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# Selection of ERP Software in Finnish SMEs

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## Abstract

*ERP software investments have various tangible and intangible costs and benefits that have to be made explicit in the investment process. Also several kinds of risks are present and they, too, must be assessed. In this study we investigate the criteria that are emphasised when making decisions on acquiring ERP software packages by Finnish SMEs. Furthermore, we describe the initial findings about the client and vendor perspectives on the ERP-selection process. The scope of the study will be later extended by a survey on the selection and use of ERP software.*

## Keywords

Software selection, Software selection criteria, Small business

## INTRODUCTION

Companies expect to get several kinds of benefits from information system (IS) investments. However, there are also serious risks involved. Failed IS investments can even threaten the functioning and existence of the whole company. This is particularly true in the case of large, company-wide systems, such as ERP software. Investments in ERP software are long-term commitments that tend to be very expensive and cause a significant amount of organisational changes. Because of this there are considerable risks involved and the issue of ex-ante evaluation of ERP software investments becomes increasingly important.

In recent years ERP software vendors have increased their focus on small and medium sized enterprises (SMEs). Oracle small business suite (OSBS) and mySAP initiative by SAP are examples of this trend. Furthermore, there are a large number of international vendors who specialise in ERP software for SMEs together with a large number of domestic ERP vendors. There are a number of issues that have encouraged the interest of ERP vendors towards SMEs. These include the saturation of the market as most large enterprises have implemented ERP software, electronic commerce benefits from close integration between large and small enterprise systems (e.g. through supply chain integration or B-to-B e-Commerce systems), the high number of SMEs compared to the number of large enterprises, and the technological development together with the availability of relatively cheap hardware (Gable and Stewart 1999).

During the recent years a large number of papers addressing ERP issues have been published (for review see Esteves and Pastor, 2001), but as Stefanou (2001) argues there is limited amount of research concerning evaluation of ERP software. Sistach, Pastor and Fernandez (1999) in their article proposed a method covering the entire lifecycle of the ERP acquisition process in SMEs. A study by Brown *et al.* (2000) identified business and IT factors that influence ERP purchase decisions. Stefanou (2001) presented a framework for the ex-ante evaluation of ERP software. Bernroider and Koch (2000) studied the differences in the characteristics of the ERP software selection process between SMEs and large organisations.

In this study our aim is to explore the client and vendor perspectives of the ex-ante evaluation criteria and the evaluation process applied by Finnish SMEs acquiring ERP software packages. The present study is a pilot for a large survey into the Finnish SME sector.

In this paper we present the preliminary results on the evaluation criteria and process. First we discuss the evaluation of IT investments in general and then more specifically the ERP software evaluation and selection in SMEs. The empirical part of the study was carried out in two phases. In the first phase a set of initial evaluation criteria was constructed in cooperation with a Finnish ERP software vendor Solagem. The vendor was interviewed for the criteria that they believe customers use in deciding on ERP software investments. In the second phase two customer organisations, which had just acquired ERP software packages, were interviewed. During the interviews the criteria and the process used by these organisations in the ERP software investment evaluation were recorded. In addition the plausibility of the criteria constructed in the first phase was tested with the customer companies.

The study revealed that the client and vendor perspectives of the important criteria in the selection of the ERP software packages differed. In the framework of selection criteria, we ended up with the vendor including many strategic-level evaluation criteria like attaining competitive advantage or new customer groups. However, these criteria were not considered so important by the case companies, which emphasised the selection operational-level criteria such as cost savings and enhancements to day-to-day tasks.

This paper is organised as follows. In the next section we discuss the nature of IT investments and present a set of general criteria for evaluating IS project utility. In the section three we discuss the ERP software investments in SMEs. The research methodology is described in section four. In the section five two case studies about the decision criteria and process of ERP investments are presented and the vendor and client perspectives are compared in the following review. Finally, the conclusions are drawn in section six.

## **EVALUATING IT INVESTMENTS**

Companies are investing extensive amounts of money in IS (WITSA, 2000) and they expect several kinds of benefits from the investments: increased revenues, cost savings, better quality of internal functions within the company, better decision support and improvement in the competitive position of the company. It has been argued in several studies that the extensive use of information systems leads to increasing productivity, organisational efficiency, performance and success (Ives and Learmonth, 1984; Banker *et al.*, 1990; Clemons, 1991; Kivijärvi and Zmud, 1993; Kivijärvi and Saarinen, 1995).

Nevertheless, it is obvious information system investments can bring substantial benefits to companies, but on the other hand, there are also many risks involved, and the possible failures can cause serious problems. To ensure appropriate decisions the strategic effects of IS investments should be taken appropriately into account in the evaluation.

A feasible starting point for evaluating any investment is to consider the investment's revenues and risks (Markowitz, 1952). However, information system investments have special characteristics that make it complicated to evaluate their risks and especially their benefits. First, the benefits are intangible in nature (see for example Powell, 1992, Kivijärvi and Tuominen, 1999). In many cases monetary measures cannot be used, but subjective arguments have to be applied. Second, the benefits of IS investments are realised during a long period of time and this lag makes the short-term results appear poor (see for example Brynjolfsson, 1993). Thus, traditional investment evaluation techniques alone are not sufficient. Most of the traditional investment criteria imply that the initial investment, the incremental cash flows, cost of capital, and the economic time horizon of the investment alternatives are known. It is assumed that all the effects of the investment can be traced, measured, and transformed into monetary units. Intangible costs and revenues are considered to be zero and subjective criteria are ignored. Third, in IS investment, the benefits are seen differently by different interest groups (Farbey *et al.*, 1992). Fourth, these investments evolve over time and get entangled with each other (see e.g. Dos Santos,

1991). Fifth, IS investments are irreversible in nature (see Heikkilä, 1995). Moreover, the risks of IS investments are often exogenous and uncontrollable (Clemons *et al.*, 1995).

In this study we present a set of evaluation criteria for the evaluation of IS projects divided to four levels. The main criterion in the model is the utility of an information system project. Every investment in an organisation should contribute to the goals of that organisation. The success of an information system investment might be described as the extent to which the expected benefits have realised and whether the development process has proceeded according to the plans. The second level criteria in our model are return and risk. These criteria are widely accepted as a basis for evaluation of any portfolio of investment alternatives (Markowitz, 1952).

At the third level in our model we divide return to two sub-criteria: profitability and intangible benefits. By profitability we mean the benefits gained from the investment that can be measured in monetary terms. The intangible benefits criterion, on the other hand, includes the intangible benefits. The benefits gained from information system investments are often intangible and very difficult to express in monetary terms (Powell, 1992). Furthermore, we divided risk to systematic and unsystematic. Systematic risk stems from outside of the company and unsystematic from inside of the company (Shapiro, 1991).

At the fourth level of our model we divided intangible benefits such as improved customer service or improved information for decision making further to business impact, strategic value and use (Peffer and Saarinen, 1993). Nowadays, information system investments are often strategic in nature (Clemons, 1991), and in many cases they have a central role in streamlining companies' business functions. The successful use of the system has been addressed in many studies about user information satisfaction (Baroudi and Orlikowski, 1988). Moreover, we divided profitability further to revenues and costs.

	Criteria level			
	Main criterion	2. level criteria	3. level criteria	4. level criteria
<b>Criteria</b>	1. IS Project utility	2.1. Return	2.1.1. Profitability	2.1.1.1. Revenues
				2.1.1.2. Costs
			2.1.2. Intangible benefits	2.1.2.1. Business impact
				2.1.2.2. Strategic value
				2.1.2.3. Use
		2.2. Risks	2.2.1. Systematic	
			2.2.2. Unsystematic	
<b>Theoretical base</b>		Markowitz, 1952	Powell, 1992 Hochstrasser, 1990 Ward <i>et al.</i> , 1996 Shapiro, 1991	Baroudi and Orlikowski, 1988 Clemons, 1991 Peffer and Saarinen, 1993

Table 1: General criteria for evaluating IS project utility

## ERP INVESTMENTS IN SMEs

The growing ERP software adoption among large companies and the initiatives in electronic commerce and extended supply chains have brought to the small and medium sized enterprises the need to integrate their information systems. SMEs are often dependent on larger customers to whom they work as suppliers. When large customer decides to implement ERP software the suppliers have little choice but to follow.

Bernroeder and Koch (2000) studied the differences between SMEs and large organisations concerning ERP software requirements and selection process. In their study they discovered that smaller organisations use a more centralised form of decision making with fewer people

involved in the selection of the ERP software. They also discovered that in smaller organisations the decisions are based on less complex models and less expensive methods of information gathering. In addition they found out that the criteria for selection of particular ERP software showed different priorities for smaller and larger organisations. Costs and adaptability of the software were more important whereas increased organisational flexibility, extra-organisational ties with customers and suppliers, and internationality were less of an issue for smaller organisations compared to larger organisations.

Shang and Seddon (2000) constructed a framework for classifying different business benefits of ERP software. This framework divides benefits into five dimensions: Operational, Managerial, Strategic, IT infrastructure and Organisational. Stefanou (2001) on the other hand divides benefits into operational and strategic in the framework that he proposes for the ex-ante evaluation of ERP software. In the present study we divided the benefits into two broad categories: tangible and intangible.

In addition to the benefits that an organisation can gain from ERP investments there are also considerable risks associated with ERP software investments. A number of articles have reported failed ERP projects (Scott, 1999; Davenport, 1998). The risks associated with ERP software investments can be particularly high in SMEs. The financial impact of failed ERP software implementation can be fatal to an SME. In the present study we divide the risks into two categories: internal and external.

When studying SMEs it is important to define the concept. Brooksbank (1991) argues that both quantitative and qualitative criteria should be used when defining small and medium sized enterprises. Quantitative criteria, such as number of employees, sales turnover and total assets, have traditionally been used in research purposes due to the problems of measurability with qualitative criteria. Also in the research asserting the ERP software and SMEs mainly quantitative criteria have been used to define small and medium sized enterprises (see for example Bernroider and Koch, 2000; Van Everdingen *et al.*, 2000). In this study we use the European Community's definition (Commission of the European Community, 1996) which defines small and medium sized enterprises as enterprises with fewer than 250 employees and which either have an annual turnover not exceeding EUR 40 million, or an annual balance-sheet total not exceeding EUR 27 million. We consider this quantitative definition suitable for the purposes of our investigation.

## **RESEARCH QUESTIONS AND METHODOLOGY**

The purpose of this study is to investigate the evaluation and selection process of ERP software in Finnish SMEs. More specifically our aim is to determine the evaluation criteria perceived important by the client companies, and on the other hand the perceptions of these criteria by the software vendors. It would benefit all the parties if the client and vendor would have similar perceptions on which are the most important issues in the selection of ERP software. The results attained in this study will be used as a basis for conducting a larger survey among Finnish SMEs.

The study was conducted in two phases. In the first phase we approached an ERP software vendor and established together with them a general set of selection criteria that the vendor believed to be those that customers use when they select ERP software. The vendor we approached in the first phase was Solagem, a Finnish ERP software vendor established in 1989. The company has 85 employees, 3 points of business and the company's turnover for the year 2000 was EUR 5.2 million.

The selection criteria were recorded in a series of group conversations and during a sales personnel training-day. The group conversations were participated by the company CEO and sales manager. The sales personnel training-day was participated by the Solagem sales personnel and sales manager. In group discussions the researchers led the discussion and helped to define the selection criteria. The active role of researchers during the interviews is a possible cause of a bias. This was taken into account when analysing the results and when preparing for the second phase of the study.

In the second phase we approached two Finnish wholesale companies: Vink Finland Oy and Allright Oy. These companies were chosen because they both had recently purchased ERP software packages. Contact information for these companies was received from Solagem.

The companies were chosen so that one of them had chosen Solagem's ERP software and the other had chosen a competitors product. This way we wanted to avoid a possible vendor bias in our study.

We asked the interviewees to describe the tangible and intangible benefits expected as well as the internal and external risks related to the ERP investment. In addition, the interviewees were asked to describe the software acquisition process in general terms, that is, who was involved in decision making and the kind of methods used in evaluating the software alternatives.

We interviewed the financial manager of Vink Finland who had been responsible for the ERP software acquisition project. We interviewed Allright's information systems manager who had led the team responsible for the acquisition project. Vink Finland was the first to be interviewed and the interviews were carried out in two separate sessions. The interview at Allright was carried out in one session.

## **RESULTS**

### **Case 1: Vink Finland Oy**

#### Background

Vink Finland Oy is a supplier of semi-finished plastics. The company's headquarters and central warehouse are located in Kerava near the Helsinki metropolitan area and the company's six regional offices are located in Kouvola, Kuopio, Oulu, Pietarsaari, Tampere and Turku. In 2000 the company employed 58 people and its turnover for the year was EUR 19 million.

Vink Finland is part of the Vink group. Vink group operates in 12 countries, employs approximately 1000 people and the group's turnover in 2000 was EUR 241 million. Vink group in turn is part of the Dutch Kendrion N.V. group, which is listed in the Euronext stock exchange in Amsterdam. Kendrion N.V. group has operations in 17 countries, employs approximately 6000 people and the group's turnover for the first six months of 2001 exceeded EUR 460 million.

The ERP software that the Vink Finland had in use prior to the acquisition of the new software was acquired from a large international ERP software vendor typically remarked as one of the top five ERP software vendors. According to the company representative there were two main reasons why Vink Finland was acquiring new ERP software. First, the old software had been designed for a manufacturing environment and to support the operations of a manufacturing enterprise. In the past, the old software's functionality had been adequate for the company's needs but at present it was not able to offer sufficient support to the operations of a wholesale enterprise. Second, the old software had been designed for large enterprises and its use had proven laborious to a small enterprise.

Further, the old software hindered possibilities to develop the company's business. For example, it was not possible to combine separate bills into joint bills, which caused customers to receive numerous bills every month. Neither was it possible to send bills electronically to the post office, which would have saved costs and speeded up the payment collection. In addition, the old software had to be run from abroad, over a data communications connection, which caused considerable cost; and it did not have a graphical user interface, which did not make it user-friendly.

#### Evaluation process

The Vink group started the evaluation process for the acquisition of the new ERP software. The group gave its subsidiaries permission to abandon the old software and to start the acquisition of new ERP software. It was planned that the subsidiaries would one by one move to new ERP software and that Vink Finland would be the first subsidiary to receive permission to go ahead with the plan.

The evaluation was conducted by a team consisting of members from every function of the company and led by the company's financial manager. First the team conducted an initial selection of candidates and found 8 potential vendors. The team graded each of the vendors and their software. According to this grading the team chose 3 final candidates. The three

vendors to qualify for the final evaluation were Solagem, Liinos and Navision. These three vendors that qualified for the second round arranged products demonstrations and reference visits to companies that used their software. The final decision was between Solagem and Liinos, and of these two, Liinos was selected.

After the selection Vink Finland started the preparations for the implementation of the new software with Liinos. Vink group interrupted the preparations with an additional demand. Vink group wanted the selected software to have support service at least in the Scandinavian area. Liinos could not offer this kind of support service and because of this, a reselection took place. In the reselection the third candidate Navision and the Axapta ERP software package was selected. Navision was the only one of the three final candidates who could offer the support service demanded by Vink group.

#### Evaluation criteria

In the initial selection of candidates the company found 8 candidates that fulfilled the set minimum requirements. The company regarded it important that the new software would be designed for small and medium sized companies. The software was required to operate in the Microsoft Windows operating system and it was required to have EDI capability. The EDI capability was demanded because some of the company's larger customers, former state-owned companies, had moved to using EDI and demanded that all their suppliers should have EDI capability before a set date.

In the initial evaluation the team evaluated the 8 vendors and their software and gave them points in the following five categories: usability, reliability, flexibility, possibilities to influence product development, and vendor's characteristics, finance and geographical location. In the initial evaluation the vendor characteristics were regarded as being more important than the software. This was because the company wanted to acquire software that would have support service and updates long in the future.

In the final evaluation the most important benefits that the company sought from the new software were rationalisation of work, better customer service and cost savings. It was regarded as very important that the new software would be suitable for the company's needs. The Liinos software for example included a feature that allowed users to acquire information about partially sold products such as plastic pipes and plastic sheets. Price was not one of the most important criteria in the evaluation. As the most important risks in the evaluation the company regarded the implementation schedule, the available recourses for the project and the competition in the field of industry.

### **Case 2: Allright Oy**

#### Background

Allright Oy is a retailer and wholesaler of motorbike and motor sleigh accessories. The company has one point of business located in Vallila near the centre of Helsinki. At this location are situated the company's retail store, warehouse and office.

At the time Allright evaluated the ERP software of different vendors in 2001 the company's turnover was approximately EUR 8.4 million. Shortly after the company had purchased the new ERP software Arwidson Oy purchased half of the company's capital stock. After this arrangement the whole group's yearly turnover was estimated to be about EUR 58 million.

The ERP software that the company had in use prior to the acquisition of the Solagem's software was acquired from a small domestic vendor. This software had been published in 1982 and the last update for the software was released in the early 1990s. The company stated that the main reasons for acquiring new ERP software were that the old software was laborious to use, had poor reporting features and did not offer possibilities to develop the company's business.

#### Evaluation process

Allright's evaluation process can be divided into two phases. In the first phase, a consulting company conducted the initial selection of candidates. Representatives from the consulting company helped each function of the company to record the functionality that they required from the new software. A call for bids was then sent out accompanied with these

requirements to a few dozen different ERP software vendors. A total of 15 responses were received from different vendors.

The second phase, the selection of the software, was conducted by a five person team consisting of a representatives from each of the company's functions. Of the 15 vendors that had answered with a bid only 7 had included all the information required of their software functionality in their answer. Of the 7 vendors the team chose 3 who were invited to arrange a product demonstration of their software. The final selection was made on the basis of the bids, product demonstrations, and discussions with the sales personnel of each vendor. No reference visits to companies using a particular vendor's software were made before the final decision.

#### Evaluation criteria

In the first phase the company set minimum requirements concerning the new software usability, reporting capabilities, user-interface (Microsoft Windows compatible software was preferred) and support service. The characteristics of the vendor were not considered as important in this phase as the software features. Of the 15 answers received 8 were disqualified because the answers were poorly composed and did not contain the requested information. All of the 7 vendors who had included the requested information in their answers qualified for the second phase.

In the second phase the team evaluated the 7 packages and their vendors. The most important benefits that the company sought from the new software were receiving accurate information for the management, rationalisation and automation of work and the possibilities that the new software offered for the development of the company's business. On the other hand as the most important risks the company identified the employee's competence and motivation to use the new software, and the possible changes in the company's business and the softwares adaptability to these changes. Particular attention was placed in that the software not only had features that were required today but also included features that might be required in the future. An interesting point was also the value that the company put on the geographical location of the vendor. The nearness of the vendor's office to company's point of business was appreciated.

#### **Comparison of vendor and client perceptions**

A key finding of this study was that there was a difference in the benefits that the clients sought from the ERP software and the benefits that the vendor believed that the customers were seeking. The benefits and risks that vendor and the clients identified as the most important in the selection of ERP software are illustrated in Table 1.

The first issue we noticed was that the clients sought answers to everyday problems and cost savings whereas the vendor emphasised the strategic benefits and the competitive advantage more. It could be argued that the SMEs do not seek strategic advantage from the systems, but rather cost effective solutions that allow them operate in a more efficient way.

Another important issue revealed by the study was that clients did not want large top-end ERP software but lighter systems designed for the needs of SMEs. It was important for the customer companies that the software they were purchasing was targeted to small and medium sized companies. They also saw the fit of the package for their given domain as more important than the reputation of the large vendor.

It is also noteworthy that the clients regarded the continuity of the software and the vendor as critical decision parameters. Both case companies announced their worries about the continuity of the vendors business as well as of the continuity of the software product that they were evaluating (this is understandable given the lengthy payback period and financial hurdles of some ERP vendors).

In the evaluation process a high value was placed on software demonstrations arranged by the vendor. However, the case companies reported that as a rule the software demonstrations had been poorly arranged and had given a bad image of the vendors. Reference visits to companies that used the software had been made by only one of the case companies but this had been influential part of the evaluation process. The sales work

done by the vendor staff however was not considered as one of the most important factors affecting the software selection.

The vendors stressed different process models, but the buyers saw them as being generic and of no particular importance in the selection process. This can be explained either by the fact that all of them knew what they were doing and thus there were no differences, or that the buyers were sceptical of the rosy picture of the smooth roll out provided by the vendors.

	<b>Vendor: <i>Solagem</i></b>	<b>Customer I: <i>Vink Finland</i></b>	<b>Customer II: <i>Allright</i></b>
<b>Benefits</b>			
Tangible (Profitability)	<ul style="list-style-type: none"> <li>-Cost savings</li> <li>-Scalability</li> <li>-Improved customer service</li> <li>-Improved operational efficiency</li> <li>-Rationalisation of procurement</li> <li>-Possibilities to influence product development</li> <li>-Support for decision making</li> <li>-Enables new business models</li> </ul>	<ul style="list-style-type: none"> <li>-Rationalisation of sales process</li> <li>-Cutting down delivery times</li> <li>-Cost savings</li> </ul>	<ul style="list-style-type: none"> <li>-Reporting capacity and receiving accurate information for the management</li> <li>-Rationalisation and automation of work</li> <li>-Making wholesale customers buying easier</li> <li>-Increased efficiency of procurement</li> </ul>
Intangible	<ul style="list-style-type: none"> <li>-Personal satisfaction</li> <li>-System usability</li> <li>-Attaining of competitive advantage</li> <li>-Improved efficiency of marketing and sales</li> <li>-New customer groups</li> <li>-New operational practices</li> </ul>	<ul style="list-style-type: none"> <li>-Receiving accurate information for operational and executive management</li> <li>-Internal trading and co-operation inside the company</li> </ul>	<ul style="list-style-type: none"> <li>-Ability to offer better service than competitors</li> <li>-Capability for integration to other systems</li> </ul>
<b>Risks</b>			
Internal (Systematic)	<ul style="list-style-type: none"> <li>-Personnel's commitment</li> <li>-Changes in business processes</li> <li>-Availability of personnel for the project</li> <li>-Managements support</li> </ul>	<ul style="list-style-type: none"> <li>-Schedule of the implementation</li> <li>-Availability of resources for the process</li> <li>-Development of the business process</li> </ul>	<ul style="list-style-type: none"> <li>-Employee's competence and motivation to use the new system</li> <li>-Future changes in the business</li> </ul>
External (Unsystematic)	<ul style="list-style-type: none"> <li>-Competence of vendor's staff</li> <li>-Sustainability of product development</li> <li>-Ownership and financial situation of the vendor</li> </ul>	<ul style="list-style-type: none"> <li>-Risks imposed by the competitors</li> <li>-Demands of large customers</li> </ul>	<ul style="list-style-type: none"> <li>-Acquisitions and mergers</li> </ul>

Table 1: Vendor and customer views of important issues in ERP software selection

## DISCUSSION AND CONCLUSION

In this paper we reported a pilot study of ERP package selection by SMEs. The findings of this study have been used as a basis in the planning a larger survey. The survey will study in a more thorough manner the criteria that Finnish SMEs use in ERP software package selection. However, already in this pilot we noticed several interesting things about the selection process. The vendors sought to sell competitive weapons for SMEs whereas the SMEs wanted to buy tools that could help them to better manage their day-to-day operations. Furthermore the clients pay close attention to local and continuing support for the product they choose.

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