

# Evaluating the Driving Factors and the Suppressing Factors Related to IS Outsourcing in Four Finnish Information Systems Organizations

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**Abstract.** This paper presents the results of a research project, in which the current situation related to the information systems (IS) outsourcing practices in four Finnish information systems development organizations was evaluated. The evaluation was based on employees' own perceptions, and it consisted of analyzing the current IS outsourcing practices in the case companies, driving factors related to IS outsourcing, suppressing factors related to IS outsourcing, and an evaluation of the company's readiness to utilize IS outsourcing. This qualitative study used grounded theory as the research method. The analysis elicited that the IS outsourcing decisions in these case companies have been mostly based on cost-related factors. The cost pressures are coming both from the shareholders and the customers. Cost reduction seemed to be the major single driver for outsourcing information system development (ISD) work. Besides, even if most of the case companies have already outsourced parts of their ISD projects, based on the interviewees' expressions the cost savings in these projects have not been remarkable. In some cases the total costs of the project have been estimated to be even higher. However, the case companies seem not to be familiar with the cost structure of the outsourced projects. The interviewees also felt that their company's ISD practices were not ready for the use of outsourcing. The level of English skills and the lack of domain knowledge among subcontractors were the other mentioned suppressing factors related to IS outsourcing.

## 1 Introduction

Globalization of industries has naturally affected also the ICT industry. Several trends are going on in the ICT field right now. ICT service providers have been consolidated into large multinational enterprises. New ways of developing software, i.e. distributed or virtual software teams and participation in open source software projects, have also come up. Since Eastman Kodak made its decision to outsource its IT operations to IBM Corporation in 1989 (Senn and Gefen 1999), information systems and software development outsourcing have become a trend in the ICT field. The changes that IS outsourcing will cause have a significant impact on economics of software business worldwide.

One of the recent trends mentioned in the field of ICT has been the outsourcing of information technology work and concentrating it to larger organizations (Dibern, Goles, Hirschheim and Jayatilaka 2004). This trend has in recent years focused on offshore software development. The main drivers behind the offshore software development are the needs to reduce software development costs (Kakabadse and Kakabadse 2002) and to gain access to a huge resource pool and latest technologies (Marcus 2004). Countries such as India, Russia and China have in recent years become significant players in this market.

Software companies in high labour cost countries encounter a totally new challenge in this situation. Their development methods, processes, practices, business models, and business networks require reorganization. Either they must somehow utilize IS outsourcing and make profit out of it, or they must find other solutions to be efficient and profitable in this new situation.

This paper introduces the current situation related to IS outsourcing in four Finnish ISD organizations. It presents their current cooperation practices and discusses the driving factors and the suppressing factors that affect the company's decision to outsource or not to outsource parts of its ISD projects.

## 2 Literature Review

The outsourcing in the ICT industry is not a new phenomenon. It originated from the professional services and facility management services in the financial and operation support areas during the 1960s and 1970s (Lee). The outsourcing has little by little become a serious strategic choice for ICT companies. In recent years IT outsourcing has also been a subject of numerous studies in several different disciplines. This literature study was first made in October 2006, and it was updated in the beginning of April 2007. Generally, outsourcing has been defined as a management approach that allows delegating operational responsibility for processes or services previously delivered by an enterprise to an external agent (Swink 1999; Elmuti and Kathawala 2000). IT outsourcing has been defined as a practice where IT assets and resources are transferred to a third party (Willcocks and Kern 1998; Gilley and Rasheed 2000).

Literature related to information technology outsourcing is plentiful. Several terms are used in the literature interchangeably addressing the same issue, i.e. information technology (IT) outsourcing and information systems (IS) outsourcing. Furthermore, the term offshoring is also commonly used interchangeably with outsourcing. Offshoring has been defined as a practice where domestically supplied services are replaced by imported services (Bedzarnik 2005). To make the terms clear, the term IS outsourcing is used in this paper to address both IT and IS outsourcing concepts. Besides, terms such as a supplier, a vendor and a subcontractor are used to some extent interchangeably in the literature. In this paper, a subcontractor is used as a synonym for a vendor or a supplier.

Several studies have addressed the driving factors that seem to support outsourcing decisions in the companies. Another popular subject of studies has been undesirable consequences of IS outsourcing. A cross-section of relevant literature and some common concepts related to IS outsourcing are presented in table 1.

Table 1. A cross-section of relevant literature related to IS outsourcing.

Focus	Concept(s)	Author(s)
Driving factors related to IS outsourcing	Cost reduction, access to latest technologies and skills	Carmel (1999), Ketler & Willems (1999), Goo et al. (2000), Hersleb & Moitra (2001), Khan et al. (2003), Rottman (2006)
	Improved quality	Laplante et al. (2004)
	Solution to the IT skills shortage	Ketler & Willems (1999), Lacity & Willcocks (2001), Nicholson (2001), Khan et al. (2003), Amberg et al. (2005)
	Pressure to cut down costs	Matloff (2004)
	Reduction of debt	Smith et al. (1998)
Suppressing factors and undesirable consequences related to IS outsourcing	Difficulties in coordination and control	Carmel (1999), Ovaska et al. (2003)
	Hidden costs, transaction costs	Duncan (1998), Aubert et al. (1998), Khan et al. (2003), Overby (2003), Barthelemy (2003), Kobayashi-Hillary (2005)
	Cost savings are far from expected	Lacity & Hirschheim (1993), Smith et al. (1998), Senn & Gefen (1999), Barthelemy (2001), Lindholm & Suomala (2004), Matloff (2005)
	Quality problems	Matloff (2005)
	Language, cultural issues, trust, threat of vendor opportunism	Sabherwal (1999), Khan et al. (2003), Narayanaswamy & Henry (2005), Nguyen et al. (2006)
	Risks & risk mitigation	Lacity & Willcocks (2001), Taylor (2005), Gonzalez et al (2005), Aubert at al. (2005), Erickson & Evaristo (2006), Sakhivel (2007)

Several theoretical lenses have also been used to describe and interpret phenomena related to IS outsourcing. The Transaction Cost Economics (TCE) approach has been used to provide a view on risk management. The Resource-Based View (RBV) concentrates on value, accessibility and control of valuable resources – those resources that may affect the competitive advantage of the firm. Based on the literature study, these two approaches seem to be the most popular theories to explain how to avoid hazards in the IS outsourcing decision making. Also the Life Cycle Costing (LCC) and Total Cost of Ownership (TCO) theories have been used in several studies to evaluate the costs of IS outsourcing. The outsourcing research has been directed in

recent years from the strategic and the economics views to a social view (Lee, Huynh, Chi-Wai and Pi 2000).

An extensive review of IS outsourcing literature and also the research approaches and theories used in IS outsourcing studies has also been presented by Dibbern et al. 2004. They report that the maturity of the IS outsourcing research is growing. Furthermore, when IS outsourcing as a research issue matures there will also be new subjects for research. The study addresses, for example, partnerships, equity deals, offshoring and backsourcing as the upcoming research issues. So, it seems that the IS outsourcing research might shift from analyzing the outsourcing decision process to analyzing relationship management and learning from experiences. The work of Dibbern et al. has been complemented by Sargent 2006. Sargent's analysis of the literature points out that the outsourcing relationship, as well as its attributes and processes, should be studied more carefully to be able to understand complex challenges related to it.

To summarize, numerous studies have been made on IS outsourcing. Some of them present its benefits and some of them present its drawbacks. Several studies also address the best practices and pitfalls of IS outsourcing supported with empirical evidence. The most recent research trend concentrates on the social aspects of IS outsourcing. Some relevant literature and common research topics addressed by them were presented in this short literature review.

### **3 Research Process**

This research is done in cooperation with Lappeenranta University of Technology. Five researchers participated in the data collection and data analysis phases of the study. The study was conducted among six Finnish information systems development organizations starting in August 2006. Four of them were analyzed for this article. The research will last till the end of December 2007. In the beginning of the study, a framework of the contexts where information systems development organizations nowadays operate was created. In the beginning, also a few representatives of the case companies were interviewed to gather some basic information about the employees' own views on their company's targets of improvement related to their ISD practices. After these preliminary discussions with the companies the targets of improvement were gathered, analyzed and reflected to our framework. The targets of improvement that the interviewees mentioned were taken into account when the interview questions were designed.

The ultimate target of this research project is to provide more understanding about the linkage between organizational context and information systems development work. Fitzgerald, Russo and Stolterman 2002 define context as "both the place where the information system will be implemented and the environment within which the development process will take place". Based on these research objectives I focused on IS outsourcing. The objectives of this study were twofold. The first goal was to study the current state of the cooperation and IS outsourcing experiences in the case companies. The second goal was to evaluate the readiness to utilize IS out-

sourcing in the case companies. To be able to fulfill these objectives, I formulated my personal research question as follows:

Q1: What are the driving factors and the suppressing factors related to information systems outsourcing in the case companies?

The data for this qualitative study was collected using theme-based interviews. A total of 29 interviews were made in six Finnish information systems development companies between October and December 2006. The interviews lasted from 30 minutes to 3 hours, depending on the interviewee's role in the company. Employees acting in different roles, i.e. software analysts, project managers and line managers, were interviewed to provide a richer insight into the company's current ISD practices. The interviews were transcribed as text and analyzed with the grounded theory method (Strauss and Corbin 1990). Qualitative research requires the researcher's ability to interpret the interviewee's actions and verbal expressions. Furthermore, these interpretations have to be validated from the data and from the experiences of other researchers and practitioners (Klein and Myers 1999).

The analysis of the data was made in close cooperation with another researcher, so the interpretations were constantly validated so investigator triangulation was utilized (Denzin 1978).

The analysis started with an open coding phase, where each researcher had his own viewpoint on the data. My personal viewpoint was "The driving factors and the suppressing factors related to IS outsourcing". The open coding phase (Strauss and Corbin, 1990) was based on certain seed categories that in other words meant an interesting phenomenon related to the viewpoint I had selected. The original seed categories for my analysis were: change, collaboration competences, and context.

The open coding phase was followed by an axial coding phase, which in practice proceeded almost in parallel with the open coding phase. During the axial coding phase the observations were grouped to three different categories: cooperation and IS outsourcing experiences, driving factors related to IS outsourcing, and suppressing factors related to IS outsourcing. During the open coding and axial coding phases, theoretical sampling (Strauss and Corbin 1990) was utilized to guide further data collection. Two specific interviews were made to be able to build a better picture of the situation in the case companies.

The analysis was closed with a selective coding phase. In the selective coding phase the core of the results was formed, the analysis of the current situation related to IS outsourcing in the case companies was evaluated, and research reports were written.

## **4 Findings**

In this section the results of this study are presented. First, the four case companies analyzed for this paper are briefly introduced. After that the driving factors and the suppressing factors related to IS outsourcing in the case companies are reported. In

the end of this section, the readiness to utilize IS outsourcing in the case companies is briefly evaluated based on the interview data. To avoid a loss of confidentiality among the companies the results are not presented in a case by case manner.

#### 4.1 Introduction of the cases

Company A is an internationally operating information systems development organization providing a number of products and services to its customers who come from several business domains. The forest industry division of this organization participated in this study. This organization has several international cooperation partners worldwide, and it has also utilized several subcontractors in its ISD projects for many years. Besides, the organization has carried out several distributed ISD projects in cooperation with its foreign agency.

Company B operates in the agricultural sector, providing several services to its customer. The company is currently owned by its customer. The company has several technological partnerships with international enterprises. At the moment, the company has no subcontractors in ISD projects. The company has experiences from utilizing both Finnish and foreign subcontractors in its ISD projects.

Company C is an internationally operating information systems development organization. It operates in the forest and saw industry sectors, providing a tailored product for enterprise resource planning. The company also executes tailored projects and acts as a consultant for its forest industry customers. The company has two remote offices in Finland with which they cooperate. The company has also three foreign agencies placed in Central Europe. Furthermore, the company has a lot of cooperation experience with its partners.

Company D provides information logistics services to its customer. The company operates mainly in Finland but it has also some ongoing projects in other European countries. At the moment the company is owned by its customer. The company cooperates with numerous companies, and it has utilized dozens of subcontractors. Some of the company's subcontractors have operated on-site in the company's premises.

#### 4.2 The driving factors related to IS outsourcing

The main driving factor related to IS outsourcing in the case companies was a strong pressure to cut down costs in ISD projects. This demand is presented by either the shareholders or the customers. In some cases a customer had demanded a company to utilize IS outsourcing to cut down ISD costs. Some expressions from the interviews about the cost pressure are included here:

*"...Well I think that cost pressure is quite high and it seems that they are more cost effective than for example in Finland..."*

*"...customer demanded us to use the XXXXXXXX. Later on they demanded to expand that and to transfer the maintenance there..."*

*"...I would say that of course two of the most definitely important points are the ways that increase their competitiveness. I mean in that sense that what are the financial limitations or requirements and so on. I mean price..."*

*“...We replace our own work with the work of subcontractors because it is cheaper. This is usually done already when the project plan is made...”*

*“...When I started working in this company five years ago, IT costs were approximately 8 percent of turnover. Now they are approximately 4 percent. So we have to produce the same services with lower costs...”*

Another strongly expressed driving factor was the company’s need to utilize certain special technological competencies. The interviewees saw that these special competencies are more cost-effective to buy from a subcontractor than to produce them inside the company. Some comments from the interviews are included here:

*“...they are based on some competence. We know that certain people are competent in some special area...”*

*“...When we get a new project and if we know that we don’t have a certain competence in-house, we have a network of consults and subcontractors that will help us by providing their specialists...”*

*“...There might be some kind of technology or something that is not reasonable for us to learn or study...or put our effort on it...”*

*“...There are certain competencies that are not reasonable for us to produce by ourselves. We buy them from subcontractors...”*

Both of these two factors were strongly expressed in the interviews. In addition, the companies are interested in utilizing subcontractors as a resource pool. In some case companies, the former positive experiences from IS outsourcing were mentioned as a driving factor for expanding IS outsourcing in the future. Some of the interviewees also saw IS outsourcing as a possibility for the company to concentrate on their own core competencies.

#### **4.3 The suppressing factors related to IS outsourcing**

One of the main suppressing factors in utilizing IS outsourcing expressed by the interviewees was the language barrier. In most case companies the interviewees somehow expressed that their written and spoken English skills were not on the level required for operating with foreign subcontractors. They also expressed that at least most and in some cases all of the documentation of the ISD projects is written in Finnish. Some expressions from the interviews were as follows:

*“...We have the objective to use English as an official language in our organization, but it will take a long time. We have plenty of employees who are not able to communicate with the foreign language...”*

*“...If you were a representative of our management and you told me that we should use a subcontractor in a certain project... The first issue I would think of would be the language context. If I had XXXX pages of Finnish documentation and then ... would it be worthwhile to hire a foreign subcontractor...”*

*“...We had people here who couldn’t speak English well and also the XXXXX staff had similar problems...”*

The lack of domain knowledge among foreign subcontractors was also expressed in several interviews in different companies. Here are two comments describing the situation:

*“...There are lots of offerers. There are probably also lots of competent employees, I suppose. Then, when we describe our business domain and tell about the domain knowledge requirements we have, the domain knowledge is not found...”*

*“There is not much domain knowledge. Then we should familiarize and educate them...”*

The ISD practices in the case companies include a lot of hidden knowledge. Interviewees saw that the ISD practices in their company have been formed in the course of time, and their customer-oriented way of operating would be very difficult to document in such a way that it would be reasonable to outsource parts of it. In three of the companies, the interviewees expressed some dissatisfaction with the way how the ISD practices in their company were organized. They felt that their ISD practices should be somehow developed to a more formal model before they would be able to utilize IS outsourcing.

There were also some other suppressing factors posed in the interviews. In one of the companies a rare technology is used, and the interviewees expressed that there have been no competent resources available for that technology. One of the companies has had contradictory experiences from its former IS outsourcing projects and the company is not interested in utilizing foreign subcontractors any more. Technically challenging environment was also mentioned in two of the case companies. They evaluated that an ISD project should last at least six months before it would be reasonable to utilize IS outsourcing. The summary of the finding in these four Finnish ISD organizations is presented in table 2.

Table 2. The factors related to IS outsourcing in the case companies.

<b>Suppressing factors related to IS outsourcing</b>	<b>Driving factors related to IS outsourcing</b>
Former contradictory experiences from IS outsourcing	Concentrating on core competencies
Documentation is done in Finnish	The access to a resource pool
Fear to outsource company's knowledge	Cost pressures
Language barrier	Former positive experiences from IS outsourcing
Subcontractors' lack of domain knowledge	Need for special competencies
Current state of the company's ISD practices	

#### **4.4 The evaluation of the readiness to utilize IS outsourcing**

In most case companies the interviewees felt that their company's ISD practices are not formal enough for the use of IS outsourcing or, in some cases, for expanding it. The interviewees saw that before using foreign subcontractors, ISD practices inside their own company should be developed towards a more formal model.

Another topic that was mentioned in several interviews was the real benefit gained from IS outsourcing. Several interviewees in different companies felt that IS outsourcing produced a new group of different cost factors. Based on the interviews these cost factors have been identified, but they have not, however, been exactly calculated or analyzed. According to the interviews the total costs of the outsourced projects are not yet known. Some comments expressed in the interviews were as follows:

*“...There were lots of problems and it wasn't cheaper at all. Lots of hours were spent and it was hard to even get any results...”*

*“...To summarize, it was good that programs worked, it could have been even worse if they had not worked at all. After all, it was probably not any cheaper, and the total cost of the maintenance has sure been bigger...”*

Table 3 summarizes the four case companies and presents their current experiences related to IS outsourcing. The evaluation of the readiness to utilize IS outsourcing in the case companies based on the analysis is also presented.

Table 3. Summary of the case companies.

	<b>Context Customer domain</b> /	<b>Type of current cooperation and IS outsourcing experiences</b>	<b>Evaluation of company's readiness to outsource</b>
<b>Company A</b>	Forest industry	Special areas of technology, user interface of software project, partnering	Contradictory (somehow ready, somehow not ready)
<b>Company B</b>	Agriculture	Some software development projects	Not ready
<b>Company C</b>	Forest industry	Special areas of technology, cooperation in process interfaces	Not ready
<b>Company D</b>	Information logistics	Special areas of technology, software development outsourcing, partnering	Mostly ready

## 5 Discussion

The companies participating in this study came from three different customer domains. All of these case companies have some experiences from IS outsourcing or other types of relationships with other organizations in ISD. Based on the empirical evidence collected during this study, it is justified to argue that IS outsourcing is in practice much more complex to implement than a management of an organization presumes. Furthermore, it seems that IS outsourcing decisions have been mostly based on cost-related issues. However, there were no expressions in the interviews about evaluation of the costs that IS outsourcing causes.

There is naturally a number of limitations in this study. Only four ISD companies are analyzed for this study, so the results cannot be generalized to a wider context. Besides, a deep analysis about the IS outsourcing decision process and different cost

factors related to it was not performed in this study. During the analysis, theoretical sampling was used to guide data collection, but timetables and resources forced to limit the number of detailed interviews. When you use theoretical sampling, you should have a lot of time and resources to make interviews, transcribe and analyze them, and maybe take another round if it is necessary. Unfortunately, you probably do not have that much time and resources in a normal research project. In my opinion this is a significant weakness in the grounded theory method – it takes a lot of time and resources.

However, the results of this study support the previous studies made about IS outsourcing and reveals that the driving factors and the suppressing factors related to IS outsourcing reported in different contexts are mostly the same in this context as in the previously studied contexts. A deeper analysis of the total costs of certain outsourced ISD projects would be an interesting topic to explore in the future studies, and it certainly should be addressed.

Finland is an interesting case for this kind of study, because Finland has in recent years done extremely well in Global Competitiveness reports. The results of this study implicate that although Finland is a highly competitive nation, there are still a number of challenges in utilizing outsourcing in ISD. It could be useful for other nations to benchmark how these challenges are dealt with in Finnish ISD organizations.

## 6 Summary

This study was a part of a larger, ongoing research project that investigates different contexts of information systems development organizations. This paper focused on describing results of the current situation related to IS outsourcing practices in four Finnish ISD organizations. The analysis provided a group of driving factors and suppressing factors related to IS outsourcing in the case companies. Besides, the case companies' readiness to utilize IS outsourcing was briefly evaluated. The main driving factors were the demand for cost-effectiveness, the utilization of special technological competencies, and the possibility to access a pool of resources. The main suppressing factors were the language barrier, the lack of domain knowledge among subcontractors, and the challenging technological environment in the case companies.

Based on the results of this study, it was possible to answer the question 'what are the driving and the suppressing factors related to IS outsourcing in the case companies'. However, it was not been possible to present how the outsourced ISD projects actually performed in the case companies. Therefore, more research is needed to analyze the situation more widely and on a more detailed level.

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