IT-Supported International Outsourcing of Software Production: An Exploratory Case Study

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ABSTRACT

This study analyses how the IT-supported international outsourcing of software production (IT-SIOSP) process is executed. The paper analyzes an in-depth case study in the areas of international outsourcing, information technology (IT) and international software production. Our literature review reveals the limitations of research on the IT-SIOSP process. Three research questions arise in this context: (1) What are the phases of the IT-SIOSP process and how are these phases executed? (2) What major activities does each phase of the IT-SIOSP process entail and how are these activities managed? (3) What are the supported IT tools, performance measures, and expected outcomes of each phase? The study addresses these research questions through an in-depth empirical investigation of the IT-SIOSP process in a single case study. Our empirical findings have served as a basis for the classification and analysis of different issues associated with the conceptual framework of the IT-SIOSP process. These findings benefit both further research and practical settings, and suggest the need for future research.

1. INTRODUCTION

The international outsourcing of software production has become common practice in the software business. Software-intensive high-tech companies in Western countries increasingly produce software and software-intensive products in developing countries (Nahar, Käkölä and Huda 2002; Press 1993). "Many firms are finding offshore software development a viable alternative to in-house development because of lower costs, the inability to hire and retain qualified programmers at home, and the growing need to move swiftly from project initialization to systems installation" (Patane and Jurison 1994, p.7).

International outsourcing refers to a commercial arrangement whereby a contractor commissions a foreign subcontractor to produce software products or services (Nahar, Käkölä and Huda 2002). It usually involves recruiting from outside the firm foreign vendors capable of performing various functions previously performed in-house, or outsourced domestically (Chen and Lin, 1998). The subcontractor produces the software products or services, delivers them to the contractors, and receives payment (Nahar, Käkölä and Huda 2002).

The need to cut costs drives international outsourcing (Elmuti and Kathawala 2000). Recently, however, things have changed (Lacity and Willcocks 2001, pp. xi-xiv) as firms frequently cite new motives such as: (1) timely access to highly qualified technical talent, (2) faster time-to-market and accelerated delivery, (3) the ability to significantly expand software development capacity at minimal costs, (4) accelerated improvement of product development processes and quality capabilities by working with world-class offshore companies, (5) reduced risk of cost overruns and late projects, (6) improved quality of customer service and closer proximity to customers, and (7) increased competitive ability and flexibility.

Yet, the international outsourcing of software production is risky and complex, and is often influenced by at least the following constraints (Orlikowski 2002, p. 255): temporal (e.g., various time zones), geographic (i.e., multiple global locations), social (many participants engaged in joint development work), cultural (various nationalities and organizational cultures), historical (e.g., different product development practices in the contractor and subcontractor companies which emerge gradually and may inhibit successful collaboration), technical (i.e., complex products), and political (e.g., the contractor and subcontractor's diverging interests). Unless all these constraints are overcome simultaneously, international outsourcing is likely to fail. Examples of failures abound in the literature (c.f., Heeks 1999).

Information technology (IT) can and should be leveraged to mitigate the risks that companies face in their international outsourcing of software production. For example, effective outsourcing requires that consumers and providers share adequate levels of knowledge concerning the product, components, and services the providers/suppliers will provide, or the IT architectures where the components will be integrated (c.f., Takeishi 2002). IT-based training tools leveraging multi-media could be very useful in training stakeholders (Nahar 2001). The Internet also facilitates the global production and distribution of digitized products and services inexpensively (Nahar 2001; Holsapple and Singh 2003). People and companies around the world are increasingly using the internet as a fast, inexpensive, and easy-to-use/user-friendly source of IT (Nahar 2001).

In our view, developing a holistic understanding of the process of effective international outsourcing of software production is necessary to overcome such constraints successfully. To this end, this paper presents the results of an empirical study exploring the applicability of the conceptual framework of the IT-SIOSP developed in our previous research (see Yalaho and Wu 2002; Yalaho et al. 2003).

Software production through international outsourcing is complex because it involves several obstacles, such as inappropriate management know-how and low intellectual property protection. In this complex environment, identifying the most effective means to execute international software outsourcing requires research. Our literature review reveals that little systematic research on international outsourcing projects exists, and no detailed framework exists to guide managers through the IT-SIOSP process.

This paper presents a conceptual framework for the IT-SIOSP and answers the primary research question: How can software productions through the IT-supported international outsourcing process is executed effectively? In addition to the primary research question, the framework addresses four sub-questions (see abstract) that have received insufficient attention in the existing literature.

This paper analyses the execution of the IT-SIOSP process by focusing on companies in developed countries that serve as international outsourcing consumers and on software companies in developing countries that serve as international outsourcing service providers. It particularly emphasizes the consumer perspective.

This paper proceeds as follows: Section 2 describes the research method applied in this study; Section 3 briefly introduces the background of the case company; Section 4 deals with the case analysis and research findings. In this section, the IT-SIOSP process of the user's perspective is analyzed in detail and validated. This framework consists of seven phases. Section 5 presents discussions of the implications and applications of the framework, while Section 6 presents the conclusions and limitations of this research and identifies future research issues.

2. RESEARCH METHOD

Our research approach is exploratory. Because this area of research is new, little is known about the phenomenon of the IT-SIOSP process. Therefore, the main goal of this research is to explore a) the execution of the IT-SIOSP, b) the management of the outsourcing project, and c) the use of various control and coordination mechanisms in the international outsourcing project. For the aforementioned reasons, a single case study is sufficient to develop an initial understanding given the relative absence of well-studied research(Yin 1994). Another motivation for a single case study is that it provides the researcher an opportunity to observe and analyze a phenomenon previously inaccessible to scientific investigation.

The field study was conducted at Jipeq Company in Finland in 2002. We used a rich and flexible data-gathering strategy, which required finding a representative, unbiased set of data. In gathering data, we approached key informants at all levels who had a stake in the implementation of the IT-SIOSP. The research question, the conceptual framework presented in Appendix 1, and the questionnaire guide developed in *Yalaho and Wu (2002)* served as a basis for conducting the field study.

Interviewing the right people was of critical to the quality and credibility of our research. We identified four key criteria for selecting the interviewees, thus ensuring the collection of information on and insights into the subject from a wide range of perspectives. The four criteria are:

1. The outsourcing project manager and coordinator
2. The person involved in the actual process of international outsourcing
3. The business or general manager
4. The "length of service" - the interviewees are highly educated and have several years of experiences in the outsourcing field

The information we sought was mostly unstructured and non-quantitative. Therefore, the primary data collection method we followed involved semi-structured interviews. The interviews lasted more than five hours. One of our co-authors conducted an empirical study at the provider's company on the same outsourcing project. In addition, we also conducted 100 interviews with other researchers and practitioners over the last five years. The interviews were carried out using a set of open questions that were later organized into a questionnaire guide.

In addition, we inquired about background information on the size and type of business and on the affiliation and education of the interviewees.

We maintained a consistent discipline of sharing the data as they were collected, held regular meetings, and maintained communication through email and chat to enable a continuous critical assessment of our progress, and to permit follow-up where necessary. We also assessed the quality of these interviews when analyzing the empirical findings.

We shared the case description to check for possible errors and omissions and to evaluate the validity of our interpretation of their "story". All errors and omissions were corrected and some statements were modified to reflect the true opinions and perceptions of the interviewees. The data and interpretations have been verified with Jipeq's interviewed staff through a 186-page provisional report, formal presentations, and our research supervisors.

3. CASE DESCRIPTION

Jipeq is a Finnish company founded in May 2000, and initially funded by the venture capital firm StratosVentures. It has offices located in Helsinki (Finland) and St. Petersburg (Russia). Jipeq provides customized software development services in two related areas: 1) Embedded Systems and 2) Video/Audio/Image Processing, and has already completed ten international outsourcing projects in Russia and India. Although Jipeq is not a "real" outsourcing consumer, it is rather an outsourcing intermediary company, which assumes responsibility for selecting providers and handles payments in international outsourcing processes. From a provider's perspective, Jipeq can be considered an outsourcing consumer. We chose Jipeq as our case company because of its vast knowledge and extensive experience in international outsourcing. Most of their team-members are top graduates from the Faculty of Mathematics at St. Petersburg State University, one of the world's leading mathematics and software engineering institutions.

4. FINDINGS

This section deals with the investigation and analysis of the IT-SIOSP of Jipeq on the basis of the conceptual framework. The framework has been described in detail in *Yalaho et al. (2003)* and *Yalaho and Wu (2002)*, and consists of the following phases: 1) strategic analysis and decision, 2) international market research and promotion, 3) selection of providers, 4) contract negotiation, 5) project implementation, 6) management of the relationship, and 7) evaluation and contract termination (see Appendix 1).

4.1. IT-supported international outsourcing process

This section investigates and analyzes each phase of the IT-SIOSP process in the investigated case company.

4.1.1. Strategic analysis and decision

In the strategic analysis and decision phase, the company decides whether to in-source or outsource domestically or internationally. During this phase, the company organizes an outsourcing team to identify the risks and benefits of international outsourcing (Greaver II 1999), focuses on understanding its own core competencies, and is forced to clarify its organizational goals (Greaver II 1999) while benchmarking the potential outsource IT process (Chen and Lin 1998), as well as evaluates costs and engages an expert team (Greaver II 1999).

This phase was missing from Jipeq's process because it is not a "real" outsourcing consumer. Consequently, it conducted no strategic analysis before outsourcing. Instead, it assumed responsibility for its Finnish customers' outsourcing projects. The following comments explained the reasons behind their Finnish customers' decision to outsource. According to the project coordinator of Jipeq:

"There was a huge shortage of talented software professionals in Finland and in the rest of Europe, as well as in the USA. Since Finland is a small country, we obviously need to look to other countries for software professionals. Both India and Russia have well-trained software professionals and programmers. So, access to those talented people is the main objective to overcome the shortage of IT professionals and achieve benefits through the utilization of their expertise and competencies." (Project coordinator, Jipeq, Helsinki, 2002)

The same interviewee stated that:

"There is no cost advantage in the whole project; it is about the skill. If we need to find certain people with certain skills, or we need to find some people with Web-logic experience and who have five years experience in software, it is very difficult to find those people in Finland. We may need them in two weeks or in a month's time. That is why we bring them here or we might kick off the offshore model." (Head of business development, Jipeq, Helsinki, 2002)

These findings are consistent with the reasons for international outsourcing in our literature review, which suggest that international outsourcing can overcome a shortage of IT professionals (Lacity and Willcocks 2001).

India meets the requirements for international outsourcing, such as a pool of IT professionals, which explains why Jipeq sought an Indian outsourcing provider.

4.1.2. International market research and promotion

Once the strategic analysis and decision phase is complete, the next step is to identify which countries represent the best candidates for outsourcing, and to attract prospective outsourcing providers. In this phase, the company should identify attractive countries by analyzing various political and social factors, and by targeting prospective international outsourcing providers through various marketing promotion functions.

Although the Jipeq founders do have personal working experience in India, nevertheless they extensively researched the international market in countries such as India and Russia.

Analyzing the political and social environment. It was clear for Jipeq that political stability is critical in doing business. Consequently, countries like India and Russia have been considered for market research. Political instability in India, however, discourages investment in international outsourcing projects. One interviewee stated:

"We negotiated one case with a CTO, but the CEO stopped it, saying that there is presently a high risk in India, because the conflict between Pakistan and India is very tense." (Head of business development, Jipeq, Helsinki, 2002)

This clearly demonstrates that political instability undermines investment in the implementation of IT innovation (Nahar 2001).

Size of the pool of skilled software professionals. Jipeq identified countries such as India and Russia as possessing a number of available, well-trained IT professionals, which makes these countries attractive areas/targets for outsourcing. This clearly demonstrates that the availability of well-trained IT personnel influences the implementation of IT-supported international outsourcing processes in emerging markets and developing countries (Nahar et al. 2002).

Low salaries of IS professionals and other production costs. The average salary in India is far less than in developed countries in general, and in Finland in particular. And India possesses various skilled IT professionals with years of experiences, which is a key reason Jipeq selected the country.

This demonstrates that low salaries increase the appeal of implementing IT-supported international outsourcing processes in emerging markets and developing countries (Nahar et al. 2002).

Availability of functional infrastructure. The availability of functional infrastructure played an important role for Jipeq. At present, infrastructures in India and Russia are quite good but need improvement. One interviewee commented as follows:

"Then there are also problems associated with infrastructure. India and Russia both have relatively good infrastructures, even though sometimes they do not work properly. Jipeq is used to this. People may think that India is a third world country because most people have not been to India. They have not seen Netkraft, which has a better office than any Finnish company. I mean their infrastructure; there is nothing to worry about it." (Project coordinator, Jipeq, Helsinki, 2002)

The company-level IT infrastructure is highly developed, but an underdeveloped Indian national telecommunications and IT infrastructure, a lack of reliable telephone and communication lines, and low telephone line bandwidth posed problems for the implementation of the IT-SIOSP project. These findings demonstrate how telecommunications and IT industry-related factors are indispensable to the effective and efficient implementation of an IT project in a developing country (Nahar 2001).

Intellectual property law. The intellectual property law and tax regulations enforced in the selected countries posed no obstacle to forming software development partnerships, especially in international outsourcing; India in particular was more flexible in that sense. Software development exports figure largely in Indian government revenue. Therefore, in most cases the customer owns the intellectual property rights pertaining to the project (the software under development).

Communications. In most cases Jipeq acted on behalf of the Finnish customers as an international outsourcing service customer to reduce the language problem and avoid misunderstandings. One interviewee commented as follows:

"The communication issue basically is simply to get involved ourselves to limit the market-direct communication. Better communication always helps us because we make sure that we understand the customer's requirements and that there is no extra level of requirements. The Indian team knows us and understands our accent. But the Finnish customers have a strong Finnish accent and the Indians have a very strong Indian accent. Thus they cannot understand each other well, even though both are speaking English and both are fluent. The accent can sometimes make it difficult to understand each other." (Project coordinator, Jipeq, Helsinki, 2002)

IT tools. To investigate the above issues, Jipeq used Indian national IT companies' databases, registered databases, and the service of an established Indian consultant. Jipeq effectively conducted market research for IT-SIOSP. These databases contained a considerable amount of information on all IT companies registered in India, their domains of expertise, information on the management, the size of the each company (number of employees), the type of technology they use, and a brief history of each company. According to the project coordinator (Jipeq, Helsinki, 2002), Jipeq consulted the above-mentioned database as well as conducted many sales interviews before engaging in business.

The above information reveals that Jipeq used the company database to investigate and evaluate the prospective service provider. In addition, Jipeq extensively used its established relationship network for most of its projects.

These findings are consistent with the conceptual framework of IT-SIOSP (see Appendix 1). Technology, such as software industry databases and web search engines, can improve the international outsourcing process (Nahar, 2001).

However, the promotional activities were not carried out in this case. This phase is missing from Jipeq's IT-SIOSP process, since Jipeq took advantage of its established relationships while two of its managing board members were working in India.

In fact, the managing staff understood Indian culture very well due to their working experience there. They knew the Indian word-of-mouth communication technique very well. This communication technique is based on intensive face-to-face communication. One interviewee commented as follows:

"We did not really do promotion, it was just automatic and that means we have friends. For example, in India everybody is somebody else's cousin or relative. I gave one business card that went to around 7 million people. It is quite easy to build a network in India. I mean everybody is your best friend (laugh)." (Project coordinator, Jipeq, Helsinki, 2002)

Jipeq did not need to invest heavily in marketing communication. It was looking for companies or programmers who were willing to provide them services. Consequently, they just contacted a few agent

companies in India and these Indian companies spread the information themselves. In fact, they accomplished two tasks at once (recruitment and marketing) while using media such as newsgroups, email and mail to advertise a job position in India, *and* diffused information about their company at the same time.

The Indians' eagerness to work for Western companies or get involved in emerging technology projects contributed to promotion. Thus, they market themselves aggressively to foreign companies.

4.1.3. Selection of providers

This phase is very crucial for Jipeq because the success of the international outsourcing of software production project relies on the selection of a suitable service provider.

Defining the selection and evaluation (acceptance) criteria. At this stage, Jipeq analyzed information obtained from databases and a few studies on potential providers. The most important criteria for the selection of providers included the background of the founder, the management team, the turnover of the employees, experience, and the reputation of the company in general. Low labor cost and availability of IT professionals helped Jipeq to select the Indian service provider. Although the culture was different, Jipeg selected an Indian provider based on above-mentioned reasons.

Jipeq's very strong relationship with many suppliers in India facilitated this phase. As a consequence, they knew the strengths and weaknesses of each Indian provider. The head of business development highlighted the following criteria for selecting providers: (1) software technology level, (2) standard methodology, (3) size of the company, (4) successful experience in dealing with Western companies, (5) a stable relationship with domestic programming companies, (6) positions with key industry organizations, (7) location of key offices, (8) relationship and strategic alliances, (9) industry knowledge, and (10) financial resources.

According to Jipeq management, company size plays an important role when someone wants to address the change management. Due to their cumbersome bureaucracies, most big companies are inflexible, have slow decision-making processes, and lack interest in small companies like Jipeq.

For any company, it is very important to control which people work on a project; knowing them personally would be ideal. Jipeq believes that, in this way, they can guarantee the quality of the product.

Jipeq also evaluated the provider by verifying the following factors: clear and trustful communication between Jipeq and the provider, the working environment (the way offices look), and the internal relationships between programmers in the provider's company. One interviewee commented as follows:

"It is all about communication. For example, if a company had very good documentation processes, but we felt uneasy dealing with them; we may stop cooperation with them because we are looking at everything from the customer point of view. Another issue is that when they are talking over phone, their voice has to sound good. We noticed that all their top managers are international people who had worked in US and Japan, so they were not typical Indian people and that probably helped us deal with them better." (Head of business development, Jipeq, Helsinki, 2002)

Another important criterion that Jipeq used was its own contract list of requirements. It developed a list of requirements or clauses in its contract template that served as a basis for partnership.

This phase is consistent with the conceptual framework. However, the technology support part is missing because Jipeq conducted face-to-face contacts with its partners. According to Jipeq, technology does not help to select the best service provider since there are many human issues involved in selecting a partner.

4.1.4. Contract negotiation

Defining legal/commercial terms and conditions. Jipeq conducted face-to-face meetings with each service provider on all elements of the contract. Sometimes its management traveled to India, and sometimes the service provider's representative came to Finland to discuss the clauses of the contract. As one interviewee stated above, it already started to enforce its contract during the selection phase. This facilitated contract discussion since the selected service provider was likely to be favorable to Jipeq's working conditions and vice-versa. One interviewee commented as follows:

"So we had the frame agreement. It is about how we work together, how we share the profits, how we handle the billing, etc. Then we had a project agreement specific to the project, and then we made a template for this. We made certain changes to it if the customers wanted any changes." (Head of business development, Jipeq, Helsinki, 2002)

We asked about how Jipeq obtains all legal competences concerning both Finnish and Indian laws. In response to our question, the head of business development offered the following statement:

"Actually, our contract was under Finnish law. So it was better for us, but in some cases, I think the dispute was about English law. With a technology-based lawyer, we obtained many legal excuses to the law, and of course, the company showed us all kinds of contracts about how they want to work with us. So, we picked up some information from those, but we also used our contract. We also believe in partnership. There will always be some threats and sanctions but a partnership means a win-win relationship." (Head of business development, Jipeq, Helsinki, 2002)

Jipeq believes the contract is not a panacea. It is good to have it, if any conflict arises in the future. According to the head of business development, the contracts are quite detailed in their nature.

Beyond the contract, Jipeq was looking for ways to build trust between partners because it believed anything could be accomplished or solved through trust. However, the contract is important for Jipeq because it represents a way to explicate mutual understanding and avoid misunderstandings between partners.

Determining mutual commitments. During the multiple meetings, Jipeq listed the required elements and discussed each of them. In addition, the change management was also addressed during the negotiation (i.e., how it should be executed), the delay, the staffing of the project, etc.).

Signing the contract. Flexibility, openness, and trust were the key words in the Jipeq partnership. If any changes were required during software development, Jipeq wanted the provider to handle them. To do that, the partner should be flexible enough to accommodate these changes. Therefore, Jipeq avoided partnering with big companies (more than 20 000 employees). Jipeq also believed that once trust is built – when the chemistry between partners is good and the relationship is established – the contract is almost forgotten. Jipeq also believed that the strategy would be pragmatic; otherwise, it would be very difficult for a small business to go to another country to claim reparations for damages incurred.

The findings of the contract negotiation phase are consistent with the conceptual framework, though the utilization of IT tools was limited in this phase.

4.1.5. Project implementation

In this phase, Jipeq executed several functions chronologically, while executing other functions concurrently.

Building a joint implementation team. The joint implementation team consists of people from three parties. A project coordinator (project manager) comes from Jipeq and acts as a coordinator and makes any technical decisions. The technical project manager from the provider's company is a person who directs the Indian team in India. While the project manager from the Finnish consumer supervises the whole implementation process. Jipeq is always directly involved with the implementation issues at the provider's site due to the poor telecommunications infrastructure in India. Otherwise, it could not even know what happens in real-time. Depending on the type of project, the project manager from the Finnish consumer side may not work full time on the project with the implementation team in India.

Developing an implementation plan. Jipeq manages the implementation process by developing efficient phases of the implementation plan. They divided the whole project into many sub-projects according to size. Two months was considered a reasonable period, though the shortest period was three weeks. The provider delivered the product to the customer in each period and received payment for that period of work. Then it moved to the next new period. In this way, Jipeq easily and effectively controlled the risks of implementation. Finnish consumers could find problems as soon as they received the products, and could easily add more functions by asking the provider to implement the required functions in the next period. Besides this iterative spiral implementation model, it also developed a parallel implementation model for fast product delivery.

Even though the parallel model is difficult to manage, it increases the cost of the project, and suits a very tight project schedule.

Training the employees of both parties. Jipeq claimed that it underwent little training before the implementation started. One interviewee described the training as follows:

"We did not really train our partner. Of course, they learned from us and we learned from them, but it was not a formal training, and we rarely formally train our customer. We explained how a project works, we might go through a case study, how the project typically works. It was more to know what kind of things they were using, so that we could be familiar with the technology they were using." (Project coordinator, Jipeq, Helsinki, 2002)

These findings are consistent with the reasons why the Finnish consumer undertakes international outsourcing: because it needs access to cutting-edge technology. Though the Finnish consumer lacked cutting-edge technology, it did possess sufficient market knowledge. The Finnish consumer shared its market knowledge with the provider and in return received training in leading cutting-edge technology from the provider. Therefore, both parties constantly upgrade their knowledge. This finding demonstrates that the successful implementation of IT innovations requires training (Lyytinen and Hirscheim 1987; Nahar 2001).

Reviewing milestones together. The two parties in Jipeq's case conducted milestone reviews together. These reviews were not executed in meetings on a regular basis; rather, they were executed through spiral and parallel models. Through these two models, the Finnish consumer receives periodic deliveries frequently. The Finnish consumer company verifies the reviews with Jipeq by checking the periodic deliveries against the planned requirements and schedules, and then sends the periodic deliveries back to the provider, possibly with additional requirements (Project coordinator, Jipeq, Helsinki, 2002). Such milestone reviews afford the Finnish company more time to send feedback as well as increase the possibility of user acceptance in the final user-acceptance testing.

Reporting progress by the provider. Jipeq required progress reports. One interviewee described the details of the progress report as follows:

"The issues that we wanted them to report to us appear in two lists: one is the total work done for this week, another is the completion date if there was any delay." (Project coordinator, Jipeq, Helsinki, 2002)

Jipeq's management provided strong commitment and effective support to the implementation of the IT-SIOSP project in India. These findings demonstrate that management support is essential to the successful implementation of innovation, technology diffusion (Nahar 2001), and IT innovations (Lyytinen and Hirscheim 1987; Nahar 2001). Cultural differences have occasionally slowed the implementation of international outsourcing projects. One interviewee explained this as follows:

"The main problem that we faced was the difficulty in correctly understanding the requirements. Communication, of course, was one of the major barriers that influenced this. But our process is basically meant to overcome those problems." (Head of business development, Helsinki, 2002)

From a management perspective, cultural issues cannot be ignored; Indian culture is very different from Finnish culture. Indian companies do not always communicate with perfect transparency; they may occasionally conceal certain information as they used to (Head of business development, Helsinki, 2002), thus slowing project implementation

During the project implementation phase, in addition to the traditional methods, both parties used MS project management software, MS PowerPoint, MS word documents, and the telephone to manage the implementation and to review the milestones. These findings show that IT has seen very little use in the project implementation phase. Jipeq considered the use of video conferencing for training or for milestone reviews unnecessary because the bandwidth in India is quite low and the level of education among Indian professionals is very high. Consequently, Jipeq experienced no problems in project implementation. This agrees with the conceptual framework of IT-SIOSP, which suggests that project implementation is one of the phases of the international outsourcing.

4.1.6. Managing relationship

Good management of the outsourcing relationship is a key to successful outsourcing, and to achieving the benefits sought from discontinuing in-house provision. Relationship management goes beyond the structure of the contract; the consumer develops and employs standard processes to manage the relationship in areas such as resolving issues and initiating (directing) work. Responsibility is executed through control and management of the processes, people, and technology associated with software production.

Managing the outsourcing relationship with both Finnish consumer and Indian provider was the key factor that helped Jipeq to successfully complete international outsourcing.

Creating a management structure. The structure of relationship management differs from the management structure of the implementation team. Jipeq manages the relationship between both the provider and the consumer. Since the management structure involves the personnel of three parties, it is important to understand each party's philosophy and culture.

To facilitate compatibility of the management structure with the culture and business changes of the two parties', the project coordinator from Jipeq was in one case sent to the provider's site, where she worked at length with the provider to develop a process to enable the two parties to cooperate on the project. This new process requires the provider to undertake greater management responsibility to promote more harmonious cooperation.

Effective and open communication. During the interviews, the interviewees repeatedly emphasized the importance of communication. They pointed out that communication is embodied in the spirit of successful relationship management throughout the international outsourcing process. This arises in one interviewee's statement:

"Communications always help because through effective communication, we ensure that we understand the customer's requirements. We want to ensure that there are no additional customer requirements. If necessary, we can teleconference with the customer and the project manager to identify requirements." (Project coordinator, Jipeq, Helsinki, 2002)

These findings demonstrate that communication is necessary in identifying and resolving potential problems before they cause disruptions. To improve communication efficiency, Jipeq recruited a project coordinator not only to interact with the consumer and the implementation team, but to lead the team as well.

The head of business development also talked about the problem of ineffective communication between the Finnish consumer and the Indian providers, which suggests that ineffective communication can raise severe difficulties for relationship management.

Free knowledge sharing. Free information-sharing between the two parties allows them to maintain a more effective relationship and become knowledgeable about each other's company.

Developing performance metrics and monitoring the mechanisms. Before starting the project implementation, Jipeq already defined the performance metrics to use to monitor the provider's performance. Jipeq sent a project coordinator to India to work for two months with the Indian provider's management to define the formal processes, details, and responsibilities of the two companies' cooperation on the project.

Monitoring performance routinely. Jipeq developed a formal implementation process (procedures) with the provider before the project started. Following these procedures, Jipeq monitored the provider's performance against the formal processes during the implementation process. Besides monitoring the provider's performance by checking it against the formal process procedure defined earlier, Jipeq also required the Indian provider to produce a detailed weekly report on the working progress. A description/explanation of this detailed report appears in Section 4.1.5. Project implementation.

These findings demonstrate that the performance monitoring was conducted weekly through the reporting system. If any problem appeared, Jipeq not only attempted to solve the problems by themselves, but did so through direct open cooperation with the consumer. Such a fully transparent performance-monitoring mechanism allows Jipeq to reduce the risks of implementation and to maintain a smooth implementation process.

Realigning the contract. As the consumer frequently asked to add or change functionality during the implementation project, Jipeq realized that frequent project alterations, especially on a big project, could cause structural change. Therefore, Jipeq decided to adopt strict rule governing change management. This change management rule required the agreement of the three parties and the implementation team's execution. The strict change management rules help Jipeq to eliminate frequent, unscheduled changes.

During the relationship management phase, the Web-based project management software, the Extranet, and Internet play an important role in monitoring the project underway. The advanced project management tool Jipeq used is particularly important in monitoring the provider's performance. One interviewee noted:

"The project tracking is mostly done with Microsoft Project Management software. However, in some projects we use something called Web tracker. There are also other tools, which are used for bug tracking and defect tracking, such as Bugzilla, for example. We have not actually used Web-based tools such as Project-plans in any projects because with Web tracker, we can interact quite well." (Head of business development, Jipeq, Helsinki, 2002)

Besides the Web-based project management tool, e-mail, fax and telephone, teleconference communication and videoconference IT tools were used in relationship management phase, to enhance effective communication. These findings reveal that use of these IT tools helps Jipeq to manage the relationship efficiently and effectively. It also reduces the amount of traveling and face-to-face meetings, increases the international outsourcing consumer's capacity and ability to manage the relationship remotely. This phase is consistent with the conceptual framework of IT-SIOSP.

4.1.7. Evaluation and contract termination

During this phase, the contract relationship ends upon delivery of the products and receipt of payment, or continues with a new contract for an outsourcing software development project. The consumer examines product performance, studies the positive and negative outcomes of the outsourcing, stores documents in a lessons-learned depository (Nahar 2001), assesses the alternatives of extending the relationship or switching providers (Lacity and Willcocks 2001), and establishes a basis for reviewing the core competence strategy.

Establishing evaluation basis. The project's success is measured in terms of customer satisfaction. The costs and the previously-defined quality standards are the key basis for evaluation, especially the product's functionality.

Evaluating products. The outsourcing consumer received products and documentation from the provider first by FTP and email, and then received a CD containing programming codes and documentation. After the outsourcing consumer received the products and documentation from the provider, they conducted user-acceptance testing or integration-testing to integrate the products into their own system. A separate quality assurance team, organized by two to eight people from the three parties, usually performed user-acceptance testing and evaluations. Jipeq had confidence in the provider's technical expertise, thus Jipeq was more concerned with the delivery verification and administration management, such as making a test plan or receiving feedback, than with technical testing. The consumer himself usually performed the integration testing. The product was evaluated at a meeting between Jipeq and the consumer, as well as through the formal evaluation forms that the consumer and the implementation team completed.

Making payment. Typically, Jipeq paid the service provider at the end of each month upon completion of the work. For example, at the end of each month, the five people working on the project full time would receive an invoice. In some cases, Jipeq paid according to the milestones. From these milestones, when the high level of project and low-level of subproject were designed and delivered, Jipeq paid 30 percent of the total price to the provider. Upon completion of the coding, Jipeq paid another 30 percent. After completion and acceptance of the user acceptance testing, Jipeq paid the provider the remaining 60 percent (Project coordination, Jipeq, Helsinki, 2002). As the international outsourcing consumer had its own preferred payment mechanism, Jipeq was flexible enough to adapt to the customized payment method according to the consumer's requirements.

Studying the positive and negative outcomes. To maximize efficiency and effectiveness in future international outsourcing projects, Jipeq studied the positive and negative outcomes of their experience. Jipeq found that the iteration spiral model and the parallel model were efficient working models that had already performed effectively in the previous international outsourcing process. Through the project evaluation meeting with the consumer, and the formal evaluation forms, Jipeq learned where consumer satisfaction is and why. By analyzing the evaluation forms completed by the developers, Jipeq also receives feedback about the project implementation process. The experience gained from studying the negative outcomes allows Jipeq to avoid similar problems in the future.

The above findings demonstrate that from studying the negative feedback, Jipeq has learned to avoid the occurrence of similar problems in the future, and to improve its ability to protect itself and the provider.

Assessing the alternatives. Based on the study of positive and negative outcomes, Jipeq determined to extend its relationship with its sole Indian provider, which handled all of Jipeq's international outsourcing projects in India. Jipeq even had some additional orders from the same consumer, and then extended the contract with the same provider. The primary reason for extending the relationship with Indian provider was that the Indian provider had all the necessary knowledge and competence Jipeq required. Other reasons include strategic business concerns, and a good and trusted relationship based on the previous outsourcing project.

Documented and stored analyses in depository. Jipeq stored all documentation and reports as organizational knowledge for managing the outsourcing process more easily in the future. Jipeq has previous experience with international outsourcing projects and always learns from its experience in order to improve the operation of its international outsourcing projects. One interviewee explained this as follows:

"The learning curve of the projects is quite high, so we go through previous projects and try to see how they have been done before. We try not to make the same mistakes again. So, the more mistakes we made, the more lessons we can learn. We will easily know about possible threats or problems in the new project." (Head of the business development, Jipeq, Helsinki, 2002)

Jipeq has previous experience regarding the implementation of the same IT-SIOSP in developing countries and emerging markets, and their staffs have personal working experience in those countries, including India. This experience helped them to implement the IT-SIOSP project

efficiently in India. This demonstrates that experience increases the chances of successful implementation of IT innovations (Nahar 2001).

Jipeq uses e-mail, telephone and teleconferencing to overcome various obstacles through collaboration, and has developed databases to store documentation and reports. This demonstrates that the evaluation and contract termination phase in Jipeq's international outsourcing process supports the conceptual framework of the IT-SIOSP.

5. DISCUSSIONS

The above case presents Jipeq's IT-SIOSP process in detail. Each of these phases consists of many different and inter-linked issues. With regard to research questions, in-depth research and a thorough analysis of the information retrieved from the interviewees revealed the following:

Jipeq conducted seven phases of the international outsourcing process. For several reasons, including the underdevelopment of IT in India, the limited resources available to Jipeq for running complex IT infrastructure and extensive personal networks reduce the need for IT tools. Jipeq used IT tools on a limited scale in some phases of its international outsourcing process, such as in international market research and promotion, project implementation, relationship management and evaluation, and contract termination. Jipeq used no IT tools in other phases and executed the international outsourcing process successfully. Presently, Jipeq uses various IT tools to execute international outsourcing, including databases, a search engine, a Web-based project management tool, e-mail, telephones, teleconferencing, Microsoft Office, and groupware. Besides IT tools, Jipeq still employs some traditional methods in each phase of the international outsourcing process, such as face-to-face meetings, interviews, visits, and others. Jipeq emphasizes that a good personal relationship with the Indian provider is the key to the successful execution of the international outsourcing process.

In terms of value-network thinking, Jipeq attempts to add value by acting as a middleman and overcoming cultural and communication differences. This type of business model is very fragile since the privilege of entry is based on relationship.

5.1. Implications

This study proposes an approach to how effectively to execute an IT-SIOSP.

It is important for companies to gain an understanding of the IT-SIOSP process. The results of this research are useful in providing such understanding. A case company investigation developed and validated the conceptual framework, the purpose of which is to offer effective guidance for companies attempting internationalization using IT in their own international outsourcing. This case study demonstrated how Jipeq is successfully utilizing IT tools in their international outsourcing.

This study presents a comprehensive picture of what actually happens in an IT-SIOSP process. The effective utilization of this framework via the addition of IT tools can provide many benefits such as: (1) correct decision-making on international outsourcing, (2) fast rapid selection of suitable providers for international outsourcing, (3) effective and efficient market research and promotion for international outsourcing, (4) reduced time and expenses of international outsourcing, (5) the facilitation of worldwide collaboration and creation of a knowledge-base of the international outsourcing process, and (6) the reduction of obstacles in the execution of the IT-SIOSP.

5.2. Applications of the framework

The IT-SIOSP is a generic process framework. A company should adapt it according to its specific situation. In the case at hand, the framework may not entirely apply. Technology did not play a significant role in all phases because the company values the relationship through face-to-face contacts, which allow it to build trust and to see if the chemistry of the relationship works. Technology does not build a relationship; instead, it may support the relationship building process.

Nevertheless, applying the IT-SIOSP process to an international context helps the companies to bridge the geographical gap, reduce both travel and communication problems by enabling them to reach their partners at any time, any place. However, to effectively apply this framework, both partners must have adequate IT infrastructures; this is the prerequisite of the framework.

6. CONCLUSIONS

This research project aimed to explore the execution of the IT-SIOSP process. To answer the research questions, a single case study of the integral factors involved in an IT-SIOSP process has been analyzed.

An in-depth literature review revealed that thus far, only limited research exists on the IT-SIOSP process. To improve the state of the field, we conducted an in-depth study of the following questions: (1) What are the phases of the IT-SIOSP process and how are these phases executed? (2) What major activities does each phase of the international outsourcing process involve and how are these activities managed? (3) What are the performance measures, the expected outcomes, and the supported IT tools of each phase? This study examines the IT-SIOSP process from the user's perspective.

6.1. Major contributions

This study contributes in terms of both theory and practice to our understanding of the IT-SIOSP process by focusing on the major activities, performance measures, and expected outcomes of the international outsourcing process necessary for the successful execution of an IT-SIOSP process.

On the theoretical level, it contributes to the existing knowledge in the following ways:

- It contributes to the/our scientific understanding of the IT-SIOSP by describing in detail the international outsourcing process of one case company.
- It develops a broad view of the international outsourcing process rather than focuses on a single aspect of international outsourcing. In this framework, the main activities related to performance measures, expected outcomes, and supported IT tools were identified and described in each sub-process.
- Through an empirical research, this study also indicated both micro and macro level factors affecting IT-SIOSP project implementation.

On a practical level, the study contributes to the existing knowledge in the following ways:

- It provides a detailed account of what actually happens in the IT-SIOSP, to facilitate better understanding.
- It identifies the main activities that should receive more emphasis in order to improve international outsourcing performance.
- It also identifies performance measures and expected outcomes that can assist IT and business managers in judging the various factors that contribute to the efficiency and effectiveness of the process. Such performance measures could serve as a control mechanism to manage the IT-SIOSP process more efficiently and effectively.

The approach establishes a specific and detailed process framework for international outsourcing, and demonstrates that the systematic utilization of IT can facilitate cost-effective international outsourcing for companies.

6.2. Limitations of the study

Because this study involves only a single case study, it may be insufficient to develop such a framework. According to Nahar (2001), one frequent criticism of the single case study method has been that the findings are difficult to generalize as they are based on small samples and qualitative subjective data. To avoid subjective bias, several measures have been integrated into the research design (Nahar 2001). These include the following measures: 1) developing a data collection protocol and formulating a questionnaire guide, 2) verifying the questionnaire guide with research supervisors, 3) developing data analysis tools, 4) verifyign analysis and research results with supervisors and other

researchers, and 5) having informants from the investigated company approve the research results.

Because the investigated international outsourcing consumer company is a Finnish high-tech company, the research results are based on the investigations of the company in one country. Consequently, the research results may not represent outsourcing consumers of other national cultures. If we were to pose the same questions to consumers from other countries, such as the U.S., we may obtain slightly different results.

Though this study focused on the IT-SIOSP process, the international outsourcing process encompasses a wide variety of outsourcing types, such as body shopping, project management, total outsourcing, business process outsourcing, and transitional outsourcing. Since the company we investigated has experience in this type of international outsourcing, it logically follows that this study should concentrate on an international outsourcing project. The findings should not, however, be taken provisionally simply because of the above limitations of this research.

6.3. Future research directions

The framework of the IT-SIOSP is composed of seven inter-linked phases, including: 1) strategic analysis and decision, 2) international market research and promotion, 3) selection of providers, 4) contract negotiation, 5) project implementation, 6) relationship management, and 7) evaluation and contract termination. Each of these phases requires development through additional research.

We did not, however, address the risk management involved in international outsourcing in this framework. Risks associated with international outsourcing projects, such as the risk management issue and the insecurity of transferring important files over the Internet. Due to the geographical distance, the international outsourcing consumer cannot simply monitor suppliers or arrange spontaneous meetings. Therefore, we believe that the question of how to control the risks involved in international outsourcing project management requires additional research.

Since the long-term success of IT-SIOSP projects depends on many factors, additional research would help to answer the question: What are the critical success factors of the IT-SIOSP process and how do they ensure success?

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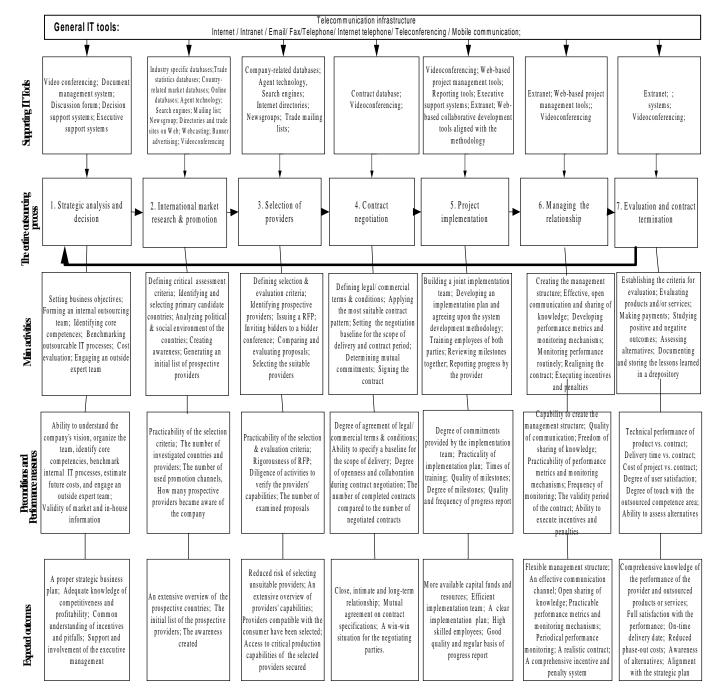Yalaho, A. and C. Wu 2002. A Conceptual Framework for IT-Supported International Outsourcing of Software Production. Department of computer science and Information Systems. Jyväskylä, University of Jyväskylä: p.186.

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APPENDIX I

The framework of IT-supported international outsourcing process (Yalaho and Wu 2002)

General IT tools:
Telecommunication infrastructure
Internet / Intranet / Email/ Fax/Telephone/ Internet telephone/ Teleconferencing / Mobile communication;

	1	2	3	4	5	6	7
Supporting IT tools	Video conferencing; Document management system; Discussion forum; Decision support systems; Executive support systems	Industry specific databases;Trade statistics databases; Country-related market databases; Online databases; Agent technology; Search engines; Mailing list; Newsgroup; Directories and trade sites on Web; Webcasting; Banner advertising; Videoconferencing	Company-related databases; Agent technology, Search engines; Internet directories; Newsgroups; Trade mailing lists;	Contract database; Videoconferencing;	Videoconferencing; Web-based project management tools; Reporting tools; Executive support systems; Extranet; Web-based collaborative development tools aligned with the methodology	Extranet; Web-based project management tools;; Videoconferencing	Extranet; ; systems; Videoconferencing;
The entire outsourcing process	1. Strategic analysis and decision	2. International market research & promotion	3. Selection of providers	4. Contract negotiation	5. Project implementation	6. Managing the relationship	7. Evaluation and contract termination
Main activities	Setting business objectives; Forming an internal outsourcing team; Identifying core competences; Benchmarking outsourcable IT processes; Cost evaluation; Engaging an outside expert team	Defining critical assessment criteria; Identifying and selecting primary candidate countries; Analyzing political & social environment of the countries; Creating awareness; Generating an initial list of prospective providers	Defining selection & evaluation criteria; Identifying prospective providers; Issuing a RFP; Inviting bidders to a bidder conference; Comparing and evaluating proposals; Selecting the suitable providers	Defining legal/ commercial terms & conditions; Applying the most suitable contract pattern; Setting the negotiation baseline for the scope of delivery and contract period; Determining mutual commitments; Signing the contract	Building a joint implementation team; Developing an implementation plan and agreeing upon the system development methodology; Training employees of both parties; Reviewing milestones together; Reporting progress by the provider	Creating the management structure; Effective, open communication and sharing of knowledge; Developing performance metrics and monitoring mechanisms; Monitoring performance routinely; Realigning the contract; Executing incentives and penalties	Establishing the criteria for evaluation; Evaluating products and/or services; Making payments; Studying positive and negative outcomes; Assessing alternatives; Documenting and storing the lessons learned in a drepository
Preconditions and Performance measures	Ability to understand the company's vision, organize the team, identify core competencies, benchmark internal IT processes, estimate future costs, and engage an outside expert team; Validity of market and in-house information	Practicability of the selection criteria; The number of investigated countries and providers; The number of used promotion channels, How many prospective providers became aware of the company	Practicability of the selection & evaluation criteria; Rigorousness of RFP; Diligence of activities to verify the providers' capabilities; The number of examined proposals	Degree of agreement of legal/ commercial terms & conditions; Ability to specify a baseline for the scope of delivery; Degree of openness and collaboration during contract negotiation; The number of completed contracts compared to the number of negotiated contracts	Degree of commitments provided by the implementation team; Practicality of implementation plan; Times of training; Quality of milestones; Degree of milestones; Quality and frequency of progress report	Capability to create the management structure; Quality of communication; Freedom of sharing of knowledge; Practicability of performance metrics and monitoring mechanisms; Frequency of monitoring; The validity period of the contract; Ability to execute incentives and penalties	Technical performance of product vs. contract; Delivery time vs. contract; Cost of project vs. contract; Degree of user satisfaction; Degree of touch with the outsourced competence area; Ability to assess alternatives
Expected outcomes	A proper strategic business plan; Adequate knowledge of competitiveness and profitability; Common understanding of incentives and pitfalls; Support and involvement of the executive management	An extensive overview of the prospective countries; The initial list of the prospective providers; The awareness created	Reduced risk of selecting unsuitable providers; An extensive overview of providers' capabilities; Providers compatible with the consumer have been selected; Access to critical production capabilities of the selected providers secured	Close, intimate and long-term relationship; Mutual agreement on contract specifications; A win-win situation for the negotiating parties.	More available capital funds and resources; Efficient implementation team; A clear implementation plan; High skilled employees; Good quality and regular basis of progress report	Flexible management structure; An effective communication channel; Open sharing of knowledge; Practicable performance metrics and monitoring mechanisms; Periodical performance monitoring; A realistic contract; A comprehensive incentive and penalty system	Comprehensive knowledge of the performance of the provider and outsourced products or services; Full satisfaction with the performance; On-time delivery date; Reduced phase-out costs; Awareness of alternatives; Alignment with the strategic plan

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