Risks and risk management in ERP Project - cases in SME Context

Mika Ojala
Tampere University of Technology, Institute of Industrial Management, P.O. Box 541, 33101 Tampere, Finland
mika.ojala@tut.fi

Inka Vilpola
Tampere University of Technology, Institute of Software Systems, P.O. Box 553, 33101 Tampere, Finland
inka.vilpola@tut.fi

Ilkka Kouri
Tampere University of Technology, Institute of Industrial Management, P.O. Box 541, 33101 Tampere, Finland
ilkka.kouri@tut.fi

Abstract

Enterprise resource planning (ERP) projects are considered to be expensive, time-consuming, difficult to manage and risky. This paper presents how companies should consider and manage the risks in their ERP project. The focus in a qualitative case study is on small and medium-sized enterprises (SMEs) and it illustrates how the risks in the case firms are identified, analyzed and managed.
Keywords: ERP project, risk management

1. Introduction

ERP systems have become everyday life also in small and medium sized enterprises. SMEs are willing to implement ERP systems to develop their operations in order to get benefits in business. In some cases the pressure towards ERP solutions comes from larger co-operating partners. ERP implementation is a complex project which includes many critical phases before it is successfully in use. Currently ERP projects, their failures and success factors, are mainly studied at larger companies. It is understandable, as in the past these companies were the ones that invested in large information systems. Currently, as SMEs' buy ERP systems, the special characteristics of these, has to be understood and proper risk management tools are needed to SME context.

It is a known fact among practitioners and researchers that many ERP projects are interpreted to be failures. IT investments, especially large as ERP systems, are difficult as the SMEs' do not have resources to involve in the projects. Many projects have faced the fact that at least some of the goals were not met. This stresses the importance of risk management concerning the ERP projects. In many cases it seems to be that even rather simple ERP risk management solution would have been helpful in order to avoid the most typical pitfalls in the project.

The main goal of the paper is to present a framework for risk management in ERP projects. This goal includes few sub-topics to be discussed. Firstly, the characteristics of SMEs' as ERP buyers and secondly, the actual risks found out in case companies. Information gathered in cases and based on the literature, have created the basis for the risk management framework presented in the paper.

2. Related theory

SME firms are in different position regarding ERP systems as they have limited resources to be able to tie into a significant IT project (Kettunen & Simons 2001). They for example, don't have possibilities to hire full time project manager to the job. On the other hand, they don't often have enough skills and knowledge of IT solutions and sourcing these. The requirements for the ERP are also differing compared to larger companies. Customer centric ERP implementation is reasoned and developed for SMEs by Vilpola & Kouri (2005) and Vilpola & Väänänen-Vainio-Mattila (2005).

There are several papers dealing this topical research area of risks in ERP project. Taylor (2005) studied 22 project managers from different vendor IT firms in Hong Kong and the point of view is, distinguishable from traditional ERP project risk papers, IT resource provider's perspective. Amoako-Gyampah (2004) presents the ERP implementation factors both managerial and end-user perspectives and states that managers have different perceptions than end-users. Huang et al (2004) present a framework for risk assessment in ERP project in a quantitative manner. Tatsiopoulos et al (2003) presented a paper, which stresses the strategic nature of the ERP implementation and especially the strategic issues in the early phase of the project and increasing the importance of operational issues in latter phases. Wright and Wright (2002) brought up the importance of risks in ERP implementation in a paper, which presents the risks of the project as did also Sumner (2000). Zafiropoulos et al. (2005) created an application for risk management in ERP project and Yang et al. (2006) applied the ideology of FMEA in risk management of ERP introduction.

3. Research method and case accomplishment

Study is done according to a case study methodology (Yin 1994). Study results are from three Finnish SMEs and the data is gathered during year 2005.

In the study the data is gathered in several ways and from several persons in the organizations. First phase in data gathering was done by interviewing different key persons in all departments of the firm. The primary aim of the first round interviews was to build up a view on case company's business processes and needs for the ERP system. Secondly, based on the first interviews some key persons were observed to get a clearer view of firm's physical, social and cultural context and risks in it. Thirdly, few key persons were interviewed specifically about the risks in ERP project.

After these preliminary phases it was created a risk list of three critical phases of the ERP project. The list was divided on the risk factors in ERP selection, implementation and maintenance & development. The risk lists were critically evaluated by the management team and risks were assessed according to probabilities and impacts of the risks. Last phase of the analysis was a workshop on ways of managing the greatest risks found out in the assessment phase.

Table 1. Research accomplishment in case firms, persons involved in the phases.

	FIRM A	FIRM B	FIRM C
First round interviews	12	8	15
Observations	6	5	8
Risk interviews	2	2	0*
Workshop – risk assessment	4	5	5
Workshop - ways of managing risks	5	5	5

**In this case the risk themes were discussed in first round interviews*

Risk assessment for the risk list was done from 1 to 5 for both probability and effect. 1 meant very small probability and effect. 5 meant high probability and catastrophic effect.

All three firms have in common a need to renew their information system in order to better accomplish their operations in the future. The need for new system has grown internally in the companies because of the problems at current system(s) and for example poor usability of systems and complex, evolutionary developed system structure.

Firm A is a manufacturer of a complex chemical product, which includes production phases from process production in early production phases to batch production in latter part of production. Firm has approximately 200 employees. Firms IT is rather complicated and evolved during time when new systems are integrated to existing systems. Firms' employees were committed and

performing well currently with existing systems supported by multiple individual assisting solutions done by MS Excel and paper notebooks.

Firm B is a project oriented company, which expertise is in specific industrial assembly operations. These projects are done mainly on customers' site when process equipment is built, re-built or fixed in factories. Customers are mainly process industry firms. Firm has approximately 70 employees. Firm B has an ERP system (or MRP) from the 1980s and it is not extensively in use to support the business. System is used mainly to support the financial management. Business is lead by general manager and project managers, and these have their own ways of doing business.

Firm C mainly earns its revenues in doing projects in planning and installing equipment to its customers' production facilities. In fact, in this case it was studied only one business unit of this company and even this business unit is separated to three sub-units. Businesses are different varying from contract manufacturing to selling knowledge and work of design engineers. Amount of employees in this business unit is approximately 200 employees. Wide variety of systems is used in the whole firm, but not effectively in use in this business unit.

4. Case study results

4.1. ERP Risks in case firms

The three case companies represent rather typical SMEs that are planning of making an ERP investment in the near future. Firms have rather limited resources to put into this project and do not have opportunities and understanding to research all ERP projects essential issues themselves. External experts are needed in order to support the firm capabilities to become more professional system buyers.

Information technology is one key area when companies are developing their business and they search possibilities for more efficient operations. ERP solutions often seem to promise a full scale service to answer all possible information needs in a company. The range of systems and their differences are difficult to understand even in larger companies which do have significant amount of knowledge and resources to develop and analyze the information needs and different solutions for those. The case in SMEs' is rather different. SMEs don't have large IT departments and vast amount of skilled personnel available for the ERP-project.

In two case companies the complexity of current information systems is a clear challenge. Today, one system is used for wages, one for maintenance, one for bookkeeping etc. Whole network of systems is complex and there are multiple links between different systems. Useful information is neither easily available nor automatically generated from the current systems.

It is evident that today also smaller companies are interested in the ERP solutions. Sourcing of these is still rather complex issue and involves multitude

of potential problems. One of the key challenges in the ERP-project is the need to assess critically the whole company's operations. The ERP project often means a change to many business processes and involves almost every employee. Firm's context e.g. people, processes and culture set some crucial limitations and evident potential problems which have to be taken into account in the project.

In the *selection phase* the amount of the strategic level risks is rather large. The basic questions have to be answered before going ahead. Why do we need new system? What do we want to get out of it? How these goals can be achieved in our company? There is no sense of starting an ERP project before these questions can be properly answered. The greatest risks in the selection phase were: buying a wrong kind of a system, choosing poor project manager or project team, having too little knowledge of making a proper contract, poor integration of new system to remaining systems and choosing too rigid system that will not adapt and fit to future business needs

In the selection phase surprisingly company representatives did not estimate information sharing and change management challenges or even lacking top management support to the greatest risks. One explanation for this might be that personnel were heavily involved into the research project and aware of the new ERP project. Also CEOs' were interviewed and they were personally involved to the project, as they have to be especially in SMEs.

The amount of risk factors was greatest in the *implementation phase*. Here the greatest risks were seen in change management and personnel adapting to new systems. Also typical project management issues like schedule, budget and functionality of project team and manager were seen as great risks. There was also concern of proper education and worries about projects effect on operational activities. On the other hand it was questioned how to find time and motivation to people to participate in education. Rather great risk was seen regarding the system supplier and its motivation and interest towards a SME buyer. One serious concern to management was also ability to get possible benefits out of the system and ensuring disciplined usage of new procedures. There was also seen a possibility that top management, after all, will not give needed time and resources to ERP project. This risk was estimated to be greater than in selection phase.

The last phase in successful ERP project is *maintenance and development* phase, where the actual benefits are realized. In risk assessment point of view these risks are more difficult to identify beforehand in the selection phase. In our cases the amount of these risks was rather small. The risks were linked to disciplined usage of new system and controlling of not to slip into old procedures. One group of concern were risks related to the supplier and system life-cycle. The risk of having a system or supplier that is not developing its activities during time, kept the SMEs management occupied. Also the system's flexibility to business changes was seen as a moderate risk.

4.2. ERP risk management framework

ERP risks are different depending on the phase of the ERP project. The most critical phase, as in every project, is the project initiation phase. What really is the goal of the project on strategic level and more operational level? It can be easily stated that if you don't know why you are buying a system, you do not have good possibilities to specify what kind of the system should be.

A traditional risk management process consists of risk identification, risk assessment, identification and implementation of risk management actions and monitoring and follow-up of risks.

There are several critical phases in the risk management process. Firstly, the risk identification is of course critical. All latter phases follow after this phase, although this identification can be carried on through the project i.e. risk factors can be added to risk list during the project. Another critical phase is risk assessment. In this phase the significance of the risk is set and greatest risks are taken more seriously.

Our suggestion is that already at the beginning the risks should be evaluated thinking of the whole ERP project. Identifying and assessing implementation and maintenance & development phase risks are essential when considering the system.

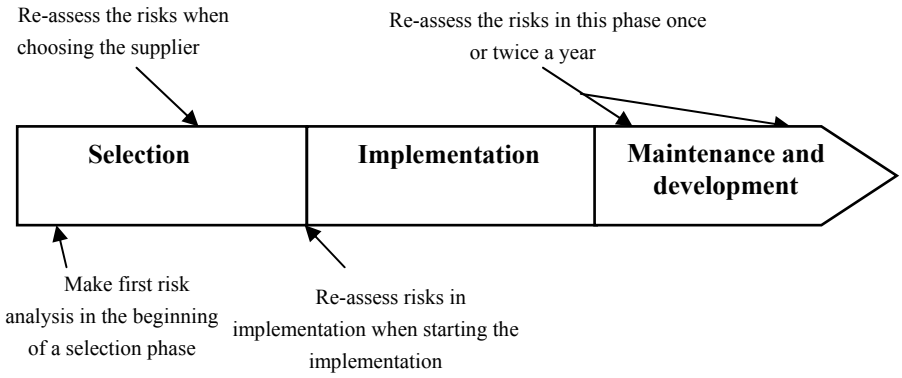

Figure 1. Risk assessment during the ERP project.

ERP risk management process should start already in the very early phase of the project even in the initiation phase. The general risk management starts from *identification of risks*. In case of ERP system project the project team should be capable of identifying all possible factors that can avoid a firm not to receive the ERP project goals. In the identification phase there is needed a broad view of the potential problems in the project, which means involvement from all possible persons / departments in the process. In next phase the *risks are assessed* and prioritized in order to find the most significant risk factors. After this, the actual

management of risks is done. Typical solutions for managing risks are avoiding risky actions, spreading, eliminating, transferring or reducing the risk. In many cases these mean actions that reduce the probability or the impact of a certain risk factor. Risks should be monitored, which means that risk management is a continuous process through the whole project.

5. Conclusion and discussion

Risk management should be an essential part of ERP projects as these projects evidently include many risks. Risks should be evaluated first time in the very beginning of the project and the risks should be identified and assessed already then considering the whole life-cycle of the system. Proper risk management is renewed in the critical phases during the project to be the most effective. Risk assessment and analysis are important, but true risk management is realized when the actions are made to prevent the risks.

Most of the ERP risks are originated already from the selection phase, so this phase is the most critical for project success. Mistakes made at this phase cannot easily be repaired later. In this phase most risks are in strategic level. Implementation risks are mainly concerns of change management within an implementing organization. In the maintenance and development phase there is mainly a question of controlling, developing and ensuring consistent use where benefits are realized of the system.

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