

December 2005

Electronic Commerce Projects Adoption and Evaluation in Australian SMEs: Preliminary Findings

Shirley Bode
Edith Cowan University

Helen Cripps
Edith Cowan University

Chad Lin
Edith Cowan University

Follow this and additional works at: <http://aisel.aisnet.org/bled2005>

Recommended Citation

Bode, Shirley; Cripps, Helen; and Lin, Chad, "Electronic Commerce Projects Adoption and Evaluation in Australian SMEs: Preliminary Findings" (2005). *BLED 2005 Proceedings*. 22.
<http://aisel.aisnet.org/bled2005/22>

This material is brought to you by the BLED Proceedings at AIS Electronic Library (AISeL). It has been accepted for inclusion in BLED 2005 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

18th Bled eConference

eIntegration in Action

Bled, Slovenia, June 6 - 8, 2005

Electronic Commerce Projects Adoption and Evaluation in Australian SMEs: Preliminary Findings

Chad Lin, Helen Cripps, Shirley Bode

Edith Cowan University, Australia
elin123au@yahoo.com.au, h.cripps@ecu.edu.au, s.bode@ecu.edu.au

Abstract

IT investments in electronic commerce (e-commerce) are used by organizations, as part of their business strategies, to assist in the inter-organizational acquisition of goods into the value chain and to provide interfaces between customers, vendors, suppliers and sellers. Careful evaluation and adoption of e-commerce projects can assist SMEs in achieving their goals. The results of this research showed that most Australian SMEs interviewed appeared to fail in some ways to conduct a proper assessment of business needs before adopting IT investment in e-commerce. Less than one-third of the Australian SMEs interviewed had carried out some sort of evaluation processes. Most users within these SMEs were not involved in the initial phases of adopting and implementing e-commerce projects and the use of these systems was generally forced upon them by the senior management. Moreover, the e-commerce systems adopted by the Australian SMEs were not integrated well with other systems. Furthermore, there appeared to be a lack of obvious linkage between the expected outcomes of the e-commerce projects adoption and organizational goals.

1. Introduction

Electronic commerce (e-commerce) is becoming an imperative for organizations aiming at improving their competitiveness. E-commerce allows organizations to access potential customers and suppliers via the Internet. Some of the major benefits of e-commerce offers expanded marketplaces, potential cost reductions, productivity improvements, customization of products and services, 24 hour trading and information exchange and management (du Plessis & Boon, 2004; McIvor & Humphreys, 2004; Raisinghani et al, 2005). This expansion of e-commerce has led to growing research into the impact of new IT investments (Raisinghani et al., 2005).

Large organisations have tended to be at the forefront of the growth in e-commerce activities with Small to Median Enterprises (SMEs) lagging behind (OECD, 2001). 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 & Matlay, 2001).

The importance of e-commerce to SMEs is growing as globalization and rapid technological changes have brought new opportunities as well as risks, via e-commerce, to the business environment. "E-commerce has the capacity to transform not only internal practices but also the methods SMEs used to interact with their trading partners, associates, and customers" (Chau 2004, p50). According to Zhu et al. (2004), organization size is inversely proportional to the e-commerce value derived, thus suggesting that smaller organizations can benefit more from e-commerce than the larger organizations.

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 organisational resource, technical expertise and experience, management support or awareness of e-commerce opportunities, telecommunications infrastructure, customer demand for online services, e-commerce usage and concerns with the security of online transactions (Jopko et al., 2001; Lawson, et al., 2003). Despite these issues there are many drivers and benefits for SMEs in adoption of e-commerce and it has been shown that recognition and anticipation of achievable benefits motivates SMEs to adopt e-commerce (Chau, 2004; Jopko et al., 2001; OECD, 2001).

Previous research has focused on a wide range of aspects specific to SMEs and their adoption of e-commerce (Korchak & Rodman, 2001; Van Beveren & Thomson, 2002). 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 & Deimezi (2003) in Greece, Levy and Powell (2003) in UK, and Locke & Cave (2002) in New Zealand). Though strategies for increasing adoption levels have been examined (Levy & Powell, 2003) it still seems that many SMEs are failing to achieve the levels of e-commerce abilities required to benefit from e-commerce (Walker, et al., 2003; Chau, 2004). This is often due to difficulties in adoption and evaluation of electronic commerce projects. 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 IS/IT investments in e-commerce (Love et al., 2005). Most of the studies on IS/IT investment evaluation and benefits realization that have been done to-date have been carried out in large organizations (e.g. Lin and Pervan, 2003; Ward et al., 1996). Very little research has been published relation to SMEs in Australia.

2. IT Investment Evaluation and Benefits Realization

According to Mirtidis and Serafeimidis (1994), 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. 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 & Edwards, 2001).

The pay-offs from implementing IT are not controllable and invariably depend upon other business functions within the organization (Dempsey et al., 1999). The major benefits organizations can gain from e-commerce investments are inherently qualitative 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 (McKay & Marshall, 2004). 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 (Torkzadeh & Dhillon, 2002; Straub et al., 2002).

Doherty & King (2001) suggest that the recent IT project failure ranged from 30% to 70%. 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. Thus, failure to plan for and, derive the benefits from an IT investment can have detrimental consequences on organizational performance. Some of the major problems associated with IT investment evaluation are:

- Organizations often fail to measure their IT investments and identify relevant risks, costs, and benefits (Lin & Pervan, 2003; Love et al., 2005).
- Organizations often have neglected to devote appropriate evaluation time and effort to IT as well as to deal with the extended investment time frame. Organizations have failed to understand that IT investments require richer evaluation approaches than mono-dimensional cost-benefit analysis (Stamoulis et al., 2002).
- Traditional financially oriented evaluation methods (e.g. ROI, NPV) can be problematic in measuring IT investments and quantifying relevant benefits and costs (Sugumaran & Arogyaswamy, 2004).
- The nature of e-commerce technology makes it harder for organizations to allocate and assign costs and benefits to IT projects, further blurring the lines of capital investment and return from IT spending in the B2B channel (Subramani, 2004).
- It is very difficult to evaluate intangibles and make relationship between IT and profitability explicit (Straub et al., 2002).

To-date the research has delivered contradictory findings on the effect of the e-commerce expenditures on organizational productivity (Thatcher & 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 & 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. Stratopoulos & Dehning, 2000), a number of researchers have indicated that IT spending in e-commerce is directly related to organizational performance (e.g. Brynjolfsson & Hitt, 2003) with effective leverage and evaluation of IT investments in e-commerce resulting in improved organizational performance (Melville et al., 2004).

3. Evaluation of E-commerce Investment by SMEs

Despite the competitive advantages offered by e-commerce (Krauth, 1999), 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 & McKay, 2002). There is also some evidence that the IT adoption by SMEs has directly or indirectly motivated further IT investments such an Internet and e-commerce initiatives (Marshall & 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 (See Appendix 1). Most of the studies carried out 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. Ballantine et al., 1998 (in UK); 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. ROI, cost/benefits analysis, gut feeling) and hence, not surprisingly, most SMEs were not satisfied with their evaluation practices (Jensen, 2003 (in Australia); Marshall & McKay, 2002 (in Australia)). According to the research by Marshall & McKay (2002), there was virtually no proactive management of IT benefits realisation by SMEs. Finally, the differences between the evaluation practices of IT and other capital investments cannot be attributed to the size of the investment or company size (Ballantine & Stray, 1999 (in UK)). 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 & 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. The research below provides some preliminary findings on the adoption and evaluation of e-commerce by SMEs.

4. 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 projects in e-commerce; and
- (2) to determine the current evaluation practices by Australian SMEs adopting IT projects in e-commerce.

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 & 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 European Commission definition of SMEs as employing less than 250 people (EC, 2004).

After having reviewed the literature on IT adoption and evaluation in SMEs, a series of exploratory semi-structured interviews were conducted in Western 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. Sixteen interviews were carried out within 8 organizations in WA that were involved in IT and e-commerce projects. The industries represented in the following cases: travel (3 SMEs), hotel (1 SME), service industry (2 SMEs), and housing industry (2 SMEs).

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.

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).

5. Research Findings

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.

5.1 Key Issues in IT and E-Commerce Adoption

All of the organizations interviewed had Internet access and agreed that the further adoption of IT will be an important factor for the future success of the organization. The participating organizations indicated that they had used email to communicate with their customers and suppliers and to increase internal efficiencies. All but one of the organizations interviewed had a website. However, half of these organizations failed to utilize their websites to conduct business effectively with their customers and suppliers. Many organizations indicated that they had insufficient technical and financial resources to implement and maintain the sort of websites that they required to effectively conduct their business online which is consistent with previous findings (Buhalis & Deimezi, 2003). Most users were not satisfied with the e-commerce projects that had been adopted by their organizations.

Adoption of e-Commerce by SMEs

All but two of the organizations interviewed had attempted to improve their ability to conduct their business online. Several of them had invested in e-commerce applications such as business-to-business (B2B) e-commerce systems, electronic customer relationship management (eCRM) applications and electronic accounting and payment systems.

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. Very seldom the benefits for the users were considered thoroughly. For example, although usability of the system was mentioned by almost all of the organizations interviewed as one of the most important factors considered before implementing an e-commerce application, they were often considered from the perspective of the top management, not the employees.

Furthermore, very few organizations had planned to have their e-commerce systems integrated with other systems in the short term. This was surprising given that e-commerce system integration enhances the benefits of the system (Daniel, 2003) while the lack of integration is one of the most cited cause for e-commerce project failure (Ward, 2001). Most organizations interviewed either had decided not to integrate their e-commerce system with other functions at all or had financial and technical difficulties in doing so. Proper integration of e-commerce systems and other functions of organizations clearly required a lot of managerial, financial, and technical resources as well as organizational capabilities. This is consistent with the finding by Steinmueller (2002) in which most organizations did not seem to be moving towards higher levels of integration in the short term and integration occurred in a piece-meal and incremental fashion. The strategies employed were mainly towards getting tangible short-term benefits (Steinmueller, 2002).

Objectives of Implementing e-Commerce Projects

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 & 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.”*

Change Management

Part of the IT investment process involves adoption of new solutions, which requires organizational change. Change management is the process of reducing resistance to change and increasing support/commitment for it and must be linked with payoff metrics such as increased user satisfaction, decreased adoption and implementation time and cost. People affected by an assessment of IT value are apprehensive if their productivity is the

subject of measurement. Timely and accurate communication strategy can lower the resistance from those who can make a difference in the success of an investment. (Kohli & Sherer, 2002). In addition, it is clear that complementary organizational resources such as change initiatives interact with IT in the process of value generation (Melville et al., 2004). Therefore, effective change management is extremely important because the cost of not realizing stakeholder expectation is quite considerable and benefits created by IT investment is linked to changes (Melville et al., 2004; Subramani, 2004).

However, according to the interview data, it appeared that most organizations' top management was not aware that there was some dissatisfaction among their employees or users regarding the adoption and implementation of some of their e-commerce projects. It was a bit surprising that to find that employees reaction about adopting these systems was not taken into account by most organizations. 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 change management was a critical part of successful adoption of any IT project, it appeared that there were some resistance by users during the adoption and implementation of these systems. Very few organizations had taken steps to manage the change and involve users in the designing and adoption phases, as mentioned by Lin and Shao (2000). Many employees and users complained about not being consulted and informed about the e-commerce projects adoption and implementation as well as about not being involved in the early selection of these systems. They were unhappy about being forced to use the system.

5.2 Evaluation Process for the Adoption of E-commerce

Evaluation happens in many ways (eg formally or informally), uses diverse criteria (eg. financial, technical, and social), follows rigorous methodologies or "gut" feelings, often becomes a political instrument that influences the balance of organizational power and stimulates organizational changes (Serafeimidis & Smithson, 2003). As mentioned earlier, evaluation for any e-commerce initiatives (eg eCRM) is difficult and requires much more rigorous evaluation process (Straub et al., 2002; Torkzadeh & Dhillon, 2002).

Pre-Project Justification Processes

Most 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 systems by their competitors or because they trusted the vendors.

When asked about their pre-project justification process, one project manager 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 adoption process. 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 & Smithson (2003), intuition or gut feeling does not provide a systematic evaluation.

IT Investment Evaluation Processes

Less than one-third of the organizations interviewed had evaluation process after the pre-project justification process. Only 2 out of 8 organizations interviewed had carried out some sort of evaluation processes (ie. KPI analysis, qualitative and quantitative analysis). The rest were simply relied on their senior management's impressions or gut feeling/intuition. When asked about the evaluation process, one senior manager 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 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 Processes

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 & 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 & Pervan, 2003; Love et al., 2005; 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 & Griffiths 1996).

6. Discussion and Conclusions

This research has been conducted as an exploratory case study. The objectives of the research were to investigate the issues surrounding the adoption of e-commerce by Australian SMEs as well as the evaluation practices of IT investments in e-commerce by these organizations. The results showed that most organizations appeared to fail in some ways to conduct a proper assessment of business needs before the adoption of IT investment in e-commerce. Pre-project planning and justification processes were not properly carried out to assess the needs and feasibility of these projects. Most users were not involved in the initial phases of adopting and implementing e-commerce projects and the use of these systems was generally forced upon them by senior management.

According to Chan and Swatman (2003), the most crucial part in the change process involves the diffusion and acceptance of the system, and this decides whether the initiatives are successful. However, it was interesting to see that it appeared that most senior executives of the Australian SMEs interviewed were not aware that there was some dissatisfaction among their employees or users regarding the adoption of e-commerce projects. It was a bit surprising to find that employees reactions about implementing the system was not taken into account by most organizations.

The e-commerce systems adopted by the Australian SMEs interviewed were not integrated well with other systems within the organizations. Although all organizations interviewed agreed that integration would be good for their organizations, all organizations interviewed either had decided not to integrate their e-commerce system with other functions because of the complexities and costs or had technical and organizational difficulties in doing so. Proper integration of e-commerce systems and other functions of organizations clearly required a lot of managerial, financial, and technical resources as well as organizational capabilities. Most organizations interviewed indicated that they did not have the technical and evaluation skills and financial resources to properly integrate their e-commerce systems with other systems within their organizations. In addition, there appeared to be a lack of obvious linkage between the expected outcomes of the e-commerce projects adoption and organizational goals.

Furthermore, it was disappointing to see that less than one-third of the organizations interviewed had carried out some sort of evaluation processes (ie. Scorecard, KPI analysis, qualitative and quantitative analysis). 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 resources for improving business processes, continuously evaluating e-commerce initiatives, and ensuring that expected benefits are delivered. 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 (McGaughey, 2002). Therefore, SMEs should ensure that appropriate evaluation practices are put in place for their e-commerce projects.

The major limitation of the present study relates to the generalizability of the research findings. The study involved only eight 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 surrounding employee involvement in the adoption of IT and e-commerce systems. The lack of resources and expertise available to SMEs due to their size seems to hamper each stage of the adoption, implementation and evaluation of e-commerce. It will also be interesting to examine the determinants and inhibitors for the lack of evaluation practices for SMEs.

References

- Australian Electronic Business Network Ltd (AUSe.NET) (1998): Taking the Plunge: Small Business Attitudes to Electronic Commerce, Department of Communications, Technology and the Arts, Canberra, p33.
- Ballantine, J., Levy, M., and Powell, P.(1998): Evaluating Information Systems in Small and Medium-sized Enterprises: Issues and Evidence, *European Journal of Information Systems*, Vol. 7, No. 4, pp. 241-252.
- Ballantine, J. A. and Stray, S. (1999): Information Systems and Other Capital Investments: Evaluation Practices Compared, *Logistics Information Management*, Vol. 12, No. 1/2, pp. 78-93.

- Bardhan, I., Bagchi, S., and Sougstad, R. (2004): Prioritizing a Portfolio of Information Technology Investment Projects, *Journal of Management Information Systems*, Vol. 21, No. 2, pp. 33-60.
- Brynjolfsson, E. and Hitt, L. M. (2003): Computing Productivity: Firm-Level Evidence, *The Review of Economics and Statistics*, Vol. 85, No. 4, pp. 793-808.
- Buhalis, D. and Deimezi, O. (2003): Information Technology Penetration and E-Commerce Developments in Greece, With a Focus on Small to Medium-sized Enterprises, *Electronic Markets*, Vol. 13, No. 4, pp. 309-324.
- Chan, C. and Swatman, P. M. C. (2003): International Examples of Large-Scale Systems – Theory and Practice IV: B2B E-Commerce Implementation in the Australian Context, *Communications of the Association for Information Systems*, Vol. 11, pp. 394-412.
- Chau, S. (2004): The use of e-commerce amongst 34 Australian SMEs: an experiment or a strategic business tool, *Journal of Systems and Information Technology*, Vol. 7, No. 1, pp. 49-66.
- Daniel, E. and Wilson, H. (2002): Adoption intentions and benefits realised: a study of e-commerce in UK SMEs, *Journal of Small Business and Enterprise Development*, Vol. 9, No. 4, pp. 331-348.
- Daniel, E. (2003): An exploration of the inside-out model: e-commerce integration in UK SMEs”, *Journal of Small Business and Enterprise Development*, Vol. 10, No. 3, pp. 233-249.
- Dans, E. (2001): IT Investment in Small and Medium Enterprises: Paradoxically Productive?, *The Electronic Journal of Information Systems Evaluation*, Vol. 4, No. 1.
- Dempsey, J., Dvorak, R.E., Holen, E., Mark, D., and Meehan, W.F. (1999): A hard and soft look at IT investments. *McKinsey Quarterly*, Vol. 1, pp.127-137.
- Doherty, N. F. and King, M. (2001): An Investigation of the Factors Affecting the Successful Treatment of Organizational Issues in Systems Development Projects, *European Journal of Information Systems*, Vol. 10, pp. 147-160.
- du Plessis, M. and Boon, J. A. (2004): Knowledge Management in eBusiness and Customer Relationship Management: South African Case Study Findings, *International Journal of Information Management*, Vol. 24, pp.73-86.
- Enterprise Ireland (2004): IT/eBusiness Status and Issues of Small and Medium Sized Irish SMEs, BSM Ltd Report, available on-line at: <http://www.enterpriseireland.com/ebusiness/eBIT ICTissues.htm>.
- European Commission (EC) (2004): SME Definition, European Commission, http://europa.eu.int/comm/enterprise/enterprise_policy/sme_definition/index_en.htm.
- Giaglis, G. M., Paul, R. J. and Doukidis, G. I. (1999): Dynamic Modelling to Assess the Business Value of Electronic Commerce, *International Journal of Electronic Commerce*, Vol. 3, No. 3.
- Hillam, C. E. and Edwards, H.M. (2001): A Case Study Approach to Evaluation of Information Technology/Information Systems (IT/IS) Investment Evaluation Processes within SMEs, *The Electronic Journal of Information Systems Evaluation*, Vol. 4, No. 2.

- Hudson, M., Smart, A., and Bourne, M. (2001): Theory and Practice in SME Performance Measurement Systems, *International Journal of Operations and Production Management*, Vol. 21, No. 8, pp. 1096-1115.
- Jensen, J. (2003): Issues Facing SMEs in Their Adoption of Electronic Commerce, 2003 Communication Research Forum, 1-2 October, Old Parliament House, Canberra, Australia.
- Jopko, A.; Morgan, D. and Archer, N. (2001): An evaluation of e-commerce support for SMEs in Canada, Working papers, McMaster University, Canada.
- Klein, H. K. and Myers, M. D. (1999): A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems, *MIS Quarterly*, Vol. 23, No. 1, pp. 67-94.
- Kohli, R. and Sherer, S. A. (2002): Measuring Payoff of Information Technology Investments: Research Issues and Guidelines, *Communications of the Association for Information Systems*, Vol. 9, pp. 241-268.
- Korchak, R. and Rodman, R. (2001): eBusiness adoption among U.S. small manufacturers and the role of manufacturing Extension, *Economic Development Review*, Winter, Vol. 17, No. 3, pp. 20-25.
- Krauth, J. (1999): Introducing Information Technology in Small and Medium Sized Enterprises, *Studies in Informatics and Control*, Vol. 8, No. 1.
- Laitinen, E.M. (2002): A Dynamic Performance System: Evidence from Small Finnish Technology Companies, *Scandinavian Journal of Management*, Vol. 18, pp. 65-99.
- Lawson, R., Alcock, C., Cooper, J., and Burgess, L. (2003): Factors affecting adoption of electronic technologies by SMEs: an Australian study, *Journal of Small Business and Enterprise Development*, Vol. 10, No. 3, pp. 265-276.
- Lee, J. and Runge, J. (2001): Adoption of Information Technology in Small Business: Testing Drivers of Adoption for Entrepreneurs, *The Journal of Computer Information Systems*, Vol. 42, No. 1, pp. 44-57.
- Levy, M. and Powell, P. (2003): Exploring SME Internet Adoption: Towards a Contingent Model, *Electronic Markets*, Vol. 13, No. 2, pp. 173-181.
- Levy, M., Powell, P., and Yetton, P. (2001): SMEs: Aligning IS and the Strategic Context, *Journal of Information Technology*, Vol. 16, pp. 133-144.
- Lin, C. and Pervan, G. (2003): The Practice of IT Benefits Management in Large Australian Organizations, *Information and Management*, Vol. 41, No. 1, pp. 13-24.
- Lin, W.T., and Shao, B.B.M. (2000): The Relationship Between User Participation and System Success: A Simultaneous Contingency Approach, *Information and Management*, Vol. 37, pp. 283-295.
- Locke, S., Cave, J. (2002): Information Communication Technology in New Zealand SMEs, *Journal of American Academy of Business*, Vol. 2, No. 1, pp. 235-240.
- Love, P.E.D., Irani, Z., Standing, C., Lin, C. and Burn, J. (2005): The Enigma of Evaluation: Benefits, Costs and Risks of IT in Small-Medium Sized Enterprises, *Information and Management*. (In Press)
- Marshall, P. and McKay, J. (2002): Evaluating the Benefits of Electronic Commerce in Small and Medium Enterprises, *The Australian Journal of Information Systems*, Vol. 9, No. 2.

- Martin, L. M. and Matlay, H. (2001): Blanket approaches to promoting ICT in small firms: some lessons from the DTI ladder adoption model in the UK. *Internet Research: Electronic Networking Applications and Policy*, Vol. 11, No. 5, pp.399-410.
- McGaughey, R. E. (2002): Benchmarking Business-to-business Electronic Commerce, *Benchmarking: An International Journal*, Vol. 9, No. 5, pp. 471-484.
- McIvor, R. and Humphreys, P. (2004): The Implications of Electronic B2B Intermediaries for the Buyer-Supplier Interface, *International Journal of Operations & Production Management*, Vol. 24, No. 3, pp. 241-269.
- McKay, J. and Marshall, P. (2004): "Strategic Management of eBusiness", John Wiley & Sons Australia, Ltd, Queensland.
- Melville, N., Kraemer, K. and Gurbaxani, V. (2004): Review: Information Technology and Organizational Performance: An integrative Model of IT Business Value, *MIS Quarterly*, Vol. 28, No. 2, pp. 283-322.
- Miles, M.B. and Huberman, A.M. (1994): "Qualitative Data Analysis: An Expanded Sourcebook", Sage Publications, California.
- Mirani, R. and Lederer, A.L. (1993): Making Promises: The Key Benefits of Proposed IS Systems, *Journal of Systems Management*, Vol. 44, No. 10.
- Mirtidis, D., and Serafeimidis, V. (1994): Evaluating Information Technology Investments In Greece, *Proceedings of the 1st European Conference on IT Investment Evaluation*, Henley, September, pp. 167-177.
- OECD (2000): "Small and Medium-sized Enterprises: Local Strength, Global Reach", *OECD Policy Brief*, June, pp.1-9.
- OECD (2001): "The internet and business performance, Business and Industry Policy Forum Series", *Reports and Proceedings*.
- Raisinghani, M. S., Melemez, T., Zhou, L., Paslowski, C., Kikvidze, I., Taha, S., and Simons, K. (2005): E-Business Models in B2B: Process Based Categorization and Analysis of B2B Models, *International Journal of E-Business Research*, Vol. 1, No. 1, pp. 16-36.
- Remenyi, D. and Williams, B. (1996): The Nature of Research: Qualitative or Quantitative, Narrative or Paradigmatic?, *Information Systems Journal*, Vol. 6, pp. 131-146.
- Serafeimidis, V., Smithson, S. (2003): Information Systems Evaluation as an Organisational Institution – Experience from a Case Study, *Information Systems Journal*, Vol. 13, No. 2, pp. 251-274.
- Stamoulis, D., Kanellis, P., and Martakos, D. (2002): An Approach and Model for Assessing the Business Value of e-Banking Distribution Channels: Evaluation as Communication, *International Journal of Information Management*, Vol. 22, pp. 247-261.
- Stratopoulos, T. and Dehning, B. (2000): Does Successful Investment in Information Technology Solve the Productivity Paradox?, *Information and Management*, Vol. 38, pp. 103-117.
- Straub, D. W., Hoffman, D. L., Weber, B. W., and Steinfield, C. (2002): Measuring e-Commerce in Net-Enabled Organizations: An Introduction to the Special Issue, *Information Systems Research*, Vol. 13, No. 2, pp. 115-124.

- Steinmueller, W. E. (2002): "Settling the e-CRM Frontier: The Experience of Innovating European Firms, Socio-Economic Trends Assessment for the Digital Revolution (STAR)", Issue Report No. 23, September.
- Subramani, M. (2004): How Do Suppliers Benefit From Information Technology Use in Supply Chain Relationships, *MIS Quarterly*, Vol. 28, No. 1, pp. 45-73.
- Sugumaran, V. and Arogyaswamy, B. (2004): Measuring IT Performance: "Contingency" Variables and Value Modes, *The Journal of Computer Information Systems*, Vol. 44, No. 2, pp. 79-86.
- Thatcher, M. D., and Pingry, D. E. (2004): Understanding the Business Value of Information Technology Investments: Theoretical Evidence from Alternative Market and Cost Structure, *Journal of Management Information Systems*, Vol. 21, No. 2, pp. 61-85.
- Torkzadeh, G. and Dhillon, G. (2002): Measuring Factors that Influence the Success of Internet Commerce, *Information Systems Research*, Vol. 13, No. 2, pp. 187-204.
- Van Beveren, J. and Thomson, H. (2002): The use of electronic commerce by SMEs in Victoria, Australia, *Journal of Small Business Management*, Vol. 40, No. 3, pp. 250-253.
- Walker, E. A., Bode, S., Burn, J. M., & Webster, B. J. (2003): Small business and the use of technology: why the low uptake?, Paper presented at the Small Enterprise Association of Australia & New Zealand Conference, Ballarat, 29-30th September.
- Ward, H. (2001): CRM Initiatives Fail Due to Lack of Integration, *ComputerWeekly.com*, Source: [On-Line]
<http://www.computerweekly.com/Article106986.htm>.
- 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 IT Benefits: An Empirical Study of Current Practice, *European Journal of Information Systems*, Vol. 4, pp. 214-225.
- Willcocks, L. and Lester, S. (1997): Assessing IT Productivity: Any Way Out of the Labyrinth?, In Willcocks, L., Feeny, D.F. & Islei, G. (Eds.), "Managing IT as a Strategic Resource", Chapter 4, The McGraw-Hill Company, London, pp. 64-93.
- Yin R.K. (1994): "Case Study Research: Design and Methods", *Applied Social Research Methods Series*, Sage, USA.
- Zhu, K., Kraemer, K. L., Xu, S., and Dedrick, J. (2004): Information Technology Payoff in E-Business Environments: An International Perspective on Value Creation of E-Business in the Financial Services Industry, *Journal of Management Information Systems*, Vol. 21, No. 1, pp. 17-54.

Appendix 1: IT Evaluation in SMEs

Articles	Key findings
Ballantine et al. (1998) (UK)	<p>Factors for evaluation practices:</p> <ul style="list-style-type: none"> ○ A lack of business & IT strategy ○ Limited access to capital resources ○ An emphasis on automating (improving efficiency) ○ The influence of major customers ○ Limited information skills
Dan (2001) (Spain)	<ul style="list-style-type: none"> ○ There is a positive relationship between IT investment and productivity ○ The output contribution of IT investment is significant and positive
Hillam & Edwards (2001) (UK)	<ul style="list-style-type: none"> ○ There is a strong linkage between the identified company strategy & the attitude of the company to IT investment & the type of investment undertaken ○ Company strategy typology will influence the type of IT implemented & the justification for this investment
Hudson et al. (2001) (UK)	<p>Barriers to evaluation process:</p> <ul style="list-style-type: none"> ○ The development process being too resources intensive & too strategic oriented
Latinen (2002) (Finland)	<p>Important measurement of performance:</p> <ul style="list-style-type: none"> ○ Employee motivation ○ Customer satisfaction ○ Product profitability ○ Company profitability ○ Liquidity ○ Capital structure
Marshall and McKay (2002) (Australia)	<ul style="list-style-type: none"> ○ Generally ad hoc approaches to evaluation of the proposed investments ○ Almost non-existent post-implementation reviews ○ few measures of success ○ Virtually no evidence of proactive management of the realisation of benefits of the investments
Jensen (2003) (Australia)	<ul style="list-style-type: none"> ○ SMEs did not consider the evaluation approach when adopting IT ○ They were prepared to bear the costs involved without any expectation of a particular return ○ Virtually no evaluation of potential benefits of the IT investments by SMEs
Enterprise Ireland (2004) (Ireland)	<ul style="list-style-type: none"> ○ Risk: 47% of SMEs had security issues ○ 38% had opportunities to get significant benefits with moderate to high IT investments ○ 55% had opportunities to get significant benefits with relatively little IT investment
Love et al. (2005) (Australia)	<ul style="list-style-type: none"> ○ IT investment levels among SMEs were not influenced by organizational size ○ organization in different industry sectors significantly differ in the amount of turnover they investment in IT ○ 'improved organizational and process flexibility' is the highest ranked strategic benefit for almost all industry sectors ○ 'hardware costs' is the highest ranked direct cost for almost all industry sectors ○ security is the number one risk factor associated with IT investments for Australian SMEs