Anicet Yalaho and Chunling Wu

IT-Supported International Outsourcing of Software Production

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Department of Computer Science and Information Systems
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ABSTRACT

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Chunling Wu and Anicet Yalaho

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This study analyses how the IT supported international outsourcing of software production process is executed. We present essential ideas and theoretical background for our study through an in-depth literature review in the areas of subcontracting, outsourcing, international outsourcing, information technology (IT) and international software production. The literature review reveals the limitations of research on IT supported international outsourcing of software production process. Three research questions arise in this context. (1) What are the phases of the IT supported international outsourcing process and how these phases are executed? (2) What are the major activities in each phase of the international outsourcing process and how these activities are managed? (3) What are the performance measures and expected outcomes of each phase?

The study addresses these research questions (1) by conceptualising a framework on IT supported international outsourcing of software production in the light of diffusion of innovation theory and relevant literature in the fields of outsourcing, software production and IT and (2) by conducting an empirical investigation.

This study reports the results of an empirical research focusing on the IT supported international outsourcing process of software production through a single case study. Different issues associated with the conceptual framework of IT supported international outsourcing process of software production have been classified and analysed based on our empirical findings. The major contribution of this framework is to help companies to understand, improve and systematise the IT supported international outsourcing process of software

production.

KEYWORDS: Information technology, Outsourcing, International outsourcing, Diffusion of innovation, Subcontracting, International software production

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1. INTRODUCTION

This study analyses how the IT supported international outsourcing of software production process is executed. It focuses on companies in developed countries that may act as outsourcing consumers and on software companies in developing countries that may act as outsourcing service providers. It particularly emphasises the consumer perspective.

In this chapter, we introduce the background of the research. Section 1.1 discusses the significance of this research and the lack of research on this topic. Section 1.2 introduces some previous research in the area of international outsourcing. The current situation of the international outsourcing of software production is discussed in Section 1.3. The research questions are presented in Section 1.4. The scope of the research is defined in Section 1.5 and the structure of the research is described in Section 1.6

1.1 Background

The end of the 20th century was characterised by several new facts and trends, which are leaving a definite imprint in the industrial development paradigm. Among such trends, an increase of competition in every industrial sub sector in practically all countries can be observed (UNIDO, 1999). In particular, competition in information technology (IT) sector in the industrialised (e.g. Germany, USA, Japan) and emerging countries (e.g. China, Poland, Brazil, Russia, and India) has increased significantly; several IT service providers have entered into the markets of industrialised and emerging countries and are offering various software development services.

> "By far the most significant drivers of strategic change in the world today, globalisation and technological innovation, are accelerating at a pace that will make them even more important in the decade ahead. Globalisation is proceeding differently in different industries, driven primarily by: a) increasingly similar demands of end users for global products; b) changing needs and capabilities of global customers; c) underlying economies of scale and scope in research, product

> development, and manufacturing; and d) the traditional differential costs of input factors (e.g. labour rates and raw materials in different countries). Technology enables firms within an industry to capture economies of scale and scope by going global; global firms rely on technological innovation to enhance their capabilities. Technology is thus both driven by and a key driver of globalisation. For an example of how globalisation and technological innovation continually reinforce one another we need only look at the way information technology and telecommunications are reshaping competitive landscapes and radically changing how both individuals and firms work together throughout the world". (UNIDO, 1999, pp. 5-9)

In the 1990s, we have witnessed the emergence of new system development tools such as object oriented programming systems (OOPS). This term refers to a number of systems development tools, computer languages, and design methods that are in use as a design philosophy for information systems. OOPS permits a new approach to describe models that make IT accessible to general management. OOPS enables technology to finally approach the language and concepts of business and organisations. System is broken or seen as 'component'; it is described in terms of actors, roles, responsibilities, behaviours, and relations. The main idea behind of object oriented programming is that systems, rather than being a list of things for a computer to do, are description of the objects that compose them as needed, and of the relationship among those objects (Bradley, Hausman and Nolan, 1993). The component of the system has enabled the practice of "programming by contract"(Meyer, 2000). Basically, programming by contract creates a contract between the software developer and software user in Meyer's terms the supplier and the consumer. Programming by contract allows the software houses to slice their software development work in manageable pieces.

The importance of software business and software industry for the world economy has received increasing attention. For example, Quinn et al. (1996, pp. 1-3) state:

> "A revolution is now underway. Most innovation occurs first in software. And software is the primary element in all aspects of innovation from basic research through product introduction:

- Software provides the critical mechanism through which managers can lower the costs, compress the time cycles, and increase the value of innovations. It is also the heart of the learning and knowledge processes that give innovations their highest payoffs.

- In many cases, software is the core element in process innovations or increasing the functionalities that make products valuable to customers. In others, software is the product or service the customer actually receives.

- Software provides the central vehicle enabling the inventor-user interactions, rapid distribution of products, and market feedback that add most value to innovations. Consequently, customers and the software itself make many inventions the company's technologists, acting alone, could not conceive".

Software has become one of the largest and fastest growing industries in the world today. According to IDC (2001), in 2000, the sector (1) sold programs worth $180 billion and spending on software was increasing by 15% a year and (2) influenced investments of another $800 billion in hardware and services. Overall, the competition has intensified and market size of the telecom and IT sector has increased significantly over the previous years.

Over the last two decades, competition has been considered as the main driver to gain efficiency and effectiveness at the enterprise and country level. Market protections or reserves, establishment of cartels, and dominant positions have been dismissed or discouraged (UNIDO, 1999, pp.1-2).

In late 1990s, international competition in various industrial sectors was becoming tougher due to the economic performance of the USA, Germany, Japan, and Italy. In these countries, several industries attained strong positions in external and internal markets (UNIDO, 1999, pp.1-2).

IT industries in general and the software industries in particular in countries such as Finland, Sweden, USA, Germany, Ireland, Israel, and Japan have made significant technological progress. Companies of these countries have established themselves both in their domestic markets and foreign markets.

Moreover, the planned economies collapsed making competition the unique and dominant economic paradigm (Porter, 1999). The need to compete cannot be ignored by any company, irrespective of their field and country. Especially, the software companies need to be innovative and compete very effectively in order to remain in business. This is partly due to the fact that their products are digital and can be sold and distributed globally through the Internet.

Industrial subcontracting or outsourcing fits well as an instrument in the drive towards increased competition and in the development of the cluster structure. Subcontracting has been practiced as a way to gain effectiveness by reducing the main contractor's fixed costs, by acquiring flexibility to react better and faster to market demands, and by avoiding non-strategic investments in various industries, including software industry. Furthermore, in complex industrial networks, subcontracting includes the co-operation in the development, manufacturing and supply of components, of complex sub-assemblies and of specialised tailored services. Subcontracting is a common practice in developed economies. IT companies of industrialised countries have been using this approach for developing and manufacturing their hardware. They also subcontract software production due to their need of technology and a shortage of skilled software professionals.

1.2 Previous research

Several researchers (Smith, Sabyasachi and Narasimhan, 1996; McFarlan, 1996; Kumar, Sita and Netaji, 1996; Harindranath and Dhillon, 1997; Heeks, 1999; Lacity and Willcock, 2000; Nahar, Käkölä and Huda, 2002) have done research on international outsourcing of software production. Their findings reveal the motives of international outsourcing, the risks involved in it, how to structure international outsourcing contracts and monitor the resulting effort. We have done intensive literature review (Chapter 2) and found no research that had dealt in-depth with the management issues of international outsourcing of

software production; especially, the international outsourcing of software production process. The software-outsourcing projects in developing and emerging countries become influenced by a variety of factors and encounter several barriers. The influencing factors include a) strategic impact and criticality, b) technological uncertainty, c) functional complexity, d) procedural knowledge, e) performance documentation, f) asset specificity, g) cultural proximity, h) environmental uncertainty, and i) IT infrastructure of the host country (Käkölä, Nahar and Huda, 2002). However, international software outsourcing is complex due to the differences of technological level of the workers of the outsourcing consumer and provider, cultural differences, a lack of good telecom infrastructure, and several other differences in macro factors. (Käkölä, Nahar and Huda, 2002). Due to these barriers, international outsourcing is very complex. Without effective management of these factors, the project may cause troubles for the consumers; even the project may end up in failure.

So, it is very challenging to manage an outsourcing project. Western companies are facing great difficulties in managing outsourcing projects. Frequently they fail to meet the quality, cost, and delivery time of the outsourcing projects. Our literature review indicates that very limited literature exists on international outsourcing of software production project management. In particular, extensive literature exists about risks involved in the outsourcing project management. Researchers (Heeks, Krishna, Nicholson and Sahay, 2001) have mentioned that it is very difficult to control outsourcing projects. However, their research does not deliver an effective control mechanism, which is the most essential tool for avoiding the risks. In fact, there is very limited literature on how to manage an outsourcing project in order to avoid these risks. Therefore, research is needed on this issue.

Earlier research findings (Heeks, 1999; Nahar, Käkölä and Huda, 2002) indicate that commonly the outsourcing service providers (OSPs) located in low cost

software production countries lack methods and tools in the areas of software development, quality assurance, project management, and documentation. In order to produce quality software through international outsourcing, software technology transfer covering aforementioned areas is needed from the Western company to OSPs in low cost software production countries. In addition, training is provided on the software concept, tools, and methods in modern software development (McFarlan, 1996; Nahar, Käkölä and Huda, 2002). Furthermore, the outsourcing service user's (OSU) company specific competence is transmitted to OSP through intensive training of the key personnel of OSP, which may also include using the same CASE tools that OSU is using for its own software production. Successful product development through international outsourcing very much depends on effective software technology transfer.

> "Technology transfer refers here to a process wherein the technology is communicated and transmitted by the supplier to the receiver, across national borders to enhance the capabilities of the receiver. Technology refers here to applied scientific knowledge and skills that facilitate the manufacturing of a product or the performing of a service" (Nahar, 2001, p.16).

Literature review also indicates that very limited literature exists on which software technologies are transferred though the international outsourcing arrangements and how they are transferred. Therefore, research is needed on this issue as well.

1.3 Current situation of international software outsourcing

International outsourcing is becoming the established way of doing business. Companies from the Western countries are attempting to produce their software or software related product in developing countries (Käkölä, Nahar and Huda, 2002; Press, 1993; Wu and Lin, 1999). In the past international outsourcing was driven by cost savings (Chen, 1996; Elmuti and Kathawala, 2000). However, recently things have changed (Lacity and Willcocks, 2002, pp. xi-xiv). Ahead of cost savings, firms frequently cite new drivers such as: (1)

timely access to highly qualified technical talent, (2) faster time-to-market and accelerated delivery, (3) ability to significantly expand the organization's software development capacity at minimal costs, (4) opportunity to accelerate the improvement in their own software process and quality capabilities by working with world-class offshore companies, and (5) reduction in the risk of cost overruns and late projects, (6) increase the level and quality of customer service, proximity to customer, (7) increases the companies' competitive ability, and (8)increase flexibility)

Increasingly competitive pressures and globalisation have forced many companies to search for better and more efficient ways of utilising IT for competitive advantage and superior performance (Braldey, Hausman and Nolan, 1993; Harindranath and Dhillon, 1997). In this regard, more and more software companies are turning towards cooperative relationships as a solution to their IT needs, in particular to their technology and IT staff needs (Käkölä, Nahar and Huda, 2002). Software development is extremely high-cost, labour-intensive, and skill-intensive (Blumberg, 1998a). Software companies strive for an ever-delusive competitive advantage in today's global economy. They are facing intense competition for efficient, on time, and within budget production. Customers' preferences and requirements for software are changing fast. Especially, in developed countries, software companies are in shortage of appropriately trained software professionals. In addition, "The software industry has achieved a notorious reputation for being out of control in terms of schedule accuracy, cost accuracy, and quality control" (Jones, 1998, p. 1). In response to these problems and business trends, software companies may overcome these challenges by transferring software professionals, facilities, hardware leases, and software licenses to third party vendors located in developing countries. This practise is called international outsourcing. It allows the companies to "share and spread" the software expenditures and maintain and improve their innovativeness.

Companies are facing a shorten product development life cycle, rapid technology change and these factors require a continual retrain of IT staff. This is difficult for companies to keep up with when they try to focus on core business. Cost reduction is one of the reasons for global outsourcing activities.

Western companies often spend a high amount of time and money only to explore how to execute many tasks of various phases of international outsourcing process. In our view, this is because there is no systematic framework of international outsourcing process, which describes the phases of the process in enough detail. We have found limited literature to guide companies how to execute the great number of tasks in each phase of an international outsourcing process. Therefore, in-depth research is needed on international outsourcing of software production (c.f., Nahar, Käkölä and Huda, 2002; McFarlan and Nolan, 1995; Heeks, 1999; and Lacity and Willcock, 2002).

1.4 Research problem and questions

We have explained above why software companies may benefit from developing software through international outsourcing. However, software production through international outsourcing is complex, because it involves several barriers, such as inappropriate management know-how and low intellectual protection. In this complex environment, research is necessary to identify how companies could execute international software outsourcing as effectively as possible. Our literature review reveals that there is a lack of systematic research on international outsourcing projects. In particular, there is no detailed framework to guide managers to execute IT-supported international outsourcing process.

The research question addressed in this study is: **How is the software production through IT-supported international outsourcing process executed?**

Prior literature suggests that this research question should be divided into the following specific questions, which are useful in building the framework for executing IT-supported international outsourcing process:

1. What are the phases of the international outsourcing process and how these phases are executed?

2. What are the major activities in each phase of the international outsourcing process and how these activities are managed?

3. What are the performance measures, expected outcomes, and supporting IT tools in the international outsourcing process?

This research seek to provide answers to these questions by 1) reviewing literature in the fields of international outsourcing, international software production, software technology transfer, and diffusion of innovation theory; (2) studying and choosing most appropriate research methodologies; b) interviewing and consulting with researchers and practitioners; and c) analysing a case company which has executed the outsourcing process several times successfully. Due to limited resources, a single case study method has been utilised in this M.Sc thesis. In further advanced level research, a multiple case study method will be utilised.

1.5 Scope of the research

The study deals with software production through IT-supported international outsourcing process. It investigates how the process and its phases and tasks in the phases have been performed. It develops a conceptual process framework of software production through IT-supported international outsourcing and validates it through the investigation of a Finnish company, which has produced software in India through outsourcing. The study of longer-term

outsourcing of IT infrastructure of organizations is beyond the scope of this research.

1.6 Structure of the thesis

Chapter 1 lay out the background of the study, the current situation of international software outsourcing, the research problem and questions, the scope of the study and the structure of the thesis.-

Chapter 2 reviews the literature concerning outsourcing, international outsourcing. The literature review in outsourcing includes the following issues: basic concepts of outsourcing, major types of outsourcing, outsourcing decision factors, international outsourcing, why international outsourcing, rational for companies to choose outsourcing over in-sourcing, major parties involved in an international outsourcing contract, major activities of international outsourcing process, and major problems and critical mistakes in international outsourcing.

Chapter 3 explores the diffusion of innovation theory through a literature review. The review on the diffusion of IT innovations includes micro level factors, telecommunications and IT industry level factors, and macro level factors.

In Chapter 4, the IT-supported international outsourcing process framework is developed and described. The IT-supported international outsourcing process consists of the following phases: 1) strategic analysis and decision, 2) international market research and promotion, 3) selection of the provider, 4) contract negotiation, 5) project implementation, 6) managing the relationship, and 7) evaluation and contract termination.

Chapter 5 describes the research methodology applied in the empirical part of the study. In order to increase the reliability and validity of the research, the inductive approach is conducted and its suitability for the examination of the

research questions has been analysed. Then, an in-depth analysis of the case study method has been conducted and the reasons behind the selection of a single case study method have been explained. This study investigates the research questions by performing qualitative data collections and analysis techniques.

Chapter 6 presents the case analysis of the investigated high-tech company Jipeq. It investigates the company in order to answer the main research question “How is the software production through IT-supported international outsourcing process executed?” and to validate the framework proposed in Chapter 4.

Chapter 7 concludes the overall study and discusses its results and implications.

Anicet Yalaho has written the abstract and Chapters 1, 2 & 3. Chunling Wu has written Chapters 4, 5 & 7. Chapter 6 has been written together. In addition, we made comments on each other’s respective chapters through intensive discussions, which in turn improved the depth and quality of the thesis.

2. LITERATURE REVIEW

We conducted a literature review in order to obtain the following objectives: a) identify the research gaps, b) determine both the research problem and questions, c) formulate the objectives of the study, d) acquire understanding of the research area under investigation, e) develop a theoretical background for this study, f) identify a suitable research methodology, and g) develop a conceptual framework for this study.

2.1. Outsourcing

Outsourcing is defined as the transferring of an internal function or functions of the information systems department to an external organisation (Ketler and Willems, 1999). According to Fitzgerald and Willcocks (1994a), outsourcing is defined as the commissioning of a third party, or a number of third parties, to manage a client organization's information technology assets, people and/or activities to required standards.

Outsourcing can also be defined as the transfer of an internal service function or activities to an outside vendor (Dilys, 1996). Basically, outsourcing is performed offsite. However, there are cases when it occurs on-site. In some literature, the term "contracting out" (Domberger, 1998, pp. 1-3) and subcontracting are used to denote buying a product or service from an outside supplier rather than providing it in-house. The terms are often used interchangeably. The word outsourcing has become the preferred term in most literature. The concept of outsourcing has gone beyond mere contracting out. It has become an intricate part of the reengineering revolution of the 1990s.

From the literature review, we can find that outsourcing is a general procedure employed in the business world (Chen, 1998) when one entity, the customer C, chooses to outsource a certain task to an external entity, the agent A. The reasons for a customer to outsource the task to the agent could be many ranging

from a lack of resources to perform the task locally to a deliberate choice made for financial reasons (that is, it could be cheaper to outsource).

Reengineering is often associated with outsourcing. Reengineering, which can be applied equally to large corporations and small businesses, begins with an analysis of yourself, your strategy, your staff, the other people you work with, the technology you use, and the process you employ to do the job. Hammer (1995, p.3) defines reengineering as “the fundamental rethinking and radical redesign of business processes to bring about dramatic improvements in performance”. It is a key principle for evaluating an organisation’s main activities and then looking at how those main activities could function better regardless of the methods or procedures already in place. Reengineering does not always result in outsourcing. Instead it lays down the opportunity to consider outsourcing as one of the tools companies can use to achieve organisational change. Organisations prepared to think about how best to produce, market, and distribute a product or service will be forced to ask themselves whether they truly need to own all the processes within their companies and whether their in-house staff can correctly discover inefficiencies (Greaver II, 1999).

“In-sourcing is the practice of evaluating the outsourcing option, but confirming the continued use of internal IT resources to achieve the same objectives of outsourcing” (Hirschheim and Lacity, 2000 p.100). In addition, in-sourcing refers to bringing back in-house an application that has been outsourced. In-sourcing occurs when technology is getting cheaper and it is more advantageous to run an operation internally. It may also happen that a firm would like to keep its IT in house because IT is strategic for its survival. In this case, an outside consultant or the staff of a provider may come in house to train the staff of a consumer under the responsibility of the management of the consumer.

2.2 Major types of outsourcing

Outsourcing has been categorised in different ways. According to Hirschheim and Lacity (1995), outsourcing may be divided into three levels: body shopping, project management, and total outsourcing. Body shopping refers to the use of contract programmers managed by the consumer's employees. In the project management case, the consumer outsources a specific project or part of the work. In such situations, the provider is responsible for the completion and management of (the part of) the project. Total outsourcing refers to a situation when the provider is in total charge of a significant piece of the consumer's all IT activities.

Outsourcing business may be divided into domestic outsourcing and international outsourcing (sometimes also called "offshore outsourcing") (Kroshrowpour, 1994).

2.2.1 Other types of outsourcing

2.2.1.1 Business process outsourcing

Business process outsourcing refers to a situation where a process that can be identified as non-core is outsourced to a third-party that can execute it at a competitive price (Lacity and Willcocks, 2002). This is not a new business. These types of services have been offered for many years (check processing, tax filings, electronic remittances). Usually the services require high level of standardisation and are thus negotiable (to respond to specific consumer needs) only to a very limited degree. Therefore, the service provider often has standard contractual provisions.

2.2.1.2 Transitional outsourcing

The organisations engage itself into a transitional outsourcing contract during the change of technology. For the implementation of the key software applications, the contractors are brought on board to ease the transitional period. With the rapid pace of technology, these tend to occur more and more frequently (Lacity and Willcock, 2002). This is particularly common when consumers change technology platforms so that the providers maintain the legacy systems whilst the consumers concentrate their efforts on the new technologies to be implemented.

2.3 Outsourcing decision factors

Doing business through outsourcing is a growing phenomenon. Outsourcing is beneficial if it delivers to management a set of outputs, outcomes or strategic advantages, which it could not achieve internally through the allocation of additional resources (Klutke, 1997). The fact that management has the responsibility to maximise the shareholder value, outsourcing of non-core functions has become an important business tool.

IT departments, office services and maintenance, insurance, and accounting functions are all being outsourced by businesses that are eager to reduce the size and cost. According to Kurtke (1997) the outsourcing option has added a new impetus to the need that determines the core capabilities that are required to do business and to build a sustainable competitive advantage. The fundamental issue is whether the function under consideration to outsource is a core competence of the organization. Therefore, a sound analysis is necessary. The important issue here is to realise that a skill set is not likely to be core competence in its own right and that a core product does not mean that a core competence exists (Klutke, 1997; Greaver II, 1999). There are many definitions

of core competencies on the subject of outsourcing. However, for the purpose of this study we select the major ones.

“Core competences are the innovative combinations of knowledge, special skills, proprietary technologies, information, and unique operating methods that provide the product or the service that customers value and want to buy” (Greaver II, 1999, p.87). According to Klutke (1997), the core competence is the technology and skill that are more difficult to competitors to replicate. We conceptualise core competence as all the methodologies, knowledge, processes, and information that uniquely characterise one organization.

As Blumberg (1998) pointed out that outsourcing may be a good management tool for companies operating labour-intensive businesses, the companies that experience sharp, steep learning curves, and requirements changing very dramatically because of seasonal or cyclical factor. An example is management and operation of client-server networks. This area is also labour-intensive and experiencing a rapid rate of change; access to skilled labour and expertise is limited. Furthermore, Blumberg (1998) argues that during their evaluation of business function, company should choose to perform internally when the following criteria are encountered:

- Customers are concerned or affected by the process of the functions that are performed. In essence, the function creates a key differentiator.
- Specialised capabilities and physical assets are required to perform the function for which there are a few qualified independent providers.
- Performance of the functions requires relatively high technology and possession of that technology can be a clear advantage to competitors.
- Resources and capabilities exist to achieve world-class performance.

- The organization maintains a leadership position compare to an alternative sources of delivery.
- The internal source is clearly at a competitive cost advantage over external suppliers and/or the rate of improvement in any performance gap is relatively high.
- A long-term commitment exists by senior management to provide this function internally.

However, outsourcing would be more interesting under the circumstances such as (Blumberg, 1998):

- Customers are concerned with the outcome of the functions performed and pay little attention to the process.
- Capabilities are readily available in the mass market and proximity or access to the customer is not an issue.
- The technology to perform the function is very stable.
- World-class performance is not a critical success factor.
- External vendors are clearly more competent.
- Significant capital and resources are required to improve any performance gap.
- Organizations have plans to harvest or exit the business in the near future.

Some organisations do have prior experience in outsourcing others do not have. For those who do have, it may take shorter time to set up an outsourcing project. However, for those who do not have, a preliminary work is necessary to investigate the full strategic assessment (Ketler and Willems, 1999) and

evaluate the outsourcing decision considering a number of factors (Blumberg, 1998). According to Williamson (1991a) the chief information officer (CIO) should spend almost 80% of her / his time for a period of three to six months for evaluating the outsourcing decision.

Another way of making good outsourcing decision is by doing 'reverse analysis'. Reverse analysis means, start from gathering how the vendor's economies are generated and how his promises to satisfy the need of the consumer are in line with these economies. The more that the consumer understands the vendor's business mechanism, the less likely it is the consumer will be disappointed by the contract (Skinner and Bond).

2.4 International outsourcing

International outsourcing involves subcontracting software development and related activities to third parties abroad (Harindranath and Dhillon, 1997). It is a business agreement that allows a firm to look outside for foreign service providers who are capable of performing or subcontracting activities that have done previously in-house domestically (Chin and Lin, 1998; Nahar, Käköla and Huda, 2002). Generally, a software package may be composed of modules. Part of those modules may be developed by a foreign partner (a software house) through subcontracting. The big player in the software industry such as Microsoft has been developing parts of the Windows OS in India and incorporating with the other parts of Windows OS. Microsoft has given its requirements to the Indian subcontractors, provided training to them, monitored and controlled the software production in India, gotten the ready software with quality and in time.

In this study, we deal with international outsourcing of software production, we are not researching on the longitudinal outsourcing therefore the analyses of different types of outsourcing are discarded.

2.5 Why international outsourcing?

Traditional outsourcing, i.e. outsourcing which is limited to using software developers in the clients' home country, has been primarily driven by cost consideration. Although international outsourcing is also driven by similar motivations, several recent trends in the global economy are making it a more attractive option, and quite often even a necessity, for firms in developed countries.

International outsourcing refers to a commercial arrangement, where a contractor entrusts a foreign subcontractor with a commission to produce the software products/services. The subcontractor produces the software products/services, delivers them to the consumers and receives payment (Nahar, Kaköla and Huda, 2002). It may be seen as a business practice of looking outside of the firm for foreign vendors capable of performing or subcontracting various functions previously performed in-house domestically (Chen and Lin, 1998). The globalisation of the world economy is putting increased pressure on companies to become more competitive to look at the bottom line, to reduce cost, and become more efficient, thus forcing more companies to look at alternative ways of doing business. There are various reasons why IT firms prefer international outsourcing instead of domestic outsourcing (domestic outsourcing refers to the outsourcing practice done by the firm within the same country). These reasons have been driven the following forces:

- Overcoming the shortage of IT professionals (Gurbaxani, 1996; Pelton, 1998; Herbsled et al., 2001). The demand for software professionals in the industrialized countries have increased significantly in recent years, recruiting skilled programmers is a burden for companies located in industrial countries. Our investigation shows that the labour market for IT specialists in

Europe will grow from 14.5 million today to 22 million by the year 2003. In real time, 14% of the jobs cannot be filled. The same number is given by IDC in their report “Europe’s IT skills shortage, 1999-2003”.

? Tapping the low cost opportunities of foreign software houses. The gap between the salary of IT professionals in industrialized countries and those in developing countries is so huge that, “many firms are finding offshore software development a viable alternative to in-house development because of lower cost, inability to hire and retain qualified programmers at home, and the growing need to move swiftly from project initialisation to systems installation” (Patane and Jurison, 1994, p.7).

? Global competition forces companies to be proactive by looking ways to produce cheaper reach new customers and expand market positions (Herbsleb and Moitra, 2001).

? “The business advantages of proximity to the market (international market) include knowledge of the customers and local condition” (Herbsleb and Moitra, 2001, p.17).

? Improve time-to-market by using time zone differences in “round-the-clock” development (Herbsleb and Moitra, 2001, p.18).

2.6 Why companies choose outsourcing over in-sourcing?

In-sourcing involves keeping the product development [in our case software development] or service within the firm. This choice has both advantages and disadvantages (Handfield, 1998). The rapid growth in the number of highly capable global competitors facing most organizations in the United States, and developed European markets has forced most organizations to dramatically

improve overall competitiveness by concentrating on their core competence (Prahalad and Hame1, 1990).

“In-sourcing / outsourcing decisions are strategic in nature because they determine where a firm allocates its manufacturing or service resources. These decisions reflect where management believes the company possesses a strong level of core competence. Unfortunately, many firms have locked themselves into a "make" position through years of tradition, i.e., "we have always made this item, so we are not about to stop now!""(Lacity and Hirschheim, 2000, pp. 99-100).

2.6.1 Initiating the in-sourcing/outsourcing decision

According to Handfield (1998), an in-sourcing / outsourcing decision is appropriate for several situations. These include the new buying situation and re-consideration of making to buying and from buying to making. Within a product's life cycle, these situations occur any number of times. Similar analysis of the various in-sourcing / outsourcing factors is necessary for each situation.

2.6.1.1 New product development

The in-sourcing / outsourcing decision process occurs during the new product development cycle, at which point an initial in-sourcing / outsourcing analysis is conducted. This is because “the product, service, and / or components have not yet been provided; there may be minimal information available to guide the analyst in the decision-making process. The components, assemblies, systems, or services under consideration for in-sourcing or outsourcing may represent unfamiliar new technology or different processes. This fact, coupled with the high levels of uncertainty associated with any new product introduction, dictates that an outsource decision can be made initially unless the parts under appraisal are considered as core competencies” (Handfield, 1998, chap.17, p.31).

2.6.1.2 Supplier performance

The failure of current supplier performance may lead to an in-sourcing/outsourcing decision initiation. “When a supplier demonstrates an inability or unwillingness to manufacture a particular part or provides a key service or shows an unwillingness to continuously improve, then the purchasing firm must decide whether to bring back manufacture of the part or component in-house or to develop another capable external source” (Handfield, 1998, chap.17, p.32).

2.6.1.3 Demand patterns

A key decision occurs when there are significant shifts in the marketplace from such conditions, as changing sales demand or changing market economics from technological innovation. “If demand decreases dramatically, then there might be an im00petus to shift production from internal to external sources to make more effective use of the firm's physical assets and skills. Likewise, if demand increases significantly, then the firm might consider in-sourcing the part or component instead of continued outsourcing to garner economies of scale or scope” (Handfield, 1998, p.32).

2.6.1.4 Technology life cycles

Changes in the technology used to produce a particular part or component may also favour a decision to in-source or to outsource. Technology life cycles refer to the duration of a particular technology before it becomes obsolete. An example here is the memory chip: the 486 replaced which the Pentium, and so on replaced.

If a technology is relatively mature or stable, then the technology life cycle will probably last a long time. In such cases, there is some reasonable assurance that investment in capital equipment to produce that technology will have a longer

payback period. On the other hand, if the technology is changing rapidly, outsourcing can help shift the risk to an external source (Handfield, 1998).

2.6.2 Advantages and disadvantages of in-sourcing

There are many advantages in in-sourcing the product or service. The key advantage is "control" (Handfield, 1998). There are cases when the buyer would like to exert control over transfer of technology. If a high degree of control is desired so that proprietary designs or processes can be protected from unauthorized use, then in-sourcing may be preferred over outsourcing. Other alternatives to maintaining control over technologies include confidentiality and nondisclosure agreements. A firm that has selected in-sourcing as a strategy increases its visibility over each step of the process by having more of the factors of production available under its daily control. A dedicated facility can also result in lower per unit costs when economies of scale or scope provide the firm with higher efficiencies (Handfield, 1998).

The disadvantages of in-sourcing are related to the level of investment required when the in-sourcing decision is made. "A high level of investment is required when new plant and equipment is bought. The firm must ensure that adequate volume is present to sufficiently pay back the plant and equipment bought to manufacture the product internally. Second, if the investment is made in dedicated plant and equipment that cannot be utilized for other types of products in the future, the risk associated with the in-sourcing alternative increases". (Handfield, 1998, chap.17, p.33) A good example is the semiconductor industry[1].

[1] In 1995 alone, at least a dozen new semiconductor plants were under construction, including three by Intel and two by Motorola. The average cost of a chip plant is currently about $1.5 billion, but is expected to rise to $3 billion by 1999. The life of these plants is often as little as 6 months, before the chips are replaced by newer technologies. Plant expansions are being made on the premise that investments in new capacity can produce rapid market-share gains. On the risk side, however, analysts are worried that the chip business may gyrate in future years, and the increasing cost of wafer-fabrication plants could soar beyond the reach of all but a few companies (Business Week, 1995)

2.6.3 Reasons for selecting outsourcing over in-sourcing

Most of the firms choose outsourcing for the following reasons:

- The most common reasons why companies turn to outsourcing are economic. Outsourcing service provider companies are specialists in the services they provide, enabling them to provide services at either lower cost or with higher quality at the same cost (Laudon and laudon, 1995).

- Firms are increasingly focusing on what they do best (core competencies) while outsourcing the areas in which they do not possess expertise (Chen and Lin 1998; Leblanc, 1993).

- Firms are forced to reduce product development time and customer order cycle time (Nahar, Käköla and Huda, 2001).

- International "outsourcing can often reduce costs by turning fixed costs into variable costs" (Laudon and laudon, 1995, p.425).

2.7 Major parties involved in an international outsourcing contract

The major parties of an international outsourcing contract are (Nahar, Käkölä and Huda, 2001):

- International outsourcing service consumer

- International outsourcing service provider

2.7.1 International outsourcing service consumer (IOSC)

The international outsourcing service consumer (IOSC) can be defined as the firm generally located in an industrial country that is in need of service provided by a foreign software house.

The IOSC takes the responsibility of developing the competences and providing training to the subcontractor personnel in any specific competencies needed in the international subcontracting collaborations (Nahar, Käköla and Huda, 2002). In most cases, “Most work undertaken by DC developers is relatively low-skill software construction and testing, leaving the high-skill tasks of analysis and design residing in Western hands.” (Heeks, 1999, p.15)

The production of software is a skilled task that “has been fragmented and standardised and thus, into a production process”(Heeks, 1998, p.5). This division of task has enabled the division of skill labour required to tackle each stage of the software production. The earlier stage of the software development such as analysis and design require higher levels of skills and experience, whereas those of coding and testing are relatively less skill-intensive but more labour-intensive (Heeks, 1998). “Coding is a relative simple process…it does not rely on creativity, organizational understanding, or consultation with end users. Common business programming representing more than 80% of the world programming requires comparatively low-level skills”. (Schware, 1987, p.1257)

The IOSC outsources the low-skill (labour intensive part) software construction and testing to developing country outsourcing service providers. As stated by Patane and Jurison (1994, p.9) “Only those tasks which require low user contact are subject to outsourcing”. Customisation and software solution are also outsourced. More often, the IOSC has the experience and skill in project management. Project management skills are acquired after years of practice (experiencing failure and success). The international outsourcing service provider (IOSP) located in developing countries lacks such experience. Thus, most of their employees are new college graduates who have only the technical skills (Heeks, 1998). Also, when it comes to outsource some critical application development, most IOSCs prefer the onsite development by bringing the IOSP developers in-house, “so that the higher skills necessary for software innovation remain the preserve of developed countries” (Heeks, 1998, pp.6-7).

2.7.2 International outsourcing service provider (IOSP)

Outsourcing is the use of an outside company or professional services to manage a function formerly carried out inside a company (Gupta and Gupta, 1995, p.17). The IOSP is the outside company or professional (in our case located in developing countries or low cost area) that provides the outsourced service. According to Morris (1996), the outsourcer acts as an extension of the company's business but the company is responsible for its own management.

2.8 Major advantages and disadvantages of international outsourcing

2.8.1 Major advantages for the consumer

The most cited advantage is that international outsourcing helps developed countries to overcome the shortages of IT workers (Gurbaxani, 1996). Outsourcing offers a quick access to broader knowledge and expertise from around the world for the contractor, this is important in an increasingly competitive environment. And **"**Realization of cost saving through economies of scale and consolidations" (Benko, 1995, p.190). International outsourcing provides a way to tape the low cost opportunities of foreign software houses (Durand and Iyengar, 1991). The great shortage of IT professionals in the industrialised countries in general, and especially in Europe may be overcome through international outsourcing, some of the software development works can be done in foreign software houses which would help avoiding the shortages of IT professionals (Gurbaxani, 1996; Pelton, 1998). International outsourcing provides better quality service. Service providers specialized in a specific service such as Java programming language, web-based development, etc, and they are often more skilled than the general IS department of the firm buying the service.

2.8.2 Major disadvantages for the consumer

IOSP may turn into a competitor. The IOSP may develop advanced technical skills, learn about the foreign outsourcing customers and markets, and start selling its expertise and products to the end customers directly (Kim, 1977). The service provider may practice the locking strategy and change the contract terms as he wishes. The consumer organization may lack organizational learning capability. “Much learning about capability of IT is experiential” (Earl, 1996, p.29).

2.8.3. Major advantages for the provider

Outsourcing contract may help to enhance capabilities of the service provider company (Rong-L and Ming-Chen, 1997) by getting training from outsourcing consumer. In most cases, the innovative technology is located in the developed countries that a well-established based of research and development (R&D), more experience in conducting information system project. So, for the outsourcing service provider it is an opportunity to expand its knowledge by getting new knowledge from the service consumer side. The service provider can extend its international market (Heitzman, 1999; Nidumolu and Goodman, 1993).

2.8.4. Major disadvantages for the provider

The major disadvantage from the provider’s side is he may neither get a good payment nor establish a brand name. This is because it does not have a direct access to the end customers.

Providers may not get payment in case the service consumers go bankrupt or are not satisfied with the service. Moreover, providers may not receive knowledge from the consumer company.

2.9 Major activities of international outsourcing process

Nahar et al. (2002) identified that the international outsourcing is characterized by the following interlinked major activities:

- International market research for software production through international outsourcing
- International promotion of software production through outsourcing
- Selection of a suitable OSP
- Negotiation and contract
- Implementation of the outsourcing project
- Handling of financial issues
- Delivery of the software products / sub-products and documentation

2.9.1 International market research for software production through international outsourcing

This phase is characterised by the search and identification of attractive countries for software outsourcing through the analysis of various factors. In their early research findings (Nahar, Lyytinen and huda, 1999; Huda, Nahar and Tipandil, 1999; Nahar, 2001) on international market research of high-tech firms, they point out that a few suitable countries for software production are selected by IOSU in consideration of the following factors (Nahar, Käköla and Huda, 2002, p. 302.):

- "Availability of well-educated, trained (for specific area such as e-business security), experienced and English speaking software

programmers and engineers, quality assurance engineer, and software project manager;

- Low salary of software professionals and low production costs;
- Availability of functioning infrastructure: telecommunication lines, Internet, electricity;
- Existence of effective intellectual protection law;
- Favourable government policy and support for software production, low tax;
- Political stability;
- Economic stability;
- Geographic location, and
- Cultural affinity"

Analysing the above factors enables an OSU to identify the suitable countries, avoid the troublesome software production locations, and reduce the probability of failure.

2.9.2 International promotion of software production through outsourcing

In this phase, intense marketing communications targeted to prospective OSPs (outsourcing service provider) is developed and performed. Various messages are sent through mailing lists in which prospective OSP are participating. Nahar and Savolainen (2000) indicate that e-mail, newsgroups, teleconferencing technology, and other IT services are used to conduct electronic marketing communication targeted to OSPs. Traditional promotional tools such as direct mailing, advertising in trade and local press are also used to reach the prospective OSPs. These tools, while delivering the messages of outsourcing

requirements, decrease considerably the promotional expenses and increase promotional capacity.

2.9.3 Selection of a suitable OSP

This phase is characterised by the analyses of various factors of prospective OSPs in order to select a suitable OSP. According to Nahar et al. (2002), by considering the following factors (cited below) of the prospective OSP, an OSU can select a suitable OSP for software production:

- “Level of knowledge and skills of software programmers and engineers, quality assurance engineers, and software project managers;
- Experience;
- Financial and human resources;
- Management capability; and
- Earlier performance in international outsourcing, etc”.

During this process, modern ITs are heavily used in the selection process. These tools include databases, research Web sites, search engines, Internet directories, CD-ROMs, e-mail, newsgroups, trade mailing lists, teleconferencing (Nahar, Lyytinen and Huda, 1999; Nahar, Savolainen and Huda, 2000). Moreover, the fast establishment of video-conferencing technology and the Internet telephony has eradicated the geographical boundaries and allows people to perform meetings. This allows an OSU to collect information faster and cheaper. Thus, for “the final selection of an OSP, traditional research methods including external consultants, face-to-face meetings, and interviews are used. Utilization of various IT tools and services helps in rapid identification of several OSPs,

investigating them, and identifying a suitable OSP”(Nahar, Käköla and Huda 2002, p.303).

2.9.4 Negotiation and contract

In this phase the following activities are negotiated such as software product and/or service requirements (such as features and functions of the software products, expected performance), delivery time for the completed software products, payment mechanism, and finally contracts are done. (Nahar, Huda, Tepandi and Nahan, 2001).

In this phase IT tool such as email and files transfer protocol (FTP) are used to conduct preliminary negotiations cost efficiently, which in turn shortens the negotiation period, reduces travelling needs and reduces negotiation expenses. Traditional methods such as face-to-face negotiations and contracts are done as well (Nahar, Käkölä and Huda, 2002).

2.9.5 Implementation of the outsourcing project

This phase is characterised by the execution of the following tasks:

- “Occasionally, a software technology transfer package is supplied from the OSU to the OSP. This package may include software development tools and intensive training of the employees of the OSP;
- The OSP implements the software project;
- The OSU provides support for technical activities in complex situations;
- The OSP reports to the OSU about the progress on a regular basis;
- Reviewing of the milestones is done together; and

? Rigorous testing and quality assurance are performed" (Nahar, Käkölä and Huda, 2002, p.304).

IT tools such as: e-mail, advanced teleconferencing, collaborative online tools, videoconferencing, Intranet, Extranet, Web-based project management tool, and reporting tool (Nahar, Huda and Tepandi, 1999; Lyytinen, Nahar and Huda, 2001) enable establishing outsourcing relationships and managing these relationships as well as resolving some of the difficulties associated with this business arrangement. The traditional methods such as the face-to-face training and face-to-face meetings are used as well (Nahar, Käkölä and Huda, 2002)).

2.9.6 Handling of financial issues

This phase is characterised by the agreement on the payment mechanism. The partner may decide to pay a partial payment at the inception stage of the project, and pay the rests at the completion stage. Tailor-made payment mechanism is used to pay a large sum of money (Nahar, 1998, 1999, 2001). Online credit cards are avoided for a large sum of money.

2.9.7 Delivery of the software products/sub-products and documentation

This phase is characterised by the delivery of the software product along with the documentation. Commonly CD-ROM or DVD-ROM, other IT tools, and computer networks (Nahar, Käkölä and Huda, 2001b; Nahar, Huda, Tepandi and Nahar, 2001) are used to deliver the software products and related documents.

2.9.8 Termination of the outsourcing relation or continuation

This phase is characterised by either the termination of the outsourcing relation after delivery of the product and payment or the growth of the relationships with probably a new outsourcing software development project (Nahar, Huda, Tepandi and Nahan, 2001; Nahar, 2001).

According to Nahar et al., (2002) the effective implementation of the above mentioned major activities allows in identifying suitable countries for software production and suitable OSPs, makes the software production through outsourcing faster, cheaper, easier, and reduces resource requirements, complexities, and risks.

2.10 Major problems and critical mistakes in international outsourcing

2.10.1 Problems

Establishing and maintaining outsourcing relationships is not simple. Many companies encounter serious difficulties in international outsourcing management (Radosevich, 1996; Smith, Sabyasachi, and Narasimhan, 1996). This includes the screening and evaluation of the situation of outsourcing partners from around the world and high expenses for managing the relationships. In some cases, the service provider employees may not have adequate IT technical skills (Heeks, 1998). Moreover, the service provider company may lack the modern knowledge of software quality control (Nahar Käkölä and Huda, 2002). Managing the supplier(s) may prove to be a greater burden than managing an in-house function (Shepherd, 1999).

In-deed, it may arise such situation where supplier and receiver would misunderstand each other because of language differences (specially bad English accent from suppliers who do not have English as mother tongue), in

addition, different management practice in working hour. Supplier may be unable to relate to the customer's culture and internal politics (Shepherd, 1999).

2.10.2 Mistakes

IT managers often do not make outsourcing decisions based on rigorous analyses (Leblanc, 1993). This lack of analyses may result from factors such as "pride of authorship, not invented-here syndrome… peer pressure, and appearance" (Leblanc, 1993, p.783). For example, in the early 1990s, multinational firms were making significant profits and there was a contest to see how much those firms could spend on technology. But in the late 1990s, technology became the commonalty that was taking whatever meager earnings were left after huge loan write-offs. What exploded as an idea in 1990 became a reality in 1995, as many multinational firms signed outsourcing agreements.

In 1990, a large IT department was a sign of excellence and a feather in the CEO's cap. In 1999, hiring a contractor to take over the IT department was the new symbol of excellence. It "saved" money.

"Adequate evaluations of the outsourcing service providers are not well performed or evaluations are not always consistent" (Lacity and Hirschheim, 2000, p.100). In addition, managers also underestimate the rapid development of the capability of the providers.

2.10.3 Main factors influencing successful international outsourcing

Various factors affect international outsourcing. The quality of services provided by the provider (McFarlan and Nolan, 1995) is critical for the continuance of the outsourcing project or contract.

Lack of technical expertise and English language proficiency of OSP may influence negatively the success of international outsourcing (Nahar and al., 2002; MacFarlan, 1996). English language skill is very important because it is the

main language used in the programming language. Differences in organization culture and working methods of both outsourcing service consumer and the outsourcing service provider are very important.

International outsourcing is affected by bad reputation stereotype (poverty, war, corruption in developing and emerging countries) built by Western media (Heeks, 1998), the underdeveloped telecommunication and IT infrastructures, the price of hardware and software, high communication expenses in developing and emerging countries (Nahar, Käkölä and Huda, 2002), and the lack of information on the management practices of developing countries (Heeks, 1998). Thus, there is a lack of academic research on the management practice of the companies located in developing or emerging countries.

2.11 Software production environment in low cost countries

Various factors influence the software production environment in low cost countries. The most cited are:

- Outsourcing clients generally located in Western countries express “fear, uncertainty, and doubt” about low cost countries’ contractors and their business environment. As stated by Heeks (1999, p.16), “ask western business managers to conjure an image of the third world, and they will tell the same story as the mass media-poverty, famine, war, and corruption”.

- Low cost countries have very high technical skills but they lack managerial and analytical skills (Heeks, 1999).

- Low cost countries lack software project management skills. There are many stories of project failure due to the lack of skills in this area. According to Heeks (1999), an entire division of an insurance firm AIG

outsourced programming to Indian staff that was not up to the job. This illustrates that developing countries have limited skills.

2.12 Characteristics of the international outsourcing software project

Most of the IT project management practice these days are characterised by: late delivery, exceeded budgets, reduced functionality and questioned quality. As the complexity and scale of attempted projects increases, the ability to bring these projects to a successful completion dramatically decreases (Lemon, et al., 2002).

Project Management Institute (1996, p.6) defines a project as: "the application of knowledge, skills, tools, and techniques to project activities in order to meet or exceed stakeholder needs and expectations from a project". Project management is very important for the information system organizations because most of the work is organized as projects. The main difference between distributed or international projects and the traditional projects of various types done in-house is related to the coordination mechanism. Distributed projects are concentrated on inter-site coordination mechanisms whereas the domestic or traditional project focuses on intra-site coordination mechanisms.

In our research, we are focusing on the analysis of a critical element of the distributed project such as relationship management, performance monitoring, and control mechanism. We assume that the readers have certain knowledge on the concept of project management. We are not studying a comparative study of the type project therefore we advise those who would like to have deeper understanding of project management to consult the bibliography in this thesis for further reading.

International outsourcing project may be defined as “a single project encompassing several sites” (Evaristo and Fenema, 1999, p.276). A single project manager manages the project. Companies organize such distributed project for

several reasons. The most cited are: “scarcity or complementarity of resources, convenience, cost, monitoring capacity, and quality” (Evaristo and Fenema, 1999, p.276). The software companies are looking at international outsourcing as a viable alternative due to the lack of talented developers in the local/domestic employment market a lack of specialized skill. According to Evaristo and Fenema (1999), to overcome this situation two possibilities are available for the software companies:

1. All the developers and experts are invited from the foreign country to spend sometime (usually time required for the completion of the project) at the planned location to develop the product.

2. Then the experts and developers leave from that location and join at their home site and let them to work at a distance on the same project.

Evaristo and Fenema (1999) states that the first option is moreover expensive if we consider the family relocation cost and all other associated expenses, “plus the fact that by being plucked away from their natural environment, their knowledge could slip away or become obsolete” (Evaristo and Fenema, 1999, p.278). The second option is suitable to the concept of international outsourcing. However, for this option to be effective, some facilities such as excellent communication networks should be available for all project members. Distributed projects have many benefits but also many problems or costs associated. The most important issues are the coordination of the separate pieces of the same project being developed and the need for communication in different areas. Meetings across project sites and different parts of the project are most of the time done by the project managers who are in charge of more than one site.

2.12.1 Relationship management

McFralan and Nolan (1995) claim that sensitivity of the interface between the IOSC and the IOSP organizations cannot be overestimated. In most cases, the IOSC will oversee the decision rights that have been transferred to the provider. "The organization may for example, want to have final approval over the provider's key personnel, any significant changes in technology used by the provider, any changes to outputs, and any changes in the provider's processes" (Greaver II, 1999, p. 269-294). Furthermore, McFralan and Nolan (1995) state that in fact, oversight is not delegatable and the chief information officer (CIO) and the supporting staff need to manage the outsourcing agreement and the relationship. Greaver II (1999) states that to do the job in more concrete way a relationship manager should be appointed. A technical manager should be associated with relationship manager; and both would be the representatives of the IOSC organizations relationship management team. Moreover, the relationship manager must be a full time position that is dedicated to managing one or more contracts and providers. Specifically, both the IOSC and IOSP organizations need full time relationship managers and coordinating groups in the project to deal with the narrow issues and potential difficulties. Due to the sensitivity and the complexity of the relationship, the interface between the IOSC and the IOSP should occur at multiple levels. "At the highest level, there should be ways to deal with issues of policy and relationship restructuring and at the lower level, a mechanism for identifying and handling the operational and tactical issues" (McFralan and Nolan, 1995 pp20-21.). Hence, success or failure is determined by the ability of both sides (IOSC and IOSP) to manage efficiently the relationship, less as a contract and more as a strategic alliance or partnership (McFralan and Nolan, 1995). In their findings, DiRomualdo and Gurbaxani (1998, p.69) suggest that "relationship with the vendor –for example, contract type, decision rights, performance measures, and risk-and-reward allocation schemes-must be aligned with the strategic intent underlying the

outsourcing initiative". In addition, they state that outsourcing would result of poor outcomes if the consumer do not address the following factors: (1) clearly defining the intent and specific goal for outsourcing, (2) align the contract and relationship with the strategic objective, (3) make the contact flexible enough to adjust to change in business or technology, (4) ensure that the service provider has the capabilities required to meet the objective for outsourcing.

2.12.2 Monitoring performance

The contract sets the performance measures, deliverables, due dates, and other things that the service provider is obligated to meet. According to one Indian management consultant[2], "Without a yardstick, there is no measurement. And without measurement, there is no control". Both the relationship manager and the account manager should develop a reporting system that captures this performance information. These reports may be detailed for the operating meetings and summarised for the oversight council meeting (Graever II, 1999). The report should be designed to report the actual performance, the performance standard, and the variance from standard.

2.12.3 Trust in relationship management

Trust is very important among the outsourcing partners. We conceptualise trust as "confidence that the behavior of another will conform to one's expectations and in the goodwill of another" Sabherwal (1999, p.82). The international outsourcing project represents at least two different organizations (client and vendor). That is why trust should be viewed differently from its role in internal IS development where participants know each other already and know that their relationship will reach beyond the current project. In an international outsourcing project, participants from both sides often lack prior relationships with one another and may take a short-term project oriented view. According to

[2] From his interview given at "Click –online" a weekly IT TV program from BBC, special India, Feb. 2001

Sabherwal (1999), the key essence of “real” outsourcing IT development is mutual trust, if any intellectual property is concerned. This kind of trust cannot be “created” artificially overnight – it must be developed in long term – taking perhaps years. Sabherwal has stated that trust improves performance and distrust hurts it. Distrust leads to each organization focusing on its own interests.

Trust characterizes successful projects and leads the participants to work together rather than to blame each other. This is quite obvious but very often somehow not understood in the projects. Our thinking is that a project is quite often based almost solely on structural mechanisms, neglecting or not understanding the importance of trust as a psychological contract, has very little, if any, chances of pull-in it through successfully. It is not only a matter of poor performance – more like a catastrophe (Sabherwal, 1999).

2.13 Summary

The literature review on outsourcing and international outsourcing indicate that outsourcing is commonly employed in the business world. There are many types of outsourcing, the major ones are the following: body shopping, project management, total outsourcing, business process outsourcing and transitional outsourcing.

In international outsourcing, outsourcing consumers transfer technology to developing countries in order to gain access to and benefits from opportunities found in foreign markets, to extend the technology life cycle, to utilize technologies, to gain knowledge of foreign market and create profit, growth and survival in the long run.

The review of outsourcing, and international outsourcing literature included the following issues: basic concepts of outsourcing, major type of outsourcing, outsourcing decisions factors, definition of international outsourcing,

advantages and disadvantages of outsourcing/international outsourcing, and reasons for outsourcing.

An in-depth literature review revealed that the current literature does not examine in-depth the process of international outsourcing of software production in developing countries and emerging markets, all the phases of international outsourcing process that occur across borders, the implementation of IT supported international outsourcing of software development projects and the effective utilization of technology and IT at the outsourcing consumer site.

3. DIFFUSION OF INNOVATION THEORY

IT-supported international outsourcing process is a new innovation, which is implemented across both international outsourcing service consumer (IOSC) and international outsourcing service provider (IOSP). In the software industry sector, the IOSC's company specific competence is transmitted to IOSP through intensive training of the key personnel of IOSP in order to produce high quality products / services and fulfil the special requirements of the IOSC. This is also considered as a diffusion of innovation into IOSP's organization. Since our topic is very much dealing with implementation of new innovation, we choose to review the literature on the diffusion of innovations (DOI) theory to help us understand how the DOI theory influences on the implementation of international software outsourcing.

The main objective of software technology transfer is to enable the transfer of software engineering methodology that helps the technology recipient to produce software products (Nahar, Käkölä and Huda, 2002). In the international outsourcing of software production, the recipient acquires a new software technology by a commercial arrangement, where a user entrusts a foreign subcontractor / provider with a commission to produce the software products / services. This software technology is one kind of innovation. Through the international outsourcing of software production process, this new software technology is delivered to the technology recipient. In this way, international outsourcing of software production can be viewed as the diffusion of software engineering innovation. Therefore, the DOI theory is suitable for examining the current research problem.

Other theories, such as cooperation theory (Axelrod, 1984; Axelrod and Keohane, 1986; Axelrod and Doug, 1988), network theories (Ford et al. 1998; Håkansson and Johanson 1988, 1993; Håkansson and Snehota, 1990, 1995; Johanson and Mattsson, 1987), and transaction cost theory (Williamson, 1975,

1979) have been used to examine outsourcing. Due to limited time and scope of the research study (i.e. M. Sc level research study), we attempt to review in-depth only one background theory and use it effectively in this study. Furthermore, our study is dealing with diffusion of IT supported outsourcing process and diffusion of software technology in the international outsourcing context. The other studies that have used cooperation theory (Al-obaidi, 1999; Nahar, Käkölä and Huda, 2001) and transaction cost theory (Lacity and Hirschheim, 1993b), did not include these issues. Therefore, diffusion theory is more relevant for our study.

According to Rogers (1983, p.135), diffusion is "the process by which an innovation is communicated through certain channels over time among the members of a social system". The implementation of international outsourcing of software production typically involves either new technologies or requires users to adopt new approaches to their work. Innovations can be any product or process that is perceived as being new by potential adopters, and diffusion is the process by which innovations are communicated among potential adopters. DOI theory has been categorized into three groups: micro level factors, industry level factors, and macro level factors (Nahar, 2001).

3.1 Micro level factors

The micro level factors or perspectives focus on characteristics of individuals or organizations. These perspectives are based on concept from economics and innovation theory (Roger, 1983; Perrow, 1986). "The perspectives help understand diffusion patterns among similar organisations and populations, i.e., within a narrow diffusion scope" (Damsgaard and Lyytinen, 1997, pp. 39-63.). According to Nahar (2001), the micro level factors include the characteristics of IT, the technology supplier, and the technology recipient. An IT supported outsourcing technology transfer process is in part executed in the technology supplying company (e.g. preparation of the technology package) as

well as the technology receiving company (e.g. outsourcing technology project implementation), thus the transfer process is influenced by the characteristics of the company.

“Micro level factors are linked to the diffusion of innovation (DOI) theory” (Nahar, 2001, p.50). Nahar (2001) has referenced Prescott and Conger (1995) who argued that the factors that are related to a particular outcome, such as a successful implementation is identified by the factor research approach of the DOI theory. The DOI theory helps in the understanding of the diffusion of innovations. IT supported outsourcing of software technology transfer process is a new process, which could be seen as an innovation. Therefore, DOI theory factor approach is appropriate when examining the implementation of the IT supported outsourcing software technology transfer process.

Researchers are increasingly carrying out studies on diffusion of innovation (Nahar, 2001; Ruppel and Harrington, 1995; Swan, Newell and Robertson, 1995; Wolfe, 1994), technology diffusions (Attewell, 1992; Barclay, Pinelli and Kennedy, 1994; Bijker, 1994; Damanpour, 1987; Mansfield et al., 1983; Pennings and Harianto, 1992), and IT diffusions (Culver-Lozo, 1994; Griffy-Brown, Watanabe and Fujisue, 1999; Gurbaxani, 1990; Heidtman, 1994; Lindgaard, 1994; Paulish, 1994; Pries-Heje, Lauesen and Schroder, 1994; Ramiller and Swanson, 1994; Saga and Zmud, 1994).

Researchers are extending DOI theory (Nahar, 2001; Rai, 1998; Rai and Howard, 1994) and integrating it with other theories (Brabston, 1993; Fichman, 2000) in order to explore the diffusion of IT innovation. According to Prescott (1995), the diffusion of innovation theory has been largely applied to study the IT innovations and the implementation of IT innovations. Several factors are included in the micro level that influence the diffusion of innovation.

3.1.1 Characteristics of an innovation

Based on the research work of Rogers (1983, 1995) and Rogers and Shoemaker (1971, pp. 22-23), it is apparent that an innovation is more likely to succeed if it includes the following characteristics:

- "Relative advantage. The degree to which an innovation is perceived as better than the idea it supersedes.
- Compatibility. The degree to which an innovation is perceived as being consistent with existing values, past experiences, and needs of potential adopters.
- Complexity. The degree to which an innovation is perceived as difficult to understand and use.
- Trial ability. The degree to which an innovation may be experimented with on a limited basis.
- Observability. The degree to which the results of an innovation are visible to others."

The research results of implementation of innovations (Leonard-Barton, 1988) and IT innovations (Premkumar and Potter, 1995) are consistent with the above findings of Rogers, that is, the aforementioned researchers have also found the above five innovation characteristics which improve the possibilities of successful implementation of the innovations.

Researchers have found out additional innovation characteristics that influence implementations of IT innovations. Hoffer and Alexander (1992) discovered that technology functionality; performance and efficiency played an important role in the successful implementation of IT innovations. Other researchers (Russo and Kumar, 1992) found ease of use, task productivity, and task

qualities were important for the success of implementation of IT innovations. Chin and Gopal (1995) identified relative advantage, ease of use, compatibility, and enjoyments are important characteristics of successfully implemented information systems.

3.1.2 Characteristics of a company

The characteristics of a company have long been associated with its capacity for successful implementation of innovations (Griffiths et al., 1986; Zaltman, Robert and Jonny, 1973). The literature review highlight the following key characteristics: need for the innovation (Robinson, 1988), availability of resources (i.e. material resources, knowledge and skills, financial resources, time, experience) (Baker, 1994; Ely, 1990), management of innovation implementation (Nahar, 1999; Nahar, Lyytinen and Huda, 2000), risk management (Lyytinen, Mathiassen and Ropponen, 1996; Nahar, 1998), management support (Leonard-Barton, 1988), leadership (Drucker, 1985; Leonard-Barton and Deschamps, 1988), champions (Willard, 1991), motivation, participation and training (Campos et al., 1997; Ely, 1990).

The company issues include the size, structure, and degree of centralization or decentralization (McMaster, Vidgen and Wastell, 1997), while the “opinion leader” (Katz and Lazarsfeld, 1955) influences include their technical competencies, social accessibility, the degree to which they conform to the norms (understand by norms, value and practices in use in one company) of the social system, and the degree to which they support or reject the innovation.

General diffusion theory cannot explain the diffusion processes of many types of innovations such as complex and networked IT solutions. Complex networked IT solutions usually are not standard-alone and cannot be implemented independently or in isolation from other companies. “Its networked nature and dependence on standards necessitates some kind of collaboration and common infrastructure.”(Damsgaard and Lyytinen, 1997).

3.1.3 Characteristics of the adopter

Individual level characteristics play very important role in the adoption of innovation. Pattern such as social status, level of education, and "cosmopolitanism" (McMaster, Vidgen and Wastell, 1997, pp. 319-320) are critical for the sucessful adoption of the innovation by the individual adopter usually located in developing or emerging country. Moreover, Rogers, (1995) argues that to be successful, innovations have to be adopted by five type of people: the innovators and early adopters, who are the quickest in the population to use the innovation; the early majority and late majority, who are slower to take it on; and the laggards, who adopt when the once-new innovation is already old.

3.2 Industry level factors

According to Nahar (2001), the industry factors are characterised by telecommunications and IT industry. These factors include the characteristics of telecommunications and IT industries of the technology supplying and technology receiving countries.

In most cases, the technology transfer project is implemented in an emerging market and/or a developing country. Therefore the implementation of innovations must adopt the recipient's perspective. "Factors originating from the IT industry have an influence on the implementation of IT-supported business process. Such perspective is necessary because the effective implementation of IT innovations and their use very much depends on the availability of reliable and cost competitive hardware, software and related services, telecommunications and infrastructure" (Nahar, 2001, p.54).

3.3 Macro level factors

The macro factors frame the boundaries for the diffusion process by recognizing regulatory regimes as central points that constrain or enable the diffusion process (Damsgaar and Lyytinen, 1997). The implementation of an IT-supported international outsourcing process in emerging markets and developing countries is influenced by country level specific factors. Those factors could be classified into the following categories Nahar (2001):

Quality of IT education

This factor is mainly concerned with availability of IT trained personnel. A great lack of IT trained personnel would negatively influence the implementation of IT-supported international outsourcing process in emerging markets and developing countries (Badri, 1992; Dexter et al.1993).

Economic factors

The implementation of technological innovation is influenced positively by the economic stability. This demonstrates the stability of the businesses in the country. Moreover, generally companies from low-income level countries are less likely to make high investments in IT and IT personnel (Bazar and Boalch, 1997). Furthermore, the restriction on currency may negatively influence the international trade and the IT-supported international outsourcing process in emerging markets and developing countries (Deans et al., 1991).

Cultural factors

Language weaknesses of the software users may create barrier for the implementation of IT innovations (Deans et al. 1991; Mata and Fuerst, 1997). Moreover, culture has an influence on technology diffusion (Baranson, 1963; Pacey, 1986) and implementation of IT innovations (Cooper, 1994; Cooper and

Zmud, 1989, 1990; Kaplan 1987; Klempa, 1994; Straub, 1994). People of different cultural background are involved in interrelated tasks during the implementation of technology innovations and IT innovation. “The project leader should be involved in extensive interaction with the project members and also collaborate with the management to complete the implementation successfully. In order to effectively communicate with project members in a developing country, the project leader may need to know the language, beliefs, attitudes, habits, and traditions of the local culture. (S)he also may need to know the culture of the company, since companies in developing countries are usually characterized with unnecessary bureaucracy, a lack of delegation and slow decision-making ” (Nahar, 2001, p.56).

Legal factors

Legal restrictions on software/ hardware acquisition and usage negatively influence the implementation of an IT-supported business process in emerging markets and developing countries (Deans et al., 1991; Mata and Fuerst, 1997).

Political factors

Political instability negatively influences the investments of foreign companies..

“A macro perspective is broad in scope as it includes macro specific factors on diffusion” Nahar (2001, p.50). There are more additional factors that could be added to the above list that influence implementations of innovations (Pressman and Wildavsky, 1984) and IT innovations. “The environments of emerging markets and developing countries can be hostile to implementations of IT innovations. Factors internal to an organization are more controllable whereas external factors are largely beyond control. For the implementation of any IT innovation requires an effective management of as many factors as possible that could then improve the chances of success” (Nahar, 2001, p.56.).

3.4 Summary

The theoretical framework of diffusion of innovations discussed above makes valuable suggestions about possible source of diffusion. As we have seen, many of the insights gained from cumulative research on diffusion of innovation are applicable to international outsourcing.

However, the multitude drivers of innovation suggested in the literature raise the question concerning which drivers of innovation are of particular importance in IT-supported international outsourcing of software production, and whether unique drivers of an innovation can be identified in the context of international outsourcing of software production.

Moreover, we have drawn attention to the fact that the diffusion of innovation theory has limitations when it is applied in the context of highly complex and networked IT solutions.

4. CONCEPTUAL FRAMEWORK

A process framework of software production through IT-supported international outsourcing is described in this chapter. The framework is intended as a tool to enable outsourcing consumers to manage the international outsourcing process. It aims to facilitate proper planning, control, and continuous improvement of the consumer-provider relationship. The framework provides structured ways in which judgements can be made about the various factors that contribute to the efficiency and effectiveness of the process. This allows IOSC to manage IT-SIOSPP faster and easier due to the key support functions identified in the framework. However, the consumer still needs to use its expertise and experience to assess the significance and importance of these factors in its own case.

The framework is based on the literature review as well as suggestions provided by the research methodologists (Miles and Huberman, 1994). This framework includes seven generic phases of the entire outsourcing process. This chapter first describes other relevant frameworks that serve as background for the conceptual framework. Then it presents the seven phases of the framework in detail.

4.1 Background of the relevant frameworks

Software production through international outsourcing is a new phenomenon. Literature identifies this research topic as being highly important (Lacity and Willcocks, 2001; Nahar, Käkölä and Huda, 2002). The literature further suggests that a few papers illustrate the general process of outsourcing (Rockart and Morton, 1984), despite the numerous studies on specific areas of outsourcing such as bidding, contract management, and relationship management (Buchowicz, 1991; Chaudhury et al., 1995; McFarlan and Nolan, 1995). Very little has been written on a) how the international outsourcing process is

executed, b) what main activities should be performed in each phase, c) what are the performance measures in each phase, d) what are the expected outcomes of each phase, and d) what IT-tools are used to support each phase.

Software production through international outsourcing brings together the issues associated with software production, technology transfer, outsourcing information systems, and the international use of information technology. Relevant frameworks and models from existing work include: (1) Outsourcing process (Momme, 2001a); (2) International outsourcing process (Nahar, Käkölä and Huda, 2002); (3) Outsourcing decision making (Blumberg, 1998b); (4) IT-supported technology transfer process (Nahar, 2001); (5) the globalisation of the software development industry (Kim, Westin and Dholakia, 1989); and (6) site and project selection for offshore development projects (Ravichandran and Ahmed, 1993). Each framework described suggests some of the issues associated with software production through international outsourcing. Among all of these frameworks, Momme (2001) and Nahar, et al. (2002) present state-of-the-art view on the outsourcing process. Momme (2001a) provides a thorough literature review with a case study of a Danish company. Momme's framework examines the outsourcing process of manufacturing activities to cost-efficient and innovative suppliers in support of internal core competencies. Nahar et al. (2002) introduced an IT-supported international outsourcing process with the mechanisms for controlling the risks and uncertainties. The research from Momme (2001a) and Nahar et al. (2002) provides the main building blocks of this study.

4.2 The international outsourcing process framework

The IT-supported international outsourcing process framework has been developed based on the literature of international outsourcing, information technology, technology transfer, diffusion of innovations, and the objectives of the study.

Benaud and Bordeianu (1998, p.8) identified that there are “three distinct phases to the outsourcing process: planning, implementation, and management”. The planning stage, by far the most complex, “consists of cost studies, proposal development, choice of a vendor, and contract negotiations”. In our process framework, we have divided the planning stage into four phases: 1) strategic analysis and decision, 2) international market research and promotion, 3) selection of providers, and 4) contract negotiation. Benaud and Bordeianu (1998, p.8) explained that implementation stage “consists of developing procedures and workflow and training the employees of both companies”. Two phases in our framework represent implementation stage: 5) project implementation, 7) evaluation and contract termination. The management phase is demonstrated by one phase in our framework: 6) Managing relationship.

The process of IT-supported international outsourcing is “typically viewed in terms of phases starting with an internal strategic analysis of core / non-core competence areas, ending up with termination of the outsourcing relationship” (Momme, 2001a, p.9). Therefore, our international outsourcing process framework begins with conducting a strategic analysis and making decision, and then moves through the phases of international market research and promotion, selection of providers, contract negotiation, project implementation, and managing relationship. The final, and no less critical, step in the process is evaluation and contract termination. For each of theses phases, a different number of main activities related to prediction / performance measures, expected outcomes, and supporting IT tools were identified. According to Momme (2001a), the performance measures were presented in order to specify what are the expected outcomes of each phase, and the expected outcomes can be reviewed according to the factual outcomes. At the same time, the prediction / performances measures either explicitly or implicitly provide input to the subsequent phases in the outsourcing process. Each phase is briefly defined and

described. The framework does not cover all international outsourcing situations; it provides a rational framework for the execution of international outsourcing. The number of phases may vary in some cases.

Through the combination of some issues from the frameworks of Momme (2001a) and Nahar, et al. (2002), our entire conceptual framework of outsourcing process has been depicted by seven generic phases from outsourcing consumer's perspective. The framework is represented graphically in Figure 1 as a series of seven-step hierarchy of international outsourcing process in their logical order. A rounded rectangular box represents each phase. A single-headed arrow indicates the transition from one phase to the next. In each phase, there are three rectangular boxes, which are linked by thin lines, representing the main activities, performance measures, and expected outcomes respectively. Besides, there is a rectangular box on the top of each phase linked by a single-headed arrow representing the IT tools, which support the performances of main activities of each phase. On the top of framework, a rectangular box represents the general IT tools, which utilized in each phase, such as: email, telephone, fax, mobile communication systems, Internet telephone, Internet and Intranet.

The arrow from the seventh phase to the first phase represents the need to reflect on lessons learned from previous phases. Furthermore, outsourcing is a recurrent process (cycle), because the company at the end of the contract period faces the decision on whether to extend the present outsourcing relationship, find an alternative provider or in-source the functional area that was originally outsourced (Momme, 2001a). While there is a logical order to the sequence of the common phases, the order of the main activities within each phase does not imply any priority or sequence. Unless indicated otherwise, the main activities are stated from the perspective of the outsourcing consumer.

Since general DOI theory has limitation in implementing complex and networked IT solutions, the utilization of our framework also associate with some limitations, especially in using IT tools to support international outsourcing process. The network nature, the dependence on standards, and the common infrastructure are main reasons for the consumer company in failing of using IT tools to support international outsourcing.

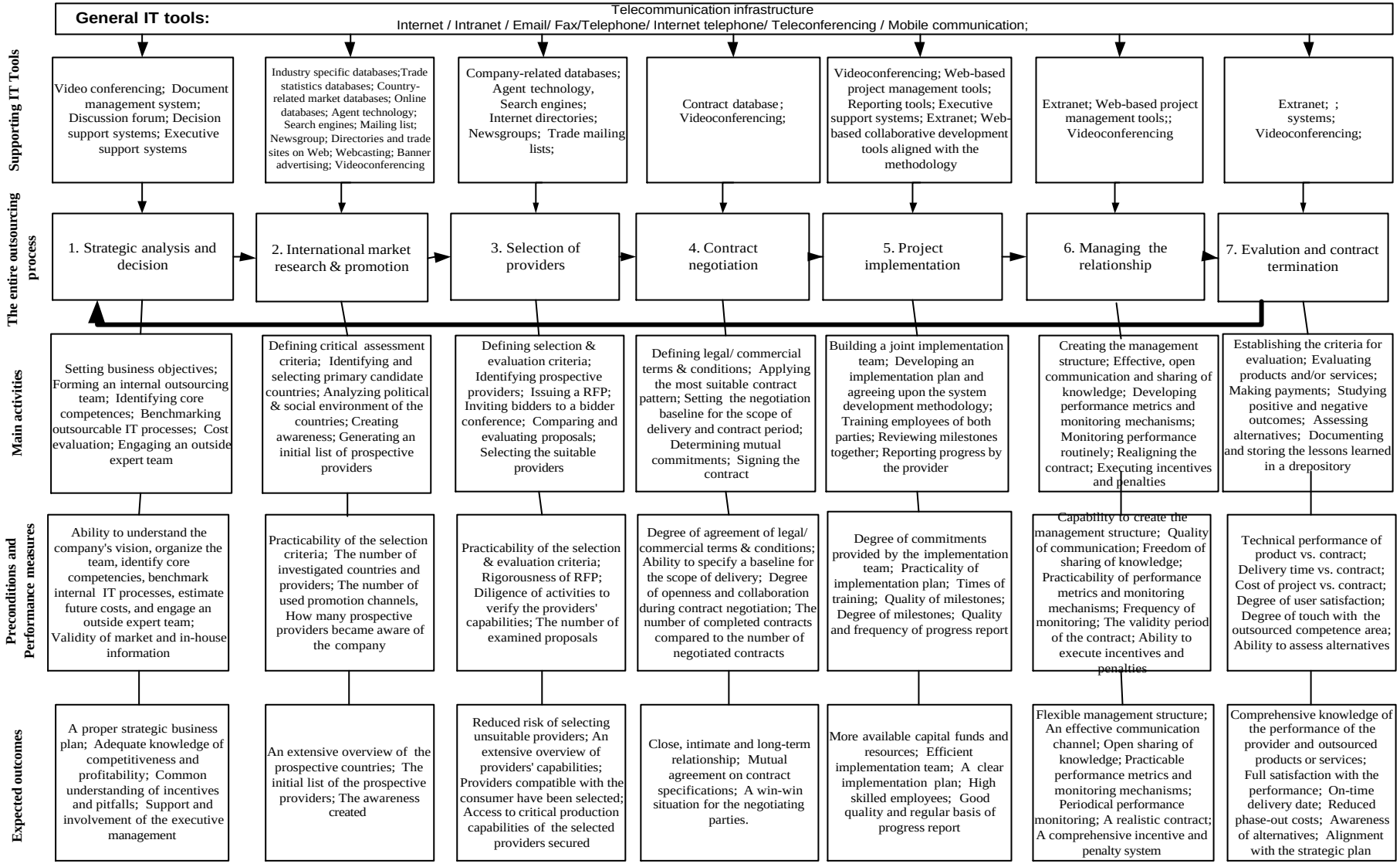

Figure 1. The framework of IT-supported international outsourcing process

4.2.1 Phase 1: Strategic analysis and decision

In the strategic analysis and decision phase, the company decides whether to in-source, or outsource domestically, or international outsource. During this phase, the company organizes an outsourcing team to identify the risks and benefits of international outsourcing (Loh, 1994; Greaver II, 1999), focuses on understanding its own core competencies, and is forced to clarify its organizational goals (Corbett, 1999; Greaver II, 1999), while carrying out benchmarking of potential outsource IT process (Chen and Lin, 1998), as well as cost evaluation and engaging an expert team (Greaver II, 1999).

4.2.1.1 Main activities

Setting business objectives. Understanding why company is outsourcing as well as what it is trying to accomplish, is a critical first step in the process. The outsourcing consumer company should identify its business objectives and then break them down into meaningful process objectives that pertain to the services the provider is providing. The benefits and risks of outsourcing are also considered at this point for determining outsourcing strategy. For example, when IT services are outsourced, the risk of losing close alignment between company and IT objectives is greater than with internal IT service provision. The potential outsourcing company needs to recognize this risk and consider its impact when making the outsourcing decisions and developing strategies for risk controlling.

Forming an internal outsourcing team. The first phase, strategic analysis and decision, is initiated when an internal cross-functional outsourcing team has been developed to administer the analysis (Greaver II, 1999; Reid, 1996). The effective team should include members from information systems division, key user groups, and executive management including marketing and/or strategy management (Reid, 1996). Okhuysen and Eisenhardt (2000, p.24) suggested,

“The team members with different ages, academic background, gender, and ethnicity are more likely to contribute different ideas. The different points of view embodies are all-helpful in developing multiple options for the team”. This outsourcing team is formed to study and implement outsourcing initiatives. This team has the responsibility of carrying out the outsourcing process, developing the collaborative relationships with the provider and managing the relationship according to change program. The outsourcing team plays an important role in coordinating efforts and selecting the providers.

Identifying core competences. Before making the decision to outsource IT services, company needs to determine which functions need to be retained for strategic management reasons. Handfield (2000) and Greaver II (1999) stated that identifying core competence is an approach to this decision. In this approach, the differentiation between “core” and “non-core” competences is based on whether the service is considered "strategic" to the company. Through core competence identification, some activities and products are eliminated as candidates for outsourcing, either because the product cannot be contracted outside or because the company must control the activity or the product to maintain its competitive position. Thus, the company can focus on the core competence and activities, while outsourcing the peripheral activities that the market can perform more cost-effectively and/or which distract the company from its core activities. Outsourcing non-core competencies allows the company to give more attention to its core competencies.

Benchmarking outsource IT processes. For those activities or products which are suitable for outsourcing, the “key strategic factor is whether the company can rely on the outsourced services or products on a level comparable with the best in the world” (Chen and Lin, 1998, p.118). According to Oliver (2000, p.37), benchmarking is “the continuous process of measuring products, services, and practices against the toughest competitors or those companies recognized as industry leaders”. Chen and Lin (1998, p.118) suggest the company first

conducts reliability measurement about the potential outsource IT process to "capture these critical success factors for the availability, timeliness, flexibility, quality, and the cost reduction". Then the company benchmarks the results against world-class level companies that offer similar services or products in the marketplace. Chen and Lin (1998) claimed that benchmarking provides the company detailed and useful external information to make an outsourcing decision of whether to continue with the internal provision of IT services or changing to an outsourced arrangement with one or more external providers. The benchmarking results also provide a basis for contract negotiation.

Cost evaluation. The outcome of this first step analysis will be a complete understanding of whether or not outsourcing will 'fit' into the company's culture. If the outsourcing team finds it will not, then the company objectives can be realigned or the evaluation process is suspended indefinitely. However, if the outsourcing team determines outsourcing will 'fit' into the company, the evaluation will proceed to the next step analysis. Here the outsourcing team will identify software production activities and their associated operating costs. This is determined by several different cost analysis methods. One of the more common practiced methods is activity based costing (ABC) (Greaver II, 1999). Utilizing this method and/or other analysis tools, the company tries to determine how much is being spent on software production and whether or not it can be done more cheaply by an outside company. When the costs associated with the various functions of the software production have been established, the results are benchmarked against similar organizations. Through cost evaluation, the outsourcing team can make reasonable projections of future costs for those outsourced activities. Based on the projections of future costs, the outsourcing team will identify whether to in-sourcing, or outsourcing domestically, or international outsourcing. By doing this, the outsourcing team will not only gain an understanding of the current operational cost-effectiveness, but will also provide a cost basis for contract negotiations which

will take place later in the outsourcing process. Based on the outsourcing team's study, the company will decide what an outsourcing provider can do for the company. Whether it is to cut costs, improve focus, or free up resources, the outsourcing consumer company should make sure all the goals are attainable.

Engaging an expert team. Greaver II (1999) indicated that if he potential outsourcing consumer company is an expert neither in negotiating contract nor in relationship management, the company needs involvement with an outside expert team to guide them during the outsourcing decision, selection, and contracting processes. The expert team who has specific contracting, business and outsourcing expertise is capable to help potential outsourcing consumer company to make outsourcing decision, select the outsourcing provider, manage the contract over time, assure a smooth migration to the new systems, and resolve problems that will arise after the contract is signed.

The potential outsourcing consumer company conducts all above activities to analyse and determine whether/how the international outsourcing will help the company achieve its long-term goals and answer questions: why international outsourcing is better than in-sourcing or demotic outsourcing? Which applications and IT resources should be outsourced and which should continue in-sourced?

4.2.1.2 Performance measures

The performance measures criteria of this phase based on the main activities. The criteria are: does the company have a visible company's vision? Does the company have the ability to organize an outsourcing team? Does the company have the ability to identifying its core competencies? Does the company have capability to benchmarking and baseline their internal IT process? Does the company have ability to estimate the future cost? Does the company have ability to identify and engage an outside expert team? In addition, does the company have adequate and "valid market and in-house information for

decision-making?" (Momme, 2001a, p. 8)

4.2.1.3 Expected outcomes

If the company decides to outsource, the strategic business plan for outsourcing must be developed. This preliminary business plan for international outsourcing (Hisrich, 2000) may include a brief description of the outsourcing project, technical feasibility, resource requirements, expected returns, estimated total costs of the project, and a project team. Outsourcing details must be decided in this phase, such as the degree of outsourcing – total or selective outsourcing (Lacity et al., 1996; Lacity and Hirschhein, 1993a), the period of outsourcing –long term or short term (Pinington and Woolcock, 1995), the number of service providers – single or multiple (Willcocks et al., 1995), and the type of outsourcing – service or asset outsourcing. Besides the expected outcomes of proper strategic business plan, the company should have adequate "knowledge about competitiveness and profitability, common understanding of international outsourcing incentives and pitfalls" (Momme, 2001a, p. 8), and executive management support and involvement.

4.2.1.4 Supporting IT tools

The role of IT tools used in this phase is to support companies in conducting strategic analysis and making decision. Besides the general IT tools, companies use specific IT tools such as: video conferencing, document management system and discussion forum to conduct discussion very cost efficiently, which can reduce travelling expenses compare with traditional methods (Nahar, 2001). Decision making IT tools, such as decision support systems (DSS) and executive support systems (ESS) can be extensively used in making decisions. Iver and Schkade (1996, p.244) stated that DSS could "provide computer-based interactive problems solving support for a specific type of decision or a class of decisions". Iver and Schkade (1996) claimed that due to the operational

complexities, political, economic, cultural differences among countries, and the unstructured nature of most international decision making situations, a DSS is necessary to assess opportunities and threats in the international outsourcing and to evaluate outsourcing strategy and resource requirements. Iver and Schkade (1996, p.248) also argued that ESS "focused on a group of managers' information and decision support needs across a range of managerial decision processes". ESS is necessary in international outsourcing to support managers in making decisions that involve the implementation of international outsourcing project, as well as the managing the relationship between two parties of international outsourcing. The above IT tools used along with traditional methods which are face-to-face meeting and traditional mail, can make the strategic analysis and decision making faster, cheaper, and more convenient.

However, due to the complexity associated with DSS and ESS, companies rarely understand them completely. Therefore, some companies fail to use such IT tools in their strategic analysis and decision phase.

4.2.2 Phase 2: International market research and promotion

Once the strategic analysis and decision phase is complete, the next step is to identify which countries are the best candidates for outsourcing and to attract the prospective outsourcing providers. In this phase, the company should identify attractive countries by conducting the analysis of various factors of political and social environment, and performing various marketing promotion functions targeted to prospective international outsourcing providers.

According to Nahar (2001), market research and promotion for international outsourcing is important since it helps to select appropriate markets for outsourcing, it identifies the specific needs for technology in the target market, and delivers important information and details of outsourcing project.

4.2.2.1 Main activities

Defining critical assessment criteria. This phase should be devoted to the defining of the critical assessment from quantitative and qualitative sides to *analyse the political and social environment* of target countries. Working with developing countries can create difficulties not typically encountered in working with providers from the developed countries. Nahar et al. (2002, p.9) and Apte (1996, p.317-319) indicate that potential outsourcing consumer can select a few suitable countries for international outsourcing by considering the following important factors related to the target countries:

- *"Stability of the political and social environment.* This is a very important consideration since a stable environment is the necessary foundation for achieving a beneficial and continued relationship.

- *The attitude of the target country's government towards foreign investment and collaborations in IT.* The attitude of the target country's government can make the alliance easy or difficult to manage. Many developing countries have been offering incentives to encourage foreign investment.

- *Low salary of IS professionals and other production costs.* The low average salary of IS professionals is one of the strongest incentives for international outsourcing. This can lead to significant additional cost saving for an outsourcing consumer.

- *Size of the pool of skilled software professionals.* In addition to the cost advantage, the target country must have a large population of well-educated, experienced citizens with a sizable pool of skilled software professionals.

- *Communications.* As the software projects typically require a substantial amount of verbal communication between the outsourcing consumer

and the provider, the common language becomes an important factor. Choosing countries using English as their primary or secondary languages pose no communication problems for consumers from English-speaking countries.

? *Time zone difference.* Another consideration is the time zone difference between the consumer and the provider. An appropriate time difference and an on-line environment with shared databases can allow for around-the-clock work, resulting in fast turn-around times. " (Apte, 1996, p. 317-319)

? *Availability of functional infrastructure.* The poor telecommunication and Internet infrastructure, a common problem in the underdeveloped countries, can be a serious drawback to the outsourcing consumer.

? *Intellectual property law*. Fundamental intellectual property rights in developing countries are relatively weak. Intellectual property protection such as trademarks and copyrights is necessity for outsourcing activity. An international outsourcing arrangement may leave an outsourcing consumer open to the risk of theft of its IS technology. This risk is considered to be a significant drawback of international outsourcing.

Identifying and selecting prime candidates. Having suggested a number of important factors in analysing the suitability of the target country, the company can identify and select several companies, which seem prime candidates for outsourcing relationships. The company then generate an initial list of prospective providers. Choosing a suitable outsourcing provider from prime candidates can avoid troublesome international outsourcing and reduce the future chances of disaster (Nahar et al, 2002).

Creating awareness. After selecting the suitable countries, the potential outsourcing consumer company starts performing different marketing

promotion functions to attract the prospective outsourcing providers. International promotion methods include: posting outsourcing messages in mailing lists and publishing articles where international outsourcing providers are participating in order to make them aware of this information. In addition, the consumer company can arrange public releases; post offers to trade sites on Web, etc. (Nahar, 2001).

4.2.2.2 Performance measures

The performance measures of this phase are: Does the company have practicable selection criteria? How many countries and providers the company has investigated? How many promotion channels the company has used to post the outsourcing messages? And how many prospective providers became aware of the company?

4.2.2.3 Expected outcomes

The expected outcomes of this phase are: the company has an extensive overview of the prospective countries, an initial list of prospective outsourcing providers, and the awareness of company has created.

4.2.2.3 Supporting IT tools

In order to investigate above-mentioned factors and select one or few countries for outsourcing, the potential outsourcing consumer company should determine the market size first by using IT tools to conduct investigation and analysis. According to Nahar (2001), the intangible natures of outsource technology makes difficulties for the international outsourcing consumer to determine the market size and to identify the most attractive markets. Nahar (2001) proposed that IT-supported international market investigation and

analysis method is innovative, fast, convenient, and less expensive than the traditional methods. Sizeable and rapidly growing markets can be identified by utilizing multiple data collecting methods, such as the industry specific databases, trade statistics databases, country related market databases, online database, agent technology, search engines, and directories and trade sites on the Web. Through further investigation, the company should select a few prime markets for promotion.

Due to the complex and intangible nature of outsource technology, the traditional international promotion tools (i.e. international advertising, trade shows, international personal selling, letterhead, public press releases, brochures, catalogues, and business cards) are not adequate for creating awareness. In addition, it is very expensive and slow to use traditional international promotion tools to deliver information. Nahar (2001) suggested that IT tools and services can significantly improve the international promotion.

IT tools and services involved in international promotion include: sending e-mails to mailing lists and newsgroups to inform prospective providers about the available outsourcing opportunities, faxing or posting the same message to all prospective providers due to some of them not yet connected to the Internet, posting offers to trade sites on Web, putting classified advertisements on network, using Web-casting, agent technology, banner advertising, and video on Extranet as well as auto-responders.

Nahar (2001) also identified that IT-supported international market research and promotion is not trouble free. The problems encountered in the IT-supported international outsourcing are the low penetrations of advanced ITs in the prospective target markets and low bandwidth communication lines which affect the success of international promotion.

4.2.3 Phase 3: Selection of providers

The selection of international outsourcing provider(s) is the most critical phase in the outsourcing process. The company can select several service providers as candidates for outsourcing and evaluate their proposals.

4.2.3.1 Main activities

Defining selection and evaluation (acceptance) criteria. In this phase, the potential outsourcing consumer company conducts research on various providers to determine which providers can provide services to achieve its objectives. In order to select a suitable provider, the company should define critical assessment criteria before conducting research on the provider. In addition to an obvious factor such as pricing, there are several important characteristics of a provider that must be analysed (Apte, 1996; Heeks, 1996; Nahar et al., 2002; Greaver II, 1999; Chen and Lin, 1998).

- *Experience.* Solid experience in performing the service should generally be important. “The companies most likely to successfully complete software projects are those with previous experience in outsourcing. Hence, the previous record tracking of the provider is a very important factor. In this task, company can check the references to determine the quality of outsourcing services previously provided by the provider.

- *Human and technology resources.* The basic resource that an outsourcing consumer is purchasing from the provider is human skills and capacity. Therefore, in outsourcing decisions both the project management skills and experience and the specific software engineering skills, such as languages, databases, networking skills, and so forth, should be verified. The technology resources should also be checked.

- *Staying power of the provider*. Outsourcing a function to a provider who

then goes bankrupt while the work is incomplete is one of the worst scenarios for the outsourcing consumer. So, the financial strength and the overall sustaining power of the provider should be verified." (Apte, 1996, p. 317)

? *Cultural fit.* "Cultural differences can present problems in outsourcing business in developing countries. These include complicated employer-employee relationships. Employees may be not only evaluated and assigned tasks based on their job skills. Some other factors such as seniority, personal relationship to authority, and socialism principles are also playing an important role in job assignment" (Chen and Lin, 1998, p.120). The outsourcing relationship is long-term, so finding an outsourcing provider who understands consumer's business goals, and shares values and information the same way the consumer does are critical success factors.

Identifying prospective providers. A short list of providers is selected based on the above selection criteria. Selecting a provider not only based on its core capability to deliver specific types of service, but also on its ability and willingness to cooperate in an alliance, to drive down on costs. The following assessments of the criteria involve visits to each provider's premises, interviews with key personnel, and establishing a long-term communication flow. As Reid (1996) suggested, if possible, check providers' contracts and the status reports on key projects. It is important to achieve consensus on the final selection and ensure that everyone has a consistent understanding of the decision and its implications.

Issuing a RFP. After identifying a short list of prospective providers, the project team with the assistance of expert team develops an initial informal rigorous request for proposal (RFP) (Greaver II, 1999), which will be sent out to each of the selected providers. The RFP is a request that solicits more detailed

information on how the provider will perform its responsibilities. As Greaver II (1999, p.188) suggested that the elements of RFP should include: reasons to outsource, scope, provider qualifications, pricing, which decision makers are accessible, and questions. This RFP has a format that forcing the responding provider to answer questions in a way that allows the outsourcing team to compare responses from multiple providers. The RFP also asks the provider to simplify their answers to pricing so that the outsourcing team can really understand what services will be included and which will be extra. Reid (1996) claimed that identifying some key clauses that the consumer company would like to see in the contract will allow consumer company to win some concessions on these, during the contract negotiation phase.

Inviting bidders to a bidders conference The potential outsourcing consumer company invites each bidder to tour the consumer's site to attend the bidders conference. The consumer's top management and the outsourcing team meet bidders to demonstrate the importance and visibility of the study. Provider bids based on the RFP. Since IT outsourcing requires significant changes in duties and responsibilities of IT management, staff, and users (Lacity and Willcocks, 2001), both parties of outsourcing must adapt and learn to interact with each other to deliver a cost-effective service.

Comparing and evaluating proposals. When the RFPs are returned, the outsourcing team also uses the expert team assistance in comparing and evaluating all the submissions, narrowing down the field of potential providers for outsourcing once again. The outsourcing team evaluates proposals against its pre-established and fully documented criteria. The team identifies different approaches recommended by the providers and verifies how they differ from its own research and preliminary conclusions. Selected criteria, specific to the outsourcing activity (ies), are used in the evaluation of the provider. No matter how well the providers look in other areas, if they do not meet the minimum "must-have", they should be contacted for clarification or dropped from the list.

Here, the outsourcing team conducts diligence activities to verify providers' capabilities; the team should not only consider its strategic business objectives but also prepare for the detailed strategy of contract negotiation in the next phase. A win-win relationship objective is essential.

Selecting the suitable providers. After evaluating proposals, Reid (1996, p.5) suggested that ranking proposals to have backup providers. "This is needed in case negotiations break down with preferred provider". In fact, some large companies have found that no single provider can meet all of their needs. Managing multiple providers can be challenging for the consumer company that must oversee each provider separately as well as coordinate among providers. The consumer company needs to identify and evaluate various outsourcing alternatives, such as choosing a single provider or multiple providers. The selected providers should be feasible, operationally, and culturally compatible with the consumer's company.

4.2.3.2 Performance measures

The performance measures in this phase consist of: a practicable provider selection and evaluation criteria, diligence of activities to verify providers' capabilities, number of examined providers, and rigorous RFP.

4.2.3.3 Expected outcomes

The expected outcomes of this phase involves: reduced risk associated with the selection of a provider, an extensive overview of provider's capabilities, access to provider's critical production capabilities of the selected providers secured (Momme, 2001a), the selected provider is compatible with the consumer, and a suitable outsourcing solution.

4.2.3.4 Supporting IT tools

Nahar et al. (2002) states that company uses modern IT tools in this phase can

make the selection of a suitable provider much cheaper, faster, and more convenient than the traditional method. Comparing with traditional methods, like searching on printed materials, local trade journals, chambers of commerce, IT tools can perform some of the tasks more quickly and effectively. Agent technology and search engines can be utilized to collect information concerning the characteristics of the potential providers from company related databases and Internet directories. Further investigation of the potential providers could be conducted via e-mail, newsgroups, and trade mailing lists. Especially, the Internet telephony and teleconferencing are used to conduct in-depth preliminary interviews of the potential providers. For the final selection of an outsourcing provider, traditional research methods are still used, including external consultants, face-to-face meetings, and interviews. Utilization of various IT tools helps in fast identification of several international providers, investigating and choosing a suitable outsourcing provider (Nahar, et al., 2002).

The problems faced by the outsourcing consumer company in using IT tools in the selection of the providers are, not all required information is available online and online database investigation is relatively expensive (Nahar, 2001). These are the main reasons for those companies that are failing in using IT tools for selecting the providers.

4.2.4 Phase 4: Contract negotiation

Once the outsourcing provider is selected, the process of defining the dynamics of the outsourcing relationship begins in the contract negotiation phase. The outsourcing contract is an important part of establishing an effective outsourcing partnership. The contract solidifies the alliance between two parties. Issues such as responsibilities, compensation, termination, service features and above all, performance measurements are put into context. The difference between successful outsourcing and a disaster may simply be determined by the selection of a suitable provider and the terms of the contract.

Good contract and good communications between all parties are building trust and reducing uncertainty for the outsourcing consumer.

4.2.4.1 Main activities

Defining legal/commercial terms and conditions. In this phase, the company uses its expert team and pre-determined target clauses, to define the legal/commercial terms and conditions of contract. According to Greaver II (1999, p.237), the outsourcing contract can generally include the following specific terms: scope of services, factors of production (such as: people, facilities, equipment, software and third-party contracts), performance standards, transition provisions, management and control, pricing schedules, and termination provisions. Among other perspectives, Heeks (1996, p.386) defines the following specifications of a good contract:

- "An unambiguous description of activities and skills required;
- Details of timetable, deliverables, and incentives or penalties;
- A clear set of performance measures, acceptance criteria, and procedures covering. For example, what happens if staff leave half-way or if quality falls below acceptable criteria;
- A clear set of "Go/No Go" decision points;
- A statement of who will own intellectual property rights to the software developed;
- Agreement on asset transfer, as when hardware is loaned to the provider;
- Agreement on post-delivery maintenance."

Applying the most suitable contract patterns. According to Fitzgerald and

Willcocks (1994b), there are three outsourcing contract patterns that consumer companies employ to overcome problems with outsourcing providers: the first is the involvement of both internal and external legal expertise in the contract negotiation, the second is to enter only short term contracts, and the third is the establishment of partnership relationships based on trust between the consumer and provider. The outsourcing consumer company should apply the most suitable contract pattern to contract negotiations.

Setting negotiation baseline scope of delivery. The outsourcing consumer company uses the expert team assistance in setting up the negotiation baseline scope of delivery to allow the contract to fill needs in most cost-effective way possible. The outsourcing consumer company should also consider setting up a contract period to allow time to negotiate the contract. In some cases, the negotiation process up to 12 months. Negotiation contract can be time-consuming and expensive; the outsourcing consumer company need to arrange extra funds to pay for services that may have been overlooked during contract negotiation and to resolve disputes.

Determining mutual commitments. A successful negotiation is predicated on the fact that both parties must gain from the resultant agreement. As each aspect of the outsourcing relationship is governed by the contract, both parties need to reach complete consensus. Understanding the business aims of the proposed provider, and what part your business will play in fulfilling those aims, is essential to create a sound lasting relationship. The open and collaborative effort from both parties for negotiation will ensure continuity of contract knowledge and experience throughout the effective life of the contract.

Signing the contract. The outsourcing contract should be comprehensive enough to cover the breadth of services being contracted. The contract also needs to be flexible enough to accommodate the changing business climate and evolving technical environments (Couldrick, 2001). The essence of the flexibility in an

outsourcing contract should include the multiple price structures for various levels of service, an escape clause for termination of an unsatisfactory partnership, and the framework for when the contract can be renegotiated.

4.2.4.2 Performance measures

Measure the performance of this phase should be: the degree of agreement of the legal/commercial terms and conditions of contract, the ability to specify baseline scope of delivery, the degree of openness and collaborative effort of the provider during the contract negotiation (Momme, 2001a). Because by observing that how willing the provider is to listen to consumer story and needs and modify its approach will indicate, whether or not the relationship between consumer and provider will be successful in the future.

4.2.4.3 Expected outcomes

According to Momme (2001a), the profound expected outcome from this phase are: the company creates a close, intimate and long-term relationship with the outsourcing provider; the consumer and the provider achieve a mutual agreement on contract specifications; the consumer and the provider have a mutual ambition to aim for win-win situation.

4.2.4.4 Supporting IT tools

According to Nahar (2001), e-mail, mobile communication, teleconferencing, videoconferencing, Internet telephone, and fax are the main IT tools that can be extensively used in the contract negotiation phase to facilitate preliminary negotiations cost efficiently, which in terms shortens the negotiation period and reduces travelling needs. Besides the above-mentioned IT tools, contract database is one important IT tool which reduce the risk and time associated with contract setting. The commonly used traditional communication methods

are still in use, such as face-to-face communication, normal mail, etc.

In some target markets, technology is underdeveloped and penetration of ITs is low, thus using video conferencing or teleconferencing is not effective way to conduct negotiations (Nahar, 2001). This is the reason for that face-to-face meeting is necessary in contract negotiation phase.

4.2.5 Phase 5: Project implementation

This phase covers the actual effort of implementing the goals and commitments identified by a joint implementation team. The whole concept of achieving mutual benefits and competitive advantage depends on the successful implementation of agreed plans. It is difficult to introduce two company cultures in a third party arrangement and expect them to perform efficiently on the first day. For a number of reasons, it is worth spending some time and effort to ensure the first day is as perfect as possible.

4.2.5.1 Main activities

Building a joint implementation team. To manage the implementation process more smoothly and solve any unexpected problems, the possible optimum option is to create a cross-functional implementation team that involves all the heroes in-house staff, the provider's professional services, and a system integrator (VanDoren and Nowicki, 1999). The project implementation phase itself requires coordinated effort, which is effectively achieved through building a cross-functional implementation team. This team focuses on financial and strategic management of the daily operation.

Developing an implementation plan. In order to move the tasks of software production to the provider smoothly, Greaver II (1999) suggested that the two parties should together develop a clear implementation plan to identify critical targets and time-scales for actions. The implementation plan should subdivide

the project implementation phase into specific tasks and activities with regard to time sequence (Nahar, 2001). This plan makes the whole implementation team understand what is going to happen, when, and where certain activities are going to happen. This will develop full understanding among transition management of the coming changes and improvements. The implementation process can take from a few to several months depending on the size of the contract and the gap between the state and the desired state.

Training the employees of both parties. Nahar (2001) argued that technology containing maximum tacit knowledge requires longer time, greater efforts, and extensive explaining and training. Continuous provision of support and training to the employees of both parties will enhance their project management, relationship management, and service delivery management skills.

Reviewing milestones together. Nahar et al. (2002) identified that reviewing the milestones by the both parties together is a critical step in project implementation. The outsourcing consumer and the provider should meet on a regular basis to review progress against the planned schedule as well as to address the identified issues and plan for upcoming implementation activities. Once the implementation is complete, the consumer and the provider should continue to meet on a regular predefined schedule. These meetings offer an opportunity to review monthly performance and verify against established objectives.

Reporting progress by the provider. Since the international outsourcing implementation phase usually carries out in the provider's country, the outsourcing consumer cannot control all activities in this phase only by milestone reviews. In order to solve the problems that occur in this phase, the outsourcing provider needs to report to the consumer about the progress of the project implementation on a regular basis. Thus, the consumer and the provider

can work together to find out the ways to solve the encountered problems as early as appeared.

4.2.5.2 Performance measures

The performance measures of this phase are done by checking the following criteria: How much degree of the commitments provided by the cross-functional joint implementation team? Is the implementation plan enough practical for carry out? How many times of trainings have been done for the employees of both parties? Are the milestone reviews always met the planned schedule? In addition, the frequency and the quality of the progress report delivered by the outsourcing provider are also including in the performance measures criteria.

4.2.5.3 Expected outcomes

During this implementation phase, the consumer company has “a strong incentive to rethink its vision and strategy and assess the quality of its knowledge bases and operating procedures relative to suppliers and competitors” (Momme, 2001a, p.9). In addition, the access to the provider’s complementary competencies is expected to produce numerous benefits like shared resource base for organizational learning and product/technology development, greater flexibility, reduced operating costs, and improved recurrent times (Momme, 2001a). Thus, the expected outcomes from this phase are: more available capital funds and resources (Momme, 2001a), an efficient implementation team, a clear implementation plan, high-skilled employees, and good quality and regular basis of the progress report.

4.2.5.4 Supporting IT tools

It is common that the following IT tools are used to ensure that the outsourcing project is implemented according to the agreements made by two parties.

Building a joint implementation team and developing an implementation plan through e-mail communications, advanced teleconferencing, collaborative online tools, videoconferencing, Intranet, Extranet to maximize the decision-making capability, and make planning efficient (Nahar, 2001). The benefits of project implementation by using IT tools, (e.g. Web-based project management tool, Web-based training tools, computer-based simulations software, reporting tool), include improve effectiveness, the ability to quickly assemble teams, the ability to access to updated information, reduce the barriers of distance and time (Nahar et al., 2002). International executive support systems and Internet distributed development tools (IDDT) improve effectiveness on managing outsourcing relationship and resolving problems associated with the implementation process. The nature of the international environment, characterized by complexities and uncertainties, requires that executives constantly monitor both the internal and the external environments. “An ESS should provide the necessary proactive scanning capabilities such that executives can be armed weaknesses, harvest opportunities, and alleviate ill effects from threats” (Iver and Schkade, p.249). While IDDT ensure the success of remote teamwork collaboration. The IDDT includes: instant messaging, virtual meeting room, application sharing, centralized document storage management, searching and indexing, co-browsing, electronic document workflow, calendaring and scheduling, online event notification, project resource profiling, whiteboards, and online voting and polling (Nealon and Johnston, 2001).

The study of Nahar (2001) reveals that the major benefits of using above IT tools and services in the project implementation phase are: improved coordination of the activities of the implementation, improved communications among all the partners, worldwide collaboration, developing a good relation with an outsourcing provider, and lowered cost in project implementation. The major problems in using IT tools in implementation phase include: low bandwidth,

underdeveloped telecommunication infrastructure, and expensive data communication. Some companies failed in using IT tools in implementation phase mainly due to above problems.

4.2.6 Phase 6: Managing relationship

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

4.2.6.1 Main activities

A solid working relationship between the provider and consumer should be built on trust and commitment to make the project successful. Such a relationship depends upon various activities (see below):

Creating management structure. Corbett (1996) examined that creating a new management structure fits the new organizational realities is more important than putting an entire management in place designed specifically to manage outsourcing relationship. This new management structure should be flexible enough to adapt the business changes. This kind of management structure enables philosophies and cultures from two parties are compatible, and allows for identifying problems before they escalate and for resolving them.

Effective and open communication. Greaver II (1999) stated that effective, frequent, and open communications between the consumer and the provider ensure that the potential problems are identified and resolved before they cause

disruptions. Communication begins at the inception of the outsourcing strategic analysis and decision phase and continues through the project implementation phase. It is embodied in the spirit of successful relationship management. A well-defined open communication channel will accelerate the knowledge transfer and provide experienced oversight. According to the need of the outsourcing consumer, it uses all the communication tools at its disposal to promote the success.

Free knowledge sharing. As described by Konsynski and McFarlan (1990), partnership can create a competitive advantage through the strategic sharing of organizations' key knowledge. The two outsourcing parties are expected to sustain the relationship that is more effective over time by sharing information and by being knowledgeable about each other's company.

Developing performance metrics and monitoring mechanisms. Baumann (2001) examined that an effective and understandable performance metrics combine service levels with financial targets and include consequences associated with failure to meet minimum standards. Effective metrics require constant monitoring by monitoring mechanisms effectively. Such monitoring mechanisms include periodically assess on provider's performance that compares with similar providers, schedule periodic working-level meetings to review provider's performance, etc.

Monitoring performance routinely. Performance monitoring is a key to providing incentives for managing and improving outsourcing relationships. Once objective metrics of performance have been created, the consumer and the provider must work closely together to monitor and continuously improve performance. Greaver II (1999) indicated that performance report is an efficient way to monitor provider's performance. The performance report ensures that provider measures and reports about performance on a regular basis. Distributing performance report to the consumer creates an open atmosphere

that builds confidence and enables the consumer to review progress toward goals. Lacity and Willcocks (2001) examined that benchmarking is a powerful tool for the consumer to leverage their bargaining position with the provider. Through comparing provider's performance against a reference group of similar organizations, the consumer could ensure that the provider's costs and service are among the best-of breed. Thus, the consumer could use benchmarking to reduce prices or increase service levels under the fixed-fee umbrella. Because benchmarks could reset prices, the financial consequences of this activity could again result in millions of dollars, serving to add to the tension.

Realigning the contract. According to Lacity and Willcocks (2001), consumers frequently find original contracts to became old-fashioned due to various changes. They claimed that contracts should not be valid for a period of more than three years. During contract realignment, the consumer and the provider both committed to realigning the contract to help set realistic expectations.

Executing incentives and penalties. The outsourcing consumer should consider incentives to motivate the provider to exceed performance requirements, such as awarding the provider to set a mark-up on new capital IT investments. The more the technology cost, the more the provider earned. The consumer also should encourage its employees to move to the provider's site working by using bonuses, stock options, and other appropriate methods. Meanwhile, the consumer can use penalties to motivate provider to meet performance requirements. For instance, they can hold back percentage of provider's pay for a particular service until performance requirements are met.

4.2.6.2 Performance measures

The performance measures in this phase are: the capability to create a culture matching the management structure; the quality of communication; the freedom of information sharing; the practicability of performance metrics and

monitoring mechanisms; the frequency of performance monitoring; the period of valid contract; and the ability to execute incentive and penalty.

4.2.6.3 Expected outcomes

The expected outcomes through this phase should be: a flexible management structure, an effective communication channel, free information sharing, practicable performance metrics and monitoring mechanisms, periodical performance monitoring, a realistic contract, and a comprehensive incentives and penalties system.

4.2.6.3 Supporting IT tools

Ives and Mason (1996, p.163) stated that the "successful global projects often employ an international design team". The international outsourcing team could heavily use IT tools to coordinate its activities, such as the same systems development methodology, computer-aided software engineering tools, project management software, and worldwide corporate data standards (Ives and Mason, 1996). E-Mail could be used extensively for daily communication among the team members because e-mail bridged the time zone differences and helped to maintain personal relationships. Nahar (2001) indicated that Extranet, Intranet, Internet, mobile communication systems, teleconferencing, and video conferencing technologies could be utilized to consult with remote experts around the world to solve complex problems.

The major problems encountered in using IT tools in relationship management phase include: cost of communication is high and video conferencing technology is still underdeveloped (Nahar, 2001).

4.2.7 Phase 7: Evaluation and contract termination

During this phase, the contract relationship is terminated after delivery of the products and payment is made or grows with a new outsourcing software

development project. The consumer examines the performance of the product, studies the positive and negative outcomes from outsourcing, stores documents in a lessons-learned depository (Nahar, 2001), assesses the alternatives of extending the relationship, switching the provider, or bringing the IT activity back in-house (Lacity and Willcocks, 2001), and establishes basis for reviewing core competence strategy (Momme, 2001 a).

4.2.7.1 Main activities

Establishing an evaluation criterion. Since the user satisfaction is often the true indicator of product or service quality, the outsourcing consumer company should include this component in the evaluation criteria. In addition, innovative ideas and creative solutions are also key components of the evaluation criteria.

Evaluating products. Products and documentation produced by the international outsourcing provider should be delivered to the outsourcing consumer according to the contract. The outsourcing consumer does user acceptance testing to the delivered products by checking the timeliness and quality of the product and documentation against the contract.

Making payments. Nahar et al. (2002) examined that the payment for international outsourcing is complicated. Due to the amount of money involved is large, the payment methods are customized according to the suitability of the provider. She indicated that secure payment method through the Web is suitable for a small sum of payment. While paying a large amount of money, the wire transfer or letter of change (L / C) is suitable. In order to reduce the risk of international outsourcing process, the consumer company should adopt flexible payment methods.

Studying about the positive and negative outcomes. Studying about the positive and negative outcomes serves to uncover numerous opportunities for increased

efficiencies, effectiveness, and improved return on investment. It also highlights activities that are already performed effectively with the outsourcing process.

Assessing the alternatives. Based on the findings of the study of positive and negative outcomes of outsourcing, the consumer company determines the relationship will be whether extended or terminated. In general, there are three possible options: extend the contract with current suppler(s), switch provider(s), or bring the IT activity back in-house. According to Lacity and Willcocks (2001), assessment of these options will depend as much on business strategic concerns and the nature of the current and future competitive climate as on the strength of relationships and past value of the outsourcing arrangement.

Momme (2001a) suggested that regardless of whether the two parties have extended the outsourcing relationship one or more times due to successful conditions, the consumer company must guard realize the fact that the relationship will probably terminate at one point in time. During the contract period, the company must therefore be adequately in touch with the outsourced competence area to enable either substitution of the provider or in-sourcing when the contract terminates. This substitution or in-sourcing must take place with a minimum of new learning involved.

Documented and stored analysis in depository. Document and maintain organizational knowledge allow the company to manage outsourcing process easier in the future. A company with substantial experience in outsourcing will have less difficulty in defining the lines between provider and the company in terms of responsibility for success. The more documented experience the company has had in the outsourcing process, the easier the outsourcing will be.

4.2.7.2 Performance measures

In this phase, the performance is measured against contract clauses such as the

service level, performance goals, etc. It is common to measure the outcome in terms of user satisfaction as well as financial or technical performance. The measured criteria include: 1) the technical performance of the product vs. contract, 2) the delivery time vs. contract, 3) the cost of the project vs. contract, 4) the degree of user satisfaction, 5) the degree of touch with outsourced competence area (Momme, 2001a), and 6) the ability to assess alternatives (Momme, 2001a).

4.2.7.3 Expected outcomes

Expected outcomes from this phase should be: fully satisfaction about technical performance of the product, on-time delivery date, reduced phase-out costs, awareness of when to extend, switch or in-source, and better link to strategic planning (Momme, 2001a).

4.2.7.4 Supporting IT tools

Nahar (2001) examined that Extranet, Intranet, Internet, IS, mobile communication systems, teleconferencing, video conferencing technologies, and Internet telephone services can be utilized to evaluate the performance of the project, to identify various problems that have occurred and their causes. She explained that teleconferencing and video conferencing technologies as well as mobile communication systems can also be utilized to consult with remote experts to solve the complex problems. The IT tools make the evaluation process more efficient than commonly used methods in the evaluation and contract termination phase.

In the evaluation and contract termination phase, companies usually encounter the following problems in using IT tools: cost of communication is high, video conferencing technology is still underdeveloped, and bandwidth is low (Nahar, 2001).

4.3 Summary

The conceptual framework of IT-supported international outsourcing process has been developed based on diffusion of innovation theory, following the objectives of this research, and literature review on international outsourcing and information technology. This framework helps in analysis of how IT-supported international outsourcing process is, or should be executed. The IT-supported international outsourcing process consists of seven sub-processes:

- Strategic analysis and decision;
- International market research and promotion;
- Selection of providers;
- Contract negotiation;
- Project implementation;
- Managing the relationship; and
- Evaluation and contract termination.

The IT-supported international outsourcing process framework is intended as a tool to enable outsourcing consumers to manage the international outsourcing process. It aims to facilitate proper planning, control, and continuous improvement of the consumer-provider relationship. Effective implementation of this framework (see Figure 1) should make the process of software production through international outsourcing faster and easier, and reduce the complexities and risks.

5. RESEARCH METHODOLOGY

This chapter describes the selection process and utilization of the research methods within this study. The purpose is to give an understanding of how we conducted research, how the work is structured, and also to demonstrate why the chosen methods are appropriate for the problem at hand. In this chapter, we will (1) provide the background to the choice of research methods; (2) describe the selection of research methods; (3) elaborate the research design; (4) explain the data collection; and finally, (5) discuss the validity of the research.

5.1 Background of the choice of research methods

The selection of an appropriate method is of vital importance for the final quality of the study.

According to Neumam (1993), the theoretical framework provides a collection of assumptions, concepts, and forms of explanation, is more abstract than a theory on a topic. It often helps to structure the research to some sort of framework. The purpose of a framework is to describe and comprehend reality with the assistance of analytical tools and theories.

Neuman (1993) stated that the most commonly used approaches in building and testing of theory are the deductive and the inductive. They are both aiming at the same goal, which is to describe and comprehend reality with the assistance of analytical theories.

The deductive approach suggests that the researcher generates hypotheses from a particular theoretical framework and then tests these by observing reality, confirming or rejecting the hypothesis. In this approach, the theory serves as the basis for making predictions about new, specific observations.

The inductive approach is radically different. The researcher starts out by examining the reality and identifying a phenomenon. The researcher will then

try to describe the phenomenon, using analytical tools such as theories, questionnaires with detailed observations of the world and move toward more abstract generalizations and ideas. The analysis can give a new theoretical framework, or simply conclude that no meaningful generalizations can be made (Neuman, 1993).

Since this area of research is new, little is known about the phenomenon of IT-supported international outsourcing process. Therefore, the main goal of this research is to explore how IT-supported outsourcing process is executed, how software technology is transferred, how the outsourcing project is managed, and how various control and coordination mechanisms are used in the international outsourcing project. We first explored the suitable theories to describe this phenomenon and then create a conceptual framework to abstract the theories. Thereafter, we collected empirical data based on the conceptual framework. Then we evaluated the framework based on the empirical data. Based on the results, we develop confidence of conceptual framework. It was therefore natural for us to choose inductive approach in our study.

The basic research questions, background theory, relevant literature review in the fields of international outsourcing, software technology transfer, software production, IT, diffusion of innovations, and the questionnaire guide guided us in formulating the field study.

5.2 Selection of the research method

The selection of an appropriate research method depends on many factors. Some key factors include: the nature of the phenomenon, the state of existing knowledge, and the types of questions to be asked (Stake, 1995; Yin, 1994; Nahar, 2001).

In order to answer the research questions and execute the research project, we considered the following specific characteristics for this research suggested by

Nahar (2001) for the selection of an appropriate research method.

- Our investigations of various IS journals, The Journal of International Technology Management and other journals dealing with software production through international outsourcing, and software technology transfer and IT, confirm that the use of IT in international outsourcing process has not been properly investigated.
- Very limited empirical research has been done on IT-supported international outsourcing process.
- Very limited literature exists on IT-supported international outsourcing process.
- Software production through IT-supported international outsourcing is a process.
- International outsourcing is a complex and risky endeavour.
- The objective of this study is to conduct in-depth explorations of IT-supported international outsourcing phenomenon.

Earlier research (Nahar, 2001) indicates that case study method is suitable for investigating those research projects that are having the above characteristics. Therefore, we make an analysis of the case study method to find out whether it is suitable for our study.

Yin (1994) identifies five main research methods: experiment, survey, history, archival analysis, and the case study. Each method is a different way of collecting data and follows its own logic. The various research methods answer different research questions and they have different control and time focus. A case study is preferred as a research strategy when “how” and “why” types of questions are being asked, when the researcher has little control over events

and when the focus is on a current phenomenon in a real-life context. “How” and “why” types of questions are more explanatory, dealing with “operational links needing to be traced over time” (p.6).

The research questions in this thesis are explanatory, since they involve “how” type of question. “***How the software production through international outsourcing process has been executed?*** ”. To answer this question we had to trace links over time, rather than focusing on frequencies, which is more common in a survey. We are focusing on a current real life context phenomenon, and when explaining this complex issue qualitative data as well as different types of secondary data are needed. The case study method allows us collect current data as well as past data of the international outsourcing process by using multiple sources. Therefore, the case study method suited the purpose of the thesis best.

A case study method was also chosen because we look at the process of software production through international outsourcing over time, and some of the dynamic aspects would be difficult to capture in a survey.

Yin (1994) states that certain topics are suitably examined via a case study method. They include: organizations, processes, programs, institutions and events. The focus of the investigation in this study is “***process***”.

Further, there are three different kinds of case studies (Yin, 1994): exploratory, explanatory, and descriptive. Our research is exploratory in nature. An exploratory approach is often used when the knowledge on the topic and prior research is very limited. An exploratory research is designed to allow an investigator to just look around with respect to some phenomenon, the aim being to develop suggestive ideas. As such, it is our aim to explore the processes of software production through international outsourcing.

5.3 Research design

Yin (1994) states that every type of empirical research has a research design. The design is the logical sequence that connects the empirical data to the initial research questions, and finally to its conclusions. For case studies, five components of a research design are especially important.

1. A study's questions,
2. Its propositions, if any,
3. Its unit(s) of analysis,
4. The logic linking the data to the propositions, and
5. The criteria for interpreting the findings.

The research questions in this thesis have the form of "how" types of questions and for that reason the case study is the most appropriate research design to carry out. We do not intend to set any propositions in the study. The phenomenon of IT-supported international outsourcing of software production is new within this industry and we want to explore the issue in-depth. To accomplish this, the purpose, *"How the IT-supported international outsourcing process of software production has been executed"* is defined to guide us. The definition of the unit of analysis and therefore, the case is related to our defined research questions. The unit of analysis in this study is the process of software production through international outsourcing. There exist several types of international outsourcing as literature review showed, such as body shopping, project management, total outsourcing, business process outsourcing, and transitional outsourcing. We have decided to study one of them that is project management outsourcing, since our investigated company is experienced in this type of international outsourcing. To interpret the findings we will use the conceptual framework that we developed for this study, where the goal is to

analyse the case study by building an explanation about the case that will support or refute our framework. An empirically based pattern, that is the case company will be compared with conceptual framework that is based on literature review. Thus, the study is aiming at an analysis and refining generalizations.

5.3.1 Single case study

According to Yin (1994), a principal distinction in designing case studies is between single- and multiple-case designs. A common motivation for choosing a single case is when the case represents an extreme or a unique case. Another motivation for a single case is when a researcher has an opportunity to observe and analyse a phenomenon previously inaccessible to scientific investigation.

The current study utilizes an exploratory single case study approach due to the massive amount of data needed from the case company in order to investigate the research topic thoroughly and also because the scope of this thesis. Special care has been given to maximize access to evidence and to avoid misinterpretation of the research data (Nahar, 2001).

Following Yin's (1994) suggestion, special attention has been given to the case company selection. The type of case company has been selected which has already successfully executed several international outsourcing projects and heavily uses modern ITs in its international outsourcing projects. Jipeq, the case company that has been identified for this study, has successfully outsourced to two foreign countries, i.e. India and Russia.

The selection of one case company was based on the following criteria:

1. Being a heavy user of IT,

2. Having produced software through international outsourcing,

3. Having experience in international outsourcing process,

4. Having extensive knowledge in international outsourcing of software production and willing to share their knowledge, opinions, and insights.

5.4 Data collection sources and methods

According to Malhotra (1996), data collection can be divided into two main categories, primary and secondary data. The primary data is collected by the researcher for the specific purpose of addressing the problem at hand. Secondary data concerns data that has already been collected and is available in periodicals, academic literature, journals, etc.

5.4.1 Primary data

Yin (1994) identifies six different forms of evidence on which the research could be based, namely documentation, archival records, interviews, direct observation, participant observation, and physical artefacts. The different sources are complementary and the serious researcher should therefore use as many sources as possible, especially since no single source has complete advantages over the other. In order to conduct a qualitative study we believe that personal interviewing combined with independent documentation is a meaningful way of collecting data.

5.4.1.1 Selection of interviewees

We conducted one interview at Jipeq Company. The interviews took place in Helsinki on 21 February 2002, which lasted more than four hours. Interviewing the right people was of significant importance to the quality and credibility of our research.

We identified three key types of criteria for selecting the interviewees, which would ensure to get information and insights about the subject from a wide range of perspectives. The three types are:

1. Outsourcing project manager and coordinator;
2. Person involved in the actual process of international outsourcing;
3. Business or general manager.

We have assessed the quality of these interviews when analysing the empirical findings. The choice to interview people from the above mentioned three types turned out to be wise and it enabled us to acquire insights from different perspectives, since the viewpoint from someone "inside" the case study as well as from someone external to it could be obtained. We managed to obtain interviews from all the parties involved in the single case study. The remaining interviewees i.e. industry researchers were selected with respect to the interviewees' knowledge within the area and with consideration to approach the interviewees, and conducting the interviews easily. For more thorough information regarding the interviews conducted, see the questionnaire guide in appendix 1.

5.4.1.2 Interview methods

Denzin (1978) defines three different categories of interview methods depending on the degree of structure: the schedule standardized interview, nonschedule standardized interview, and nonstandardized interview. In the schedule standardized interview, the interviewer asks all respondents the same series of preestablished questions with a limited set of response categories. In a non-scheduled standardized interview or unstructured schedule interview, the interview poses a few predetermined questions but has considerable flexibility concerning follow-up questions. This form of interview requires that each

interviewer has been involved in a particular experience and they have previously studied the situation. The unstructured schedule interview permits the researcher to obtain details of personal reactions, specific emotions. The least structured kind of interview is the nonstandardized interview or unstructured interview, in which the interviewer encourages the respondent to discuss a topic related to their experiences but provides little or no guidance and poses a very few direct questions.

Denzin states that the unstructured, non standardized interview is best suited for exploratory studies.

5.4.1.3 The choice of nonschedule standardized interview

Since the purpose of the interviews was to acquire knowledge about how IT-supported international outsourcing process is executed, the nonschedule standardized interview method was the most suitable choice. This method enabled us to pose follow-up questions in order to obtain valuable information from different angles and perspectives. To be able to generate meaningful follow-up questions, we developed the questionnaire guide by reading background theory and literature review of different aspects of the research topic, such as international outsourcing, software production, software technology transfer, and IT. The questionnaire guide was composed of open-ended and semi-structured questions. The questionnaire guide was refined and reviewed by our supervisors.

The questions have been open-ended in nature and we appeared naive about the topic to allow the respondents to give a fresh comment. We used all the questions in the questionnaire guide, but sometimes only questions suitable to the interviewee's area of knowledge were answered. We used tape recorder to get more accurate interpretations. The interviews were conducted in English.

We chose two persons from the case company which representing the above categories for interviewing. The two persons have experiences covering all aspects of IT use in outsourcing process. We conducted face-to-face in-depth interviews only once with these two persons, then followed by a telephone conversation and e-mail interviews. The selection procedure and rich data collection strategy allowed us to overcome bias.

5.4.2 Secondary data

The major strength of the case study data collection is the opportunity to use many different sources of evidence (Yin, 1994). We have collected information from multiple sources to confirm our research phenomenon. The secondary data that have been used consist of articles from papers, Internet sources, surveys conducted by others, books, and industry papers. When we could not assess the credibility of these sources, we confirmed the secondary data with interviews, which could provide us with an even better understanding about the research subject.

5.4.3 Data analysis

Analysing data is the heart of case study. In order to make data analysis both rigorous and effective, this study systematically deployed several strategies suggested by Nahar (2001).

The first step is informal data analysis that was performed during and immediately after each interview:

1. During each interview, ideas and references to the theory were written down as they occurred;

2. Summarizing of interviews was done immediately after each interview; and

3. Preliminary findings were identified from each summary.

Nahar (2001) argued that the interview summary and identification of each preliminary finding were useful for data reduction and conducting preliminary analysis.

The second step that Nahar (2001) suggested was transcribing the taped-recorded interviews. This step was a more formal process compared with the first step. During this step, taped-recorded interview were thoroughly listened to and transcribed verbatim following a second listening. A third listening where the transcribed texts were compared to the tape was also conducted. Texts have been carefully edited and forwarded to interviewees for authenticity.

The collected information has been verified by comparing with the data from the interview of outsourcing service provider, and also comparing data of two interviews. The data has been read several times to ensure familiarization.

A narrative from each interview was developed. The narrative was organized thematically, the themes include the phases of the IT-supported international outsourcing process, software technology transfer, software production, project management and IT. The data was sorted according to the set themes. This allowed us to reduce the data. Each theme for all the narratives has been compared extensively. Similarities emerged from each interview.

To support the analysis, a number of quotations from the interviewees were included in the case analysis sections.

5.5 The quality of the research

A study should be critically judged in order to determine its quality. Yin (1994) identified four relevant tests in judging the quality of a research design: construct validity, internal validity, external validity, and reliability. Before

initiating the discussion on the quality of the research, we want to stress the importance of a thorough theory selection. According to Yin (1994), the development of a theoretical framework is the vehicle for generalizing the results of the case study. We believe that the most important theory and relevant literature have been applied to examine our case. The reader should however be aware that we have only included a limited amount of theory compared to what has been found on the subject.

5.5.1 Construct validity

Construct validity concerns the question on how well a study measures what it is supposed to measure (Yin, 1994). Construct validity is especially problematic in case study research due to the interviews usually made. Yin (1994) presents three tactics for avoiding research subjectivity, namely (1) the use of multiple sources of evidence, (2) the establishment of a chain of evidence, such as clear links between the data gathered, the questions asked and the conclusions drawn, and (3) the opportunity to have the draft of the case study reviewed by key informants. According to the three tactics, we developed the following five steps' construct validity control to avoiding research subjectivity in our research.

First, background theories and a questionnaire guide were used in order to deal with detailed documentation of the data and minimize errors and biases. The questionnaire guide was verified by supervisors, the case companies. Second, interviewees selected are involved in the outsourcing process and possess a vast knowledge of the phenomenon under investigation. Third, the concepts of this research were delineated to interviewees before conducting the interviews. Fourth, multiple data sources were included in this study in order to increase the construct validity of the research. Fifth, the draft of our case study report was sent to the interviewees to check for errors and evaluate the validity of the interpretation (Stake, 1995; Yin, 1994). The errors were corrected.

We have followed Yin's three tactics in our research by conducting five-steps´ construct validity control, as discussed above to ensure the construct validity in this study.

5.5.2 Internal validity

Internal validity refers to the extent to which it can be inferred that a causal relationship exists between two (or more) variables (questions) (Yin, 1994). Thus, internal validity is an important consideration in causal or explanatory case studies. In case study research, it also has to be considered in making inferences. Since events in most cases cannot be directly observed, a researcher has to "infer" that a certain event is the result of some earlier events based on interviews and secondary data.

In treating the empirical evidence, Yin (1994) suggests to follow the theoretical propositions that led to the case study, since the theoretical propositions have been the basis for data collection, and have provided a "guide" for what kind of data one should focus on. The theoretical framework that we developed for this study served as the basis for data collection and the analysis of the gathered data. In order to improve internal validity we have followed the same interview form for each interview session i.e. each respondent has been asked the same set of questions. In addition, the original raw data were presented for readers to see which improves the internal validity of the study (Patton, 1990).

5.5.3 External validity

External validity refers to the ability to make valid generalizations to a larger population of interest. In other terms, it concerns the extent to which the study can be generalized to cases other than the ones studied (Yin, 1994). Yin (1994) recommends replication logic to improve the external validity. The reasoning behind replication logic is to test the findings from one case study with other cases in order to find out if the findings are valid.

We believe the external validity to be limited concerning the ability to generalize the analysis to other cases. However, the same questions were asked to two interviewees and results were compared. Multiple data sources were utilized and research results were compared with prior research in the international outsourcing field. These measures increase external validity of the research and overcome the specific criticism that case studies are not easily open to generalization.

5.5.4 Reliability

Yin (1994) claims that the goal of reliability is to minimize errors and biases in a study. This is to be sure that if another researcher followed exactly the same procedures as the earlier researcher and conducted the same study all over again the later research should arrive at the same findings and conclusions. One prerequisite for allowing another investigator to repeat the same case study is the need to document the procedures followed in the earlier case.

One drawback with interviews is that they are subject to personal interpretations. One could also argue about the accuracy of the results if additional persons had been interviewed in each company. Thus, the key is to interview the right person i.e. the one possessing most information or the most suitable person as far as the problem at hand is concerned. As stated earlier the respondents were all key management persons. As such, their legitimate opinions were most likely to reflect the stance of the whole company.

Two tactics are recommended by Yin (1994) to deal with this issue. These are (1) using a case study protocol and (2) to develop a case study database.

In the case study protocol we stated whom we interviewed and when. The questionnaire guide is also included in the Appendix 1 together with a description of the interviewees. However, it might be hard to fully replicate the in-depth interview, since the semi-structured interview allows for flexibility,

which makes it difficult to replicate. We used a tape recorder in order to facilitate the recollection of the interview. The results also depend on the interview situation, how much an interviewee is willing to reveal, all of which would probably vary from time to time. To deal with the database issue we have saved all the transcripts and notes from the interviews. Concerning the secondary data, we have stated the sources and these sources are available to the readers of the thesis. The theoretical literature and the web-references are also easily accessible. Thus, both the database and the protocol issues are fulfilled. We therefore believe that the data collection procedure can be repeated with the similar results and the reliability of the study is fair.

5.6 Strategies adopted to overcome the limitations of the research method

No single research method is perfect for executing a research project chosen. A case study method has been identified as being the most appropriate method for investigating this research problem, yet it may have a few weaknesses.

This research uses a single-case design. Single-case research imposes limitations and is subject to possible bias. Miles and Huberman (1994) have shown that in a multiple case research “there is much potential for both greater explanatory power and greater generalization than what a single-case study can deliver”. That was controlled for by doing what Yin (1994) suggests. According to Yin (1994), special attention must be given to the selection of an appropriate case company. He maintains that the selected case company selected must have already successfully executed the same process that is under investigation. The case company selected for this study, fits this profile and has successfully performed international outsourcing and transferred technology to foreign countries.

A case study method is often blamed for producing massive quantities of time-consuming data that are difficult to summarize and analyse. The research framework and an interview guide were used to maintain the focus on data

collection and to reduce the amount of material to be processed. Preliminary analysis of the data as soon as it was collected also reduced the need for a huge amount of information (Nahar, 2001).

Another criticism is that the researchers allow equivocal evidence or biased views to influence the findings and the conclusion. In order to control this, Miles and Huberman's (1994) suggestions were followed, that is, the data interpretations were checked by supervisors, fellow researchers in outsourcing field and the interviewees.

5.7 Summary

In this chapter, the selection process of the research methods and their utilization within this research has been described. First, an analysis of inductive approach has been conducted and their suitability for the examination of the research questions has been analysed. Then, an in-depth analysis of the case study method and the reasons behind the selection of a single case study method has been conducted. Next, the research design of a single case study has been explained. Then, an in-depth design of data collection and analysis methods has been explained. Finally, a discussion of the quality of the research and a variety of measures taken to reduce the weaknesses of the research methods has been explained.

6. CASE DESCRIPTION AND ANALYSIS

This chapter presents the performance of a case analysis of the investigated company, Jipeq. The analysis was performed following the suggestions of several different research methodologists (Creswell 1994; Marshall and Rossman 1989; Merriam 1988; Miles and Huberman 1994; Yin 1994). The case study analysis has been performed based on the conceptual model, diffusion of innovation theory, and relevant literature in the fields of international outsourcing, software production, and information technology.

At first, the issues of the IT-supported outsourcing process have been analysed. The transcripts have been organized thematically and sub-thematically. The main theme being an IT-supported outsourcing process and the sub-themes being phases of IT-supported outsourcing process. The data from all of the transcripts was first organized according to the themes, and then arranged according to the sub-themes. For instance, contract negotiation is one of the sub-themes and all of the data from all of the transcripts with reference to contract negotiation were combined for the analysis of contract negotiation phase. Comparisons were made and results were gathered for each theme by looking at data from all the informants together. References to the transcribed texts of the interviews and quotations from the case have been used throughout the case analyses and descriptions. A description of all transcript-related issues as well as how the transcript was documented and verified have been explained in detail in section 5.4.3 of research methodology chapter.

To conclude this chapter, a summary has been provided discussing the overall issues relevant to this chapter.

6.1 International consumer's background

The Jipeq Company was founded in Finland in May 2000. It is funded by the virtual capital firm. Stratos Ventures. Jipeq 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. It has already done ten international outsourcing projects in Russia and India. Even though Jipeq is not a “real” outsourcing consumer rather than an outsourcing intermediary company, it takes responsibility of selecting providers and handles the payment during the international process. From provider’s perspective, Jipeq can be considered as an outsourcing consumer. We choose Jipeq as our case company because of its vast knowledge and extensive experience in international outsourcing.

Excellency in these areas requires strong skills in mathematics and digital signal processing. Most of their team-members are top graduates from the Mathematical Faculty of the St Petersburg State University, one of the world's leading mathematical and software engineering institutions.

6.2 IT-supported outsourcing process

This section investigates and analyses each phase of the IT-supported international outsourcing process in the investigated case company.

6.2.1 Strategic analysis and decision

Because in some domain such as digital signal processing a significant gap exists between the demand of highly skilled software personnel and the supply of these software professionals in Finland, some Finnish companies start looking for high-skilled software professionals from other countries. Jipeq is not a real outsourcing company, that is why it did not conduct strategic analysis before outsourcing, but Jipeq has responsibility to help its Finnish customers to analyse the suitability of outsourcing. The following comments explained the reasons behind their Finnish customers’ decision to outsourcing. According to project coordinator of Jipeq:

> "There was a huge shortage of talented software professional in Finland and in the rest of Europe as well as in the USA. Finland being a small country, it is obvious that we need to look at 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 competences." (Project coordinator, Jipeq, Helsinki, 2002)

The same interviewee stated that:

> "There is no cost advantage in the whole project. It is about the skill - e.g., if we need to find certain people with certain skills, or we need to find some people with Web logic experience and who have 5 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 time. That is why, we bring them here or we might kick off offshore model." (Head of the business development, Jipeq, Helsinki, 2002)

These findings are consistent with the reasons of international outsourcing in our literature review which propose that international outsourcing can overcome the shortage of IT professionals.

The same interviewee also explained why the Finnish customers have chosen Jipeq as a mediator / agent to conduct international outsourcing.

> "Why would they choose us depends on what they are looking for and what is the comparison. If the comparison were working with firm XXX (Finnish big company), then they would choose us because of the competitive price, flexibility, quality of work, and our commitments. FirmXXX has defined that type of process which makes them inflexible. For example, the specification time is very long and once they start programming, they do not accept any changes and it is very difficult to make some changes in the project. They are inflexible in that sense. Because it is very difficult to find the technical competence in Finland. It is also about some specialized high-skilled things that the (Finnish consumers) usually required from us. They could not find themselves; they cannot recruit by themselves, and they know it is a difficult and expensive endeavour. " (Head of the business development, Jipeq, Helsinki, 2002)

Besides the technical competence of Jipeq, customers want to reduce the learning curve and it is another reason for them to choose Jipeq. According to the head of the business development:

> "If you want to proceed, you have to be ready. It takes at least 2 years to gain knowledge about the learning curve. You have to travel to India in order to evaluate the providers and handle everything, that means you have to put high effort on building the relationship" (Head of the business development, Jipeq, Helsinki, 2002)

These findings indicate that India meets the requirements for international

outsourcing, such as pool of IT professionals with professional expertise and competencies.

6.2.2 International market research and promotion

Though Jipeq founders do have personal working experience in India, they did an extensive international market research on a few countries such as India and Russia.

Analysing the political and social environment. It was clear for Jipeq that political stability is very important to do business. It is also important to point out that, at time, when Jipeq was doing their international outsourcing market research, issues such as reduction of development cost, time-to-market and shortage of well trained IT talented professionals were critical for IT companies in the USA and developed European countries. Therefore, countries like India and Russia have been considered for market research. However, the Indian political instability negatively influences the investments on the international outsourcing project. One interviewee stated:

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

This finding demonstrates that political instability negatively influences the investments of the implementation of IT innovation (Nahar 2001; Apte, 1996).

Size of the pool of skilled software professionals. Jipeq identified countries such as India and Russia where an amount of well-trained IT professionals are available and therefore these countries were attractive for outsourcing. This finding demonstrates that the availability of well-trained IT personnel influences the implementation of IT-supported international outsourcing process in emerging markets and developing countries (Badri, 1992; Dexter et al, 1993). The Indians involved in the outsourcing project were well-educated IT professionals who were eager to learn about new technologies. They were proactive to try to new

things or engage into new IT project adventures. This finding shows that Indians are early adopters and eager to try new things and come up with new technologies. This characteristic is critical for the success of innovation (Rogers, 1995).

Low salaries of IS professionals and other production costs. The average salary level in India is far lower compared to the developed countries in general and in Finland in particular. And India possesses various types of skilled IT professionals with years of experiences. This is the key element for Jipeq in selecting the country

> "As the market changed, cost as well as the quality of the work became more important for our Finnish clients. Because the software development processes are much more mature in India. For instance, time-to-market is not the most important thing anymore as it used to be when we worked in Russia." (Head of the business development, Jipeq, Helsinki, 2002).

This finding exhibits that the low-income level influences the implementation of IT-supported international outsourcing process in emerging markets and developing countries (Bazar and Boalch, 1997).

Availability of functional infrastructure. Availability of functional infrastructure played an important role for Jipeq. Infrastructures in India and Russia are quite good but need improvement. One interviewee commented as follows:

> "Then there is 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).

An underdeveloped Indian telecommunications and IT infrastructure, a lack of reliable telephone and communication lines, and low telephone line bandwidth posed problems for the implementation of IT-supported international outsourcing of software production project. These findings demonstrate how telecommunications and IT industry related factors are indispensable in effective and efficient implementation of an IT project in a developing country

(Dexter et al., 1993; Mata and Fuerst, 1997).

Intellectual property law. The tax regulations and the intellectual property law enforced in the selected countries were not an obstacle to develop software development partnership especially in international outsourcing. Particularly, India was more flexible in that sense. Software development exports heavily account to Indian government revenue. Therefore, in most cases the customer owns the intellectual property rights of the project (the software under development). One interviewee commented as follows:

> "They (Indian provider) never have the IPR (intellectual property right), the customers always have the IPR in most of our projects in Finland." (Head of the business development, Jipeq, Helsinki, 2002).

Communications. The communications were facilitated by the Jipeq members, who have worked in the selected countries and speak English fluently. Moreover, they did have some native Russian and English speaking people, such as the project manager and project coordinator. In most cases Jipeq was acting 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 to simply 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 there is not 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).

Time zone difference. For Jipeq the time zone difference was not the important element for selecting a provider country. Because the main issue was not time-to-market rather developing a high quality and unique product that would make a break through (Head of the business development, Jipeq, Helsinki, 2002).

Identifying prime candidates. The international market research allows Jipeq to monitor opportunities in IT sector in the underdeveloped or emerging countries and identify potential business partners. One interviewee stated that:

> "We did have some sort of research phase, some kind of research about India and Russia was already done. We found there are many benefits in India and Russia. Especially the cost of developing is low there and the cost to developing globally is still big" (Project coordinator, Jipeq, Helsinki, 2002).

IT tools. In order 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-supported international outsourcing of software production. These databases contain a considerable amount of information concerning all IT companies which are registered in India, their domains of expertise, information on the management, size of the each company in term of employees, type of technology they use, and a brief history about each company. According to project coordinator (Jipeq, Helsinki, 2002), Jipeq investigated above-mentioned database as well as conduct many sales interviews before starting business.

Another interviewee continued by saying:

> "There is software industry in India. There is also an organization called Nascom, which has a database of the most of Indian software companies and it is delivering most up-to-date information about software companies. So we did use this database a lot, we used search engines and also conducted a feasibility study about Indian outsourcing service provider." (Head of the business development, Jipeq, Helsinki, 2002).

The above information reveals that Jipeq used company database to investigate and evaluate the prospective service provider.

The above findings are consistent with the conceptual framework of IT supported international outsourcing of software production. Technology such as software industry databases and web search engines can improve the international outsourcing process (Nahar, Lyytinen and Huda, 1999b, 1999e, Nahar and Savolainen, 2000a; Nahar, 2001).

Emerging markets are attractive for international outsourcing of software production due to a large number of buyers for the services produced by the service providers in underdeveloped or emerging countries, favourable economic and political situations at the time, and the availability of highly trained and cheap labour. According to one interviewee:

> "India was not as near as the St. Petersburg was to Finland. The Indian culture is quite far from the Finnish one. So, I would say that our previous experience about India and the competences that I gained in India as well as we noticed the availability of the IT people are main reasons for us the choose Indian company as our provider." (Head of the business development, Jipeq, Helsinki, 2002).

Moreover, Jipeq extensively uses its established relationship network for most of its projects. As stated above, Jipeq's founder worked several years in India before creating Jipeq. This facilitated their international market research activities.

Jipeq also reviewed some research publications on outsourcing in India; for instance, it used search engines and the service of a private Finnish consultant located in India who has experience working with various Indian firms.

The usages of various IT resources and personal relationship allow a faster, cheaper, and more convenient process for Jipeq in the selection of high potential markets for international outsourcing. Jipeq's international market research for international outsourcing of software production consistent with the conceptual framework (see Figure 1).

However, the promotional activities were not carried out in this case. This phase is almost missing from Jipeq's IT-supported international outsourcing of software production process, since Jipeq took the advantages from its established relationships during the time when two of the managing board members were working in India. The project coordinator at Jipeq commented the promotion phase as follows:

> "We do not really have to do it. However, the promotion was more like we have been

> working there in India and we have connections. So, I mean the promotion was done through our personal networks" (Project coordinator, Jipeq, Helsinki, 2002).

Another interviewee continued by saying:

> "Anyway, the fact is that we worked in the software industry in India. Therefore, we had lot of connections and when a foreigner works in the software industry in India, everybody wants to meet him. My inbox is always full because my business card has been circulated all over India. It has already been a few years, I have come back to Helsinki, but people send me email and also call me sometimes from India." (Project coordinator, Jipeq, Helsinki, 2002)

In fact, Jipeq's 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 gone like around 7million people. It is quite easy to build the network in India. I mean everybody is your best friend (laugh) when they hear that a foreigner is working somewhere" (Project coordinator, Jipeq, Helsinki, 2002).

Jipeq did not need to invest heavily in marketing communication. They were looking for companies or programmers who are willing to provide service to them. Therefore, they just contacted a few agent companies in India and these Indian companies spread the information by themselves. In fact, they took two actions at a time (recruiting and marketing) by using some media such as newsgroup, email and mail to advertise a job position in India and they spread information about their company at the same time. The project coordinator commented concerning the promotion of international outsourcing of software production as follows:

> "We contacted them and went to meet them. Then we started getting inquiries and we had an advertisement in the Bangalor newspaper. It was about that we were looking for employees. Some companies saw this advertisement and they contacted us." (Project coordinator, Jipeq, Helsinki, 2002).

Another interviewee continues:

> "We did not start from here, we started studying the country and knew what India is about. We knew the Indian industries and all companies to start with" (Head of the

> business development, Jipeq, Helsinki, 2002).

Moreover, the promotion was facilitated by the fact that Indians are eager to work for Western companies or get involved in emerging technology projects. Therefore, they market themselves aggressively to foreign companies. One interviewee commented as follows:

> "It was wireless boom at that time, like Wap was the key word in India. Therefore, everybody likes to be involved with wireless development. It seems everybody is crazy" (Project coordinator, Jipeq, Helsinki, 2002)

The above findings are consistent with the conceptual framework of IT supported international outsourcing of software production.

6.2.3 Selection of providers

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

Defining the selection and evaluation (acceptance) criteria. At this stage, Jipeq engaged with an analysis of information obtained from databases and a few studies on potential providers. Most important criteria for the selection of the providers is the background of the founder, the management team, the turnover of the employees, experience and the reputation of the company in general. One interview described the selection process as follows:

> "For us, of course, the most important criteria were: the background of the founder, the management team and their competencies, and the turnover of the employees. Low labour cost and availability of IT professionals help us to select the Indian service provider. Although the culture was different, we approached to select an Indian provider due to above-mentioned reasons. " (Head of the business development, Jipeq, Helsinki, 2002).

The same interviewee added an example on how they (Jipeq staff) evaluated their actual provider as follows:

> "Of course, all the time we are looking at different companies. How they are succeeding on the market, what kind of projects they have done, etc. For example, Netkraft, all the

> time they are making big breakthroughs, such as they built the mail.com India version. It is a huge community site where 80 people are working. They (Netkraft) have been able to take a big lead and a big chance to succeed in this area. Then they moved to a new area and started as a Web designer company. Now, they change to a B2B or exchange billing integrated company. They seem to be successful on those moves." (Head of the business development, Jipeq, Helsinki, 2002).

This phase was facilitated by the fact that Jipeq has a very strong relationship with many suppliers in India. Therefore, they knew about the strengths and weaknesses of each Indian provider and the Jipeq staff had the working experiences there. The head of the business development of Jipeq characterised the following factors as criteria for selecting providers. (1) Software technological 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 the key industry organizations, (7) location of the key offices, (8) relationship and strategic alliances, (9) industry knowledge, and (10) financial resources.

Then, another selection criterion was the size of the company. According to Jipeq management, the size plays an important role when someone wants to address the change management. Most of the big companies are inflexible due to their bureaucracies, have slow decision-making processes, and a lack of interest in small companies like Jipeq. On interviewee commented as follows:

> "We also noticed that it would be better to work with the medium size companies because we also tried to work with large companies like TCS, who has 19000 people in the same building." (Head of the business development, Jipeq, Helsinki, 2002)

The same interviewee added:

> "There are some big companies who are interested in getting services from small companies. They are also inflexible because they have their own ways; they also have their marketing partners. They have only one type of agreement, if you want to change it takes six months. It goes up the whole layers from a Finnish manager to a European manager, then to an Indian manager, to CEO to sign the contract. They cannot make any exceptions." (Head of the business development, Jipeq, Helsinki, 2002).

For any company, it is very important to be able to have a control on people in the project. However, knowing them personally would be the best. Jipeq

believes that this way, they are able to guarantee the quality of the product. Another interviewee gave the following comment:

> "And we have control over the people that we have. We can say their names, we know the names of all the programmers, the head of the programmer, project manager, and so on. We also know the personnel turnover rate of the Indian company. However, in the big company like TCS, it is not possible to have detailed information about these above mentioned issues. So in this case, as a smaller company we have more control over that" (Project coordinator, Jipeq, Helsinki, 2002).

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

> "It is all about the communication. For example, if a company had a very good documentation processes, but we feel uneasy dealing with them, we may stop cooperation with them. We may feel there is not a connection or they just speak too strangely, or they do not communicate well, or somehow they have very bad office or something like that. Because we are looking everything from the customer point of view. Another issue is that when they are talking over phone, their voice have to sound good. We noticed that all their top managers are international people who had work in US and Japan, so they were not typical Indian people and that probably helps us to deal better with them." (Head of the business development, Jipeq, Helsinki, 2002).

Another important criteria that Jipeq used, is their own contract list of requirements for a contract. Jipeq developed a list of requirements or clauses in its contract template that is proposed as a basis for partnership.

This phase is consistent with the conceptual framework. However, the technology support part is missing due to the fact Jipeq conducted face-to-face contacts with 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.

6.2.4 Contract negotiation

*Defining legal/commercial terms and conditions***.** Jipeq conducted face-to-face meetings with each service provider regarding all elements of the contract. Sometimes, Jipeq's management travelled to India, and sometimes the service

provider's representative came to Finland to discuss the clauses of the contract. As one interviewee stated above, Jipeq already started to impose its contract during the selection phase. This facilitated Jipeq to proceed on the contract discussion since the selected service provider was likely to be favourable to Jipeq's working conditions and vice-versa. On 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 which was specific to the project, then we make template for this. We made certain changes to it if the customers wanted any change" (Head of the business development, Jipeq, Helsinki, 2002)

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

> "Actually, our contract was under the 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 got 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. Therefore, we picked up some information from those, but we also used our contract. Moreover, I think we got the actual framework we started to use that we got from one of our customers who has used it before with their partners. From it, we got many inputs. As I mentioned earlier that we have a lawyer, so we did not use really IT tools in this situation. The problems were mostly about when we have agreed about something is it legal or not? If we put some kinds of terms for the contract, is it legal to have those terms? Then if there are some problems, can we handle it? Relationship management is important because it is very difficult for a small company to go to India and claims something from Indian company or vice-versa for them to come here. So, there is an agreement but it is still based on the trust. That is why the Finnish companies are dealing with us, they have noticed that handling Finnish law is very easy than handling Indian law. We also believe in partnership. There will always be always some threats and sanctions but a partnership means a win-win relationship" (Head of the business development, Jipeq, Helsinki, 2002).

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

> "It is always better to make a contract because there may be differences in perception that are taken by the middle level people and the managers of the organization. For example, if I talk to the CEO of Netkraft we may agree on something, and then if I talk to people here and people who work there the decision that is taken may always be the same. We thought that we have agreed on something, but when the lawyer started making an

> agreement with each other, then at the discussion stages we understood that what we really have been agreed. That is why it is important to make an agreement to avoid misunderstandings and future conflicts. Also of course, the lawyer tries to put a few tricks there. I think it means to make sure that we understand the same thing. I do not think it increases trust. We have not been renewing the contract; we were working on the same contract. I don't even know if our contract is valid at the moment. I think it is about just to show that it is the relationship that counts on" (Head of the business development, Jipeq, Helsinki, 2002).

Beyond the contract, Jipeq was looking for the ways to build trust between partners. Because it is believed that when trust is there anything can be done or solved. Jipeq's project coordinator commented as follows:

> "If you do not trust each other then it is not going to work" (Project coordinator, Jipeq, Helsinki, 2002).

The contract is important for Jipeq because it is a way to fix the agreement and avoid misunderstandings between partners. It also improves the performance or quality of the work.

Applying the most suitable contract patterns. Jipeq wanted to protect itself by using its contract as one condition for selecting the service provider, so that once this one (service provider) is chosen he is more likely to accept the proposal to work with Jipeq under its clauses or with a little modification. One interviewee commented as follows:

> "In the provider selection criteria, we emphasized that we want to use our contract where we have written down how we want to work with our partner. Of course, some partners have their own contracts about how they want to work with their partners. Then we discuss to choose which one to use and how flexible it is. The terms are, for example, who handle the billing, who has the responsibility, who handles the customer relationship, who owns it, etc. If some companies are not flexible enough in negotiation, then we reject those companies. We negotiate all of these things pretty much" (Head of the business development, Jipeq, Helsinki, 2002).

Determining mutual commitments. During multiple meetings, Jipeq discussed every element about the requirements. They made a list of those elements. Moreover, the change management was also addressed during the negotiation. How it should be done, the delay, the staffing of the project, etc (Head of the business development, Jipeq, Helsinki, 2002).

Signing the contract. Flexibility, openness and trust were the key words in Jipeq partnership. Jipeq wanted that if any changes were needed during the software development, the provider should do them. To do that, the partner should be flexible enough to accommodate theses changes (Head of the business development, Jipeq, Helsinki, 2002). Therefore, Jipeq avoided partnering with big companies (more than 20000 employees). Jipeq also believed that once the trust is built, when the chemistry of both partners goes together and the relationship is established, the contract is almost forgotten. Jipeq also believed that the strategy would it pragmatic, otherwise, it would be very difficult for a small business to go to another country to claim damage reparation.

The findings of the contract negotiation phase are consistent with the conceptual framework. However, Jipeq did not use IT tools in this phase.

6.2.5 Project implementation

In this phase, Jipeq executed several functions chronologically, while executed 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 provider's company is a person who directs the Indian team in India. While the project manager from Finnish consumer who keeps supervising the whole implementation process. Jipeq always directly involved with the implementation issues at provider's site due to the poor telecommunication infrastructure in India. Otherwise Jipeq could not even know what happens on real-time. Depending on the implementation of the project, the project manager who came from the Finnish consumer side might not work full time in this project or always work with the implementation team in India, but this kind of implementation team allows Finnish consumer to feel the same as working with the Finnish service provider. (Head of the business

development, Jipeq, Helsinki, 2002). They do not need to go through the learning curve to overcome the problems of international outsourcing.

Developing an implementation plan. Jipeq manages the implementation process by developing efficient phases of implementation plan. They divided the whole project into many milestones according to the size of the project. Two months were a reasonable period, however, the shortest period was three weeks. The provider delivered the product to the customer in each period and got payment for that period's work, and then moved to the next new period. In this way, Jipeq easily controlled the risks of the implementation. Finnish consumers could find problems as soon as they received the products, and can easily add more functions by asking the provider to implement the required functions in the next period. Besides this iterative spiral implementation model, Jipeq also developed a parallel implementation model for fast product delivery. One interviewee stated regarding this issue as follows:

> "In some cases, the phases are done in parallel. For example, the team was divided into five different tasks that did the different parts of the same project, and then, they (the team) delivered each subproject at different stage. For example, one of the tasks requires four months' work; one person worked on it [in the beginning], the other one joined in this task when he finished his task." (Head of the business development, Jipeq, Helsinki, 2002)

Even though the parallel model is difficult to manage and increases the costs, it is suitable for a very tight schedule project.

Training the employees of both parties. Jipeq claimed that it did not execute much training before the implementation started. One interviewee described the training as follows:

> "We did not really train our partner. Of course, they learnt from us and we learnt from them, but it was not a formal training, and we rarely formally train our customer. We explained about how a project works, we might go through a case study, how typically the project 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)

Another interviewee continued by saying that:

> "The training was provided from both sides at some point. We asked them to study the Finnish market. They trained us on the top of the technology which they used in their processes. " (Head of the business development, Jipeq, Helsinki, 2002)

These findings are consistent with the reason that the Finnish consumer to do international outsourcing because it need access to cutting technology. The Finnish consumer had a shortage of cutting-edge technology, but adequate market knowledge. The Finnish consumer trained the provider with the market knowledge and accepted the top technology training from the provider. Therefore, there is a constant upgrading on knowledge from both sides. This finding shows that training is needed for the successful implementation of IT innovations (Alavi and Joachimsthaler, 1992; Chau and Tam, 1997; Kappelman, 1995; Kappelman and McLean, 1992; Lyytinen and Hirscheim, 1987).

Reviewing milestones together. Two parties together in Jipeq's case conducted milestone reviews. The reviews were not executed in meetings on a regular basis; rather they were executed through the spiral and parallel models. Through these two models, Finnish consumer gets the periodic deliveries often. Finnish consumer company goes through 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 adding some requirements (Project coordinator, Jipeq,Helsinki, 2002). This kind of milestones review allow Finnish consumer company to have more time to send feedback as well as increasing the possibility of user acceptance in the final user acceptance testing.

Reporting progress by the provider. Jipeq demanded the report of the progress. One interviewee stated the details of the progress report as follows:

> "The issues that we wanted them to report us include two lists: one is the total work done for this week, another is the completion date if there was any delay. For example, the task for the next week, and who is assigned to the task, how many working hours were used, how many people worked on this task, who worked this week, how many hours they worked, and what is the total cost to the customer after this week. Usually, most of them attached as weekly report the MS Project schedule and we drew the Gant chart according to their report."(Project coordinator, Jipeq, Helsinki, 2002)

Jipeq's management provided strong commitment and effective support in the implementation of the IT-supported international outsourcing of software production project in India. These findings demonstrate that management support is needed for the successful implementation of innovation (Leonard-Barton and Deschamps, 1988), technology diffusion (Chen, 1996), and IT innovations (Baker, 1994; Bauder, 1993; Lyytinen and Hirscheim, 1987).

Cultural differences have somewhat slowed down the implementation of international outsourcing project. One interviewee explained as follows:

> "The main problem that we faced was the understanding the requirements correctly. The communication of course was one of the major barriers that affecting this. But, our process is basically meant to overcome those problems. In some cases, for example the understanding phase has been six weeks long." (Head of business development, Helsinki, 2002).

There are some cultural issues from a management perspective. Indian culture is very different from Finnish culture. Indian companies are not full transparent in communication, they want to hide some things that they used to (Head of the business development, Helsinki, 2002), thus slowing down the project implementation. This finding reveals that culture has an influence on technology diffusion (Baranson, 1963; Pacey, 1986) and implementation of IT innovations (Cooper, 1994; Cooper and Zmud, 1989, 1990; Kaplan, 1987; Klempa, 1994; Straub, 1994).

During the project implementation phase, in addition to the traditional methods, MS PowerPoint, telephone, MS word documents, MS project management software were used by Jipeq to provide training to the employees of both parties, managing the implementation, and to review the milestones (Head of the business development, Jipeq, Helsinki, 2002). These findings show that IT has been used very little in the project implementation phase. Jipeq did not use video conferencing for training and milestone reviews because the bandwidth in India is quite low and the level of education among Indian professionals is very high. Therefore, Jipeq experienced no problems in project

implementation. This is consistent with the conceptual framework of IT-supported international outsourcing, which suggests that project implementation is one of the phases of the international outsourcing.

6.2.6 Managing relationship

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

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

In order to make the management structure compatible with two parties' culture and business changes, the project coordinator from Jipeq was sent in one case to provider's site, where she worked with the provider for a long time to develop a process of how the two parties work together in the project. This new process demands the provider to take more managing actions to contribute to the synchronized cooperation. One interviewee demonstrates it in the following way:

> "So the idea was to carry out the synchronization from their point of view, we are just like one of their project offices in Finland. From our point of view, they are just like one of our production factories in India. So we became a synchronized streamlined organization, which required formal processes, and it was developed last year. But it also required extensive human interactions. That was the strategy of becoming basically one company in the delivery sense." (Head of the business development, Jipeq, Helsinki, 2002)

Effective and open communication. During the interviews, the interviewees emphasized the importance of communication many times. They pointed out that the communication is embodied in the spirit of successful relationship management throughout the international outsourcing process. From one

interviewee's statement, we can find the above issue.

> "Communications always help because through effective communication, we make sure that we understand the customer's requirements. We want to make sure that there is not any extra level on customer requirements. If necessary, we can have teleconferencing with the customer and the project manager on requirements identification."(Project coordinator, Jipeq, Helsinki, 2002)

These findings examined that communication is helpful in identifying the potential problems and resolve them before they cause disruptions. In order to improve the efficiency of communication, Jipeq recruited the project coordinator who can interact with the consumer and the implementation team, as well as also lead the team.

The head of the business development also talked about the problem of lacking effective communication between Finnish consumer and Indian providers, which proves that the ineffective communication can bring about severe challenges in the relationship management.

Free knowledge sharing. There was a lack of transparency at Indian provider's side, therefore, Jipeq had to demand the Indian provider to report the progress of project. One interviewee commented on this issue in the following way:

> "That is something we have to work a lot because Indian companies are not usually used to have full transparency. They want to hide something that they are used to. Actually, we want to openly discuss the activities of their team in this project. Because we want them to report us how many hours everybody has worked as the customer is paying us. So, they have to know exactly this kind of thing. That was one part of relation strategy, it requires full transparency." (Head of the business development, Jipeq, Helsinki, 2002)

Free information sharing between two parties allows them to sustain 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 that would be used to monitor the provider's performance. Jipeq sent a project coordinator to India to work with the Indian provider's management in order to define how the two companies actually work together in the project. The project

coordinator worked with the provider for two months to define the formal processes. One interviewee commented regarding this issue in the following way.

> "Before the project started, some quality metrics were defined. Basically, the philosophy Jipeq has had is the quality measure of basic customer satisfaction. That is the most important thing. But there are metrics that can be defined scientifically, like how many defects there are per line code. These types of things were already defined at the beginning before the project started. When the tests are carried out, then the number of defects will show up, and then you can use those metrics. And the other important measure of quality, I guess, is also on-time-delivery." (Project coordination, Jipeq, Helsinki, 2002)

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 whether it is against the formal process defined earlier, Jipeq also demanded that the Indian provider should report about the working progress every week in great detail. The detailed report has been explained earlier in the section 6.2.5.

These findings demonstrate that the performance monitoring was conducted weekly through the reporting system. If any problem appeared, Jipeq did not just try to solve the problems by themselves but cooperated with the consumer to solve the encountered problems. This kind of fully transparency performance monitoring mechanism allows Jipeq to reduce the risks of implementation and keep the implementation process smooth.

Realigning the contract. As the consumer frequently asked to add or change functionality during the implementation project, Jipeq realized that often changes on the projects, especially on a big project, could cause the architectural change. Therefore, Jipeq decided to develop a very strict rule about change management. This change management rule should be agreed by three parties and executed by the implementation team. The impacts of the strict change

management rule help Jipeq to get rid of frequent, unscheduled changes. One interviewee explains about this change management rule as follows:

> "For the change management, we have to be quite strict. The change, which will take place, has to be agreed by a project coordinator, the customer, and the Indian project manager. Maintaining an effective change management, we can get rid off every unexpected change." (Project coordination, Jipeq, Helsinki, 2002)

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

> "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, Web-based tools such as Project-plans, we have not actually used them in any projects because with Web tracker we can interact quite well." (Head of the 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 the effective communication (Head of the business development, Jipeq, Helsinki, 2002). These findings reveal that the utilization of these IT tools helps Jipeq to perform effective and efficient relationship management. It also reduces the amount of travelling and face-to-face meetings, increases the capacity of international outsourcing consumer and the ability to manage relationship remotely. This is consistent with the conceptual framework of IT-supported international outsourcing process.

6.2.7 Evaluation and contract termination

Establishing evaluation basis. The successful project is measured in terms of customer satisfaction. The costs and the earlier defined quality metrics are the key basis for evaluation, especially the functionality of the product. One interviewee commented:

> "To the customer, the quality of the product basically means the product meets their expectations of the number of defects, but mostly it is the functionality. Customer receives the product and tests it. If it does not have this x-feature, then they are upset, no matter how good the quality of the rest of the product is. They are just missing the one function that is their favourite function. "(Head of the business development, Jipeq, Helsinki, 2002)

Evaluating products. Outsourcing consumer received products and documentation from provider by FTP and email first, and then the consumer received a CD with contained programming codes and documentation. After the outsourcing consumer received the products and documentation from the provider, they conducted user acceptance testing or integration testing so that the products can be integrated with its own system. The user acceptance testing and evaluation were usually done by a separate quality assurance team, which was organized by 2 to 8 people from three parties. Jipeq had confidence on the provider's technical expertise, thus Jipeq was more concerned on the delivery checking and administration management, such as making a test plan, get feedback, etc. than technical testing. The integration testing usually was done by the consumer himself. The product evaluation was done through meeting between Jipeq and consumer, and through the formal evaluation forms answered by the consumer and the implementation team. One interviewee gave an explanation regarding this issue as follows.

> "Customer evaluation form includes all sorts of things, such as: was the project on time? Was the project on budget? Had the project functionality? Then there is also evaluation of the development team, because they have different things to say. Like, are they happy about the product they did? What about their performance? What about the interaction with the customer? Did the customer give them all information they wanted? So, those are useful things for us to evaluate the project." (Project coordination, Jipeq, Helsinki, 2002)

If the user acceptance testing was unacceptable, then the provider has to rework on the part of the project. For example, one case demonstrates that the consumer was not satisfied about the quality of the one part of the project. However, this is caused by the consumer's fault because they could not acquire the specific hardware and ship it to India. In order to build a long-term relationship with consumer, Jipeq negotiated with consumer and gave 10,000 dollars discount on price to the consumer. (Head of the business development,

Jipeq, Helsinki, 2002)

Making payment. Typically, Jipeq made the payment to the provider at the end of each month when the work is done. For example, there were five people working on the project full time, at the end of each month, they get a bill. In some cases, Jipeq made payments 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 total price to the provider. When the coding was done, Jipeq paid another 30 percent of total price to the provider. When the user acceptance testing was done and accepted, Jipeq paid the rest of price to the provider. (Project coordination, Jipeq, Helsinki, 2002). As the international outsourcing consumer had its own preferred payment mechanism, therefore, Jipeq was quite flexible to adapt the customized payment method according to the consumer's requirements. The following interviewee commented on this issue as follows:

> "For example, YYY has a very specific payment method. They tell you exactly how they are going to pay. They outline everything, such as how the project is done, how they will pay for it. Since YYY is a big reference for us, thus we accept their payment method". (Project coordination, Jipeq, Helsinki, 2002).

Studying the positive and negative outcomes. In order to increase efficiencies and effectiveness in the future international outsourcing project, Jipeq studied the positive and negative outcomes from their experience. Jipeq found that the iteration spiral model and the parallel model were the efficient working models that were already performed effectively in the pervious international outsourcing process. Through the project evaluation meeting with the consumer as well as following the formal evaluation forms, Jipeq learned where is the consumer satisfaction and why. By analysing the evaluation forms that were done by the developers, Jipeq also gets the feedback about project implementation process. The experience gained through learning the negative outcomes allows Jipeq to avoid the similar problems in the future. There is an example which exhibits that Jipeq has learned from its worst experience.

> "One example concerning our worst experience is that the people involved in the project at customer site have required to grow the project and we thought that they had the authority to grow it. But the management of the customer company did not want to grow it and made us responsible for it. They stopped the payment. Then we had to start negotiation, had to go through all the e-mails and communication documentation to find out who were responsible for this situation. We went through everything that took a lot of time and efforts. That was not so favourable, but we learned a lot from this case." (Head of the business development, Jipeq, Helsinki, 2002).

When we asked about how Jipeq protected himself to avoid this kind of problem. The answer is below.

> "We protect ourselves in this way that the provider gets payment after we have been paid by Finnish customer. For example, when we start a project, they (Finnish customers) should pay one-month payment to us in advance, so we always have one-month money in-hand. Then our losses are smallest if there are something wrong in the project." (Head of the business development, Jipeq, Helsinki, 2002).

The above findings demonstrate that Jipeq has learned from negative outcomes to avoid the similar problems occurred and to improve the skills of protecting himself and the provider.

Assessing the alternatives. Based on the study of positive and negative outcomes, Jipeq determined to extend the relationship with Indian provider. We have mentioned earlier that, Jipeq has only one provider in India. All of Jipeq's international outsourcing projects were done in India with this provider. Jipeq even had some further orders from the same consumer and then extended the contract with the same provider. The important reason for extending the relationship with Indian provider was that the Indian provider has all the required knowledge and competence which Jipeq and consumer needed. The other reason includes the business strategic concerns, a good and trust relationship from past outsourcing project, etc. One interviewee stated about this issue as follows:

> "The were many reasons behind the selection of ZZZ, the Indian company which we mentioned earlier. In addition, the relationship between our staff and their staff is good, and we communicate with them very well. Plus what they are offering and their involvement seem to match our requirements. We did a lot of projects with them and we got the best results." (Head of the business development, Jipeq, Helsinki, 2002).

Documented and stored analyses in depository. Jipeq stored all documentation and

reports as organizational knowledge for managing outsourcing process easier in the future. Jipeq has previous experience in international outsourcing projects and it always learns from its experience in order to improve the operation of the international outsourcing project. One interviewee explained regarding this issue as follows:

> "The learning curve of the projects is quite high, thus we go through previous projects and try to see how they have been done before. We try not to do the same mistakes again. So, the more mistakes we have done, the more lessons we can learn. We will know easily about the 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-supported international outsourcing 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 supported international outsourcing project efficiently in India. This finding shows that experience increases the chances of a successful implementation of IT innovations (Leonard-Barton, 1987; Rai and Howard, 1994).

Jipeq uses e-mail, telephone and teleconferencing to solve various encountered problems collaboratively. It has developed databases to store documentation and reports (Head of the business development, Jipeq, Helsinki, 2002). These findings demonstrate that the evaluation and contract termination phase in Jipeq's international outsourcing process supports the conceptual framework of the IT-supported international outsourcing process of software production.

6.3 Summary

The above case presents Jipeq's IT-supported international outsourcing process. With regarding to the research questions, in-depth research, and thorough analysis of information retrieved from the interviewees revealed the following:

Jipeq conducted seven phases of international outsourcing process. Due to several reasons, such as: underdevelopment of ITs in India, the limited

resources which Jipeq having for running complex IT infrastructure, and extensive personal networks which reducing the need for IT tools. Jipeq used IT tools on a limited scale in some phases of its international outsourcing process (international market research and promotion, project implementation, managing relationship and evaluation and contract termination, it did not use IT tools in other phases) and executed the international outsourcing process successfully. Presently, Jipeq uses the following IT tools to execute international outsourcing: databases, search engine, Web-based project management tool, e-mail, telephone, teleconference, Microsoft Office, etc. Besides IT tools, Jipeq still employs some traditional methods in each phase of international outsourcing process, such as face-to-face meeting, interview, visiting, etc. Jipeq emphasizes that the good personal relationship with the Indian provider is the key for the successful execution of the international outsourcing process.

7. CONCLUSIONS AND IMPLICATIONS

This chapter presents the overall study by explaining its results and the implications. Section 7.1 briefly introduces the conclusions. The major contributions of this study are described in section 7.2. In section 7.3, the implications are described in detail. In section 7.4, the limitations of this research are analysed and finally, in section 7.5 discussions are presented which include the applications of the framework and benefits, and future research directions are suggested based on the findings of this research.

7.1 Conclusions

The purpose of this thesis was to analyse *how is the IT-supported international outsourcing of software production process executed.* To answer the above research question, a single case study of the integral factors involved in an IT-supported international outsourcing of software production process has been analysed.

An in-depth literature review revealed that limited research exists on the IT-supported international outsourcing process so far. In order to improve the state of the field an in-depth study was conducted on the following issues: (1) what are the phases of the IT-supported international outsourcing process and how these phases are executed? (2) what are the major activities in each phase of the international outsourcing process and how these activities are managed? and (3) what are the performance measures, the expected outcomes, and the supported IT tools of each phase?

7.2 Major contributions

This research contributes to the understanding of IT-supported international outsourcing process by focusing on the major activities, performance measures, and expected outcomes of international outsourcing process. This is an important new topic in outsourcing research. The phases, the performance measures, and the expected outcomes identified in this study are necessary for

a company to execute an IT-supported international outsourcing process successfully.

This study made an in-depth investigation on the diffusion of innovation theory supports to international outsourcing process (Nahar, 2001) in diffusion of IT tools to each phase, which leads to a discovery of new issues and solutions. This investigation is particularly important for the IT-supported international outsourcing in a software production environment, it helps us to understand how the consumer and supplier can learn from each other, and how successfully the international software project can be managed.

This research began with developing an integrative perspective on many issues that fall under the IT-supported international outsourcing umbrella. Implications of this study also contribute to the IT-supported international outsourcing project management by showing the main factors of outsourcing management. Such analysis can further inform the development of more effective management activities.

Through an in-depth investigation and analysis, this study contributes in terms of both theory and practice. At the theoretical level, it indicates the existing knowledge in the following ways:

- ? It contributes to the scientific understanding of the IT-supported international outsourcing process in software production by describing in detail the international outsourcing process of one case company.
- ? It delivers a conceptual framework of IT-supported international outsourcing process in software production that is composed of with seven sub-processes. This framework can be used as a basis for further research.
- ? It develops a broad view of the international outsourcing process rather than focusing on a single aspect of the international outsourcing. In this framework, the main activities related to performance measures,

expected outcomes, and supported IT tools were identified in each sub-process.

- Through the empirical research, this study also indicated both micro and macro level factors affect the IT-supported international outsourcing 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-supported international outsourcing process, so that a better understanding may be gained.
- It provides a conceptual framework of the IT-supported international outsourcing process of software production, which may be used as a guide for managing international outsourcing process effectively and efficiently.
- It introduces IT-supported tools, which could be utilized to perform different activities as well as to improve planning and control performance in the international outsourcing process. CIOs and their IT-staffs responsible for IT infrastructure should be able to ensure using the framework that their companies are able to execute all phases of international outsourcing effectively using the IT infrastructure and tools. CIOs and their staffs have a crucial role in the diffusion of IT tools to the companies and specifically to the project teams responsible for the international outsourcing process.
- It identifies main activities that should receive more emphasis in order to improve the international outsourcing performance.
- It also identifies performance measures and expected outcomes that can help IT and business managers make judgments about the various factors that contribute to the efficiency and effectiveness of the process.

The performance measures could be used as control mechanism to manage the international outsourcing process efficiently and effectively.

The conceptual framework in the study is more comprehensive than previous research. It describes all the major phases of the international outsourcing process, being developed in conjunction with rigorous theoretical and empirical research. Previous research illustrated the framework of general process of international outsourcing (Momme, 2001a; Nahar et al., 2002; Blumberg, 1998; Nahar, 2001; Kim, et al. 1989; Ravichandran, et al. 1993). Each framework described suggests the ways to approach some of the issues associated with software production through international outsourcing but unable to provide a comprehensive IT-supported international outsourcing process framework. There are also many previous studies on identifying some specific areas of international outsourcing process, such as bidding, contract management, and relationship management (Buchowicz, 1991; Chaudhury et al., 1995; McFarlan and Nolan, 1995). In comparison, this study introduces an all-encompassing approach to the international outsourcing process. The approach establishes a specific and detailed process framework for international outsourcing and demonstrates that the systematic utilization of information technologies can facilitate cost efficient international outsourcing for companies.

7.3 Implications

This study proposes an approach on how to effectively execute an IT-supported international outsourcing process of software production.

Creased competition and high shortage of skilled software professionals in their domestic markets, as well as other reasons (see section 1.3). Thus, the study of the competitive advantages of companies through IT-supported international outsourcing of software production is essential.

It is important for companies to gain an understanding of the IT-supported international outsourcing process of software production. The results of this research are useful in providing such understanding. A conceptual framework was developed and it was validated by a case company investigation. The purpose of the framework is to propose guidance for companies attempting internationalisation using IT in their own international outsourcing. Through case study it was demonstrated how the company is successfully utilizing IT tools in their international outsourcing.

This study presents a comprehensive picture of what actually happens in an IT-supported international outsourcing process of software production. The effective utilization of an IT-supported international outsourcing process framework suggests that companies will benefit from this framework via the addition of IT tools. The benefits include: correct decision-making on international outsourcing, fast selection of suitable providers for international outsourcing, effective and efficient promotion for international outsourcing, reduced time and expenses of international outsourcing, facilitation of worldwide collaboration and creation of a knowledge-base of international outsourcing process, and reduction of obstacles in the execution of IT-supported international outsourcing.

7.4 Limitations of the study

This study may be criticized for using a single case study that is not typical enough or adequately representative 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 (Bonoma, 1985; Briff and Ginzberg, 1982) as they are based on small samples and qualitative subjective data. In order to avoid subjective bias several measures have been integrated into the research design (Nahar, 2001). These included the following measures: 1) developing a data collection protocol and formulating questionnaire guide; 2)

verifying the questionnaire guide by supervisors; 3) developing data analysis tools; 4) having analysis and research results checked by supervisors and other researchers; and 5) having the research results approved by the informants of the investigated company.

The investigated international outsourcing consumer company is a Finnish high-tech company. Thus, the research results are based on the investigations of the company in one country. The research results may not represent the outsourcing consumers within different national cultures. If the same questions were asked to consumers from other countries, such as U.S., the slightly different results may have been obtained.

This study has been emphasized on software production through IT-supported international outsourcing process. However, the international outsourcing process encompasses several various outsourcing types, such as body shopping, project management, total outsourcing, business process outsourcing, and transitional outsourcing. This study has concentrated on project management outsourcing since our investigated company has experienced in this type of international outsourcing.

Due to the above limitations of this research, generalizations based on this study should be approached with caution.

7.5 Discussions

7.5.1 Applications of the framework and benefits

The IT-supported international outsourcing of software production framework is a generic process framework. The company should adapt it according to their specific situation. In the case at hand, the framework may not be applicable totally. Technology did not play a significant role in all phases. This is because the company values relationship through face-to-face contacts, because this

allows them to build trust and seeing if the chemistry goes together. Technology does not build relationship instead it may support the relationship building process.

Nevertheless, applying the IT-supported framework in international context helps the companies to bridge the geographical gap, reduce both travel and communication problems by being able to reach their partners at anytime, any place. However, to effectively apply the IT-supported framework, both partners must have adequate IT infrastructure - this is the prerequisite of the framework.

7.5.2 Future research directions

This research delivers an IT-supported international outsourcing process that can be used as a basis for further research in the field of international software production through outsourcing. Further theoretical and empirical research will be helpful in refining the framework.

The framework of the IT supported international outsourcing process is composed of seven interlinked phases. They are: 1) Strategic analysis and decision, 2) International market research and promotion, 3) Selection of providers, 4) Contract negotiation, 5) Project implementation, 6) Managing relationship, and 7) Evaluation and contract termination. Each of these phases needs to be developed through further research.

The framework presented here is developed from the consumer's perspective. However, it might be interesting to examine from the supplier's perspective.

As we explained earlier, the general DOI theory has limitation in implementing complex and networked IT solutions due to the network nature, the dependence of standards, and the prerequisite of collaborative common infrastructure, the utilization of our framework also associate with some

limitations, especially in using IT tools to support international outsourcing process.

However, the risk management involved in international outsourcing was not addressed in this framework. Risks associated with international outsourcing project, such as the risk management issue and the security problem of transferring important files on the Internet. Due to the geographical distance, international outsourcing consumer cannot simply monitor suppliers or call spontaneous meetings. Therefore, we believe that further research is necessary on: *how to control the risks that are involved in an outsourcing project management?*

Long-term success in IT-supported international outsourcing projects depends on many factors, further research would be helpful to refine the following question: *what are the critical success factors of IT- supported international outsourcing process?*

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APPENDIXE 1: THE INTERVIEW QUESTIONNAIRE GUIDE

A. General background regarding the outsourcing service consumer and its outsourcing experience

1. Name of your company, your title and contact information.
2. When is your company established?
3. Industry in which main activities are concentrated?
4. Have your company done international outsourcing project? Where? When? How many projects have you done?
5. What are your major software technologies?

B. Examining outsourcing issues

1. What software did you outsource and what were their characteristics?
2. Did you outsource software development or conversion (for example legacy transformation to Web-based)?
3. Why did you choose outsourcing over in-sourcing?
4. How did you evaluate for the suitability to outsource?
5. Why did you choose international outsourcing over domestic outsourcing? In other words, why have you outsourced to foreign countries instead of inside the country to some other companies?

C. General background regarding the outsourcing service provider and the country where the IOSP is located

1. Background information of the outsourcing service provider

? Name of the company and contact information

? Year of the establishment

? Location of the company

? Software technological level

? Software products and services produced by the company

2. Background information of the country where the IOSP is located

? How is the software engineering education level of the country?

? How is the availability of the software professionals?

? How is the English proficiency of the software professionals?

? How is the telecommunications infrastructure?

D. International outsourcing process

1. What were the phases in the international software outsourcing process? Please indicate them in a chronological order.

D1. International market research for software production through outsourcing

1. Why was the international market research phase important?

2. Which factors listed below played an important role in selecting the country for software production?

? Availability of the software professionals and companies

? Low salary

? Other low production expenses

? Relatively developed telecommunications infrastructure

? Nearby geographical distance

? Cultural factors, and

? Others

3. How did you use IT and other traditional tools in selecting the appropriate country?

? Country specific databases

? Industry specific databases

? Professional databases

? DVD/VCD with market data

? Agent technology

? Internet directories

? Online research sites

? Search engines

? E-mail

? Internet telephony

? Video conferencing, and

? Others

4. Which benefits did you get?

5. Which problem did you encounter?

6. How did you overcome these problems?

7. Why did not / did you select a country nearby Finland?

D2. International promotion of software production through outsourcing

1. Why was the international promotion of software production through outsourcing phase important?

2. Which tasks were performed in international promotion phase and in which order?

3. How did you use IT and other traditional tools in international promotion?

4. Which benefits did you get?

5. Which problems did you encounter?

6. How did you overcome these problems?

D3. Selection of the outsourcing service provider

1. Why was the selection of the outsourcing service provider phase important?

2. Which factors listed below played an important role in selecting the company for software production?

- Software technological level
- Standard methodology
- Size of the company
- Successful experience in dealing with Western companies
- Stable relationship with domestic programming companies
- Connections, positions with key industry organizations

- ? Location of key office
- ? Relationship and strategic alliances
- ? Industry knowledge
- ? Financial resources, and
- ? Others

3.What was the area of expertise of the IOSP?

- ? Networks and telecommunications
- ? Mobile station software
- ? Computer telephony

4. Did you examine the quality of the process used to develop software?

If you did, how did you check their:

- ? Development process
- ? Development tools
- ? Testing methods
- ? Testing tools
- ? Previous performance of on-time-delivery.

5. Did you check your potential outsourcing providers' client list?

6. How did you use IT and other traditional tools in selecting the appropriate outsourcing service provider?

7. Which benefits did you get?

8. Which problems did you encounter?

9. How did you overcome these problems?

D4. Negotiation and contract

1. Why is negotiation and contract phase important?

2. Which of the following issues were negotiated?

- ? Software product and / or service requirements
- ? Components of the software technology package that should be transferred
- ? Delivery time to the completed product
- ? Cost of the contract to be calculated on the basis of the fixed price or on hourly basis
- ? Payment mechanism, and
- ? Non disclosure agreement

3. Which of the following areas were in contract?

- ? Scope of the responsibilities and services
- ? Third-party services
- ? Project managers
- ? Project development standards and acceptance
- ? Project timetables and milestones

- ? Progress reports and meetings
- ? Problem resolution and escalation of differences
- ? Acquisition of systems and facilities
- ? Final acceptance testing
- ? Documentation
- ? Training
- ? Fees
- ? Company's proprietary rights

4. How did you use IT and other traditional tools in this phase?

5. Which benefits did you get?

6. Which problems did you encounter?

7. How did you overcome these problems?

8. Which traditional methods were used in this phase and why?

D5. Implementation and management of the outsourcing project

1. How do you proceed to set up your international outsourcing project?

2. How the outsourcing project was planned?

3. In which areas did you provide training?

4. How did you use IT for training?

5. Which traditional methods did you use?

6. Was the training provided at your premise or the outsourcing service provider's premise?

7. How did you provide support for technical activities?

8. Did the outsourcing service provider report to you about the progress on a regular basis? How did he report?

9. How did you review the milestones?

10. How the quality assurance was performed?

11. How was the produced software tested?

12. How many different types of tests did you conduct?

13. How did you monitor and measure quality?

14. How or which technology did you use in managing your project?

15. How did you measure the results?

16. Which are the common negative consequences of international outsourcing and which measures were taken to avoid these negative consequences?

D6. Managing the relationship

1. Which kinds of strategies were used in this phase and why?

2. Which problems did you encounter?

3. How did you overcome these problems?

D7. Handling of financial issues

1. Did you make part of the payment at the inception stage of the project and rests at the completion stage, or

2. Did you adopt a customized payment mechanism?

3. What problems were encountered in this phase? How were they solved?

D8. Delivery of the products and documentation

1. How the ready software products along with the documentation were delivered?

D9. Evaluation

1. How successful was the project?

2. Did you meet your targets in the following rests:

- ? Quality
- ? Cost
- ? Delivery time

3. What were the reasons for not meeting some of the targets?

4. Which methods were used in this phase and why?

5. After completion of the outsourcing project, did you start with a new order?