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Ying-Chieh Liu

Yu-An Huang

Chad Lin

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EVALUATION ISSUES IN MANAGING AND REALIZING BENEFITS IN B2BEC/IT INVESTMENTS

Ying-Chieh Liu, Chaoyang University of Technology, Taiwan, allanliu@cyut.edu.tw
Yu-An Huang, National Chi Nan University, Taiwan, yahuang788@gmail.com
Chad Lin, Curtin University of Technology, Australia, elin123au@yahoo.com.au

ABSTRACT

Organizations have invested substantial amount of financial resources in information technology (IT) over the last few decades. However, there is still a lack of understanding of the impact of IT investment evaluation processes and practices in these organizations. This study extends the Limits-to-Value model to examine the relationship between the levels of IT maturity and the adoption of IT investment evaluation and benefits realization methodologies as well as their effects on B2BEC benefits. The study has found that IT maturity has a direct positive relationship with the adoption of these evaluation methodologies. A number of issues and problems have also emerged from the analysis of the data collected. These findings will assist organizations in making better evaluation of B2BEC/IT investment.

*Keywords***:** IT evaluation, IT investment, B2BEC, IT maturity, evaluation methodologies

INTRODUCTION

The extent of investment in information technology (IT) is one of the major factors determining the success or failure of organizations in implementing business-to-business electronic commerce (B2BEC) projects (Love et al, 2005). Yet, senior IT managers have found it increasingly difficult to justify rising IT expenditures and are often under immense pressure to find a way to measure the contribution of their organizations' IT investments in relation to the performance in B2BEC, as well as to find reliable ways to ensure that the business benefits from IT investments are actually realized (Bannister and Remenyi, 2000). There are many researchers who argue that such productivity gains and losses may be attributed to, among other things, the inappropriate use of IT evaluation methodologies (e.g., Tallon et al, 2000) and, moreover, it is unclear whether the ability to evaluate IT investments in B2BEC has something to do with the organizations' levels of IT maturity (Hackbarth and Kettinger, 2004). There are two types of methodologies that organizations need to undertake in order to ensure that IT investments in B2BEC are properly planned, evaluated, and monitored, and that expected benefits are eventually realized. An IT investment evaluation methodology (IEM) is concerned with making investment decisions about IT projects (Ballantine and Stray, 1999). In this domain the concern is about selecting the project or projects that at the outset seem to offer the greatest returns or benefits for the outlay. The other domain is an IT benefits realization methodology (BRM) and can be seen to extend investment evaluation further into the project life cycle by ensuring expected benefits are realized once a decision to invest has been taken (Changchit, 1998). This involves planning how and when benefits will be realized and deciding who will be responsible for achieving benefits as well as actually overseeing the realization of benefits (Ward and Daniel, 2006).

Given the above analysis, it can be concluded that, in general, organizations that employ BRMs would be likely to also employ IEMs but the converse would not necessarily be the case. Behind this assertion however, is a more fundamental observation concerned with the underlying 'IT maturity' of an organization in terms of its willingness and cultural capability to use formal or semi-formal processes explicitly as part of its decision-making. In other words, it will be asserted in this paper that organizations that are more mature in IT are more likely to display more willingness to use evaluation processes. Closely connected with this is this notion that it is possible to define and record an organization's IT maturity against some predefined benchmark or benchmarks and in so doing provide a basis for organizations to plan to towards greater IT maturity. IT maturity refers to an organization's capability to utilize its existing IT infrastructures to lever further business benefits (Galliers and Sutherland, 1991). Therefore, this paper sets out to examine the relationship between the levels of IT maturity and the use of IEMs and BRMs on business-to-business electronic commerce (B2BEC) benefits. This relationship is rarely researched before. This paper will explore this relationship in some depth by applying the Limits-to-Value Model proposed by Chircu and Kauffman (2000) and then validate the relationship by one survey and two case studies. In the next section, relevant literature regarding IT evaluation and IT maturity is briefly discussed. Following that, the research approach used is described. The main section of the paper then discusses the research findings. Research and managerial implications are also presented.

LITERATURE REVIEW

IT Investments Evaluation Methodologies (IEMs) and IT Benefits Realization Methodologies (BRMs)

As mentioned earlier, many IT managers still do not understand the importance of the IT investment evaluation and benefits realization methodologies (e.g. IEMs and BRMs) (Lin et al., 2005). For example, Sohal and Ng (1998) found that in large organizations the potential of IT has not been utilized to meet the competitive challenges due to inadequate evaluation of the IT investment projects. Moreover, they reported that 45% of the responding organizations do not evaluate whether IT systems are

still consistent with business objectives and 59% do not determine whether expected benefits are being achieved. Therefore, the inability of many organizations to measure and apply IT both, inter-and-intra organizationally is resulting in missed opportunities and a lack of business value on B2BEC (Lin and Huang, 2007). Fortunately, there are many methodologies that can help to evaluate IT investments in B2BEC and deliver expected B2BEC benefits. Renkema and Berghout (1997) have found that there are more than 65 currently available IEMs and several BRMs. IEM is about selecting, evaluating and monitoring the project or projects that at the outset seem to offer the greatest returns or benefits for the outlay whereas BRM involves planning how and when benefits will be delivered and deciding who will be responsible for achieving benefits as well as actually overseeing the results. According to the literature, organizations that make extensive and effective use of IEMs or BRMs had higher perceived IT benefits (Melville et al., 2004). For example, according to Tallon et al. (2000), as IT is used for more strategic purposes, the use of IEMs provides a means for organizations to undergo routine, recurring and systemic evaluation of their IT investments in B2BEC. In addition, the effective use of BRMs helps organizations to gain higher B2BEC benefits by having a constant focus on the expected benefits and by making sure that the project remains aligned with business goals as well as to make strategic adjustments in resources in a changing environment (Ward and Daniel, 2006).

IT Maturity

Various stages of growth models have been presented by researchers to describe the evolution of organizational information systems (e.g. Nolan, 1979). Despite some criticism of these models, they provide an insightful organizing framework for thinking about IT change in organizations. The revised stages of growth model by Galliers and Sutherland (1991) is meant to overcome some of the limitations by introducing a means of bringing together a range of key elements associated with the operation and management of an organization. The revised model of Galliers and Sutherland (1991) can be represented as six stages, each with its particular set of conditions associated with the seven "S" elements. The seven elements are strategy, structure, systems, staff, style, skills, and superordinate goals. The six stages of the revised model are: ad hocracy, starting the foundations, centralized dictatorship, democratic dialectic and cooperation, entrepreneurial opportunity, and integrated harmonious relationships. The seven "S" elements provided a rich set of conditions upon which we could analyze an organization's maturity in terms of its IT infrastructure.

Limits-to-Value Model

The Limits-to-Value Model proposed by Chircu and Kauffman (2000) showed that possible IT investment constraints included valuation barriers (i.e. industry and organizational barriers) and conversion barriers (i.e. resource, knowledge, and usage barriers) to realize B2BEC benefits. Many of the components discussed in the model relate to the organization's ability to use IT effectively and this can potentially be one important constraint to IT investments (e.g. Chiru and Kauffman, 2000). Organizations need to overcome these constraints to obtain as much realized B2BEC value from IT investments as possible. In addition, organizations need to have sufficient IT infrastructures such as complementary assets to overcome these constraints to realize the benefits of IT investments. Organizations are often unsuccessful in obtaining full value from their IT investments because they fail to invest sufficient complementary assets (Teece, 1987). The complementary assets include new organizational processes, work routines, organizational knowledge, and responsibility structures. IT investment constraints appear when organizations fail to invest in the requisite complementary assets. This research focus on how the organizational valuation barrier and knowledge conversion barrier affect the realization of B2BEC benefits in IT investments. This model implies that organizations' levels of IT maturity determine the amount of their organizational valuation barrier that needs to be overcome before they can assess the potential B2BEC benefits. According to Galliers and Sutherland (1991), organizational IT maturity can be measured in terms of the seven elements (strategy, structure, systems, staff, style, skills, and superordinate goals). These seven elements represent the organization's degree of readiness to effectively utilize IT. Organizations which have higher levels of usage of IEMs and BRMs are likely to minimize the knowledge conversion barrier, retain the potential B2BEC benefits, and therefore, maximize the realized benefits. Therefore, we extend the argument that organizations investing in B2BEC/IT need to first increase their levels of IT maturity by overcoming their organizational valuation barrier and maximize their potential B2BEC benefits, and then implement IEMs and BRMs by minimizing knowledge conversion barrier.

RESEARCH APPROACH

This study adopts a pluralist research approach by using survey and case study methods. According to Mingers (2001), the results will be richer and more reliable if different research methods are combined together because they are likely to increase the reliability of the data and the process of gathering it. The survey was conducted as a means to obtain an overview of the current industry and government practices and norms in realizing IT benefits and evaluation. Case study 1 was then conducted and the interesting and important problems and issues (identified via survey) were investigated more closely in a large Australian organization. Case study 2 was conducted in another large Australian organization to further investigate these revised problems and issues (identified in case study 1).

Survey

The initial survey focused on Australia's largest organizations. A list of chief information officers (CIOs) of the largest 500 Australian organizations by gross revenue was prepared and used in this survey. The structure of the questionnaire addressed many aspects of IS/IT benefits management and included Likert scale, nominal scale and open-ended questions. It was derived from an existing study by Ward et al. (1996) and its validity and reliability derived from their acceptance in the literature. The aim of this survey was to investigate many aspects of IT investments evaluation and benefits realization processes and practices in large Australian organizations. Specifically, the survey sought to: (a) determine how B2BEC benefits from IT

investments in B2BEC are identified, evaluated 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 IT investments in B2BEC; and (c) determine how organizations in Australia attempt to deal with the IT investment barriers with their current evaluation and benefits realization processes and practices.

First Case Study: Semi-structured interviews, observation, and document review were used to gain a deeper understanding of issues surrounding the current practices and norms in managing B2BEC/IT benefits and investments evaluation in a large Australian organization. In total, ten interviews were conducted with seven senior executives from a large Australian organization ("Organization 1"), and three contract managers from the three major external outsourcing contractors. The questions asked during the interview were related to the Organization 1's three major outsourcing contracts, the contractual relationship between Organization 1 and the contractors, IT investment evaluation methodology deployed, benefits realization process used, and the management of the contract transition period.

Second Case Study: Semi-structured interviews, observation, and document review were also used in this second case study to gain a deeper understanding of issues and problems identified in the survey and the first case study and other general issues surrounding the current government practices and norms in managing B2BEC/IT benefits and investments evaluation. In total, ten interviews were conducted with five senior executives from another large Australian organization ("Organization 2"), and five contract coordinators and managers from its two major external outsourcing contractors. The questions asked during the interview were related to the formal benefits realization methodology used by the Organization 2, major outsourcing contracts, contractual relationship between the Organization 2 and the contractors, and IT investment evaluation methodology or technique deployed.

RESEARCH FINDINGS

This section reports on the findings of the survey and two case studies which reveal a number of aspects of these practices that confirm much of the (non-Australian) literature (Bannister and Remenyi, 2000; Kim and Umanath, 2005; Ward et al., 1996).

The Relationship between IT Maturity, IEMs and BRMs

Through analysis of the data collected via the survey and case study, we were able to conclude that those organizations which employed a BRM were more likely to: (a) use formal processes for their investment evaluation and benefit realization activities; (b) be more confident about what they did in their IT activities; (c) have better integration of their IT functions; and (d) manage their projects or contracts to achieve better results and with less problems and hence, at a higher level of IT maturity. Given the discussion previously about stages of growth and maturity, it seemed reasonable to conclude that organizations with high IT maturity would be more likely to be able to implement a benefit realization methodology while low IT maturity organizations would be less likely to. This was corroborated by the research data. The results showed that while most responding organizations had used some sort of IT investment evaluation methodology, only a relatively small percentage of organizations employed a benefits realization methodology. For example, in Organization 2 where a formal BRM had been employed, greater control over its outsourcing contracts and better IT integration within the organization was experienced than Organization 1 which had not use any BRM. Therefore, we concluded that an organization's IT maturity was highly likely to be positively associated with the usage of an IEM and/or a BRM. It was also concluded that organizations with higher IT maturity were more likely to adopt a formal BRM. However, such a simple dichotomy was felt to be insufficient to embrace the richness of detail that had been uncovered especially in the case studies and so a deeper analysis was performed by plotting the 7 "S"s in Galliers and Sutherland's model (1991) against the two case studies. Our results show that Organization 2 was at a higher IT maturity stage than Organization 1. The case study results indicated that both organizations failed to adopt a formal IEM (although an informal process was used) and also had problems in understanding what constituted an IT investment evaluation. However, since Organization 2 had adopted a formal BRM and it had fewer problems than Organization 1 which had not adopted such a methodology. All of Organization 1's seven elements were mostly at stage 4 whereas Organization 2's seven elements were mostly at stage 5. From the results above, we are able to conclude that organizations with higher levels of IT maturity possessed higher degree of readiness to address these seven elements and therefore, were more likely to be able to effectively eliminate or minimize the organizational valuation barrier arising out of IT investments in B2BEC.

Some IT Investment Evaluation Problems from the Survey and Case Study Results

These IT investment evaluation problems (e.g. focus on quantitative IT investment evaluation measures and conflicting motivations for outsourcing) were uncovered via the analysis of survey and case study results. These problems were mostly caused by the lack of attention to the IT investment evaluation. We have grouped these problems in accordance with: (1) the seven elements from the revised stages of growth model by Galliers and Sutherland (1991); and (2) the two major IT investment evaluation barriers identified by the Limits-to-Value Model (Chiru and Kauffman, 2000). Suggestions and recommendations for resolving these problems were also given below. In addition, attempts were also made to link the literature with what was actually happening in practice in real organizations (via survey and case studies).

Organizational valuation barrier

"System" problem: Lack of commitment by contractors.

Suggestions: In order to minimize the lack of commitment by contractors, genuine partnership and an open book relationship should be struck. It is critical to involve all stakeholders (including external contractors) throughout the whole evaluation process. A study by Lee and Kim (1999) indicates that partnership quality may serve as a key predictor of outsourcing success.

Partnership quality was found to be positively influenced by factors such as participation, communication, and information sharing, and negatively affected by age of relationship and mutual dependency (Lee and Kim, 1999). For example, the use of a formal BRM by Organization 2 allowed it to continuously monitor and improve its relationship with external contractors. On the other hand, Organization 1 did not adopt a BRM and was having problems with some of its external contractors.

"Superordinate goal" problem: Conflicting perceptions of the stakeholders.
Suggestions: Organizations have to make sure that they not only educate the stakeholders and users about the concepts of benefits realization but also other organizational goals and objectives such as motivations for outsourcing and criteria for determining success of the outsourcing contracts. There are potential disadvantages for not adopting a formal IEM and/or a BRM. These include outsourcing for the wrong reasons, losing control of the resource, losing staff who have been trained in the organization, and in particular, the risk that the outsourcing contractors may not be able to achieve the desired benefits or may fail in providing critical services. Organization 1 was a good example of not having a clear objective for outsourcing and, as a result, having conflicting motivations for outsourcing and criteria for determining success of the contracts.

Knowledge conversion barrier
"Strategy" problem: Lack of strategy for understanding of the IT investment evaluation and benefits realization practices and concepts by senior management.
Suggestions: All IT investments in B2BEC should be guided by a strategy for undertaking formal evaluation methodology (Tallon et al., 2000). Not only would formal IEM and BRM provide proper evaluation of investment risks and benefits but also enhance the understanding by the organizations of investment evaluation and its importance during the IT outsourcing and systems development processes. For example, even the Organization 2 with a formal BRM but without a formal IEM was unable resolve some problems and issues faced.

"Skill" problem: Lack of skills to adopt benefits realization processes.
Suggestions: Skills should be developed to adopt a formal BRM by the organizations involved in IT investments. Not only would this ensure the delivery of the proposed benefits but also enhance the organizations' understanding of benefits realization practices and its importance during the systems development processes (Ward and Daniel, 2006). More importantly, having the skills to adopt a benefits realization methodology is crucial in determining the success of an outsourcing contract because a BRM can constantly remind the organization of its goals and objectives. This can also encourage the organization to support and carry out the necessary changes within the organization. For example, one participant in Organization 2 said a formal BRM "clearly highlights to you what was proposed in the first place …… why the project was commenced……. I have found the main benefits in this methodology is that you continually go back and revisit the original business plan of what you have been telling people so in 2 years' time when you do deliver you keep promises, unlike politicians." On the other hand, the participants in Organization 1 did not know anything or care about the benefits realization process. They were generally less enthusiastic about the IT investments than the participants from Organization 2.

IMPLICATIONS AND CONCLUSION

One important theoretical contribution of the paper is the extension of Limits-to-Value model with organizational factors such as the levels of IT maturity, and the use of IEMs and BRMs. This enables organizations to examine their relationships in the context of benefits realization of IT investments in B2BEC. As can be seen from the model presented earlier, the paper argues that the failure in eliminating or minimizing IT investment constraints is likely to lead to unsuccessful realization of B2BEC benefits. In particular, the eliminating or minimizing of organizational valuation barrier and knowledge conversion barrier is the most important and yet often ignored issue. In order to obtain the required B2BEC benefits, organizations need to increase their levels of IT maturity, and usage of IEMs and BRMs. Otherwise, more IT investment constraints will arise. Therefore, this paper has stressed that organizational valuation and knowledge conversion barrier should be carefully evaluated before implementing a B2BEC/IT investment. Once it is decided to implement B2BEC/IT investment organizations should operate and execute it with caution with following our guidelines. In addition, organizations should fully assess the different sources of barriers when undertaking B2BEC/IT investments. The survey and case study results indicate that organizational valuation barrier and knowledge conversion barrier are the two most common types of IT investment constraints. Our findings also clearly demonstrate that lower levels of IT maturity are likely to result in higher levels of organizational valuation barrier whereas knowledge conversion barrier arises from a lack of skills and understanding in adopting IEMs and BRMs. Organizations should attempt to improve their levels of IT maturity in order to increase their ability to effectively eliminate or minimize the organizational valuation barrier arising out of investing in B2BEC/IT projects. Similarly, organizations should also put in place a strategy to increase the understanding of IEMs and BRMs processes throughout their organizations as well as to equip the necessary skills for IT managers to adopt IEMs and BRMs. Finally, organizations should try to getting rid of organizational valuation barrier first before eliminating knowledge conversion barrier during the course of maximizing their realized B2BEC benefits.

REFERENCES

Available upon request.