce work to the benefits of all customers, suppliers and the organizations themselves, whether viewed from a narrow buyer/seller perspective or a broader supply chain perspective. Therefore, SMEs should ensure that appropriate evaluation practices are put in place for their e-commerce projects. Finally, senior executives of the SMEs interviewed were too optimistic of the realization of IT benefits

in their organization. Instead, they should ensure full participation and consultation from other members of the organization during the IT investment evaluation and benefits realization processes. When an organization has problems assessing IT benefits because of a lack of expertise in evaluation then they should consider employing external consultancy support. It is also suggested that SMEs' senior executives should carefully assess their e-commerce adoption and evaluation tasks during the planning stage in order to minimize future problems.

The major limitation of the present study relates to the generalizability of the research findings. The study involved only ten SMEs in Australia and the results need to be read in this context. A further limitation is our reliance on the information provided by the key personnel in the interviewed organizations and the organizations' published documentation. This exploratory study confirms some of the recent findings and raises issues for the planning and implementation stages in the adoption and evaluation of IT investments in e-commerce. The lack of organizational resources and expertise available to SMEs due to their size seems to hamper each stage of the adoption and evaluation of e-commerce. Future research can be conducted to examine the key issues and practices for the post implementation review stage. Finally, survey can also be used to quantify this exploratory research.

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