MANAGING THE PROCESS OF OUTSOURCING – Examining the process of outsourcing product-development activities in software firms

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"All my life Ive been searching for somethin
Somethin never comes, never leads to nuthin
Nothin satisfies, but Im gettin close
Closer to the prize at the end of the rope"

- Foo Fighters, All my life -

Sweat, blood and tears. One day it still feels like a good idea, another the worst. This has been a process with many ups and downs. It is not the vicissitudes related to the thesis that made it difficult from time to time, it has rather been the trade-offs I have had to make. Would I go through it all over again? Yes, I probably would! Do I have any regrets – definitely not!

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- To my father -

Espoo, September 2008

Jussi Hätönen

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LIST OF ABBREVIATIONS

ASP	=	Application Service Provider
BPO	=	Business Process Outsourcing
CMM	=	Capability Maturity Model
COTS	=	Commercial Off-The-Shelf
CSF	=	Critical Success Factor
FDI	=	Foreign Direct Investment
GSO	=	Global Software Outsourcing
ICT	=	Information and Communications Technology
IE	=	International Entrepreneurship
INV	=	International New Venture
IOS	=	International Outsourcing of Services
IPR	=	Intellectual Property Rights
IT	=	Information Technology
ITO	=	Information Technology Outsourcing
KI	=	Knowledge-Intensive
KPI	=	Key Performance Indicator
MNC/MNE	=	Multinational Corporation, Multinational Enterprise
NGO	=	Non-Governmental Organization
NIV	=	Not-Invented-Here
NPD	=	New Product Development
OEM	=	Original/Own Equipment Manufacturer
OS(S)	=	Open Source (Software)
PD	=	Product Development
RFID	=	Radio Frequency Identification Devices
RFP	=	Request For Proposal
RBV	=	Resource-Based View
SLA	=	Service Level Agreement
SME	=	Small and Medium sized Enterprise
TCE	=	Transaction Cost Economics

1 INTRODUCTION

There is no question that outsourcing, commonly defined as the transfer of activities and processes previously conducted internally to an external party (e.g., Ellram & Billington 2001), is one of the most sustained trends in current business (Fill & Visser 2000). Recent industry studies and surveys indicate high growth in outsourcing, particularly in areas such as logistics (IWLA 2008), different back-office processes (Trestle Group 2004), and information systems (Datamonitor 2005; Nasscom 2006). Further, research has indicated that such developments seem to continue and will even accelerate in the future. For instance, a recent study by KPMG International (2007) reported that 89 percent of the firms surveyed (n = 658) announced that they would continue or even increase the pace of outsourcing their activities and processes in the future. In addition to its growth in terms of scale, leading consultancies and research companies have anticipated that it will also expand in scope, creating new models according to which firms assess the skills and resources of other, often more specialized companies. In fact, Prisma Research (2007) recently stated that the number-one business trend is the growth in outsourcing and the simultaneous evolution of new outsourcing models.

What we have and continue to witness is an outsourcing revolution, which has already changed the way firms compete in industries as diverse as automobiles, aerospace, telecommunications, computers, pharmaceuticals, chemicals, healthcare, financial services, energy systems, and software (Carson 2007; Dahan & Hauser 2002; Quinn 2000). The concurrent hyper-competitive environment could also be referred to as an outsourcing economy, given the increased focus on core organizational activities and the simultaneous leveraging of external[1] pools of resources, skill, knowledge, capabilities and competences. Arvind Parkhe (2007, 3) began a recent editorial as follows:

> *"No company alone possesses the full complement of resources needed to compete effectively in today's increasingly competitive global marketplace."*

Such developments have coerced practitioners and researchers alike into rethinking the factors behind the success of modern organizations, and thereby

[1] External refers to assets – physical or otherwise – that are used by the firm and over which it has no direct ownership (Jarillo 1989, 135).

their position in the marketplace. The key management challenges lie in recognizing the key competence areas, finding suppliers to provide the value to the rest of the operations, and managing the resulting global network of suppliers and partners (e.g., Nummela, Saarenketo & Puumalainen 2004). While many companies have succeeded in the rapidly changing business environment, others have failed, thereby constantly adding new aspects to the field of academic research. Yet, in parallel with the new challenges, the current industrial fragmentation also offers firms various opportunities. The large-scale decomposition of production activities has dramatically altered the product development in many industries (Carson 2007), creating new market potential for several firms, large and small. In addition, the increased competition in outsourcing has caused a shift towards buyers' markets, enabling companies of all sizes in nearly all industries to capitalize on their external sources of knowledge and capabilities. As these developments are quite recent and constantly evolving, current academic research provides us with only a limited understanding of these issues. The outsourcing revolution and the consequent move towards an outsourcing economy has brought new aspects to academic study, thereby providing "steam" for the current research and introducing new "big questions" for further exmination (cf. Buckley 2002; Peng 2004).

1.1 The outsourcing (r)evolution

It used to be the case that companies in all industries were highly vertically integrated units, or so-called conventional industrial organizations (Stigler 1951), in which activities in every link of the value chain were conducted internally. For instance, 7-Eleven used to deliver its own gasoline and make its own candy and ice, and it even owned the cows that produced the milk it sold (Gottfredson, Puryear & Phillips 2005, 139). Today, it no longer delivers gasoline or makes candy or ice, nor does it own any cows. IBM used to build their computers in their own central processing units, and sell them with their own operating system. Today, people buy IBM computers with Intel chips and Microsoft operating systems, all of which originated from IBM. In fact, IBM's core business no longer lies in selling computers: it sells services, and the computers sold under the IBM logo are most likely manufactured by other companies, distributed by yet others, and so on. How have we come to this point? In his book "The Outsourcing Revolution" Michael Corbett (2004) describes outsourcing as a phenomenon that is far from new, but which has skyrocketed in recent years, gathering momentum in terms of the amount taking place as well as of the importance of the strategy to the overall success

of firms. In fact, although outsourcing as a strategy stems from the early ages of industrialization and purchasing, as a specific tool for modifying supply-chain structures it has only recently gained in popularity[2]. Looking back at these recent developments that have occurred in this strategy we could identify three broad and overlapping, yet distinct phases: the era of the Big Bang, the era of the Bandwagon, and the era of Barrierless Organizations.

The first wave of outsourcing could be referred to as the *era of the Big Bang*. The term 'Big Bang' originates from the way and the intensity with which the strategy gained popularity. Although the concept of outsourcing was used by manufacturing executives in the late 1970s (Corbett 2004, xiii), it was not until the late 1980s that the term was officially introduced. Only a decade later it was already referred to in Harvard Business Review as one the great management ideas of the past century (Sibbet 1997). However, is it really a new phenomenon? It has been noted that even the ancient Romans used to "outsource" tax collection, and in 18th-century England the maintenance of the streetlights was outsourced to the habitants (Kakabadse & Kakabadse 2000, 670). Further, explorers, traders and mercenaries could be considered early examples of the concept of outsourcing (Corbett 2004, xiii). However, its history as a corporate strategy dates back as far as the 1950s (Dibbern, Goles, Hirschheim & Jayatilaka 2004; Quinn & Hilmer 1994), although even as a strategic tool it was not until the 1980s that it really became a viable strategy: this was when organizations first began farming out call centers and other service-oriented operations (Lacity & Hirschheim 1993a).

During this first wave, lasting generally to the end of the 1980s, companies outsourced non-core business processes basically to cut operational costs. The new buzzword "outsourcing" was a tool with which to make organizations more efficient economic units in order to maximize the profits from the operations. It mainly occurred domestically, and was managed in an arms-length manner with a strong reliance on agreements and contracts.

It was not until the early 1990s and the re-engineering of purchasing when outsourcing started to gain popularity (Morgan 1999). At that time, the prestigious Oxford English Dictionary (see Oxford English Dictionary 1990) did not even recognize the concept, yet the practice was well underway and gathering momentum. Positive experiences from early outsourcing cases drove other companies to jump on the *bandwagon* (Lacity & Hirscheim 1993a), which instigated a new era. At that time, the seminal article "The core competence of the corporation" by Hamel and Prahalad (1990) introduced a new management approach to replace strategic-business-unit (SBU) thinking,

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[2] The historical heritage of the practice and research of outsourcing is more thoroughly discussed in Chapter 2.

which led managers to rethink their competitive edges. As a result, companies started outsourcing functions that were not in their area of expertise. Achieving cost efficiency was no longer the single motive, and companies started to seek skills, competences and knowledge outside the organization in order to add value to more complex and strategically important organizational processes. A new buzzword, "strategic outsourcing" emerged (e.g., Alexander 1996a; Quinn & Hilmer 1994). In contrast to traditional outsourcing, more strategic functions were now involved, the arms-length management of outsourcing relations became insufficient, and firms started to build closer relationship with their vendors. Organizations stretched their boundaries in order to gain competitive advantage. The management ideology of "focus on your core competence, and outsource the rest" (see e.g., Porter 1996) was gaining popularity in several industries. Although this knowledge base was already being sought from domestic markets, in the early 1990s firms started to view the external resource pool as an international asset. By the end of the 1990s outsourcing had become a standard operating procedure in nearly all industries, which again led to the transformation of corporate strategies.

What we have recently witnessed is the third wave of the outsourcing phenomenon – the *era of the Barrierless Organization*. By the turn of the millennium, the popularity of outsourcing had led to a situation in which outsourcing as such was no longer a competitive differentiator, it was a common way of doing business – a norm rather than an exception (Lawton & Michaels 2001, 104). Global access to vendors, falling interaction costs, and improved information technologies and communications provided companies with equal opportunities to restructure their businesses (Doig, Ritter, Speckhals & Woolson 2001, 25). The global resource pool had become available to all. These developments led to the current phase in outsourcing history. In his recent Business Week article Pete Engardio (2006) refers to transformational outsourcing as the "new buzzword" of the 21st century, suggesting that in contrast to "old" outsourcing strategies, the aim is to create radical business models that can give firms a competitive edge and change the game in their industries. Whereas "traditional" outsourcing focuses on working assets harder, and "strategic outsourcing" aims at acquiring capabilities that do not exist internally, transformational outsourcing is about changing the paradigm, i.e. targeting the new adaptive and barrierless enterprise (Linder 2004; Linder et al. 2002; Mazzawi 2002). A quarter of a century ago Jean Francois Hennart (1982) concluded that internal organization allowed faster adaptation to change because internal practices could be changed without the need to obtain the assent of all parties to the transaction. However, today the view is quite the opposite. As a result of the developments in outsourcing, management executives have created competences in the

management of the created portfolio of value suppliers. The future competitive edge is seen to lie in flexibility achieved through a tight operational focus and the leveraging of external core competences outside of this focus area (e.g., Quinn 1999). In fact, according to Fine et al. (Fine, Vardan, Pethick & El-Hout 2002, 70), a company's real value-creating competency, perhaps its only sustainable one, might even accumulate from its ability to continuously restructure its value chain. The rapid change across industries makes core competences only temporal, and the new ones required in order to cope in the new economy imply the need for their constant refinement and the modification of the existing pool of knowledge, skills and resources. More and more critical and knowledge-intensive business components are outsourced, often developed in close cooperation with the vendor. The new challenge lies in creating a flexible organization in which companies focus on key value-creating competences and allow outside experts located globally to provide the rest.

Table 1 The (r)evolution of outsourcing[3]

	BIG BANG	BANDWAGON	BARRIERLESS ORGANIZATIONS
Time period	1980s to early 1990s	Early 1990s to early 2000	From the early 2000s onwards
Prime motives for outsourcing	Cost cutting	Cost cutting, capability enhancement	Organizational transformation
Buzzwords	Outsourcing	Strategic Outsourcing	Transformational outsourcing
Location	Domestic	International	Global
Management	Arms-length, transactions	(Strategic) alliances	Collaborative development
Organization	Efficient organization	Focused organization	Virtual organization
Core organizational competences	Management of key strategic business units (SBUs)	Key strategic competences (Core competences)	Dynamic competences and network competences
Strategic rationalization	Profit maximizing	Strategic and competitive edge	Survival
Outsourcing objects	Structured and well defined turnkey manufacturing processes	Strategically important organizational process	Highly knowledge-intensive and creative projects
Main theories	Transaction cost theory	Resource/competence-based view	Organizational theories

Yet it still remains unclear what the next big issue and phase in the outsourcing (r)evolution will be. One thing is certain, however: outsourcing

[3] The historical theories behind outsourcing are further discussed in Chapter 2.1.

has dramatically changed the way companies compete in the current global market place. As mentioned, the outsourcing of production activities has already led to the restructuring of industries as diverse as automobiles, aerospace, telecommunications, computers, pharmaceuticals, chemicals, health care, financial services, energy systems and software (Quinn 2000, 14), just to name a few. On the other hand, the changes in and the evolution of industry systems have opened up new opportunities for firms to outsource, thereby providing a contrary view on the relation between industrial fragmentation and outsourcing. Industrial fragmentation due to an increased focus on selected core activities has created new market possibilities for suppliers providing different organizational processes, thereby simultaneously opening up new outsourcing opportunities for companies in several industries. Although it remains unclear how companies will prosper in the future, one thing is certain: the new outsourcing economy is bringing challenges as well as opportunities to companies operating in these versatile industries.

1.2 Competing in the outsourcing economy

The competition challenges imposed by the current outsourcing economy are closely related to the constantly changing environment. The world of business is moving at a pace that makes yesterday's techniques obsolete today. Several phrases have been devised to describe this phenomenon: the age of unreason (Handy 1990), the age of smart toilets (Davis & Davidson 1991, 15), the age of paradox (Handy 1994), and latterly the funky times (Nordström & Ridderstråle 2000, 16). If over a decade ago Unland and Kleiner (1996, 5) described the competitive environment of the time as changing, evolutionary, turbulent and chaotic, what is it today? The current business environment is best described as hyper-competitive (e.g., Corbett 2004, 4). It is increasingly stated that in order to survive in such an environment companies should focus on a narrow set of core competences (e.g., Miozzo & Grimshaw 2005). In fact, a decade ago Achrol (1997, 56) predicted that the classic, vertically integrated organization that was so successful in the 20th century was unlikely to survive in the knowledge-rich and very turbulent environment of the 21st century. A few years later Lawton and Michaels (2001, 91) predicted that the global economy would accelerate to the point at which only the most flexible organizational structures would be able to survive in the increased competition. In fact, according to Hayes and Pisano (1994, 79), in a turbulent environment the very goal of the strategy should be strategic flexibility. As a consequence, firms that increasingly pursue this flexibility seek value in the non-core areas across company borders through outsourcing. In fact, activities

that have always been assumed to be essential to their business are suddenly being offered by new, specialized competitors that can perform them better, faster and more efficiently (Hagel & Singer 1999, 134). Vertical disintegration and specialization is the most significant contemporary organizational development in the corporate world (Miozzo & Grimshaw, 2005), and has led to current times being referred to as the 'outsourcing economy'.

The new industrial characteristics impose many challenges upon the companies operating in it. For instance, market globalization and concurrent technological developments have increased the competition in all industries. The increasingly integrated global marketplace has also led to a situation in which even a company operating solely on domestic markets still has to face the pressures of global competition (Cateora & Ghauri 2000, 15). In today's global economy every company must compete against customer alternatives coming from everywhere and anywhere (Corbett 2004, 4). Firms need to find ways of reaping value from innovations rapidly, as product life-cycles are becoming shorter, and in times of rapid technological change competitive edges are only temporary. In fact, in the context of global competition a sustainable competitive edge relying on products rarely exists, and in several industries products as well as services have ceased to be the source of competitive advantage. Thus, sustainable advantage lies in the creation of innovative business models that more often rely closely on creating network relationships, facilitated by industrial fragmentation. Further, the increasing outsourcing intensity brings several challenges in terms of managing day-to-day operations. The question is no longer whether to outsource an activity or a process, but rather how to outsource every single activity in the value chain (Gottfredson et al. 2005, 132-134), and this development seems to be irrespective of the industry. In fact, in the future the main value-creating competences may well be based on a superior ability to combine activities across internal and external boundaries, and to manage the resulting network (Gemünden & Ritter 1997; Nummela 2004, 42; Ritter, Wilkinson, Johnston & Wesley 2002). Firms need new competences in outsourcing management because those that outsource poorly may not only fall behind their competitors, but also be severely hampered in their ability to compete (Dwyer & Tanner 1999, 76). In addition, it is not only the volumes that challenge outsourcing management, but also the nature of the activities concerned. As mentioned above, more and more knowledge-intensive (and R&D-intensive) and creative-in-nature activities are being outsourced (see Mol 2005). Accordingly, the new management question of how to outsource innovation has arisen.

What has caused the skyrocketing popularity of this phenomenon? Increased competition arising mainly as a result of globalization has coerced

companies into rethinking their position in the marketplace. They are being forced to find ways of making their economic activities better, faster and cheaper while still remaining flexible enough to meet the ever-changing demands of customers and competitors. In meeting these challenges, outsourcing in all of its aspects provides more than a respectable alternative. The drive towards outsourcing has largely been fuelled by industrial fragmentation, as a result of which a new supplier base has emerged to provide the necessary activities and processes in the value chain. According to Engardio (2006), it is becoming possible to buy off the shelf practically any function required to run a business. Activities that companies have always believed to be core activities in their business are suddenly being offered by new, specialized competitors that can do them better, faster and more efficiently (Hagel & Singer 1999). Global access to these vendors and falling interaction costs caused mainly by improved information technologies and communication links are diminishing this transaction cost of outsourcing and are thus providing companies with unprecedented restructuring opportunites (Doig et al. 2001). As a result, companies of all sizes and in all industries are capitalizing on the possibilities a well-executed outsourcing strategy can provide (Engardio 2006). Possibly because of this, outsourcing has been one of the strongest and sustained trends over the last few years (Fill & Visser 2000), and thus has been referred to as a topic of growing interest in future business research. However, the research community has still not given it the attention it deserves (Miozzo & Grimshaw 2005; Parkhe 2007; Ramamurti 2004). The general purpose of this thesis is to address this shortcoming in an attempt to provide novel insights into this constantly evolving phenomenon.

1.3 The purpose and the outline of the thesis

As a consequence of these above-mentioned developments in outsourcing and the consequent restructuring of various industries, researchers are giving increased attention to this phenomenon. The current research base falls within several different research streams, including strategic management, international business, supply-chain, marketing, information systems, and economics, all of which have covered outsourcing issues quite extensively - the first three being the most predominant[4] (see Graf & Mudambi 2005; Maskell, Pedersen, Petersen & Dick-Nielsen 2007) - and various perspectives are taken. It is considered a tool for restructuring organizations into more

[4] The reasons why strategic management, international business and supply-chain management could be considered the key streams in outsourcing research are further elaborated in Chapter 2.1.

flexible entities (e.g., Lei & Hitt 1995; Morgan 2003; Tully 1993), known as transformational outsourcing (e.g., Linder, Cole & Jacobson 2002; Linder 2004; Mazzawi 2002); the focus may be on motives (e.g., Heikkilä & Cordon 2002; Kakabadse & Kakabadse 2002), value (e.g., Alexander & Young 1996b; Quinn & Hilmer 1994), pitfalls (e.g., Barthélemy 2003b), its effects on performance (e.g., Bryce & Useem 1998; Gilley & Rasheed 2000) and market value (e.g., Hayes, Hunton & Reck 2000), or on how to manage outsourcing relationships (e.g., Barthélemy 2003a; Lonsdale 1999; Useem & Harder 2000), to name but a few.

Recently much more emphasis has been placed on outsourcing in an international context (e.g., Beulen, Van Fenema & Currie 2005; Doh 2005; Farrell 2004a; 2005; Lewin & Peeters 2006; Levy 2005; Metters 2007), and offshore outsourcing[5] is a phenomenon that has recently been gathering momentum in business research, particularly in the area of international business. Yet Parkhe (2007, 4-5), for instance, maintains that although this carries enormous implications for researchers in the fields of international business, corporate strategy, organizational structures and information technology, there is a surprising dearth of systematic, rigorous study on the phenomenon.

Despite the extensive amount of research on outsourcing in various areas and research disciplines, it has recently been argued that there are still several areas in which the current theory base provides only limited understanding (e.g., Miozzo & Grimshaw 2005; Parkhe 2007; Ramamurti 2004). One of the underlying reasons why scholars still insist on the need for more research is because outsourcing has been touted as a strategy of high context dependency. This has fuelled the pursuance of results and generalizations from comparative analyses based on independent variables such as country of origin (e.g., Apte, Sobol, Hanaoka, Shimada, Saarinen, Salmela & Vepsalainen 1997; Kakabadse & Kakabadse 2002), industry of operation (e.g., Quélin & Duhamel 2003) and outsourced activity (e.g., Conklin 2005; Gottschalk & Solli-Sæther 2005), or some other specific context. This study aims to increase understanding of outsourcing management in two specific contexts.

Despite the fact that information technology outsourcing (ITO) is and has been one of the principle subjects of outsourcing research since its birth (see e.g., Dibbern et al. 2004), it still has contextual limitations. Firstly, the focus in its long research history has primarily been on examining and describing information systems outsourcing as a strategy for decomposing the supportive

[5] Although 'offshoring' as a concept is sometimes used in a similar context, it is problematic in that it could describe either captive (FDI) or non-captive (outsourcing). For reasons of conceptual clarification it therefore refers in this thesis to the captive mode as opposed to offshore outsourcing.

business function/process, rather than the outsourcing of product-development activities (see e.g., Loh & Venkatraman 1992a; Lacity & Hirschheim 1993; Huber 1993), and less is known about outsourcing IT work in IT firms. In such situations the scenario shifts from the outsourcing of supportive functions, which are nevertheless often core in terms of business processes, to outsourcing product-development activities. Kivelä (2007, 30), for instance, maintains that the aim in various IS-development approaches is to improve processes in order to produce better and more predictable outcomes, and therefore they lack the market perspective that is essential in examining product development in software firms. This inherently involves new managerial challenges in outsourcing product-development activities, and in turn leads to the second limitation of the current research on software outsourcing. Research so far has broadly examined specific management issues connected to IS outsourcing, such as the motives (Seddon et al. 2007) as well as the risks (Earl 1996; Tafti 2005), how to manage outsourcing relations (Barthélemy, 2003b), supplier selection (Levina & Ross 2003), the choice of location for the outsourced processes (Graf & Mudambi 2005; Palvia 2004), and other ways of identifying the determinants of its success (e.g., Loh & Venkatraman 1992b). Further, a lot of recent research has focused on identifying the critical success factors (CSFs) by correlating different phases of the management process, such as contracting and vendor management, with its success (Barthélemy, 2003b; Luo 2002). However, fewer studies have focused on the comprehensive management of the entire process of outsourcing IT activities and processes, particularly in a context in which such activities are product-development-related rather than supportive of business processes. In her recent work Kinnula (2006, 26) concludes that "*software research and development (R&D) outsourcing or partnering has not attracted much interest*", and this, in short, is the first limitation this thesis addresses.

In addition, and secondly, one very important context that has received only limited attention in the current literature on outsourcing is firm size. Prior research has consistently shown that increasing industrial fragmentation has created a favorable market setting for SMEs in many industries (e.g., Buss 1995; Preece et al. 1999; Whitehouse 2005). While multinational corporations (MNCs) are decomposing their production activities globally, SMEs have been aiming at supplying them. It has been concluded that SMEs, especially in highly volatile industries, must utilize and leverage the established sales channels provided by MNCs in order to achieve substantial and rapid growth, revenues and cash flow (Gabrielsson & Kirpalani, 2004; Preece et al. 1999). These channels may also provide opportunities for learning, and for technological and evolutionary growth (Gabrielsson & Kirpalani, 2004). Small firms seek to supply large MNCs with the niche technologies they need to

succeed in the face of the increasingly global competition. In fact, Buckley and Casson (2001) predicted that the winners and the profit earners in the globalization game would be not only successfully globalized firms, but also the firms that supply them.

It in terms of adopting an outsourcing strategy in the context of small firms, less is known from previous research. Such a strategy used to be considered a 'luxury' enjoyed by large multinational enterprises (MNCs). However in the current outsourcing economy, industrial fragmentation has reached the point at which practically every business component can be bought from external suppliers by any company, irrespective of size or industry (Engardio 2006). Companies of all sizes are seeking to capitalize their production resources across company boundaries and the flexibility gained from barrier-free organizational forms. It may be due to the newness of such developments that researchers have largely overlooked the issue of size as an outsourcing variable. Size is important and should be incorporated into strategy studies (Coviello and Mc Auley 1999; Smith et al. 1989), especially because in the case of SMEs a small size as such is a challenge to strategic decision-making. Although some recent studies (e.g., Landis, Mishra & Porrello 2005) have identified differences in outsourcing motives between SMEs and MNCs, for instance, the research still lacks a focus on the challenges associated with its management in SMEs. In terms of outsourcing, it is plausible to expect that in seeking external sources of knowledge and innovation as well as in restructuring the business, the challenges are much different than those faced by MNCs.

Given these two identified limitations of current research, the aim in this thesis is to increase our knowledge of this important, yet inadequately studied area. This leads to the purpose of the thesis, which could be broadly formulated as: **to examine the process of outsourcing product-development activities in software firms**. Fulfillment of this purpose entails describing the process and investigating the different management-related challenges and opportunities regarding the possibility of capitalizing external resources in order to undertake product-development activities. Given the purpose of this thesis, the outsourcing process is analyzed on three different hierarchical and contextual levels. Firstly, the industry-level context is software. Secondly, the specific firm-level context of particular interest is small and medium-sized firms. Finally, the activity or business-process context remains in (software) product development. Through theoretical structuring and empirical analysis **the aim is to unveil the different aspects of the outsourcing process, and further to investigate how, along with the growth process, software firms are able to capitalize outsourcing as a strategic tool in their product**

development[6]. The different contextual levels of the thesis are illustrated in Figure 1.

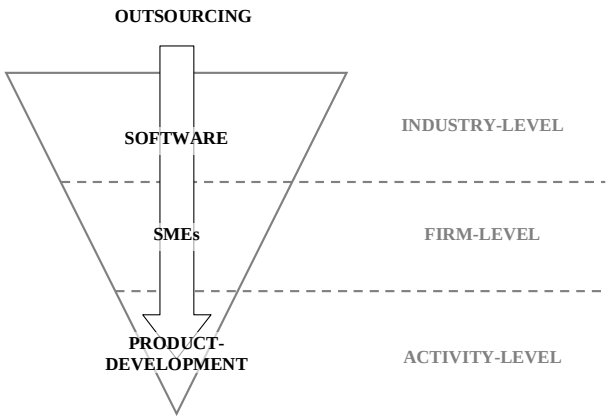

Figure 1 The three contextual levels of this thesis

The specific context was chosen and further narrowed down because, as argued above, outsourcing is highly context-dependent. Not only has it been found that firm size has an impact on the outsourcing decision and its management, previous research has also concluded that situational factors such as what is being outsourced and why have a significant influence (e.g., Graf & Mudambi 2005; Barthelemy 2003b). Software development is an activity or a business process similar to software sales and marketing, and as will be discussed later, outsourcing product-development activities involves different characteristics and managerial chanllenges than outsourcing marketing-related activities, for instance. Therefore, in order to decrease the number of potentially influencing variables, specific industry-, firm- and activity-level contexts were chosen for the analysis.

Although the focus is not on small firms per se, as the study concerns the phenomenon of outsourcing in software firms, the context is inherently that of the small firm. For instance, in a nationwide industry survey Kuitunen et al. (2005)[7] reported that 80 percent of all software firms surveyed (n= 198) employed fewer than 40 persons, and 65 percent of them had total revenues of less than three million euros. Only 13 percent employed more than 100 persons (Kuitunen et al. 2005, 24). Recent research has produced similar results, and has even indicated growth in the relative number of small firms in

[6] More detailed research questions covering the problem were built on the theoretical discussion in Chapters 2 and 3, and further summarized in Chapter 3.3.

[7] Finnish Software Industry Survey 2005

the software industry. The 2007 Finnish Software Industry Survey (see Rönkkö et al. 2007) estimated that 87 percent of the approximately 1,000 Finnish software firms had a turnover of less than three million euros, and only four percent had a turnover of more than 10 million. Accordingly, given the European Commission classification, the majority of Finnish software firms are small or even micro-sized (according to the estimate, 96 percent)[8]. Thus, by randomly focusing on a number of firms in this specific industry cluster, this thesis inherently examines the management of the outsourcing process in the context of small firms, and moreover it is natural in this context to examine issues from the perspective of SMEs. However, the analysis also includes outsourcing practices in larger software firms, thereby allowing comparative analysis of practices in firms of different sizes, in other words of how outsourcing practices evolve as the firm grows.

The thesis is structured as follows. Chapter two, which builds on existing literature and on relevant analyses, examines the phenomenon of outsourcing on a very general level, covering the current research streams and the prevailing topics. This discussion is then taken to the historical level, the focus being on the underlying theories. The general outsourcing process is scrutinized next in order to identify the different decision-making phases and thereby to pinpoint the key managerial tasks and challenges. The generated sequential process outline is then used to structure the later discussion.

Chapter three discusses these issues with regard to the process of outsourcing product-development activities in the specific context of software firms. Following a similar logic and structure as Chapter two, Chapter three begins with a short discussion and overview of the general characteristics of software firms, the purpose being to illustrate the complexity of the research arena and context. The discussion covers the organizational structures and the product and overall strategies. The focus then turns to the process of outsourcing product-development activities in software firms as depicted in existing research. The chapter closes with a discussion summarizing the empirical research questions.

Chapter four discusses the methodological choices for the empirical research. The issues addressed include the research setting and the philosophical approach, the rationalization behind the chosen qualitative approach, the data collection and analysis, and questions of validity, reliability and credibility. Further, given the format of this thesis as a collection of

[8] Commission recommendation 2003/361/EC classifies firms with less than 50 persons and a turnover of less than 10 million euros as small. Micro firms have less than 10 employees and a turnover of less than two million euros.

articles, this chapter concludes with a brief summary and an explanation of how each one relates to the discussion as a whole.

Chapter five gives a summary of the results of the empirical research. Again, following a similar structure as in Chapters two and three, it begins with an illustration of the descriptive results concerning outsourcing practices in software firms. The discussion then turns to the findings on the management challenges involved in outsourcing/licensing processes and decision-making in software firms, and provides insights into managing these challenges.

Chapter six summarizes the discussion provided in Chapter five by introducing the possible theoretical and managerial implications of the study, as well as the insights it offers policymakers. On the basis of the results and theoretical analysis, propositions for further research in different disciplines are put forward. This chapter closes with suggestions on how managers and policymakers could apply the results of the thesis, in other words, it offers some managerial implications.

The discussion and analysis provided throughout this thesis are finally summarized in Chapter seven. The summary is followed by a list of references used in the text. The Appendix consists of the articles from which the results presented in this thesis are derived, and which provide more in-depth analysis of the presented results.

1.4 Positioning the study

The theoretical position of this thesis falls to large extent between four different, yet in many cases overlapping, research traditions, i.e., strategic management, international business (IB), information systems (IS), and software business. Whereas the two former research traditions provide the discipline-based theories for the research setting (outsourcing), and in part for the firm-level context (SMEs), the two latter streams are connected to the different analytical contexts: software development (R&D) and software business (see Figure 1). Although it may seem that the most obvious position is "international management" or "information systems management", the *focus is not on managing international operations, nor is it on managing information systems: it concerns operations in general,* which may have substantial implications as far as internationalisation is concerned. In fact, the "information-systems" aspect of this thesis relates only partially to the context of the analysis. The adoption of ideas from the IS literature is only due to the specific software-firm industrial context of the study. Moreover, whereas the level of analysis of IS research more often lies in processes and functions

(software units of organizations), the primary level in this study remains the firm[9]. However, for this particular reason software-business research provides an applicable theory base from which to address the complexity of the chosen research context[10]. Still, the two underlying research disciplines applied are strategic management and international business, as research on the software business often builds on these discipline-based theoretical streams. In fact, these are perhaps the two dominant research disciplines driving current outsourcing research (Graf & Mudambi 2005; Maskell et al. 2007). In the following, the three abovementioned streams most relevant for the purposes of this study are briefly discussed with regard to its context and purposes.

1.4.1 Strategic management research

In the context of strategic management research this study addresses several different gaps in the existing literature. As argued above, despite the extensive amount of research focusing on outsourcing (see Jiang & Qureshi 2006), also in the context of software (see Dibbern et al. 2004), the small-firm aspect of this phenomenon is still unknown. This is surprising given the long history and vast amount of research focusing on strategic management in growing small firms, also in terms of inter-organizational technology-related relations (e.g., Doz 1988). For instance, Utterback and Abernathy (1975) argued that small firms needed to be highly innovative in order to attract attention, interest investment and, most importantly, to overcome larger competitors' advantages in terms of attracting customers.

The characteristics of the entire context of analysis (small software firms), which frequently include rapid growth and internationalization, imply several questions concerning the management of the outsourcing process. Firstly, it has been shown that the strategies of these companies evolve significantly during the different phases of growth (Alajoutsijärvi, Mannermaa & Tikkanen 2000; Ethiraj et al. 2005; Moore 2000; Seppänen 2002). Consequently, their outsourcing strategies should correlate with their overall strategies (Quélin & Duhamel 2003). Yet, it remains unknown how the outsourcing strategies change when the overall strategies change. Accordingly, and from the perspective of strategic-management research, this thesis is intended to contribute by combining the issue of outsourcing and the perspective of SME

[9] Nevertheless, as will be shown, the analysis in this thesis is often of the project. However, the primary interest still lies in the broader implications of these projects, and although the level of analysis may shift, the 'level of interest' remains with the firm.

[10] The distinction between ITO and software-development outsourcing addressed in this thesis is further elaborated in Chapter 1.4.3.

growth. Further, it remains unclear how the management of the outsourcing process in SMEs differs from findings reported in previous research, which is often focused on large firms. It could be argued that the liability of newness (e.g., Moen 2002) and of the small size and limited resources (Gabrielsson & Kirpalani 2004, Knight et al. 2004, Moen 2002) of small software firms have implications in terms of outsourcing management. Therefore, with its small-firm management aspect, especially in the volatile and rapidly changing software industry, this study will contribute novel knowledge to the existing literature on strategic management.

1.4.2 International business research

In the context of international business research, the study is also intended to contribute in terms of the topic (focus of analysis) as well as the context (level of analysis in software firms). In the global economy, turbulent high-tech markets are very often characterized by international competition and customers. Companies operating in highly volatile high-tech sectors such as software need to reap the benefit from innovations rapidly (cf. Oviatt & McDougall 1994), often on a global scale. This has encouraged small software firms, especially from small European countries, to search for growth internationally since their small home market often provides only limited growth potential, and the customers for their niche products are located worldwide (e.g., Knight & Cavusgil 2004, McNaughton 1996, Moen 2002, Sapienza et al. 2003, Crick and Spence 2005). This, in turn, has caused these firms to seek rapid growth and internationalisation (e.g. Moen 2002, Madsen and Servais 1997, Oviatt & McDougall 1995), often relying on different types of market-related network relationships in the process (e.g., Bell 1995; Coviello & Munro 1997; Varis, Kuivalainen & Saarenketo 2005). The speed of developing innovations and getting them into the global market place has become an inescapable aspect of survival, given the need to build international mechanisms to protect their commercial value from expropriation (Oviatt & McDougall 1994). Yet, the reported difficulties among rapidly growing and internationalizing firms (e.g., Aspelund & Moen 2002, McDougall & Oviatt 1996, Moen 2002, Mudambi & Zahra 2007, Sapienza et al. 2003) still leave open an important question for further research, which according to Peng (2004) continues to be the leading question guiding international business research: ‘What determines the international success and failures of firms?’ This study aims at contributing to this quest by exploring the implications of outsourcing for overall performance and the rate of growth. In fact, outsourcing is hardly ever an identified factor in the current IB research aimed

at identifying the determinants of these issues, although previous research has suggested that outsourcing in high-tech industries may give firms internationalization and consequent growth potential (Gabrielsson & Gabrielsson 2004; MacDermott & Handsfield 2000; Madsen & Servais 1997).

Moreover, in terms of international business research and the context in question, software firms are often characterised as entrepreneurial enterprises seeking to achieve international business space rapidly after establishment (e.g., Bell 1995), and thereby this specific context (software) is viewed from the perspective of international entrepreneurship (IE). International entrepreneurship is defined here as 'the process of creatively discovering and exploiting opportunities that that lie outside a firm's domestic markets in the pursuit of competitive advantage' (Zahra & George 2002, 261). Although some of the literature identifies inward (e.g., sourcing, purchasing, subcontracting) operations as one such opportunity (e.g., Madsen & Servais 1997), the analysis of the impact of capitalising external resource and knowledge sources remains limited. According to Stevenson (see Baldwin & Clark 1997, 90), true entrepreneurship lies in the "pursuit of opportunity beyond the resources currently controlled". The lack of overall current knowledge on outsourcing within the context of small entrepreneurial firms such as software houses leaves several important issues open to consideration. Much of the current research on IB and IE has focused on companies aiming at creatively discovering and exploiting market opportunities that that lie outside their domestic markets in the pursuit of competitive advantage (Zahra & George 2002). However, *less is known about companies aiming at creatively discovering and exploiting resource opportunities that similarly lie beyond their domestic boundaries in the pursuit of competitive advantage, internationalization and rapid growth*. Interestingly enough, this is something that was noted by Jarillo (1989), yet has since fuelled only a limited amount of research.

Although the evolution and development of small software firms, especially in the area of international business, is dealt with in the entrepreneurial literature, the capitalization of such a limited theoretical position is challenging. This study aims at increasing general knowledge of how outsourcing strategies can be capitalized in small software firms, with an emphasis on rational decision-making on an organizational level. For such purposes the literature on entrepreneurship (including international entrepreneurship), which often emphasizes small firms' decision-making as highly dependent on the entrepreneur's characteristics, competences and common knowledge (e.g., Harveston et al. 2000; Reuber & Fisher 1997; Oviatt & McDougall 1995; Roberts & Senturia 1996), does not alone provide a suitable theoretical basis. Nevertheless, this study does not discount the fact

that the decision-making is, to some extent, bounded by the attributes of the entrepreneur, and in some instances the specific characteristics of entrepreneurial firms are taken under consideration. For instance, in the case of small software firms, previous research has characterized those that have internationalized as possessing prior international experience, general knowledge, and an understanding of the target industries, together with established relationships and contacts with clients, and knowledge of global industrial trends (Bell 1995; Bell et al. 2003). The conclusion has been that inward international operations such as licensing, franchising, sourcing and subcontracting carry positive effects through the creation of the kind of internationalization-related knowledge or network connections that might assist in later outward internationalization (e.g., Andersen & Christensen, 2005; Carstairs & Welch 1982; Karlsen, Silseth, Benito & Welch 2003; Korhonen, Luostarinen & Welch 1996; Korhonen 1999; Welch 1990; Welch & Luostarinen 1993). As these inward-outward[11] connections have been found to form from relationships with the suppliers and the like, and as outsourcing as a strategy more often requires more intensive effort at relationship building, it is likely that the potential benefits are broader than suggested in previous research. Furthermore, as mentioned, internationalization in smaller entrepreneurial firms has been found to be connected to the attributes of the entrepreneur (e.g., Harveston et al. 2000; Reuber and Fisher 1997; Oviatt and McDougall 1995; Roberts and Senturia 1996), and as the same person(s) are most often involved both in market-related and sourcing-related operations (Korhonen et al. 1996; Wiedersheim-Paul et al. 1978), the knowledge and connections may be more extensively realized. However, current research provides limited empirical evidence of how these possibilities apply to the context of small firms, especially software firms. Therefore, in addition to contributing to the research on international business in general, given its focus on small software firms, which are often characterized as entrepreneurial firms, this thesis also offers a contribution to the current stream of research on international entrepreneurship (IE). In terms of entrepreneurship, this combinative positioning could also be described as a stream referred to as corporate entrepreneurship (CE) (see Zahra 2005). Whereas international entrepreneurship places some emphasis on irrational decision-making and the pursuit of rapid internationalization, corporate entrepreneurship focuses on more varied aspects of entrepreneurial management. As the core of this thesis lies in strategy analysis and not in internationalization per se, corporate

[11] Inward-outward connections refer to various ways in which inward operations (e.g., sourcing, licensing, franchising, subcontracting) in some way influence and facilitate the later international expansion of the firm, i.e., outward internationalization

entrepreneurship seems to be one of the sub-disciplines to which it will contribute.

Accordingly, this study adopts the Schumpeterian view that basically all new combinations are entrepreneurship (Schumpeter 1934), and further and especially the notion put forward by Stevenson and Gumpert (1985), for instance, that the central argument in the concept of entrepreneurship concerns the seeking of opportunities that lie outside of the firm's already-controlled resources. In particular, one aspect that has gained less popularity in the current entrepreneurship literature is "the conquest of a new source of supply", which is included in the novel combinations Schumpeter identified as expressions of innovation (Servais, Zucchella & Palamara 2006). The fact that this thesis examines the conquest and the use of external resources inherently touches upon the issue of firm boundaries. In fact, the basic question behind outsourcing is where to draw the line between internal and external operations. Accordingly, this thesis touches on the discussion concerning where to set the firm's boundaries in terms of organizing product-development activities.

1.4.3 Software business research

Although research on strategic management and international business has covered organizational issues in the context of high-technology and software firms, there is a specific stream of literature that specifically focuses on software firms. The research examines process-related, organizational and industry-level issues in the software industry. Although studies on the software business borrow insights from and strongly rely on prominent research traditions such as strategic management and international business, researchers have been forced to gain an understanding of the complexity of the field, and of how it reflects the adoption of prominent organizational theories (e.g., growth and internationalization) in this context. In fact, much research has focused simply on describing this complexity, particularly the different possible business models: understanding this diversity, in turn, facilitates examination of the industry setting (e.g., Rajala, Rossi & Tuunainen 2001).

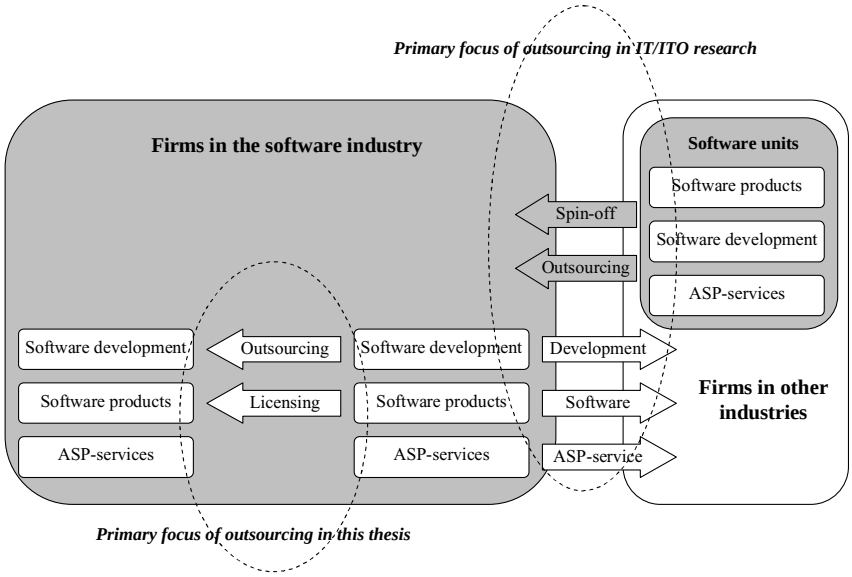

Figure 2 Outsourcing in IT and software business research (adapted from Tyrväinen, Warsta & Seppänen 2004)

As illustrated in Figure 2, and also discussed earlier in this chapter, the IT and ITO literature primarily examines outsourcing-related issues when the outsourcing party is a software/IT unit of a company in another industry, and the analysis accordingly remains on the level of processes and functions. The interest in this study is in outsourcing in which a software firm outsources, or equally licenses, some product-development activities to another firm in the software industry, thus shifting the analysis to the firm level, and as a result rendering the IT/ITO literature largely irrelevant for the purposes of this thesis (Figure 2). However, what is relevant is the current research on the software business, in other words software business research, which has established a strong foothold particularly in the Finnish research field. Kivelä (2007, 21) summarizes the distinction by stating that that the objective of software-product-development systems is to create new successful product designs, while IS processes aim to analyze, design, and implement improvements in the functioning of businesses.

There are a number of specific topics in software business research in which academics have shown particular interest. These include software business models (e.g., Rajala et al. 2001; Sallinen 2002), competence development in various contexts (e.g., Kivelä 2007; Nieminen 2007; Seppänen 2002), and different types of networks and interorganizational relations (e.g., Helander 2004; Kinnula 2006; Kulmala & Uusi-Rauva 2005). Moreover, these issues are quite often related to the internationalization process (e.g.,

Kuivalainen 2003; Ruokonen 2008), which, it has been argued, has become an essential factor in the success of software firms (e.g., Bell 1995; McNaughton 1996). Partly for this reason much of the research has focused on SMEs in this industry context (e.g., Bell 1995; Coviello & Munro 1997; Crick & Spence 2005; Ruokonen 2008; Ruokonen et al. 2006). This, as discussed, is also perhaps due to the nature of the overall structure of this volatile industry cluster in which the majority of firms are small or medium-sized (see Rönkkö et al. 2007). However, what makes software SME research different from other industrial contexts is that it takes into account the complexity of the software business environment, which affects the adoption of traditional theories such as SME internationalization. In fact, several recent research projects have focused on providing insights into the internationalization process of software firms, often seeking ways in which to capitalize on various types of marketing and sales-related partnerships (see e.g., Ruokonen et al. 2008; Tyrväinen et al. 2005; Äijö et al. 2005). However, while increased research attention has been given to managing market-related networks and relationships, upstream product-development-related relations have attracted less interest.

In fact, in terms of software-development outsourcing, and related to the IT and ITO literature with its rather long research history on the topic, there have been fewer studies from the perspective of software business research, despite some prominent efforts to gain an understanding of this topic. For instance, Kinnula (2006) examined the formation and management of software-outsourcing partnerships, reporting an in-depth case study of the evolution of an outsourcing relationship. Although the focus of her research was on large companies, her work provides an excellent basis for understanding the life-cycle and complexity of software-development outsourcing. In addition, other research has addressed different issues related to outsourcing and purchaising in the software business (see, for instance, Helander 2004; Sallinen 2002; Ulkuniemi 2003; Warsta 2002), providing valuable initial insights into this important topic.

However, despite the existing research on software SMEs and some recent studies on outsourcing and purchasing in the software business, the current literature is still lacking in terms of combining these two prominent areas of research. As discussed above, the current literature is much more focused on the opportunities, challenges and management of market-related partnerships in software SMEs (e.g., Alajoutsijärvi et al. 2000; McNaughton 2002; Kulmala & Uusi-Rauva 2005; Ruokonen et al. 2006), and less is known about the capitalizing of external research-oriented resources in SMEs. Some earlier research has examined outsourcing in software SMEs with a view to identifying the potential sources of external knowledge for software

development (e.g., Jordan & Segelod 2006; Segelod & Jordan 2004), or the challenges related to adopting such a strategy in this context and how to mitigate them (Carmel & Nicholson 2005), but has focused less on the opportunities the strategy could provide for software firms – particularly small firms. This is the primary research gap in this specific stream. It is the intention in this thesis to complement previous research and to provide novel insights.

1.4.4 The combinative positioning of the study

As discussed earlier, although from the contextual perspective this thesis touches upon issues that have been addressed and discussed in prior IT and ITO research, the findings are not applicable per se to the purposes of this study. Accordingly, the aim is to contribute to filling the research gaps in three distinct streams: strategic management, international business, and software business. Figure 3 illustrates the key theoretical areas of each research tradition, as well as the identified research gaps to be addressed in each stream.

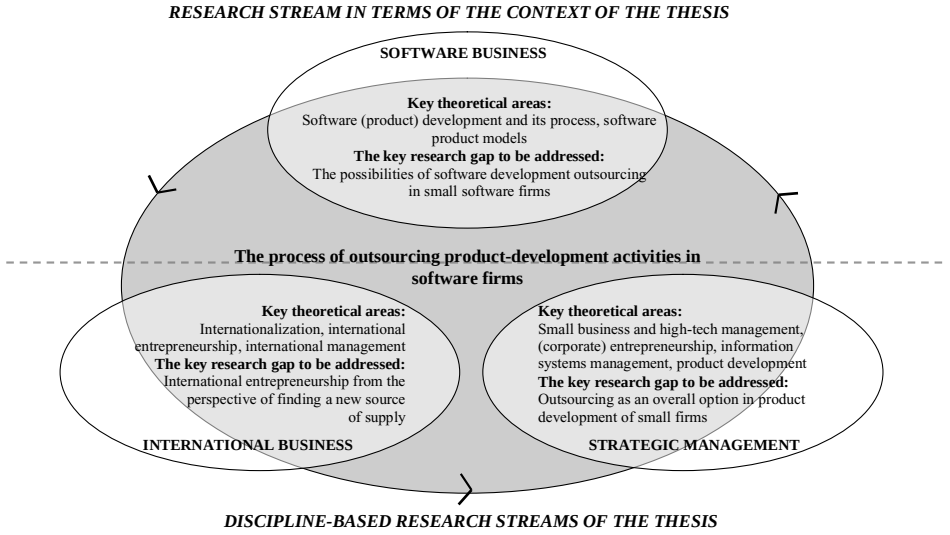

Figure 3 The positioning of the study

In sum, the aim of this thesis is to fill gaps in the existing research, mainly in two different discipline-based streams, international business (international entrepreneurship) and strategic management. Given the chosen software-

industry context, certain ideas have been adopted from the existing literature on the software business. This specific research stream gave significant insights into the dynamics and complexity of this industry setting. In general, the complexity and extensity paralleled with the evolution of the practice of outsourcing has led to a situation in which the theoretical background of the phenomenon has recently become much more eutrophic. This in turn, encourages the adoption of a highly interdisciplinary perspective, as illustrated in Figure 3. A researcher cannot be bound to one specific theoretical frame when examining the different aspects of outsourcing, as this would most likely result in an oversimplified assessment of this complex phenomenon. Therefore, although this thesis is positioned between the streams of strategic management, international business and software business, it gives insights into several different prominent areas such as organizational and systems theory. The theoretical diversity behind the current outsourcing phenomenon is explained in the following chapter.

2 THE PHENOMENON AND PROCESS OF OUTSOURCING

This chapter begins with a theoretical overview of the phenomenon of outsourcing. First the complexity of the concept is discussed from a historical perspective. As argued, the historical developments in outsourcing strategies have changed the nature of the phenomenon, and thereby opened up various questions for debate, even on the conceptual level. The conceptual discrepancies include not only the definition of outsourcing, but also its historical heritage in terms of the underlying theories. Scrutiny of the outsourcing decision-making process follows this brief theory-focused overview. A decision-making model is introduced, which is based on existing frameworks and is further utilized to structure the discussion throughout this thesis.

2.1 Current research and applied theories of outsourcing

Although the academic literature first referred to the concept of outsourcing in the mid 1980s (Pastin & Harrison 1987)[12], it is open to question whether the practice is, in fact, new. It is not only outsourcing as a concept that is the subject of lively discussion, but also its theoretical heritage. This section explores the questions of 'what outsourcing is' and 'where it comes from'. It also assesses the current status of the outsourcing phenomenon in terms of the theory.

2.1.1 Rationalization and the heritage of the outsourcing concept

According to Mintzberg (1987, 11),

"Human nature insists on a definition for every concept."

A concept, as defined, is an abstraction representing a certain phenomenon and one of its main purposes is to introduce a perspective – a way of looking at empirical phenomena (Frankfort-Nachmias & Nachmias 1992). Every new

[12] According to the literature review conducted for this thesis, Pastin and Harrison were the first to use the concept.

concept should be created to describe a new or a modification of an existing phenomenon as accurately as possible, not to override existing concepts. What, then, is the case with outsourcing? Its conceptual heritage has created friction among researchers and practitioners. According to one school of thought (e.g., Domberger 1998; Kern, Willcocks & van Heck 2002; Ring & Van de Ven 1992), outsourcing has evolved from and is the natural continuation of the work of Williamson in particular (e.g., 1975, 1979, 1981), and of others on contracting and transaction cost economics. Williamson argued, simplistically put, that if using the markets resulted in lower costs than carrying out the transaction internally (using hierarchies), it should be bought from the markets, i.e. contracted out[13]. These ideas date back as far as to Ronald Coase (1937), who suggested that transactions should be organized within a firm when the cost of doing so was lower than the cost of using the market.

Although Williamson's and Coase's ideas on transaction cost economics are often seen as the historical heritage behind the concept of outsourcing, other researchers discussed similar issues, although they used different concepts. Whereas transaction cost economics focuses on contracting out, Stephen Hymer (1972), for instance, discusses externalization as opposed to internalization. According to Strange and Newton, (2006, 190), Hymer postulated that international production could take place with control in firms and exercised over independently owned firms, without ownership being the tool for control. In contrast to internalization and to transaction cost approach, he saw the transfer of production as a means of extending rather than relinquishing control over production (Strange & Newton 2006, 181). Similarly, Richardson (1972) discussed 'co-operating' and 'co-ordination' in using market mechanisms as opposed to the markets and hierarchies dichotomy of the transaction cost approach. Moreover, in the garment industry the transferring of production activities to other companies has long been referred to as putting-out (cf. Landes 1998). Although the externalizing, coordinating and putting-out approaches are slightly different to the idea of contracting out, they all refer to the same management-decision dichotomy - whether to make or buy.

Still, despite the number of researchers who consider outsourcing a development of transaction-cost thinking and the consequent make-or-buy decision, some scholars (e.g., Embleton & Wright 1998; Loh & Venkatraman 1992) argue that contracting out cannot be used as a synonym for outsourcing

[13] Jarillo (1988) later presented Williamson's ideas in equation form, stating that if EP (external price, the actual price) + TC (transaction cost, cost of transferring) < IC (internal cost) the activity should be contracted out.

because, whereas outsourcing entails a long-term relationship with a high degree of risk-sharing, contracting out refers more to work conducted by an outside supplier on a job-by-job basis, cost being the only decision-making criterion. Whereas the transaction-cost approach considers buying in terms of more or less arms-length transactions, outsourcing also entails closer inter-organizational relations of various types. However, it has been argued (see e.g., Morgan 1999) that in the 'early days' the outsourcing strategy largely entailed contracting out based on cost-driven motives (see Table 1 on page 19). Thus *it is not that the theory has become obsolete; it is perhaps the evolution of the practice*[14] *that has complicated the theory base*. Yet, although transaction cost theory could be seen as the underlying theory behind outsourcing, it is insufficient in terms of explaining the extent of the current phenomenon into which outsourcing has evolved.

Accordingly, it could be argued that due to the evolution of a practice that has dramatically altered the way firms capitalize outsourcing as a strategic tool, the concept and definition of outsourcing has dramatically altered over the years. As a consequence, since its birth and up to the present day, various authors (e.g., Alexander & Young 1996b; Embleton & Wright 1998; Gilley & Rasheed 2000; Loh & Venkatraman 1992; Morgan 2003; Sanders, Locke, Moore & Autry 2007) have noted the complexity of outsourcing as a concept, which means that it is often mislabeled or even misunderstood. Yet, as mentioned, the differences in the definitions may be attributable to the evolution of the practice, which has developed in scope, scale, strategic importance, and management approach, for example. Take two of the definitions, for instance. According to Lei & Hitt (1995, p. 836), outsourcing is

> *"reliance on external sources for manufacturing components and other value-adding activities.",*

whereas Barthélemy (2003a, p. 87) defines it as

> *"turning over all or part of an organizational activity to an outside vendor."*

Clearly these two definitions differ in both scope and scale, yet both accurately describe the phenomenon as it was at the time. For instance, whereas Lei and Hitt (1995) refer to acquiring manufacturing components, Barthélemy (2003a) defines outsourcing as a strategy for acquiring an entire organizational activity.

How is outsourcing defined today? Current business literature generally refers to the use of external resources to carry out functions or processes that have previously been carried out internally. The phenomenon could be viewed

[14] The evolution of outsourcing practice is described in Chapter 1.1 and summarized in Table 1.

from two perspectives: product and process. From the process perspective, as defined by Barthélemy (2003a, see also Knudsen & Servais 2005), outsourcing means turning over all or part of an organizational activity or process to an outside vendor (cf. the definition above). From the perspective of production, however, Ellram and Billington (2001, p. 16), for instance, define it as:

> *"the transfer of the production of goods or services that had been performed internally to an external party."*

Although these approaches adhere to slightly different views, they both define outsourcing, only they give it different characteristics[15]. The common denominator, which could be considered the primary issue, is the fact that *outsourcing entails the transfer of ownership of an activity*. For instance, from the financial perspective, it could be considered a means of making fixed costs variable (e.g., Bielski 2004), which results from divesting (transferring the ownership of) internal functions or processes. In conclusion, building on the above definitions, this thesis uses the following definition of outsourcing: *the transfer of ownership of an activity, process or function that has previously been conducted internally to an external party*.

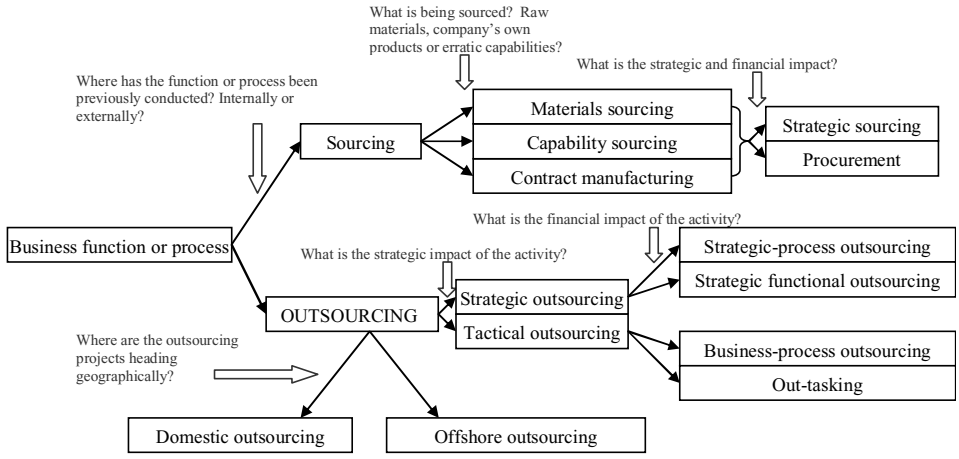

Figure 4 The distinction between outsourcing and sourcing (Hätönen 2006)

Figure 4 illustrates the conceptual complexity behind the phenomenon of outsourcing. As the figure shows, it basically entails some level of divestment, which differentiates it from activities such as sourcing and procurement (see

[15] The multiplicity of factors in the outsourcing decision is further discussed in Chapter 2.2.2.

also Knudsen & Servais 2005), and from conceptual developments such as capability sourcing (e.g., Gottfredsson et al. 2005) and strategic procurement (Venkatesan 1992). It is imperative to make this distinction in studies on strategies and management, as the transfer of ownership imposes several challenges in terms of managing the process, challenges that do not arise in sourcing or procurement. Further, as the figure shows, outsourcing can be further categorized based on the strategic importance of the outsourced objective (what and why), where the outsourcing projects are heading (where), and the mode of transaction (how). These issues are further discussed below.

2.1.2 Current streams of research on outsourcing

As mentioned above, research on outsourcing in the form of contracting out internal transactions dates back over 30 years (Hymer 1972; Williamson 1975, see also Quinn & Hilmer 1994), although the practice has existed for more than a half a century (e.g., Dibbern et al. 2004). For instance, Williamson (1975) questioned Adam Smith's (1776, taken from 1933) pin-making logic, stating that the technically distinct operations (wire straightening, cutting, pointing, grinding, and so forth) of the manufacturing process could, in principle, be performed not only by particular employees, but also by independent specialists. As mentioned, Williamson followed the ideas of Ronald Coase (1937), who suggested that transactions should be organized within a firm when the cost of doing this was lower than the cost of using the market. Since then, the research on outsourcing has attracted increasing attention among researchers in several different disciplines. Nevertheless, many aspects of this complex phenomenon remain unclear.

Maskell et al. (2007) identified three main concurrent literary streams focusing on outsourcing, all with their own specific characteristics: the literature on strategic management, supply chains and international business (IB). Furthermore a fourth stream, which has existed since the beginning of the practice, could be mentioned, and that is the literature on information systems/technology (see Dibbern et al. 2004). However since the IS and IT literature more often relates to the context of what is being outsourced (the outsourcing objective), it draws on theories of strategic management and IB, and sometimes on supply-chain management, the underlying issues behind which derive from these three main traditions, only in a specific industry

context[16]. Given the focus in this thesis on outsourcing-related issues especially from the perspective of strategic management and international business, related research in the context of supply-chain management is not discussed[17]. Table 2 on page 47 summarizes the key questions addressed in each literary stream.

2.1.2.1 Strategic management

The literature on strategic management is largely focused on the resource base, the core competencies and the boundaries of the firm, thus on the phenomenon of outsourcing in general rather than on offshore outsourcing. Nevertheless, recent developments in that field are heading towards explaining economic and managerial incentives for offshore outsourcing. Still, the main focus in the literature is on the rationale behind the actions leading to outsourcing. In terms of strategic management, outsourcing has previously been seen as a tool for trimming the cost base (cf. transaction-cost theory, Coase 1937; Williamson 1975), i.e. as transactional outsourcing, or for acquiring resources that were insufficient or not internally available (cf. resource-dependency theory, Johanson & Mattsson 1987; Pfeffer & Salancik 1978), i.e. resource-seeking outsourcing. It was used as a tool for trimming organizational efficiency through the handing out of non-critical peripheral functions to specialized providers. As a result of the increased competition brought about by globalization, alongside falling interaction and communications costs and the emergence of specialized suppliers, companies are moving towards outsourcing more critical functions and processes. Simultaneously, the focus has shifted from strict cost discipline to the creation of superior customer value. Furthermore the distinction between core and non-core competences is fading, and some researchers have even touched on the issue of outsourcing core competences (Baden-Fuller, Targett & Hunt 2000; Gilley & Rasheed 2000; Gottfredson et al. 2005).

The increased outsourcing activity, and in particular transformational outsourcing and the resulting overall business transformation, has generated a platform and a need for a dynamic set of new core competences, and this has been the focus of several recent studies on strategic-management research. The first of these could be referred to as strategic restructuring competence

[16] The context is often the outsourcing of information systems and/or infrastructure (information-systems outsourcing). For a thorough analysis of the literature on information-systems outsourcing see Dibbern et al. (2004).

[17] Interested readers will find a discussion on the research issues in the literature on supply-chain management in Maskell et al. (2005) and Hätönen & Ruokonen (2007), for example.

(Fine et al. 2002; Hagel & Singer 1999). The essence of this is that a company's real value-creating competence, perhaps its only sustainable one, might even accumulate from its ability to continuously restructure its value chain. Although the issue of value-chain restructuring is often considered in terms of supply-chain management, the literature on strategic management has also given it some attention because it is closely connected to core-competence analysis. Another "new" core competence concerns the company's ability to manage the geographically dispersed network of suppliers that results from outsourcing economic activities (e.g., Kakabadse & Kakabadse 2002), which is also referred to as network competence (Gemünden & Ritter 1997).

On the strategic level, the literature on outsourcing is increasingly addressing three main underlying issues and questions: 1) what could or respectively should not be outsourced (e.g., Hamel & Prahalad 1990; Bettis et al. 1992), 2) finding the right supplier for activities that are outsourced (e.g., Feeny, Lacity & Willcocks 2005; Hoetker 2005), and 3) determining the most appropriate relationship with suppliers of activities that are outsourced (e.g., Insinga & Werle 2000).

2.1.2.2 International business

During the last few years the Journal of International Business Studies has provided the forum for a vivid discussion on the future of IB research. Buckley (2002) suggested that the research agenda could be running out of steam due to the fact that no big research question had currently been identified. Peng (2004) argued against Buckley's (2002) view, stating that the question of 'What determines the international success and failures of firms?' had always been the leading question guiding IB research, and would continue to remain so in the 21st century. Indeed, the success behind international firms and their internationalization has been one of the dominating themes in IB research, mainly because it is closely connected to the *raison d'être* of international firms in today's globalizing marketplace. Even if a company operates solely on domestic markets, wherever they are located, it still has to face global competition pressures (Cateora & Ghauri 2000). As mentioned, at the end of the day the winners and the profit earners are those that fully exploit globalization opportunities, or the firms that supply them (Buckley & Casson 2001). In fact, Buckley (Buckley & Ghauri 2004) recently revised his statement about the possible "loss of steam", stating that globalization was possibly the new big question in international business research. Assuming that globalization drives outsourcing, Ramamurti (2004) suggests that

outsourcing could and should advance on the IB research agenda. In fact, international outsourcing is often referred to as one of the strategies that have led to the (international) success of a company (e.g., Engardio 2006), and thus in seeking answers to the question 'What determines the international success and failures of firms?' outsourcing cannot be overlooked.

In general, the research on international business and management has developed two broad traditions: theories of developing variance and process theories (Langley 1999). The former aim to explain the determinants of variation in corporate performance or behavior and are typically tested on cross-sectional data, whereas process theories seek to explain how and why businesses evolve over time (Meyer & Gelbuda 2006). From the IB perspective, the literature on offshore outsourcing has focused almost exclusively on developing variance theories. For instance, the effect of offshore outsourcing has been studied in terms of company performance (e.g., Gilley & Rasheed 2000; Landis et al. 2005) and market value (e.g., Bryce & Useem 1998; Hayes et al. 2000), but most importantly, due to the political nature of the topic, the IB literature has focused on certain stakeholder impacts on groups such as workers and labor (e.g., Deavers 1997; Kletzer 2005), governments (e.g., Baily & Farrell 2004; Clark 2004; Farrell 2004b), NGOs (Venkatraman 2004) and societies as a whole (e.g., Doh 2005; Farrell & Agrawal 2003a; Levy 2005).

Table 2 Current research streams on outsourcing and their special characteristics (adopted from Hätönen & Ruokonen 2007, 177)

RESEARCH STREAM	MAIN QUESTIONS ADDRESSED	SOME RECENT CONTRIBUTORS	DISCIPLINE-BASED THEORIES*
International business	1) Why outsource abroad?	Farrell 2004a; 2005; Quelin & Duhamel 2003; Lewin & Peeters 2006	Geographical-location theory, transaction-cost theory, resource-based view
	2) Where outsource to?	Palvia 2004; Graf & Mudambi 2005; Vestring et al. 2005; Kotabe & Murray 2004; Bunyaratavej et al. 2007; Doh 2005; Kshetri 2007	Geographical-location theory, resource-based view, internationalization theory of the firm
	3) What is the impact of offshore outsourcing on different stakeholders?	Agrawal & Farrell 2003; Deavers 1997; Baily & Farrell 2004; Farrell 2004b; Doh 2005; Levy 2005; Venkatraman 2004	Institutional theory
	4) Is offshore outsourcing an incremental learning process?	Hagel & Brown 2005; Graf & Mudambi 2005; Maskell et al. 2007; Beulen et al. 2005; Lewin & Peeters 2006	Internationalization-process theories
Strategic management	1) What should be outsourced?	Baden-Fuller, Targett & Hunt 2000; Gilley & Rasheed 2000	Internalization theory (transaction-cost theory, resource-based view)
	2) What is the right supplier for the outsourced activities?	Hoetker 2005,; Feeny, Lacity & Willcocks 2005; Hussey & Jenster 2003	Network approach, principal-agent theory
	3) How should the outsourcing relationships be managed?	Barthélemy 2003a; Lonsdale 1999; Useem & Harder 2000; Håkansson & Ford 2002; Hussey & Jenster 2003; Kedia & Lahiri 2007	Relationship theory (principal-agent theory), network approach, (modular) systems theory

* The discipline-based theories are further discussed in the following section

As the various studies on international outsourcing dominate the IB literature, only limited research has focused so far on the process aspect. However, it has been noted that companies are increasingly starting to outsource more critical aspects of their businesses abroad (e.g., Beulen et al. 2005). The concurrent research on outsourcing in international business often emphasizes international localization and factor aspects in explaining the extent to which outsourcing is conducted abroad. Some researchers have recently started to scrutinize this evolution of offshore outsourcing. Over a decade ago, for instance, Quinn and Hilmer (1994) viewed outsourcing as a development process proceeding from short-term to long-term supplier contracts. Furthermore, Hagel and Brown (2005) found that once a company has developed outsourcing skills it is more likely to consider moving its relationships to companies offshore. This type of incremental learning is of growing interest to researchers today. For instance, as Graf and Mudambi (2005), as well as Maskell et al. (2007), state, offshore outsourcing is, or should be, a sequential learning process in which cost-advantage motives precede differentiation advantages, and near-shore locations precede far-shore outsourcing. Interestingly, this process closely resembles the early staged models of the internationalization process (cf. Cavulsgil 1984; Johanson & Vahlne 1977; Luostarinen 1979).

In line with these developments, Ramamurti (2004), among others (e.g., Bunyaratavej et al. 2007; Doh, 2005; Kotabe and Murray, 2004), stress the need for researchers to focus more on the IB perspective. Although the phenomenon of outsourcing, especially across national borders, has been taking up more and more column space in magazines and journals, researchers should step aside from the political juxtaposition and focus more on the questions of how to do it right and for the right reasons. Moreover, research should aim to seek answers to the questions of what and where, and researchers should also address the question of when, given that the applicability of the outsourcing strategy is dependent on the right timing. All in all, given the limited research on these issues, it is clear that outsourcing is of growing interest in IB research. There are several questions still requiring answers (see Table 2). Why outsource abroad (e.g., Farrell 2005; Lewin & Peeters 2006)? Where outsource to (Bunyaratavej et al. 2007; Graf & Mudambi 2005)? What is the impact of offshore outsourcing on different stakeholders (Doh 2005; Levy 2005)? Is offshore outsourcing an incremental learning process (Beulen et al. 2005; Maskell et al. 2007)?

2.1.3 The interdisciplinary theory base and research on outsourcing

During the history of outsourcing researchers have embraced several theoretical disciplines in seeking to explain different aspects of this complex phenomenon. In fact, they have become aware of its highly holistic nature, which discourages them from adopting a single theoretical background and drives them towards a combinative approach. For instance, Hui and Beath (2001) analyzed 143 studies and identified four main theoretical bases underpinning outsourcing research: transaction cost economics, other economics theories such as agency theory and production-cost economics, the resource-based view, and social-exchange/trust/relationship theories. Further, Grover, Teng and Cheon (1998) propose a contingency model for examining different aspects of outsourcing based on four theories: the resource-based view, resource dependency, transaction-cost theory, and agency-cost theory. It thus seems that the complexity of the phenomenon accounts for the holistic nature of the theory base.

However, even researchers focusing on single instances of outsourcing have been coerced into taking a holistic theoretical approach. For instance in explaining the motives and drivers they often turn to transaction cost theory, the resource-based view and various theories of organizations and the firm. Further, in explaining the phenomenon of offshore outsourcing and the related location decision, they have noticed the applicability of Dunning's (1980; 1988; 2000) eclectic paradigm (e.g., Bunyaratavej, Hahn & Doh 2007; Graf & Mudambi 2005; Palvia 2004), which as such combines the theories of internalization, organization and geographical location. Figure 5 is an attempt to identify the main underlying theories behind the main issues of the current outsourcing research. It sets the underlying theory-base against the identified key questions of the current research, i.e., what, why, where and how, which were found to be the guiding questions in current strategic management and IB literature (see Table 2 in the previous section).

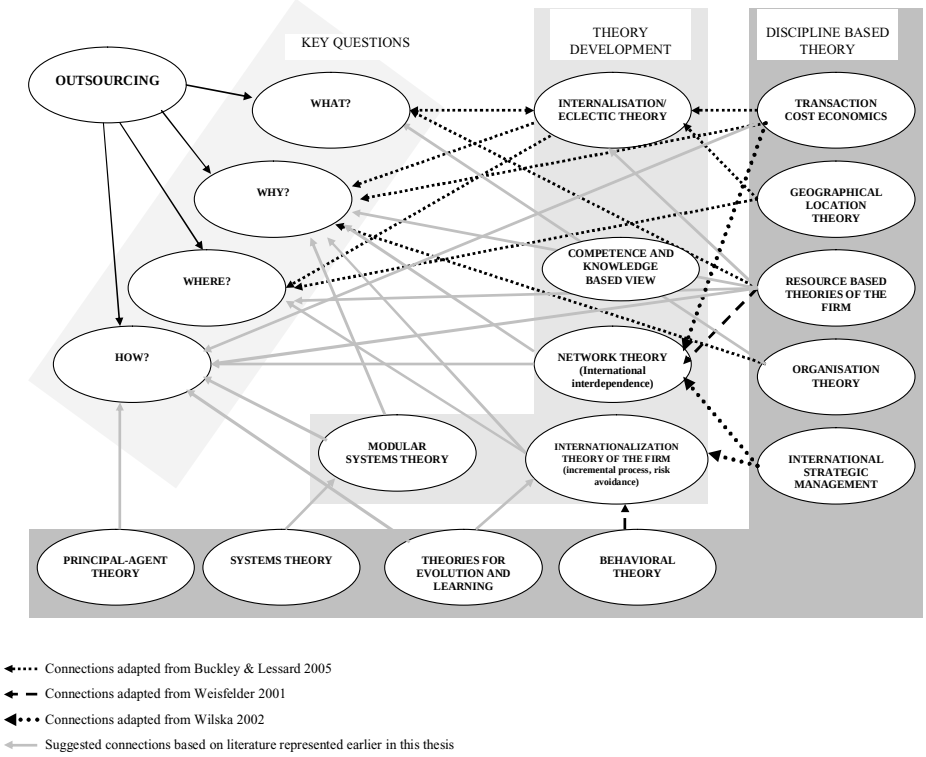

Figure 5 The discipline-based theories on key outsourcing questions

As argued above, the practice of outsourcing has its roots in transaction cost economics (TCE) (e.g., Coase 1937; Williamson 1975, see also Buckley & Lessard 2005) and in the internalization and externalization dichotomy (also Hymer 1972). As early as in 1937, Coase stated that the *raison d'être* of firms was the ability to organize some activities at a lower cost than market prices. Later, Williamson (e.g., 1975; 1979) argued that if using the markets resulted in lower transaction costs than making a product internally (using hierarchies), it should be bought from the markets, i.e. contracted out. This has been the prominent and the basic doctrine concerning the question of ***why*** firms outsource. As to whether or not to outsource it is a matter of why the firm is better at serving the market for that good than its competitors in some areas. This often boils down to ownership advantages,[18] which further derive from organization theories (e.g., Southard 1931; Dunning 1958; Hymer 1960; Caves 1971).

[18] Also referred to as the market-power approach.

Further, it was argued above that transaction-cost theory has lost some relevance in that contracting out refers more to work conducted by an outside supplier on a job-by-job basis, cost being the only decision-making criterion (e.g., Loh & Venkatraman 1992). Thus this and internalization theory (Buckley & Casson 1976) are no longer able fully to explain the current trends in the evolution of outsourcing. It is not merely a strategy for cutting costs accruing from the hierarchical organization of activities, it is a means of acquiring superior resources, knowledge and competences from external sources, i.e. a resource-seeking strategy. It should therefore be examined in the context of resource-based theories (RBV) of the firm (e.g., Penrose 1958; Wernerfelt 1984; Barney 1991). Resources are broadly defined (Wernerfelt 1989), and include tangible and intangible assets as well as capabilities.

Furthermore, the recent notion of transformational outsourcing does not directly and primarily aim at cost savings or acquiring resources that are unavailable internally, which is in line with TCE and the RBV: the focus is on new organizational structures, thereby again rendering these theories as such inadequate in terms of capturing this concurrent strategy. As transformational outsourcing aims at creating an adaptive, modular organization, researchers have been considering modular systems theory as a possible theory base, basing their arguments on the early work of prominent systems theorists such as Herbert Simon (1962) and Christopher Alexander (1964). Moreover, the notion that transformational outsourcing is preceded by stages of incremental learning (e.g., Morgan 2003) suggests the application of theories of evolution and learning (e.g., Nelson & Winter 1982) to capture the different aspects of this concurrent phenomenon.

With regard to transformational outsourcing, the main motive given for adopting such a practice was to achieve the structures and form of a virtual firm. The search for these flexible and dynamic structures has given rise to organizational forms such as the ‘hollow corporation’ (e.g., Pastin & Harrison 1987),‘virtual organizations’ (e.g., Davidow & Malone 1992), ‘network organizations’ (e.g., Miles & Snow 1986), ‘modular organizations’ (e.g., Tully 1993), ‘barrierless or boundaryless organizations’ (e.g., Ashkenas, Ulrich, Jick &Kerr 1995), ‘federated organizations’ (Child & Faulkner 1998), and ‘shamrock organizations’ (e.g., Morgan 2003). Although the terms are sometimes presented in slightly different ways, they all describe the phenomenon whereby the tightly integrated hierarchy is supplanted by loosely coupled networks of organizational actors (Schilling & Steensma 2001). According to Buckley & Lessard (2005), the idea of these virtual firms derives from resource-based theories, transaction cost theory, internalization theory, and organization theory, for example. Today the dilemma is to decide what the company should focus on, and around that build a network of world-class

suppliers, which at the end of the day is the task of transformational outsourcing. Thus and furthermore, it could be argued that network theory[19, 20] (e.g., Johanson & Mattsson 1988; Håkansson & Johanson 1992) has contributed to the evolution of this literature tradition.

In addition to leaning on resource-based theories and internalization theory, international outsourcing, as well as offshore outsourcing, calls for a theory that could explain the organization of economic activities not only externally but also in a foreign location. In seeking to resolve the dilemma of ***where*** to outsource, researchers have been looking at economic geography (Ohlin 1933) and geographical-location theory (e.g., Weber 1958; Vernon 1974), which could be a respectable alternative. In fact, several authors (e.g., Doh 2005; Graf & Mudambi 2005; Palvia 2004) have discovered the applicability of Dunning's (1980; 1988; 2000) eclectic paradigm, which combines theories of organizations, internalization theory and geographical-location theory. According to Dunning's paradigm, international production is justified if ownership-specific, internalization-incentive and location-specific advantages exist. In the context of international outsourcing, ownership and location advantages exist, but not the internalization incentive (cf. Hymer 1972). In addition, as shown earlier, recent research on offshore outsourcing has found that the outsourcing-related internationalization process (e.g., Maskell et al. 2007) may share certain characteristics with early models describing internationalization as an incremental learning and risk-avoidance process (cf. Johanson & Wiedersheim-Paul 1975; Johanson & Vahlne 1977; Luostarinen 1979). This again suggests the need for a theoretical background with roots in theories of evolution and learning (e.g., Nelson & Winter 1982) to resolve the issue of the outsourcing location.

In terms of ***what*** is and can be outsourced the most prominent current approach is the notion of core competencies, which represents one stream of the competence-based view (Hamel & Prahalad 1990). The competence-based or knowledge-based (e.g., Grant 1996) view is often seen as a revised version of the resource-based view/theory of the firm. Ownership advantages explain why the firm in question and not some other firm produces the good, and include all the reasons why it is better at serving the market for that good than its competitors. In fact this could be considered its raison d'être. Thus these ownership advantages derive from organization theories (Southard 1931;

[19] Here referred to as "theory" although its proponents and contributors refer to themselves as constructing an approach rather than a theory.

[20] The view that companies are closely interrelated through resource ties and activity links is, of course, the core proposition in the Industrial Network Approach. This viewpoint is also put forward in the more recent network propositions in the fields of economic sociology and strategic research, which are primarily based on the resource/capability view (RBV) of the firm (Möller, Rajala & Svahn 2005).

Dunning 1958; Hymer 1960; Caves 1971; 1974), and because they cover the issue of company competences they also take something from evolutionary theories. The concept of core competence was introduced by Hamel and Prahalad (1990; 1994) to replace the notion of the strategic business unit (SBU). Similarly, the knowledge-based view (e.g., Grant 1996) introduces ideas about the existence and nature of the firm that emphasize the role of knowledge. Accordingly, knowledge is the overwhelmingly important productive resource of a company. Different types of knowledge vary in their transferability: explicit knowledge can be articulated and easily communicated between individuals and organizations; tacit knowledge (skills, know-how, and contextual knowledge) is manifest only in its application, and transferring it from one individual to another is costly and slow (Nonaka 1994; Kogut & Zander, 1993). As mentioned, both the competence- and knowledge-based views are often seen as a continuation of the resource-based view (e.g., Wernerfelt 1984; Barney 1991).

Although the basic management task of selecting outsourcing objects draws on the above-mentioned discipline-based theories, it is worth noting that such theories may vary when it comes to further examination based on what is already being outsourced (post-selection). For instance, it is reasonable to expect that further examination of outsourcing marketing-related processes and functions differs theoretically from examination of outsourcing product-development-related processes, as is the case in this thesis. Lindman (1997, 17; see also Seppänen 2000, 17), for instance, suggests that the main approaches to new-product development lie in the resource-based view and organizational learning, strategy and strategic management, organizational theories, marketing management, new-product success/failure models, adoption/diffusion models, and technology/innovation management. Although many of these are not prominent in terms of outsourcing phenomena, they come into play in any detailed examination of the process of outsourcing in the product-development process. It is therefore also relevant to address them within the premises of this thesis.

Finally, as Insinga and Werle (2000) argue, one of the key questions behind outsourcing research with regard to the activities that are outsourced concerns the most appropriate form of relationship to foster (***how***). Several theories, such as transaction-cost theory, network theory, the resource-based view, and theories of evolution and learning are built on the need to explain the management of interorganizational relations, most of which today extend beyond markets and hierarchies into relationships, or so-called quasi-integration or quasi-relationships (e.g., Thorelli 1986). In fact, the way in which outsourcing relations should be managed has become on of the key concerns of researchers, who in seeking answers often draw on different

relationship theories as well as principal-agent (agency) theory (Eisenhardt 1989b, see also Logan 2000). In addition, previous research examining modular systems has found that embedded modularity significantly eases coordination in outsourcing decisions (e.g., Baldwin & Clark 1997), thereby providing insights into the management of outsourcing relations. This approach has its roots in Simon's (1962) and Alexander's (1964) systems theory.

As this short theoretical overview, has shown, and also as illustrated in Figure 5, the theoretical background behind the different aspects of the outsourcing phenomenon is rather versatile. Accordingly, adopting a singe theoretical view would most probably lead to an oversimplified analysis, especially given the intention to address the four questions of what, why, where and how. This requires a holistic view. Accordingly, the focus shifts in the following section to various theories to be drawn on in explaining the comprehensive process of outsourcing decision-making and management.

2.2 The process of outsourcing

One of the challenges that has intrigued researchers involves describing the process in which outsourcing occurs[21]. The first process models regarding purchasing date back as far as the late 1960s (e.g., Robinson, Faris & Wind 1967). However, while much of the academic interest in the field of outsourcing has concentrated on specific aspects of the process (Jiang & Qureshi 2006), it could be argued that only a limited number of studies provide a comprehensive account of the tasks involved. There have been various models (Greaver 1999; Momme 2002; Momme & Hvolby 2002; Francheschini et al. 2003; McIvor 2000b; 2005; Van Weele 2005; Zhu, Hsu & Lillie 2001), but the focus has often been on the planning phase (what should be outsourced), not on the whole process (see de Boer, Gaytan & Arroyo 2006, 446). Therefore, there still remains a lot to be studied in this context, as Maskell et al. (2007) concluded.

Most of these existing models illustrate three or four seminal phases of the outsourcing process (e.g., Van Weele 2005; Zhu et al. 2001). First, they suggest that companies should first determine the potential objects of outsourcing, which is often closely connected to the identification of core competences (e.g., Lonsdale 1999). The second stage is generally connected to

[21] In this thesis the 'process of outsourcing' entails the entire decision-making process, from the initial evaluation of the potential outsourcing objects to the final evaluation of the outsourcing performance and its implications. In some literature the term 'outsourcing process' is used to describe a narrower set of activities concerning the actual outsourcing.

the management of the transition of production activities to the vendor (e.g., Van Weele 2005). In this three-stage model, the final phase entails managing the outsourcing process. Although these broad phases are identified as generic, they encompass several distinct management tasks. For instance, Momme and Hvolby (2002, 71, see also Van Weele 2005, 124-132) describe a process comprising six generic steps, starting from competence analysis and proceeding through assessment and approval, contract negotiation, project execution and transfer, and relationship management all the way to contract termination. They further divide these tasks into three distinct phases: the strategic phase, the transition phase, and the operational phase. Moreover, Zhu et al. (2001) conclude that in addition to planning, development and implementation a fourth and final phase should be added, i.e., evaluation.

However, such approaches tend to underestimate the assessment and planning of the outsourcing process. In fact, reported failures in outsourcing projects are most often due to the fact that activities or processes are outsourced that should have not been outsourced, but rather 'in-sourced' (see e.g., Doig et al. 2001; Fine et al. 2002; Tanzer 1992), or the chosen model was inappropriate in the specific outsourcing situation (e.g., Miozzo & Grimshaw 2005). It is therefore essential to emphasize the assessment- and planning-related tasks in the outsourcing process. In building on existing models (Momme & Hvolby 2002; Van Weele 2005; Zhu et al. 2001), this study adopts a slightly refined approach to analyzing the outsourcing process in terms of four, or in principle five, distinct stages: (1) internal assessment, (2) outsourcing decision (assessment), implementation management, which can be further divided on the basis of the transfer of operations into (3) *ex ante* and (4) *ex post* implementation management, and finally (5) evaluation. The outsourcing process serving the purposes of this thesis is illustrated in Figure 6[22].

[22] Although Figure 6 simplifies outsourcing as a sequential process, it should be noted that in reality there are several feedback loops, there may be leapfrogging over different phases, and the order of the phases may vary (for instance, in some cases 'why' may precede the question of 'what') (see e.g., Kinnula 2006). However, these complexities and the intedependencies between the different phases are not extensively addressed in this thesis, the main purpose of the process framework being to structure further analysis of the management issues in each phase. Accordingly the outsourcing process is not a central framework to be revisited in this thesis.

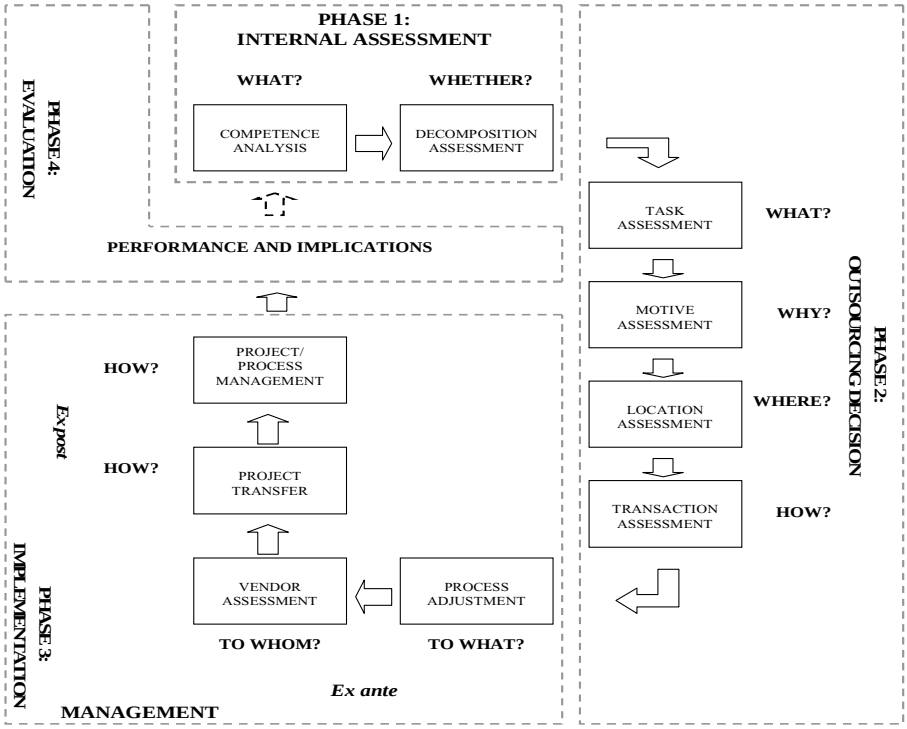

Figure 6 The process of outsourcing

Figure 6 depicts an outsourcing decision-making process flowing through four different phases. Although this model assumes that the stages are progressive, it is argued later that there are several linkages between them. In addition, the process can be stopped at any point, and the sequence of the stages may vary according to the decision-making situation. An analysis of the different phases reveals that the process, in fact, covers all the issues that have been described as crucial in the current outsourcing research. In other words, first firms face the question of what could be outsourced, and in the operational context whether or not it should outsourced. Secondly, they need to define the nature of the outsourcing situation, answering questions such as what is the nature of the outsourced objective, and why it should be outsourced, where and how[23]. The third phase entails answering various questions regarding the outsourcing implementation. Finally, the evaluation phase provides the performance implications, which remains one of the key issues in outsourcing research (Gilley & Rasheed 2000; Hartland et al. 2005;

[23] "How" in this case refers to the choice of outsourcing model, including the extent to which the task is decomposed and transferred to the vendor

Mol, Pauwels, Matthyssens & Quintens 2004; Quelin & Duhamel 2003). As illustrated, several theoretical considerations relate to this process, and thereby confining oneself to a single theory or theoretical background is not possible, Each of these stages is discussed in more detail in the following sections in the light of existing research.

2.2.1 Internal assessment for outsourcing

According to Lonsdale (1999, 181), prior to outsourcing firms need to establish whether the activity, resource or capability is responsible for competitive advantage. Nadler and Tushman (1999, 46-47) state that strategy should drive outsourcing decisions because organizational structure and strategy are reciprocal. Hence the first stage of outsourcing is to formulate the strategic objectives (Quélin & Duhamel 2003, 658; Dess, Rasheed, McLaughlin & Priem 1995, 9-10). This strategic approach provides the firm with information about the main activities that could potentially be outsourced (Gottferdson et al. 2005; Quélin & Duhamel 2003, 649), and identifies the driving forces behind its success, i.e. its core competences (Christensen 1997, 142-144). However, it is not sufficient merely to identify the key competences. Firms should also assess the implications of the possible outsourcing of its 'non-core' activities. According to Morgan (2003, 36), a successful management team knows what to outsource, but more importantly it knows what not to outsource (see also Barthelemy 2003a, 87-89). Thus it could be stated that the internal-assessment phase of the outsourcing process, entails (1) identifying the key value-adding competences (what) and (2) assessing the implications of the decomposition of the activities that are amenable to outsourcing (whether).

2.2.1.1 Identifying the key value-adding competences

Perceptions of what could be outsourced vary depending on the issues on which the company has decided to focus. Scholars have long been advising companies to focus their energies on activities in which they shine (e.g., Williamson 1975). These activities were later conceptualized as core competences (Hamel & Prahalad 1990), in other words competences in which the company excels and which are valued by the customer. In this context, it is suggested in the current literature on outsourcing that companies should keep these more complex, high-margin, critical components and processes of their value chain within their organizational boundaries, and outsource peripheral

activities (Kavan, Saunders & Nelson 1999). Quinn and Hilmer (1994) defined these core competences as a set of competences that gave the company definable preeminence and provided unique value for customers. These sources of value need to be carefully identified before any decisions on outsourcing are made.

The most important question concerning core competences concerns what they are in a given company. Hamel and Prahalad (1994) suggest three identification criteria: customer value, competitor differentiation and extendibility. In terms of customer value, firstly and most importantly a core competence must make a disproportionate contribution to customer-perceived value. Whether it is the competence or its outcome that is valued can be established through market research. Secondly, according to the competitor-differentiation criterion, a core competence must be competitively unique and preferably hard to imitate. The only way to specify this is through competitor analysis, in which benchmarking is a widely used tool. Finally, while a particular competence may be core in the eyes of a single business in that it passes the tests of customer value and competitive uniqueness, it may not be from the corporation's perspective if there is no way of imagining an array of new products or services issuing from it, i.e. it must be extendable to other businesses as well. The first two tests have to be conducted through external analysis, but the third one calls for internal analysis. Because the internal analysis of a company's own core competences calls for a great deal of objectivity, as studies have shown, it might turn out to be a tricky task and competences are often mislabeled (e.g., Nummela, Saarenketo & Puumalainen 2004). In fact, Christensen (1997) observed that in many companies strategic decision-making was not a core competence. Thus, ironically, the core-competence analysis is often carried out externally, i.e. it is outsourced to management consultancies and the like.

2.2.1.2 Assessing the implications of the decomposition

After the identification process companies tend to rank their value-adding activities in a natural, or generic, hierarchy of strategic importance (Maskell et al. 2007), and naturally, the more they resemble the core competence by fulfilling the criteria the more important the function is to the company. For instance, Hussey and Jenster (2003) classify non-core activities or competences as traditional, peripheral, critical and strategic in accordance with their importance. Regardless of the division, after the segmentation it is not the peripheral or the core competences that bring on managerial headaches, but those that fall somewhere in between, referred to variously as critical (Duarte,

Sackett & Evans 2004), strategic (Hussey & Jenster 2003) and essential (Quinn 1999). This happens because such a two-fold distinction between core and non-core oversimplifies the actual business situation (Heikkilä & Cordon 2002; Long & Vickers-Koch 1995), and often leads to unconsidered and drawn-out outsourcing decisions. This is why the existing literature has identified several reasons why some of the core competences, even if they do not rank as best-in-the-world, should also be kept in-house. These reasons include customer requirements (Quinn 1999), political considerations (McIvor 2000b), high asset specificity (Lonsdale 1999), and the protection of the core competences (Quinn 1999; Unland & Kleiner 1996), their interdependence (Bryce & Useem 1998), and inadequate supply-base capabilities (Fine et al., 2002; Lonsdale 1999). In sum, competences, even though not classified as core, should be kept in-house if outsourcing them 1) has a negative impact on real core competences due to connections to them, 2) provides no added value due to the absence of a competitive supplier market, 3) might cause the loss of possible future core competences, or 4) is required by certain stakeholders. The following sections elaborate on these issues further.

Connections with the core competencies: Core competencies seldom occur or develop in a vacuum. Even if a function, activity or a process in itself does not qualify as a core competence, outsourcing it might 1) lead to vulnerabilities to the very core competence or 2) destroy some synergy effects and thus destroy the entire competitive advantage of the company. Firstly, as an example, the enterprise resource planning (ERP) system as such might not be a core competence of a manufacturing company. However, outsourcing it all to an outside vendor might lead to a situation in which the entire manufacturing process is dependent on the services provided by the vendor, and outsourcing some activities might lead to unanticipated and unwanted interdependencies with suppliers. Secondly, core competences often span the boundaries of individual activities, and it might be unwise to separate the functions that contribute to them. For instance, as Schoemaker (1992) states, capabilities often complement other capabilities in a 2+2=5 fashion, and it is only through this equation that the very core competence emerges. In fact, it is even possible that competences complement other capabilities that are controlled by others, and core competences might even arise from interfirm cooperation (e.g., Croom 2001). Thus a specific capability might be a core competence only if it is complemented by another capability. Outsourcing this capability might have serious consequences.

Inadequate supplier base: Even though an activity does not constitute a core competence, outsourcing is not a viable option if there are no available suppliers to provide it at the required volume, and performance level, and with the desired cost structures (e.g., Lonsdale 1999). Lonsdale (1999, 181) further

argues that in the case of uncompetitive supplier markets firms should outsource only if the in-house solution is impractical. Similarly, according to Doig et al. (2001), an inadequate supply base argues for insourcing. These ideas, in fact, derive from Williamson's (e.g., 1975) ideas on transaction cost economics, according to which in uncompetitive supplier markets firms should prefer 'hierarchies' over using the 'markets'. In other words, there is no supplier available that could meet the required service-level agreement (SLA), which is often based on costs and/or other performance measures. Historically this has been the case (Barthélemy 2003b). However, the continuously growing supply markets have provided the opportunity to reassess which activities should remain in-house and which should be outsourced (Jennings 1996). Furthermore, activities that companies have always believed to be central to their business are suddenly being offered by new, specialized competitors that can carry them out better, faster and more efficiently (Hagel & Singer 1999). However the evolvement of suppliers is reactive to the development of innovations. The problematic area in evaluating the supplier base is, as noted by Williamson (1975), the existence of asymmetrical information between the actors. For instance, the client and the vendor might have different assumptions about the vendor's capabilities: vendors tend to overvalue their capabilities, and this is something that has to be acknowledged in supplier evaluation. Moreover, even though there are potential suppliers, firms should avoid using the markets whenever there are uncompetitive supplier markets.

Possible future core competences: Only a fraction of competences are core to the company from the beginning, and most are developed. Furthermore, core competences are not static, and competitive advantage is, at best, a fleeting commodity that must be won again and again (Fine et al. 2002). However, the more a company possesses and nurtures core competences, the more it means making compromises in resource allocation. Highly specialized companies do not have to make these compromises and it gives them enormous advantages over integrated companies (Hagel & Singer 1999, 34). Firms therefore need to be careful when assessing the future potential of the competence. Outsourcing a future prospect might have severe consequences, but keeping a non-promising competence in-house is a cost burden that takes resources away from the very core competence.

Stakeholder requirements: Stakeholder demand does not mean that a company should listen to all the opinions of all its stakeholders - just those that might have a negative influence. Some stakeholders, through status or law, hold more power over company decisions, and it is thus imperative for firms to listen to these stakeholder groups when making their outsourcing decisions. The main stakeholder groups in this respect are customers and the

government. According to Quinn (1999), customers might insist that the company does not outsource some activities, as they fear that this might lead to decreased value or increased complexity in the supply chain. Governments are another stakeholder group that might have an impact on the outsourcing decision-making. For instance, the US government is even introducing bills aimed at punishing or restricting offshoring and offshore outsourcing (see Mankiw and Swagel 2006).

In sum, the number of 'peripheral' and 'strategic' activities has increased while the number of 'core' activities has decreased because the definition of a core competence has drastically tightened. Indeed, in today's marketplace core competence is not merely something at which a company is efficient: it has to be close to a best-in-the-world capability. If you are not best at what you do someone else is always better. Although this neoclassical and somewhat harsh Darwinist phrase might seem axiomatic, it holds within the current doctrine of outsourcing. For unless the company is best-in-the-world at an activity, it is another company's core competence: it gives up its competitive edge by not buying that skill from a best-in-the-world source (Quinn 1999). In reality, the situation is rarely so straightforward, however, but nevertheless, companies are increasingly and on a continuous basis coerced into rethinking their existence and their purpose in the marketplace. However, once a firm has identified the activities that are worth outsourcing, it is then faced with another set of considerations regarding the outsourcing scope, scale, location, mode, and so forth – a phase in the process that was conceptualized as the outsourcing decision.

2.2.2 The outsourcing decision

This second phase in the process entails the assessment and conceptualization of the outsourcing task. It entails addressing issues concerning the nature of the outsourced task, the motives and performance goals of the outsourcing project/process, and the target location of the decomposition and its nature and characteristics. In other words, the outsourcing decision entails answering the questions of what, why, where and how regarding the outsourcing situation (see Table 3). It is essential to address these issues prior to the decomposition of activities because the management roles and tasks, for instance, change significantly based on these variables.

Table 3 Key outsourcing decision tasks and examples of considerations

DECISION	DICHOTOMY/SCALE	EXPLANATION/CONSIDERATIONS
The nature of the outsourcing objective **(WHAT?)**	**IMPORTANCE** Core vs. non-core Strategic vs. non-strategic	Basic dichotomy that companies should identify their core competences and outsource the non-core ones (Porter 1996; Quinn 1999) Strategic outsourcing refers to a policy of outsourcing more strategically important activities (Alexander & Young 1996a; Quinn & Hilmer 1994; Quinn 1999).
	TRANSFERABILITY Knowledge- vs. labor-intensive Assets specificity	Knowledge intensity reflects the extent to which a process depends on the knowledge inherent in it, whereas labor intensity refers to activities with limited prior knowledge required for task completion (Autio Sapienza & Almeida 2000). Asset specificity refers to the uniqueness of assets to support the exchange (Williamson 1975).
	SCOPE Individual, functional, project, process	Individual refers to moving specific positions out of the organization, functional refers to structured cost centers with specialized knowledge and responsibilities, and process refer to how the products or services actually flow through the organization (Greaver 1999, 5-6). Process outsourcing (BPO) refers to continuous transaction, and project outsourcing means that the responsibility for a certain defined project is transferred to an external party (e.g., Willcocks et al. 2004).
The outsourcing motives **(WHY?)**	**MOTIVES** Cost rationale, resource acquisition, organization transformation	Cost-rationale outsourcing is strictly focused on the costs, often from a transaction-cost perspective (cf. Williamson 1975), Resource-acquisition-driven outsourcing refers to outsourcing that is motivated by the need to acquire skills, knowledge or competences that are unavailable internally (Quelin & Duhamel 2002), and transformational outsourcing could be defined as a strategy that seeks a rapid, sustainable step-change improvement on the enterprise level of performance (Linder 2004; Linder et al. 2002; Mazzawi 2002; Morgan 2003)
The outsourcing location **(WHERE?)**	**LOCATION** Domestic, offshore (near-shore, far-shore) Partner influence	This concerns the basic decision of whether to transfer the tasks locally or to another country. The primary factors affecting location choice have been identified as situational, internal, locational and external (Graf & Mudambi 2005; Palvia 2004). In addition, offshore outsourcings are sometimes categorized based on the geographical distance between the vendor and the outsourcer, such as near-shore and far-shore (Click & Duening 2005; Smith, Mitra & Narasimhan 1996).
The nature of the governance, divestment and the business model with the vendor **(HOW?)**	**GOVERNANCE** Control vs. cooperation Transactional vs. relational Equity vs. non-equity holding	The management of non-equity outsourcing relations is depicted along a continuum on which arms-length management refers to relying on contracts, and alliance-based management more on building inter-organizational trust and commitment (Barthelemy 2003b). Transactional refers to one-time or short-term projects, whereas relational refers to long-term partnerships (Oates 1998). Equity vs. non-equity refers to whether the outsourcer or the vendor takes an equity stake in the other (Cullen & Willcocks 2003; Heywood 2001; Kakabadse & Kakabadse 2000).
	TASK DIVISION Parent, vendor, cooperation On-site vs. off-site	This refers to where the actual work will be done and by whom, on-site meaning at the premises of the customer and off-site meaning at the premises of the vendor. The task division also entails dividing responsibility for the process, in other words deciding whether a specific part of it is to be carried out internally, transferred to the vendor, or conducted in collaboration.
	SCALE/INCREMENTALITY Partial vs. turnkey Total vs. selective Incremental vs. big bang	Partial outsourcing refers to situations in which only a certain part of an activity or a process is transferred to the vendor, whereas in turnkey outsourcing the ownership of the entire activity/process is transferred (Van Weele 2005). According to Willcocks and Choi (1995), total outsourcing refers to a situation in which more than 80% of the function or process is outsourced, and consequently, in selective outsourcing the figure is less than 80%.

Once the internal competences and the outsourcing rigidities have been identified, and outsourcing is still the favored option, this study proposes four key questions to be addressed in the subsequent decision-making, as illustrated in Table 3.

1. What is the nature of the outsourced activity, i.e., what?
2. What are the underlying motives and performance goals in the outsourcing, i.e., why?
3. What are the prospective outsourcing locations, i.e., where?
4. What are the different governance, task-division and divestment options in the outsourcing situation, i.e., how?

Although these questions are distinct areas to be addressed, they are nevertheless highly interconnected. For instance, it has been found that the nature of the outsourced activity has an impact on the choice of outsourcing location (e.g., Graf & Mudambi 2005; Palvia 2004), as well as on the choice of mode of transaction and divestment (e.g., Hussey & Jenster 2003). Further, it has been argued that the underlying motives are prime influencers in terms of location and decomposition model (Carson 2007; Farrell 2005). Thus, it is proposed that although these issues should not be separated from each other, the chronological order in which they are addressed should be as illustrated above. Accordingly, the outsourcing decision-making process is cumulative, and the decisions made in prior stages affect those attached to each question. The following sections discuss the issues behind these questions in more detail.

2.2.2.1 The nature of the outsourcing objective – WHAT?

The nature of the outsourcing object has been seen as the key determinant not only in the initial make-or-buy decision (e.g., Williamson 1975), but also in devising the performance metrics for the outsourced activity, the decomposition location, and the process and extent to which the activity or process is transferred to the vendor. Previous research has illustrated several ways of categorizing different types of outsourcing. Although several studies propose categorizations based on the related value-chain activity (e.g., production, R&D, marketing), it could be simplistically argued that this is inadequate: in R&D outsourcing, for instance, there may be significant differences in scale, scope and complexity.

Another prevalent categorization of different outsourcing objectives is according to their importance to overall operations. The strategic importance of an activity is a yardstick that is among the most frequently used to categorize outsourcing decisions (e.g., Alexander & Young 1996a; Duarte et

al. 2004; Hussey & Jenster 2003; Quinn & Hilmer 1994; Quinn 1999). For instance, distinctions have been made between strategic and non-strategic outsourcing (Alexander & Young 1996a), critical and tactical outsourcing (Duarte et al. 2004), and core and non-core outsourcing (Quinn 2000). Regardless of the variety of classifications, the strategic nature of the activity provides useful insights, especially concerning the management of these different types. The more critical the outsourcing is to the company the more likely the company is to seek to build a relationship with the vendor in order to ensure continuous supplies. Moreover, and prior to that, the strategic importance of the supply has been found to have a significant impact on the supplier selection criteria (e.g., Hoetker 2005). From the perspective of academic research, the problem with categorizing in terms of strategic importance is that it is a context-dependent measure, meaning that the same activity most likely has a different emphasis in terms of the overall operations in different companies. Therefore, capitalizing strategic importance as a single outsourcing characteristic in a comparative setting is difficult.

A frequently used way of examining the nature of the outsourced activity is through the asset specificity of the objective (e.g. Lonsdale 1999). Asset specificity refers to the extent to which the production activity is dependent on the current environment and resources for completion (Williamson 1975). In terms of measurement it could be viewed from the perspective of knowledge transfer. For instance, Kogut and Zander (1993) propose that the transferability of an activity is dependent on its complexity, teachability and codifiability. Yet, it has to be noted that although asset specificity is embedded in a task, it is not chronic, so to speak. Tacit knowledge, which is often associated with asset specificity, could be made more explicit, thus enabling the transfer of these activities relatively freely across the globe (Nonaka & Takeuchi 1994). Current research has shown that firms may take several actions to decrease the asset specificity of the task, and thereby increase its transferability[24] (e.g., Nicholson & Sahay 2004). Therefore, although asset specificity and transferability are an extremely important aspect of the outsourcing decision, like strategic importance it is a measure that is dependent on the outsourcing organization.

Similarly, there is another measure that may be used to examine the nature of the outsourced activity, i.e., knowledge-intensiveness in contrast to labor-intensiveness. Whereas strategic importance refers to the relation between the factors behind firm success and the proposed activity, and asset specificity to the relation between the task and the transferability of it, knowledge-intensity provides a more focused view of the nature of the activity itself. On the firm

[24] These actions are further discussed in following sections, especially in Chapter 2.2.3.

level it reflects the extent to which a firm is dependent on the knowledge inherent in its activities and outputs as a source of competitive advantage (Autio et al. 2000). From a task perspective, it could similarly be defined as the extent to which the successful completion of a task is dependent on knowledge and skills as a primary resource. Although knowledge-intensiveness is often contrasted to asset specificity, it is largely an independent measure of the firm's strategies (strategic importance) and operations (asset specificity).

It is important to address all of the issues pertaining to the nature of the outsourced objective before proceeding with the outsourcing decision-making: as argued above, inherent in the outsourced activity are several issues to be considered throughout the outsourcing process. For instance, its asset specificity or knowledge-intensity has implications in terms of inter-organizational knowledge transfer, in other words the transfer of the production activities to the vendor (cf. Kogut & Zander 1993). Further, the strategic importance of the activity is a key influencer in the decision concerning supplier selection, and on issues concerning the management of the supplier relationship (Hoetker 2005; Hussey & Jenster 2003), for instance. According to the analysis, the purpose of assessing the nature of the outsourced activity is to clarify three different characteristics: 1) the nature of the activity as an independent task (knowledge-intensiveness), 2) the nature of the activity in relation to other tasks (asset-specificity), and 3) the nature of the activity in relation to firm success (strategic importance).

2.2.2.2 Outsourcing motives – WHY?

For outsourcing to occur, and to make sense for that matter, there has to exist an incentive or motive. The competitive nature of the supplier markets and the transferability of the activity or the process are just enablers of outsourcing, not the drivers. In other words, companies do not outsource because they can, they outsource because they see it as profitable in some way. Motives differ between activities, companies and even regions. For instance in their comparative study of outsourcing motives in the USA and Europe Kakabadse and Kakabadse (2002) found that US companies adopted a more strategically oriented approach in concurrently aiming to achieve best practices, improve service quality, focus on the core competences of the organization, and to better utilize and leverage new technology throughout their processes and systems, whereas European companies paid greater attention to cost savings and to achieving economies of scale. Table 4 summarizes the findings of some recent studies on outsourcing motives and their ranked importance. Although

the studies represented in the table provide insights from larger companies, some preliminary work on outsourcing motives in SMEs has indicated that, regardless of some differences in prevalence (importance), the motives remain, in principle, the same in large and small firms (see e.g., Swoyer 2004).

Table 4 Recent studies on outsourcing motives

REFERENCE	AREA	FOCUS INDUSTRY	N	MAIN MOTIVES
Kakabadse & Kakabadse 2002	US and Europe	N/A	747	1) Cost discipline/control 2) Aim to achieve best practice 3) Improve service quality 4) Focus on core competences 5) Enhance capability to develop new product/service 6) Access to new technology/skills
Landis, Mishra & Porrello 2005	US	Large companies in manufacturing, transportation, consumer business, energy, financial services, technology/media/ telecommunications, health care and the public sector	25	1) Cost savings 2) Acquiring best practices/quality/innovation 3) Flexibility 4) Focus on core capabilities 5) Access to high-caliber labor 6) Transfer risk to vendor 7) Lack of expertise in-house
Quélin & Duhamel 2003	Europe	Large manufacturing companies	180	1) Lower operational costs 2) Focus on core activities 3) Gain flexibility
Swoyer 2004	US	Broad range of industries such as advertising, aerospace, financial services, manufacturing, retail and telecommunications.	744	1) Reduce or control costs 2) Gain access to resources unavailable internally 3) Free up internal resources 4) Gain access to high-quality resources 5) Accelerate project 6) Improve business focus 7) Reduce time to market 8) Accelerate company reorganization/transformation 9) Gain access to management expertise unavailable internally
Trestle Group Research Report 2004	Global (16 countries from which 70% in Europe)	Financial services, telecommunications and manufacturing sectors	N/A	1) Reduce costs 2) Gain access to resources unavailable internally 3) Access to a flexible workforce 4) Internal reorganization 5) Improve business focus 6) Reduce time to market 7) Free up internal resources

According to Alexander and Young (1996b, 729-730; also Quinn, 1999, 12), outsourcing contributes value in two different ways. Firstly, and most commonly, a company can enhance value simply by appropriating it from others. In this type of value creation the vendor already possesses the capabilities and skills to enhance its client's value chain. It is also possible that the vendor does not yet posses these skills, but in time it would. For instance, through their management approach and skills, many IT providers believe that they can dramatically improve the performance of their clients' IT systems with the same staff who were previously carrying out the outsourced activities. Many providers of outsourced services seem to think that this is the prime basis of their advantage. The second way of increasing value is, conversely to value creation, through the removal of current value destruction. According to Alexander and Young (1996b, 730), by carrying out a certain activity or

process in-house a company may encourage knock-on effects that are damaging to other processes in which it wishes to engage; and according to Christensen (1997, 142), in addition to identifying its core capabilities a company should also identify the most imminent forces affecting its health. In simple terms this means that a non-core activity ties up, financial, managerial and other resources that could, if allocated elsewhere, create more value. Various studies and authors (e.g., Landis et al., 2005, 5; Heikkilä & Cordon, 2002, 185) have found that one of the main outsourcing drivers is the prospect of freeing up resources that could be reallocated to the focused activities, and thereby enhance core competences.

On the functional and corporate levels, several researchers have studied the managerial, economic and strategic incentives for outsourcing. For instance, Heikkilä and Cordon (2002) suggest that the key drivers for outsourcing decisions are cost savings, scarcity of capital, lack of know-how, flexibility, speed, and economies of scale. Others (e.g., Quélin & Duhamel 2003; Landis et al. 2005; Swoyer 2004) have validated such findings in their studies, yet with some additions, such as access to resources/skills/competences that are not available internally, a focus on core activities, the improvement of service quality, and risk transfer. Domberger (1998, 51) put the benefits of contracting into four categories: specialization, market discipline, flexibility, and cost savings. However, specialization and flexibility are seen in the current outsourcing literature as two overlapping and intervening benefits (e.g., Linder et al. 2002), and this study therefore proposes a three-fold categorization of outsourcing motives: (1) transactional, (2) resource-seeking and (3) transformational.

Transactional outsourcing is based on cutting costs, which is the most common argument in favor of it (see e.g., Table 4). Although some scholars claim that outsourcing is more than just cutting costs, and others have found that as a cost-cutting strategy it is overrated, there will always be functions or processes that will be thus focused. The transactional outsourcing of functions can be analyzed to large extent through transaction cost economics (TCE), mainly the work of Williamson (e.g., 1975). According to this theory, if using the markets results in lower transaction costs than producing the activity internally (using hierarchies), it should be bought from the markets, i.e. contracted out. Jarillo (1988), as mentioned, presented Williamson's ideas in equation form, stating that if EP (external price, the actual price) + TC (transaction cost, cost of transferring) < IC (internal cost) the activity should be contracted out. In its simplicity, this is the main argument behind cost-rationalized, transactional outsourcing.

Resource-seeking outsourcing entails acquiring resources, capabilities or competences controlled by others. It has long been said that a company is

reliant on resources controlled by others (e.g., Johanson & Mattsson 1988; Pfeffer & Salancik 1978), and that it is dependent more and more on the critical capabilities of others (e.g., Gottfredson et al. 2005). However, nowadays when companies, irrespective of the industry, are trying to maximize their value through focusing on their core competences, they are becoming reliant on core competences produced by others. These resources, capabilities or competences, or their level and/or quality, are difficult or even impossible to create internally. Cost is not the main driver behind resource-seeking outsourcing: it is rather the increased value, although simultaneous cost savings can be achieved with value-adds.

Finally, *transformational outsourcing*, a new buzzword coined by Engardio (2006) (see also Linder et al. 2002; Linder 2004; Mazzawi, 2002), unlike "traditional" outsourcing that focuses on working assets harder or acquiring capabilities that do not exist internally, is about changing the paradigm, i.e. targeting a new adaptive enterprise (Mazzawi, 2002). Linder, Cole and Jacobson (2002) define transformational outsourcing as follows:

> *"…as a program to change the way a company works by using outsourcing to achieve a rapid, sustainable, radical improvement in enterprise level performance."*

Thus transformational outsourcing from the motivational perspective could be defined as a process the main motive of which is not to cut costs or to acquire resources, but to transform the organization into a more dynamic, efficient economic unit. Accordingly, whereas resource-seeking and transactional outsourcing aims to achieve direct results, transformational outsourcing aims to change the way the company operates. This, in turn, makes it difficult to measure the implications. However as divestment, at some level, is a prerequisite for or a by-product of outsourcing, some level of business transformation always occurs. Nevertheless, when this is the primary motive, from the motivational perspective it could be referred to as transformational outsourcing.

Table 5 Different types of outsourcing in terms of motives

Type	Definition	Examples of motives
Transactional-outsourcing	Outsourcing aimed directly at cutting and reducing operational costs	• Reduce costs • Cost discipline/control • Lower operational costs
Resource-seeking outsourcing	Outsourcing primarily aimed at acquiring resources and/or capabilities that are unavailable, inadequate or insufficient internally	• Aim to achieve and acquire best practices • Improve service quality • Access to new technology and skills • Lack of expertice in-house • Access to a flexible workforce
Transformational outsourcing	Outsourcing aimed at transforming the organization into a more dynamic, efficient, and more focused economic unit	• Focus on core competencies / activities • Improve business focus / internal reorganization • Flexibility • Free up internal resources • Accelerate project

Table 5 summarizes and categorizes the different types of outsourcing in terms of the underlying motives. As discussed above and illustrated in the table, outsourcing can be categorized into three different types according to how firms intend to capitalize the strategy. Inherent in the different types are different specific motives, examples of which are provided in the table. Regardless of the motives, however, the reason why the firm decides to outsource certain activities or processes affects later decisions in the outsourcing process, such as the choice of outsourcing location.

2.2.2.3 The outsourcing location – WHERE?

In addition to seeking to explain the underlying motives behind outsourcing decisions in terms of 'what' and 'why', the question of 'where to outsource' is one of the most crucial and, perhaps accordingly, it has become one of the key research questions (Graf & Mudambi, 2005; Palvia, 2004). However, previous results offer only a few theory-based guidelines (Bunyaratavej et al. 2007; Doh 2005; Kotabe & Murray, 2004). According to the guidelines that are available, where the initial outsourcing drivers derive from internal pressures, several external and case-specific variables influence the final location choice.

Previous studies on outsourcing the location decision have built largely on Dunning's (1980; 1988) framework regarding the location decision for international production (FDI). Dunning (1988) described several location-specific variables, or locational advantages, that may favor home or host

countries in terms of production. However, whereas he took a somewhat linear approach, other researchers see the location decision as more of a reciprocal process, in which more variables have an impact. For instance, Graf and Mudambi (2005, 258) suggest that in terms of offshore outsourcing, three sets of factors affect the location's attractiveness: location-specific, firm-specific, and situation-specific.

In line with Dunning (1988), Richardson and Marshall (1999) identified eight major *location-specific* outsourcing considerations: the availability of advanced telecommunications; telecommunications costs; a labor pool of sufficient quality; labor costs; government financial incentives; an attractive living environment; low occupancy costs; and access to good transportation. Similarly, Palvia (2004) identified the factors that affect location choice as the political environment; the ICT infrastructure; government regulations; the legal system; the workforce; and language and culture. Graf and Mudambi (2005) found that Dunning's (1988) framework lacked the human-capital dimension, and therefore suggest that location-specific factors influencing the choice of an outsourcing location should be further clustered in terms of infrastructure, country risk, government policy, and human capital.

Previous research has suggested that outsourcing is often a strategy subject to incremental learning, in which near-shore locations precede far-shore locations and non-strategic functions precede strategic functions (Graf & Mudambi 2005; Hagel & Brown 2005; Maskell et al. 2007; Morgan 2003). For instance, it is likely that companies are more receptive towards outsourcing if they have previous experience of it, and that they favor outsourcing locations in which they possess knowledge, although some researchers suggest that the spreading of an outsourcing portfolio to different countries reduces risk and increases potential reward (Vestring et al. 2005). Furthermore, it is not only the experience of the international arena that affects the location choice, but also prior knowledge of managing outsourcing relations. For instance, Dunning (1988, p. 44) stated that the decision on where to site a factory or office is not independent of the ownership of these assets, nor of the route by which they or their rights are transacted. For example, the ability of an enterprise to choose the correct location or organize its assets efficiently may itself be considered a competitive advantage. In fact, the management of a geographically dispersed network of suppliers resulting from the outsourcing of economic activities has evolved to become one of the main value-creating competences of the modern company (Gemünden & Ritter 1997; Kakabadse & Kakabadse 2002). Therefore, the *firm-specific* or internal factors that affect the choice of location include outsourcing and location-specific (international) experience, and, consequently, knowledge. In addition to the experience-related factors, the underlying outsourcing motives could be

expected to have an impact on the location decision (Graf & Mudambi 2005). For instance, companies outsourcing for strict cost-based reasons are more likely to seek locations with a low-cost labor infrastructure, whereas those outsourcing to enhance capabilities are more likely to seek locations with a high level of know-how and knowledge (Doh 2005).

According to Cantwell (1989, see also Cantwell & Narula 2001), firms often need to be on-site with their own production and innovatory capacity if they are to benefit properly from the latest advances in geographically localized technological development in feeding their innovation. However, using ownership or hierarchies is not the only way to benefit from localized capabilities as companies are increasingly shifting towards using market mechanisms even for innovative activities, i.e. decisions that are often referred to as strategic outsourcings (e.g., Quinn & Hilmer 1994). As discussed, whether an activity is strategic or not is broadly defined by its impact on the firm's overall operations (e.g., Alexander & Young 1996), which in turn most likely has an impact on the chosen outsourcing location. In addition, the nature of the outsourced activity also includes its transferability, in other words its asset specificity. The ability and ease of inter-organizational transfer may influence the choice of location, as transferring more complex and uncodified tasks requires a highly intensive effort in terms of teaching the outsourcing vendor how to produce them (cf. Kogut & Zander 1993). Therefore, the nature of an outsourced activity, mainly in terms of strategic importance, process standardization, asset specificity and visibility to customers, impacts not only upon the choice of make or buy (see e.g., Williamson 1975), but also on the location decision. Furthermore, Graf and Mudambi (2005) suggest that when different business processes are outsourced the degree of interpersonal interaction and convenience for customers varies. Therefore, in addition to the nature of the outsourcing activity, customer expectations have to be included in the *situation-specific factors* that may have an impact on the final location decision.

Given the controversial and even political nature of the phenomenon, it would also be unwise to exclude *external factors* in the form of stakeholder impact from the decision. In fact, it has been suggested that, mainly due to the visible nature of job losses resulting from outsourcing (Kletzer 2005), different stakeholder groups such as customers, governments and even different non-governmental organizations (NGOs) have adopted measures aimed at restraining offshore outsourcing (see e.g., Alsop 2002; Clark 2004; Venkatraman 2004). This is an issue companies should consider prior to making their final decisions regarding the outsourcing location. Therefore it is likely that certain stakeholder groups, in addition to shareholders, will influence the location choice, although the main impact is whether it is

domestic or foreign. Figure 7 illustrates the influence of the above-mentioned factors on the decision.

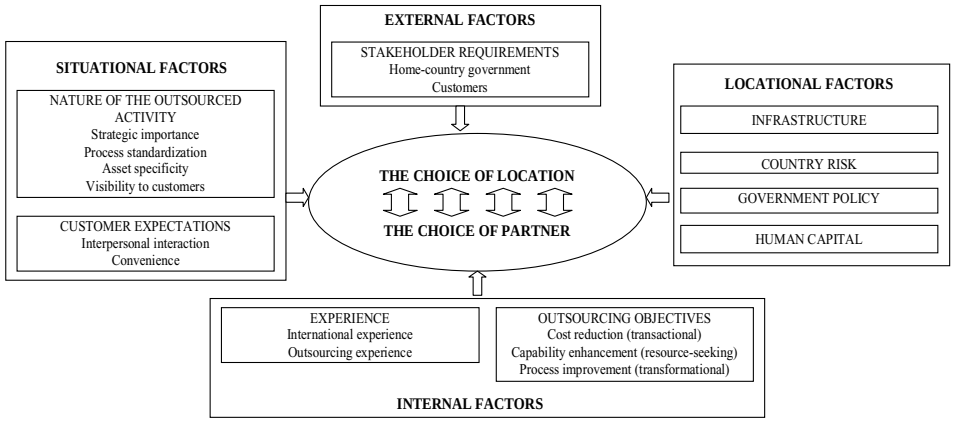

Figure 7 The factors influencing the outsourcing location decision

Although the above-mentioned factors (Figure 7) may well affect the choice of outsourcing location, it should be noted that how and the extent to which the actual work is divided between different locations depend on the situation. In other words, the entire outsourcing process may be divided into separate tasks that are completed either on-site or off-site in the vendor's premises. This, however, involves a further choice of outsourcing model defining how the activity or process is divided between the contracting parties and how the work is split geographically. This issue is further elaborated in the following chapter.

In addition to the factors illustrated in Figure 7, one of the main questions in terms of location choice is whether it precedes the choice of partner or vice versa. In the end, the two decisions are reciprocal and highly interconnected (Graf & Mudambi, 2005). It is likely that situational and internal factors (Figure 7) will influence the primary choice between partner and location. For instance, it is plausible to expect that with activities of low strategic importance and highly competent supplier markets, and with a primary motive of cost reduction, companies will choose the location before choosing the partner (e.g., Doh 2005). On the other hand, in cases of high strategic importance and asset specificity and/or uncompetitive supplier markets they are more likely to seek partners with competences and a proven track record before choosing the final location (Mol et al. 2004). In some cases the partner might influence the final location choice. According to Podoshen (2004), some

firms will choose a business partner, and tap its expert advice on the final location, yet few leave the location decision solely to the partner.

2.2.2.4 Governance, divestment and the decomposition model – HOW?

The question of how to outsource has assumed major significance. The final consideration related to the outsourcing decision concerns the mode of governance, divestment, and the overall model for decomposing the activity. As illustrated above in Table 3, the key considerations in deciding the outsourcing model relate to questions such as what kind of control mechanisms are built in (governance), where the actual work is done and by whom (task division), and the extent to which and how the tasks/process is transferred to the vendor (decomposition model). These issues are further elaborated in the following.

First, in terms of *governance mode*, it has been suggested that there is no optimal model for managing outsourcing relations, but often firms need to adapt both hard (contract-based) and soft (trust-based) governance mechanisms (Barthelemy 2003). Yet, it is imperative that the governance mode be included in the decision-making as it is the key in terms of achieving the outsourcing objectives and goals. Further, certain types of outsourcing require certain management approaches if they are to succeed. Accordingly, it could be argued that the mode of governance is highly determined and influenced by the nature of the outsourced activity (what) and the underlying motives (why). Firstly, asset specificity and knowledge intensity often increase the need for closer inter-organizational cooperation. For instance, firms outsourcing highly knowledge-intensive activities need to build mechanisms to facilitate task transfer to the vendor. Secondly, as Barthelemy (2003) reported, the governance model should be aligned with the underlying outsourcing motives. Nevertheless, it could be argued that choosing the wrong governance mode for a specific outsourced activity is one of the prime reasons for outsourcing failure. For instance, Miozzo and Grimshaw (2005) found that implementing strict governance structures in outsourcing projects aimed at increasing supplier-generated innovation was contradictory in terms of motives, as projects aimed at innovation (resource-seeking) should allow the vendor some freedom to innovate.

Secondly, *task division* basically refers to two aspects of the outsourcing process, namely where an activity is carried out and by whom. Outsourcing is a process involving the transfer of part of the entire production process to an external vendor. One-off transfer of a certain part is not always possible, and firms may need to collaborate during some phases of the process. In addition,

the outsourcing agreement may well involve the temporary, or even permanent, transfer of personnel (Lacity & Hirschheim 1993b). It is quite common, especially in more complex outsourcing arrangements, for the outsourcer's personnel to be temporarily transferred to the vendor's premises to ensure successful transfer of ownership of the activity. It is thus likely that the more asset-specific the activity is (Williamson 1975), the greater the need to take cooperative measures in order to secure its transfer. Asset specificity, or the transferability of the activity, could be considered in terms of attributes such as codifiability, teachability and complexity (Kogut & Zander 1993), and the higher the asset specificity (equally the lower the transferability), the more effort required in codifying and teaching the vendor. The firm seeking to outsource should be well aware of the cooperative requirements, otherwise they may incur 'hidden costs' (Barthélemy 2001).

Further, in terms of task division in the case of offshore outsourcing, the model should specify the location in which the activity is undertaken (see e.g., Ali-Yrkkö & Jain 2005). It is quite common practice nowadays for separate tasks to be undertaken in different locations. For instance, the entire IT management may be outsourced while the functions remain physically at the same location. Yet at the same time, some of the application development may be carried out offshore, in India, for instance. The new outsourcing models include "body renting", which basically means acquiring external resources from the global pool to come to the buyer's premises to conduct the outsourced work. Nevertheless, it seems that the boarders of the physical locations in which activities are undertaken are breaking down, and especially in more complex outsourcing processes or projects it is essential to decide where the different related tasks are physically undertaken, on-shore (buyer's premises) or offshore (vendor's premises).

In addition to the physical distribution, and thirdly, another key consideration relates to the extent to which the firm outsources the function or activity (*decomposition mode*). Van Weele (2000, 54-55) argues that there are two different outsourcing strategies, turnkey (or total) and partial. Companies following the turnkey model outsource an entire function to an external supplier, whereas in the partial mode only part of an integrated function is outsourced and its coordination is still the responsibility of the purchasing company (Axelsson & Wynstra 2002, 68-69). Willcocks and Choi (1995) further quantified this, suggesting that total outsourcing referred to a situation in which more than 80 percent of the function or process was outsourced, and consequently in the selective mode less than 80 percent was outsourced. Sanders et al. (2007, 7) further divided different types of outsourcing into four categories in terms of the scope ('selectiveness'): out-tasking, co-managed activity, managed activity, and full (total) outsourcing. Accordingly, it could

be argued that the higher the level of selectiveness of the outsourcing, the more management control of the activity the firm retains.

However, it quite often happens that firms increase their outsourcing portfolio over time as the relationship evolves. Kinnula (2006), for instance, describes how larger outsourcing relationships in particular require a large amount of time to establish and develop, and outsourcing firms often increase the scope and scale of activities that are transferred to the vendor as the relationship evolves. Thus, and in addition to the total selective dichotomy, the outsourcing model needs to include whether the activity or process is outsourced as a one-time hand-off of ownership (big bang) or in incremental stages. Prior research has shown that firms often extend the outsourcing portfolio over time (Morgan 2003). Further, it has been argued that some adopt a similar incremental logic in outsourcing a specific process/activity. This kind of incremental approach basically builds on the notion of developing the interfirm relationship. At first, due to the uncertainty, only small components are outsourced (e.g., out-tasking), but as the relationship develops and common routines and processes evolve, the outsourcing company gradually expands the vendor's responsibility (e.g., managed activity). On the other hand, a firm may transfer full responsibility for the production and development of the activity to the vendor at the outset (full outsourcing).

To conclude, the entire outsourcing model depicts the nature of the outsourced activity, and thereby it should be aligned with what is being outsourced, i.e. the nature of the outsourced objective. In deciding on the outsourcing model, according to the above discussion, firms should address questions such as: 1) What kind of governance mechanisms are needed for the specific outsourcing? 2) How are the responsibilities divided between the contracting parties, and what is the physical location in which each of the outsourced activities is undertaken? 3) To what extent is the activity transferred to the vendor, and how are the task responsibilities transferred - incrementally or as a one-off transfer? Once firms have answered these vital questions they can proceed to the next phase of the process – the management of outsourcing implementation.

2.2.3 The management of outsourcing implementation

As illustrated earlier in Figure 6 on page 56, once a company has decided to proceed with the outsourcing and has identified the characteristics and nature of the case in question, it needs to manage the outsourcing process. This management process may be further divided into two distinct phases: pre-implementation (*ex ante*) and implementation (*ex post*). In other words,

whereas *ex post* management activities relate to the vendor relationship and the tasks involved, *ex ante* management relates to the activities that precede the outsourcing initiation, such as internal reorganization, and vendor search and selection. This section gives a detailed account of the issues and challenges related to the management of the outsourcing process during both phases.

2.2.3.1 Ex ante implementation

The first pre-implementation management task was referred to as *process adjustment* (see Figure 6 on page 56). According to Sanchez and Mahoney (1996), if a production process calls for highly specific assets and involves collaboration among several teams, companies should organize these activities hierarchically (internal production). However, it was argued above that although certain activities are highly asset-specific, firms might take actions that decrease the asset specificity (see e.g., Nonanka 1994). One of the key strategies for decreasing the asset specificity of an activity, and accordingly for improving its transferability, lies in the process referred to as modularization. In fact, the modularization of products and processes has been found to significantly assist in the outsourcing process (e.g., Mikkola 2003).

What is this 'modularity', which seems to be tightly connected to the firm's ability to outsource? It reflects the degree to which the products and their production processes are decomposed into smaller subsystems and activities, which may be designed and managed independently yet function as a whole (Baldwin & Clark 2000; Mikkola 2006). In sum, modularization is the degree to which firms implement the concept of modularity on both the product and process levels (Kotabe, Parente & Murray, 2007). Although it has been rather conclusively stated that a high degree of modularity embedded in product and organizational structures significantly eases outsourcing, previous research has provided only scattered results on the reasons why modularity promotes the realization of its benefits. It appears from previous findings that there are at least five separate yet to some extent overlapping reasons why modularization enables successful third-party dispersion of activities, in other words outsourcing.

Firstly, it facilitates the independent design, production and management of activities. On its most abstract level, system modularity refers simply to the degree to which a system's components can be separated and recombined (Schilling 2000). Modularization allows the disentangling and decomposition of components and activities from the system. Through limiting interdependencies between the subsystems (modules) that communicate with

each other through simple interfaces, subsystems can be designed and managed independently, and are thereby amenable to outsourcing (Baldwin & Clark 1997; Mikkola 2006).

Secondly, modularity enables the parallel design, production and management of activities. It is not enough that activities can be managed independently, and successful outsourcing requires the possibility of parallel design and production. Moreover, even though certain activities may be performed independently, if they have many ties with other activities in the system, the production is deemed to be sequential. Furthermore, if different parts of the production and design processes of the entire system were interlinked, decomposing an activity would acquire a vast amount of cooperation and, consequently, coordination. However, when the system is decomposed to smaller subsystems that operate independently and communicate with each other through standard interfaces, modularity enables the parallel and sequential design and testing of the outsourced activity (Loch et al. 2001).

Thirdly, modularization increases the transferability of activities. It coerces firms into establishing visible rules covering the design process (Baldwin & Clark 1997). These design rules enable a more fluid transfer of activities in that they enhance teachability and codifiability of the activity and thereby decrease its complexity when transferred (cf. Kogut & Zander 1993). Even tacit knowledge can be made explicit and transferred relatively freely across national and organizational boundaries (Nonaka & Takeuchi 1994). Modularization would thus be expected to make explicit existing design architectures[25] and thereby increase the transferability of activities.

Fourthly, it enhances the management of dispersed activities, simplifying their coordination (Sanchez & Mahoney 1996; Schilling 2000). If an outsourced activity is embedded in the entire production process, the management of the ensuing relationship will involve individuals throughout the value chain. Well-defined interfaces allow individuals working on particular components to work within the departmental configuration they deem most desirable, and still to be assured that the components will interact effectively (Schilling 2000).

Fifthly, and finally, modularization further decreases the transaction costs arising from the attachment of new activities. Schilling (2000) suggests that

[25] Ulrich (1995, 419) defines architecture as the scheme by which the function of a product is allocated to physical components. Product architecture encompasses: 1) the arrangement of functional elements, in other words establishing how the different functional requirements are structured in order to contribute to the total product performance; 2) the mapping of the functional elements to the physical components, in other words determining which component implements which function; and 3) the specification of the physical component interfaces.

the adoption of increasingly modular product designs could result in both the further differentiation of firm capabilities and the development of diverse technological options. Modularization facilitates the attachment of activities to the system: the decomposing of internal activities into modules that communicate through standard interfaces makes it significantly easier to attach possible new modules. This may encourage the company to lean towards 'buy' in future make-or-buy decisions.

Even though modularity appears to assist in the process of outsourcing, according to Schilling (2000) it is not prominently embedded in the system. However, systems that were originally tightly integrated may be disaggregated into loosely-coupled components that could be mixed and matched, allowing much greater flexibility. Such a process could be described as modularization of the design structures. Previous research has concluded that modularization occurs on two basic levels: 1) in product-design architectures (product modularity) and 2) in the processes these products are designed for (process modularity) (e.g., Baldwin & Clark 1997; Brusoni & Prencipe 2001; Fine et al. 2002; Langlois 2002; Sanchez & Mahoney 1996).

Products can be made increasingly modular both by expanding the range of compatible components (increasing the range of possible product configurations) and by uncoupling integrated functions within them (making the product modular at a finer level) (Schilling 2000). Such uncoupling basically entails breaking up the system into discrete modules that communicate with each other through standardized interfaces or rules and specifications (Langlois 2002). The idea is to decrease the complexity of the system by decomposing its complex tasks into simpler independent units that communicate with each other through standard interfaces without compromising the overall performance (Mikkola 2006), and limiting the interfaces between those modules to the minimum (Baldwin & Clark 1997). As Langlois (2002, 20) stated, complexity is a matter of both the sheer number of distinct parts a system comprises, and the nature of the interconnections and interdependencies among those parts.

It is not sufficient that the products as such are modular, and the process in which they are produced must also be modular for the successful inter-organizational transfer of production activities to occur. Managing product modularity requires an intense effort of knowledge and organizational coordination (Brusoni & Prencipe 2001). It is therefore likely that companies wishing to capitalize the full spectrum of benefits enabled by modularity in product architectures will also have to go modular in their design processes. Modularization in product design could pave the way for a similar process in organizational design (Ethiraj & Levinthal 2004), thus facilitating the coordination of activities via an "information structure" other than hierarchical

and managerial authority (Sanchez & Mahoney 1996). Such a structure would delineate the lines of authority and minimize redundant information flow, reduce conflicts, and improve coordination (Ethiraj & Levinthal 2004). According to Baldwin and Clark (1997), the first step towards devising a modular structure in the design process is to redefine the cells in the production process. Furthermore, they suggest that in the design context, uncoupling integrated functions is akin to grouping information into visible design rules that fall into three categories:

1. *An architecture*, which specifies the modules that will be part of the system and what their functions will be;
2. *Interfaces*, which describe in detail how the modules will interact, including how they will fit together, connect and communicate;.
3. *Standards* for testing a module's conformity to the design rules and for measuring one module's performance relative to another.

As illustrated, modularity within product architectures not only enables economies in product design but also greatly simplifies coordination (Schilling 2000), promoting the independent and dispersed design and management of different modules. If all components must be tightly integrated and optimized, their production often requires everyone involved in the design and production also to work in close contact. In fact, Helander (2004) concludes that the system-architecture view enables a firm to better identify its area of core competence, and further greatly assists in making further outsourcing (make-or-buy) decisions. A firm that creates well-defined standard interfaces can allow the individuals working on particular components to work in whatever departmental configuration they deem most desirable (even if that means that the departments are highly autonomous), and still be assured that the components will interact effectively (Schilling 2000). However, although previous literature makes a strong prediction that product and organizational modularity will correlate (see Brusoni & Prencipe 2001), research has shown that this is not automatically the case (Brusoni & Prencipe 2001; Sanchez & Mahoney 1996). Nevertheless, companies need to take separate actions to reorganize internal activities and processes so as to correlate the changes made in the product architecture. According to Baldwin and Clark (1997), in order to compete in a world of modularity, leaders must redesign their internal organization. If they are to create superior modules, they need the flexibility to move quickly to market and make use of rapidly changing technologies, but they must also ensure that the modules conform to the architecture. Such an

ability not only entails possessing organizational dynamic capabilities[26] it also requires the adoption of modular design principles in both product architecture and organizational structure.

The second task in ex ante implementation involves *supplier assessment*. The selection of the right supplier has been touted as the key to the success of an outsourcing strategy (e.g., Baden-Fuller et al. 2000; Barthélemy 2003a; Gottfredson et al. 2005). A survey conducted by the Trestle Group (2004) identified various criteria that were used in supplier selection. These included, in order of importance, specific skills, reputation/references, price, geographic location, language/culture, scalability, certification level, flexible contract terms, and available resources. In fact, the selection of an outsourcing supplier is often seen as a progressive process in which different criteria prevail in different phases (e.g., Hughes, Ralf, Michels 1998).

According to the literature, the most important criteria in selecting the outsourcing supplier lie in the vendor's skill set and reputation, and in price. Yet it could be argued that the outsourcing objective, i.e. what is being outsourced, determines the supplier-selection criteria that carry the most influence in the decision. For instance, Hoetker (2005) argues that when innovative components are sourced, the vendor's technical level is the most important criterion. Similarly, high asset specificity, for instance, forces firms to look for highly specialized supply sources (Mol et al. 2004), and thereby to evaluate suppliers accordingly. On the other hand, when the outsourcing does not require substantial skills from the vendor, other criteria such as price become more important. In general, for outsourcing to be feasible, the company needs to be able to measure the important characteristics and to evaluate the suppliers based on the specifications they need to meet (Christensen 1997). This also suggests that the outsourcing motives (why) have a substantial impact on the supplier-selection criteria. It was further argued above that the choice of supplier is not entirely independent of the choice of location (where). For instance, firms may wish to tap locational advantages such as a low-cost labor infrastructure (Doh, 2005), and thereby seek partners from a previously chosen location. Furthermore, it could also be assumed that the outsourcing model (how) affects the decision criteria. For instance, language and cultural issues may carry more emphasis in outsourcing that requires deep collaboration than when the vendor is expected to perform based on standardized specifications. Thus, one size does not fit all (Baden-

[26] Dynamic capabilities could be defined as "the firm's ability to integrate, build and reconfigure internal and external competence in line with a rapidly changing environment" (Teece et al. 1997, p. 516).

Fuller et al. 2000, 292), and outsourcing partners need to be selected, at least partially, based on task-related criteria.

Prior research has also indicated that firm-specific factors are crucial in the supplier-selection process. For instance, Child and Faulkner (1998, 92-98) conclude that the two basic qualities sought in a partner are strategic and cultural fit. Moreover, Hughes, Ralf and Michels (1998) argue that once a firm has located a potential partner with the necessary business capabilities, the candidate should be screened for strategic fit. Accordingly it seems that although task-related criteria are imperative in supplier selection, in the end the choice is based on the criteria used for evaluating the vendor's strategic suitability.

All the above implies that possible vendors should be evaluated based on two sets of criteria, task-related and related to strategic compatibility. While some emphasize the primacy of task-related criteria (e.g., Hoetker 2005), others come down on the side of firm-level compatibility (e.g., Hughes et al. 1998). Thus it still remains largely unclear what the contingencies between the different criteria in vendor selection are, and particularly whether these criteria change according to the outsourcing situation. Nevertheless, once the prospective vendor has been identified, before implementing the outsourcing process firms should draw up a contract including the functional requirements of the outsourced task and terms dictating vendor-evaluation requirements, with clear quality and effectiveness objectives[27] (Platz & Temponi 2007; Power, Bonifazi & Desouza 2004). This, again, emphasizes the importance of taking a detailed approach to the outsourcing decision and conceptualization prior to selecting the supplier and making the contract (what, why, where and how).

2.2.3.2 Ex post implementation

While the outsourced task cannot be specified to the extent that the vendor could independently perform it, ex ante contracts are followed and accompanied by ex post control mechanisms, which refers to ongoing control exercised during the performance of the supplier's work (see Carson 2007). Accordingly, the next stage of the outsourcing process, which could be referred to as *ex post* implementation management, consists of two distinct

[27] Although a contract is a vital part of the outsourcing process, its main purpose is to provide a formal commonly agreed outline of 'what the vendor is supposed to do', and financial and legal guidelines concerning the outsourced task. Accordingly, the contract strongly reflects the outsourcing decision variables (Platz and Temponi (2007) and Barthélemy and Quélin (2006) adequately describe the contents of the outsourcing contract in their recent work.

phases, as illustrated on page 56 in Figure 6: project/process transfer and project/process management. Transfer refers to the management task of actually moving production to the vendor. Once this has been accomplished and production initiated, the key management task is to manage the on-going outsourcing process.

In terms of transfer management, it was argued above that this could be a one-time effort or it could be incremental. Nevertheless, a delay or even failure to transfer ownership could have severe consequences, affecting overall performance or even leading to the dissolution of the relationship before it takes off. As argued, the required extent of collaboration in this phase depends not only on the embedded asset specificity of the activity, but also on the success of the internal product- and process-related modularization. The importance attached to the transfer of activity-related knowledge to the vendor is also evident in the recent increase in research in this area (see e.g., Nieminen 2007).

The second key task, and perhaps the most critical, is related to the on-going management of the outsourced process. Building relationships and day-to-day management procedures with the provider is one of the most vital elements behind success in outsourcing (Morgan 2003, 44). Companies increasingly seek to combine the strengths of integration and outsourcing in order to achieve operational integration without financial ownership (Gottfredson et al. 2005; Jennings 1997; McIvor 2000a; Schmitz & Frankel & Frayer 1995), and it is the task of management to extract the value while simultaneously managing the risk. In fact, the on-going management of outsourcing relations has been referred as the key issue behind the success of outsourcing deals (Morgan 2003; Useem & Harder 2000). For today's scholars, one of the main tasks is to determine what form of relationship is most appropriate for these activities (Insinga & Werle 2000, 58-59)?

In terms of outsourcing management, firms need to make the general decision of whether to make, buy, or ally (see e.g., Jacobides & Billinger 2006). Whereas 'make' refers to using hierarchies and 'buy' to using markets at arms-length, ally refers to "hybrid" forms of cooperation, also referred to as "quasi-integration" (Schmitz, Frankel & Frayer 1995). Accordingly, on the basic level all business transactions fall into two broad categories - interactions (cf. buy) and relationships (cf. ally) (Johanson & Mattsson 1987). Further, various concepts have been used to describe business relationships, including terms such as alliances (e.g., Lewis 1990), strategic alliances (Gulati 1998; Lewis 1990), partnerships (e.g., Holmlund & Törnroos 1997; Perlmutter & Heenan 1986), coalitions (e.g., Porter & Fuller 1986), and several types of networks (e.g., Gulati 1999; Håkansson & Johanson 1992; Jarillo 1988). Basically, all of these concepts define different levels of cooperation that exist

in the relationship. On the one hand, strategic alliances, for instance, could be seen as voluntary agreements between firms involving a high level of exchange, sharing, or the co-development of products, technologies or services (Gulati 1998), while on the other, outsourcing relations may be managed in a distant arms-length manner. According to Gadde et al. (2003, 361-363), companies use both strategies, or at least they should do, in managing their outsourcing transactions.

Although current research on managing outsourcing relations suggests that companies should seek to increase value through building closer relationships with vendors, it is not so straightforward. High-involvement relationships require substantial investments in time and resources and are costly to handle (Gadde et al. 2003, 359-361; Wilkinson & Young 2002, 124). It may be unwise to invest heavily in outsourced activities that only account for a fraction of the overall value (Snyder & Ebeling 1992). It has been found that when they manage it correctly companies keep the benefits of vertical integration with vertical relationships, without incurring the costs associated with bureaucracy (D'Aveni & Ravenscraft 1994). The potential benefits of outsourcing are, to a large extent, contingent on the nature of supplier relationships (Gadde & Håkansson 2002, 135). Again, how these relationships are managed and in what form to suit the situation is the key question in outsourcing-management decision-making. It is a matter of selecting the right degree of involvement in order to achieve the expected outcomes (Gadde & Snehota 2000).

Management approaches to outsourcing fall broadly into two strategies, hard and soft. Whereas the hard approach emphasizes the importance of contracts and other agreements, soft management relies on building up the relationship with the vendor (Barthelemy 2003b). Firms developing an outsourcing relationship will often seek to build mutual commitment and trust. Sometimes this commitment comes through minority investments (Albaum et al. 2002; Lewis 1990). Insinga & Werle (2000) state that if an outsourced activity truly becomes a key source of competitive advantage, acquiring ownership of the vendor should be considered. Willcocks et al. (2004) even state that any deal concerning a strategic-outsourcing partnership is based on a joint-ownership arrangement.

The problem in the day-to-day management of different outsourcing relations is, however, that there is normally no optimal form for managing the dispersed activities. Different forms suit different types of outsourcing, driven by different motives, in different locations and transactional operational modes. In other words, what is being outsourced, why, where and according to what kind of process model carries several implications in terms of the management of outsourcing relations (cf. the outsourcing decision in Figure

6). This, again, emphasizes the importance of prior detailed assessment of the variables.

First, it has been widely noted that the strategic impact has a significant influence on the way in which outsourcing relationships are managed. As argued above, the asset specificity of the activity imposes several restrictions on the selection of the most appropriate outsourcing model, and accordingly the governance mode. For instance, complex innovations cannot be outsourced off-the-shelf, and require closer vendor relationships (Hoetker 2005). On the other hand, research has shown that firms outsourcing highly structured and codifiable work could rely more on arms-length governance, and might want to do so because building a deeper relationship incurs a gratuitous cost that may decrease the total value sought from the outsourcing (Barthélemy 2001). As a simplistic example, building a strategic alliance with a vendor providing facilities management is hardly necessary, whereas it is necessary with vendors providing marketing or complex IT activities and processes, for instance (Hätönen 2006a).

Secondly, as Barthélemy (2001) found in his study on IT outsourcing, emphasizing the hard-management approach increased the possibility of achieving cost goals, whereas the soft approach was more effective in terms of achieving overall performance goals. Accordingly it is likely that, in addition to the nature of the outsourced activity, the underlying outsourcing motives influence the way in which the transactions are managed. Further, if the vendor is expected to create innovations, imposing strict contractual clauses on price-related performance metrics may affect the achievement of the goals (Miozzo & Grimshaw 2005). On the other hand, as mentioned by Gadde et al. (2003) and Wilkinson & Young (2002), although high-involvement relationships are resource contributors, they also require substantial investments in time and resources and are costly to handle. Thereby in the case of outsourcing peripheral activities with strict cost control, seeking deeper relationships may not be profitable. As Aulakh and Gencturk (2000, 522) state:

> *"Control is not necessarily desirable per se, but is subject to efficiency/effectiveness considerations."*

Thirdly, the outsourcing location also carries several management implications. It is widely noted in the literature that when cooperation with parties from different cultures is involved the management is more challenging (Beulen et al. 2005). Cultural differences affect communication regarding the outsourced work. In fact, previous studies have reported that cultural differences are often the most cited "major problem" in outsourcing abroad (see Metters 2007, 9). Thereby, and arguably, whenever a firm engages in

outsourcing across national boarders, cultural distance (Kogut & Singh 1988) has an effect on the management of the process/project.

Fourthly, and finally, the nature of the decomposition, and thereby the chosen outsourcing model, is a further management challenge. Obviously, when the vendor is expected to provide creative-type solutions rather than highly structured and specified work, management needs to rely on more cooperative relationship building (Barthélemy 2001; Carson 2007), and should not burden the innovation process with additional requirements related to cost saving, for example (Miozzo & Grimshaw 2005). Accordingly, the extent to which the vendor is expected to contribute to the development of the activity requires the adoption of a management approach that suits the chosen business model.

2.2.4 Performance and implications

In terms of outsourcing process and performance, Knudsen and Servais (2005, 20) point out that there is only little empirical focus on the outsourcing process and the underlying performance implications. The basis on which the success of outsourcing should be evaluated has not been examined thoroughly enough (Harland et al. 2005). At the minimum, outsourcing performance is the degree to which the vendor meets, or fulfills, the pre-agreed service levels (SLAs). Key performance indicators (KPIs) are often used in this context. They should be based on the situation, which in turn depends on the different aspects related to the outsourcing decision. It has been found that the implications of outsourcing often fall short of the pre-determined performance goals. For instance, Landis et al. (2005) found that over one third of those aiming to achieve cost savings through outsourcing incurred additional, hidden costs related to the process. Similarly, they report that about one third of those who outsourced in order to achieve improved quality/innovation encountered a situation in which the vendors became complacent once the contracts were in place. They also found that of companies that outsourced in order to focus on core competences, one fourth had mislabeled some functions as non-core, and ultimately brought them back in-house.

In addition, Barthélemy (2003a), for instance, states that the key reasons behind the failure of outsourcing, or what he calls the seven deadly sins, stem from (1) outsourcing activities that should not be outsourced, (2) selecting the wrong vendor, (3) drawing up a poor contract, (4) overlooking personnel issues, (5) losing control of the outsourced activity, (6) overlooking the hidden costs, and (7) failing to plan an exit strategy. From another perspective, according to a study conducted by Enterprise Systems (2004), the three main

issues behind outsourcing success, in order of importance, were understanding the goals (cf. outsourcing decision), selecting the right vendor (cf. pre-implementation management), and on-going management (cf. post-implementation management).

These results suggest that the failure to achieve outsourcing goals lies in the ineffective management of the outsourcing process. For instance, in terms of the findings of Landis et al. (2005), the appearance of 'hidden' costs in the process is a result of nothing less than the inadequate assessment of the total costs involved. Further, the fact that vendors become complacent once the contract is signed implies inadequate management of the supplier relationship, or the wrong choice of vendor. It is also suggested that the outsourcing of core competences is a result of poor core-competence assessment and management: efficiency in this context has often been identified as the primary success factor behind outsourcing deals (Barthélemy 2003a; Gottschalk & Solli-Saether 2005).

Regardless of the reported challenges in achieving performance goals, positive experiences of outsourcing projects/processes indicate that failure is not permanently embedded in the outsourcing situation: it is rather embedded in the context and the management. As shown above, the primary reasons for outsourcing failure stem from the inadequate management of the different parts of the process. It is not enough to manage certain parts well while overlooking others, however. For instance, if a company mislabels its competences and decides to outsource something that should not be outsourced, not even appropriate vendor selection or partnership management can save the situation. Thus, if we are to understand how companies can outsource successfully, it is essential to expose the entire process and to identify the managerial considerations that affect each stage.

3 THE PROCESS OF OUTSOURCING IN THE CONTEXT OF SOFTWARE FIRMS

Industrial fragmentation and increased competition have changed the competitive position of firms in many industries. While hyper-competition and rapid technological change call for operational flexibility and fast adaptation (Mazzawi 2002), a large organizational size has ceased to be a competitive advantage in many industries, and small and agile niche competitors are able to change industries and cost structures overnight (Greaver 1999). In fact, in attempts to manage the constant and rapid technological change, larger firms have begun to increasingly seek flexibility and innovative labor across company boundaries. Yet, rising labor costs due to competition between firms in a relatively small skills pool, the internationalization of the software market and time-to-market pressures spur even small companies in this industry to adopt more efficient production techniques and to restructure their organizations (Grimaldi & Torrisi 2001). These production techniques are often sought from outside the organization, in other words through outsourcing.

However, it has been concluded that size does matter in the outsourcing of software product development (Nicholson & Sahay 2004), and despite some recent research taking size as a variable in these outsourcing decisions (e.g., Carmel & Nicholson 2005), it still remains unclear what kind of wider management implications this variable carries in product-development outsourcing. It has been noted, however, that, overall, development-related challenges and strategies in small software organizations differ from those in larger software enterprises (see e.g., Fayad et al. 2000), which makes it plausible to expect that the strategies and challenges related to the management of dispersed software development similarly differ.

Accordingly, the focus in this chapter is on the outsourcing process from the perspective of software firms and in the context of the framework introduced above. The discussion covers the various aspects incorporated into each phase of the process (see Figure 6 on page 56). First, this section briefly describes the characteristics of the chosen context in a hierarchical analysis of the nature of software firms and products, and the process of product development: it is imperative to understand certain underlying contextual issues prior to analyzing outsourcing opportunities and challenges. A more

thorough theoretical discussion on outsourcing opportunities, challenges, strategies and implications in this context follows.

3.1 Software firms as a research context

Software companies have been termed high-technology organizations. They are characterized by rapid technological change, extensive start-up investment (the resources required to provide software in one million copies versus to one copy are very often the same), and increasing returns through lock-in effects (e.g., Cusumano 2004; Hoch et al. 1999; Katz and Shapiro 1985). The software business as such is unique, and thus requires a unique approach to strategy and management (Cusumano 2004, 3) – not least to the examination of outsourcing in this context.

Given the focus on outsourcing in this thesis, there is a strong emphasis on the characteristics of the software product and on software production. A software product has been described as comprising nothing but knowledge in a codified form (Hoch et al. 1999). However, the software programs and products are becoming more complex in terms of the multiplicity of interconnected functions, which sets new challenges with regard to managing the continuous innovation development (Jordan & Segelod 2006). Yet, software products have been distinguished based on the amount of pre-codified (ready-made) knowledge in their final delivery. For instance, some products are tailor-made for a single client (tailored systems), and in such cases there are few or no pre-made components. In fact, software organizations as such are most often defined in terms of their product characteristics. Accordingly, Alajoutsjärvi et al. (2000) make the distinction between a tailored-systems business and a packaged-software business. At one end of the continuum, tailored systems entail projects in which the total solution is developed from scratch according to a single customer's requirements, while at the other end, packaged software offers standardized fully pre-codified solutions aimed at the mass-markets. Accordingly, and as Cusumano (2004) suggests, software companies fall on the product-service continuum. Sallinen (2002), for instance, concludes that software firms do not operate exclusively in either the software-product or the software,project (service) business but rather deliberately incorporate both in certain proportions. Hence, this two-fold distinction is insufficient in terms of describing the different forms of software organizations. Based on their qualitative world-wide survey of software enterprises, Hoch et al. (1999) propose a distinction between mass-market packaged software companies, enterprise solutions, and professional services. Similarly, Carmel and Sawyer

(1998) propose a three-fold typology comprising packaged software, customer-information-systems development, and embedded software. Segelod and Jordan (2004) divide software organizations into providers of single-client, customized, and packaged software. Despite all the different typologies, however, the common denominator is that software firms in general differ according to the degree of service intensity embedded in their product offering (see, for instance, Sallinen 2002).

In terms of service intensity, the software product is often a combination of a 'product' part, which includes the embedded technical specifications, and a 'service' part including possible add-ons such as tailoring, implementation, service support, and training. The 'services part' can be further divided into implementation and after-sales services depending on their occurrence in the sales process. Logically, the nature of the product in terms of service intensity affects the decisions concerning its management, marketing, and product development, and thereby it is most productive to view a software organization through the layers of a software product (Figure 8). It could be argued that these layers with their processes exist in all software companies, although their emphases in revenue and operation models vary. If one needs to distinguish software companies based on service intensity, it can done by considering the revenues (where they) and the product layers in terms of packaged software (main revenues from core software → licenses), tailored software (main revenues from tailoring projects, i.e., implementation services), and software services (main revenues from after-sales services).

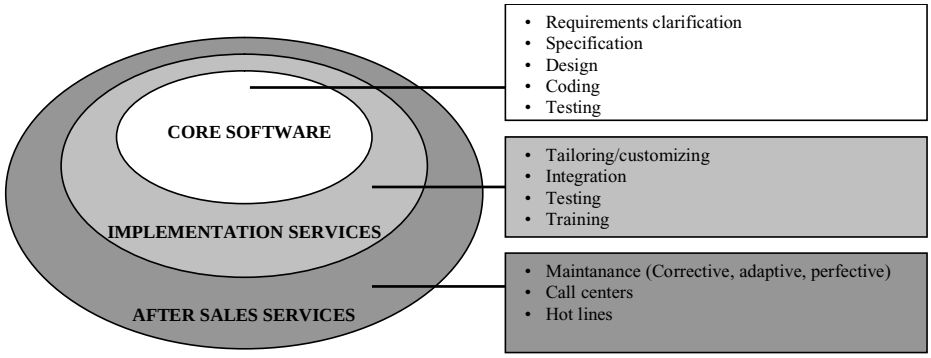

Figure 8 The layers of a software product

The complexity of the industry, which is mainly attributable to the product complexity, is in the end the key to understanding many of the strategic choices software companies make. Furthermore, prior results have indicated that switching from a 'service company' to a 'product company' is an essential

part of the life cycle of many software companies. They often start as highly service-intensive, just gathering information and developing best practices. Eventually they start to implement all this in their core software and thus move towards producing packaged software (e.g., Segelod & Jordan 2004).

It has been widely noted in the current literature that small software firms more often seek rapid growth, mainly from the international arena (e.g., Bell 1995). This is due to the fact that in a highly globalized industry such as software, and especially with companies on small and open markets, the home markets become saturated due to the small demand and fierce global competition, and thereby only offer limited growth potential (Crick & Spence 2005; Knight & Cavusgil 2004; McNaughton 1996; Moen 2002; Sapienza et al. 2003). Although it has been established that not all small firms necessarily seek growth (Nummela et al. 2005; Pulkkinen et al. 2005), it is at the same time argued that, due to the shortening and rapidly changing product life-cycles, knowledge-intensive companies increasingly seek opportunities and enter the global market soon after their birth in order to reap value from their innovations and to protect their commercial value from expropriation (Oviatt & McDougall 1994). This drive for rapid internationalization and consequent growth imposes several management challenges on small software firms. For instance, Nummela, Saarenketo and Puumalainen (2004) have found that internationalizing software companies have difficulties defining their core competences. This may be due to the fact that these competences evolve at a rapid pace as the companies seek a global market presence. The competences of software companies are often evolutionary, and thus they are sometimes referred to as experience factories (Basili, Caldiera & Rombach 2002). For instance, as argued above, the basic evolution of a software firm is that it moves from project business (services) towards product business (e.g., Moore 2000; Seppänen 2002; Ethiraj & Levinthal 2004).

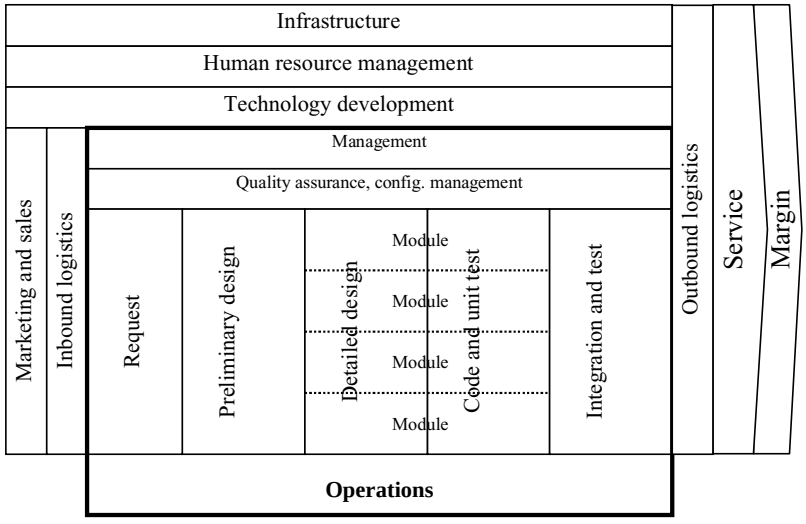

Figure 9 The value chain of a software company (original source: Boehm 1987)

Previous research has indicated that partnering may provide growing software firms with a viable strategy for accessing foreign markets rapidly while reducing the associated risk of internationalization. Prior research has quite extensively covered the potential of partnering in capitalizing external resources and networks for market-related operations (Alajoutsijärvi et al. 2000; Bell 1995; Coviello & Munro 1997; Kulmala & Uusi-Rauva 2005; McNaughton 2002; Ruokonen et al. 2006; Varis et al. 2005). However, less is known about how small software firms are able to capitalize external resources through outsourcing in product-development-related operations ('operations' in Figure 9). This leads to the main purpose of this thesis, which is broadly to **examine the process of outsourcing product-development activities in software firms**. This is achieved through a processeual analysis of outsourcing within this specific context. In the following the outsourcing process is discussed in the light of the existing literature on outsourcing software development and on existing research, and also in terms of the rationalization of the possible impact of the size of the firm. In line with the outsourcing-process model presented earlier (see Figure 6), prior literature has illustrated that the outsourcing process for IS/IT work follows a similar progressive decision-making framework (Dibbern et al. 2004, 15). This led to the application of the originally created framework for analyzing the outsourcing of software development.

3.2 The process of outsourcing product-development activities in software firms

Industrial fragmentation and consequent restructuring have occurred in sectors as diverse as automobiles, aerospace, telecommunications, computers, pharmaceuticals, chemicals, health care, financial services, energy systems, and software (Brusoni & Prencipe 2001; Mikkola 2003; 2006; Quinn 2000; Tully 1993). However, in no other industry has this development changed the competitive field as drastically as in innovation and technology development (Cantwell & Narula 2001), both of which characterize the software industry. In fact, previous research has quite extensively witnessed this shift towards modular organizational structures in various technology-intensive industries (Baldwin & Clark 1997; Langlois & Robertson 1992; Miozzo & Grimshaw 2005; Schilling 2000; Sturgeon 2002).

Reflecting on existing literature, this chapter discusses the process of outsourcing product-development activities in the context of software firms. This process was depicted in Figure 6 on page 56, and then discussed on a very generic level. The aim in this section is to set it in the context of outsourcing software development, and further to discuss the management implications of firm size. Following the four-step structure suggested in the developed outsourcing-process framework, the analysis covers the issues related to internal assessment, the outsourcing decision, implementation management, and evaluation in this specific context. Given the focus in this study on the outsourcing of product-development activities, the concepts of outsourcing and product development are described first.

In terms of the outsourcing concept and definition, there are several problems with adopting the common definition[28] of outsourcing in the context of small software firms.

The first of these relates to size and newness. Many of the activities undertaken in small firms might be new, especially those related to product development. Such firms might choose to 'outsource' certain activities from inception, as they may wish to focus on core development issues, or they may not possess the required resources. Furthermore, even though these activities may have previously been conducted internally, outsourcing would most likely increase the scale: many small software firms have insufficient resources to conduct certain activities on the required scale and scope, which leads to outsourcing. Thereby it is not the activity as such that is transferred, merely its production.

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[28] Defined earlier as the "transfer of production activities, that have been previously conducted internally, to an external party" (e.g., Barthelemy 2003a, Ellram & Billington 2001).

The second problem relates to the context and the nature of the outsourcing. In product-development-related software outsourcing much of what is being bought is knowledge. However, the vendor may quite often re-use existing pre-codified knowledge in delivering the solution. Further, as a substitute for creating software functionality from scratch, firms nowadays have increased opportunities to 'outsource' some of their software-development activities by utilizing (reusing) the readily available functionality of commercial off-the-shelf components (COTS)[29] (Boehm & Abts 1999; Jacobson, Griss & Jonsson 1997). Again, the production of the activity is transferred to the vendor, although the approach is similar with licensing. In fact, this activity has been referred to as out-licensing (RTEC 2003). Given these characteristics of the given context, for the purposes of this study the definition of outsourcing is revised as follows: "*Outsourcing is a process in which the responsibility for a production activity that was previously conducted, or should otherwise have been undertaken internally, is transferred to an external party*". The following analysis is based on this slightly extended and modified definition, and thereby examines the process of outsourcing product development in software firms from a wider perspective.

This leads to the second key issue addressed in this thesis, software product development. In terms of product development, software development could be defined as:

> *"The application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software." (IEEE 610.12)*

Software development has been described as a complex problem-solving process simultaneously involving a number of individuals, teams and organizations with competing goals, interests and responsibilities (Curtis et al., 1988). However, it has been argued that the production process is characterized by a high degree of modularity, which allows the decomposing (outsourcing) of different product-development activities (Arora et al. 2001; Grimaldi & Torrisi 2001; Lall, Albaladejo & Zhang 2004). In fact, Grimaldi and Torrisi (2001, 1430) argue that different software companies share some common characteristics, including (1) modularity of the development process (which is partitioned in distinct tasks) and outputs (partitioned into modules and components), (2) an integrated set of development tools, (3) standardized procedures and management practices, and a (4) matrix organization. In general, it was argued that a high degree of modularity in the value-chain

[29] Although the term COTS is sometimes used as a synonym for packaged software (see e.g., Sawyer 2000), it is used in this thesis to describe smaller reusable software components that can be reused and integrated into the process of software development.

architecture significantly eases outsourcing (Fine et al. 2002). In fact, the production process for software has been characterized by a high degree of technical divisibility (modularity) with extremely small transportation (inter-organizational transfer) costs. For this reason the industry is particularly amenable to fragmentation and global dispersion (Arora, Arunachalam, Asundi & Fernandes 2001), and on a global scale it is organized rather like global production networks in manufacturing with high labor requirements (Lall et al. 2004).

Yet not all software-development processes embody a high degree of modularity, as firms have several options regarding the different development models according to which they may organize their production processes (see e.g., MacCormack 2001, 78). Software product development involves systems analysis and design, and follows one of a range of development-process methodologies (Jordan & Segelod 2006). Perhaps the most modular of the models is the waterfall model (Royce 1970), which has been widely used in the industry since the 1970s. It comprises distinct development stages in which, at least in theory, the current stage needs to be fully completed before the next stage is entered (MacCormack 2001). The progressive stages of software development consist of requirements engineering, system definition, system design, the realization of programming activities, integration and testing, and finally implementation and maintenance (Figure 10).

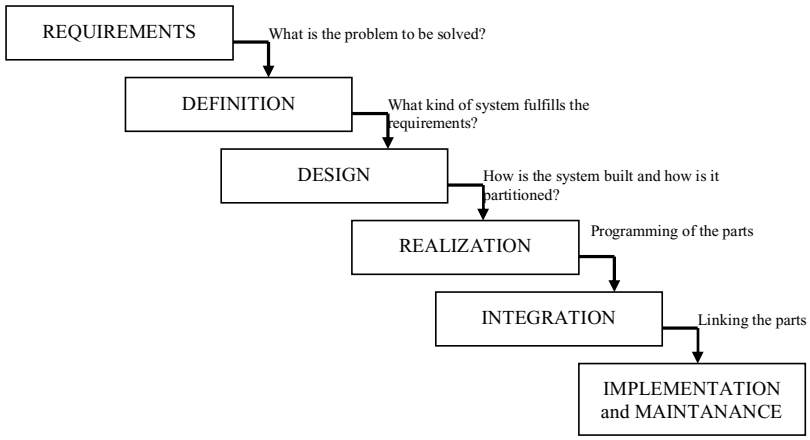

Figure 10 The Waterfall model of software development (Adapted from Haikala & Märijärvi 2004, 36)

However, the escalating costs associated with software development and the unsatisfactory reliability, performance, and functionality of the resulting software have since then motivated software engineers to develop new models

(Davis et al. 1988). Some examples of these alternative approaches include agile methods (Highsmith & Cockburn 2001), the spiral model (Boehm 1986), and the rational unified process (Kruchten 2003). One of the common themes in the evolution of software development is its iterative and incremental nature. From the perspective of outsourcing, it appears that development activities such as design and testing are increasingly overlapping, thus making the outsourcing of distinct activities more difficult. Yet it appears that there are still distinct differences between the outsourcing party and the subcontractor in this respect. Perhaps such differences could be better illustrated through the examination of software development through the hierarchical nature of software architecture.

When a new system is developed, the first stage in the design process is typically to outline the overall architecture, and then to proceed to the detailed design of the components of smaller granularity. The hierarchical level at which outsourcing occurs then affects the activities that the subcontractor is required to do (the level of selectiveness). The smaller the granularity of components for which the vendor is responsible, the less the vendor will be involved in the overall design. Still, within the scope of the outsourced component, the subcontractor is typically required to perform a wide range of software-development activities, such as a detailed design (software design), implementation (coding) and testing (software verification). Having the subcontractor developing some of the components is only one side of the story. The other side of integration, verification and validation still frequently receives less attention. The degree of selectiveness of the outsourcing probably also affects the number of tasks the vendor is expected to perform in terms of integration, verification and validation. One reason for this could be that some of the software-process models (such as the waterfall model) are inadequate in terms of describing such activities. Accordingly, an attempt is made here to illustrate the activities typically performed by the outsourcing party and by the subcontractor, in accordance with ideas put forward in the V-model (IAGB 2007) and the dotted U-model (Kit 1995).

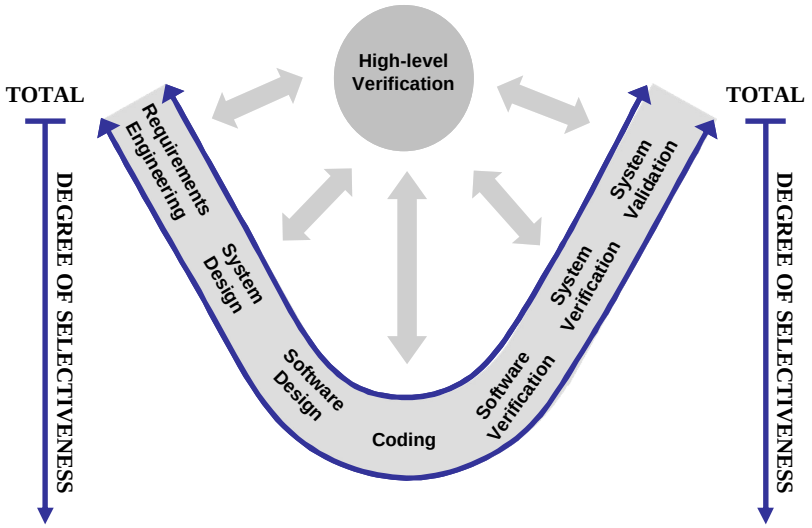

Figure 11 The U-model of software development (Adapted from Hätönen & Jantunen 2007)

As illustrated in Figure 11, undertaking the entire software-development process internally would entail the management of a process stretching from requirements engineering to system validation, while controlling its fluency through high-level verification. The basic idea behind this model is the same as behind the waterfall model: the development process flows through distinct phases. Furthermore, the U-model includes aspects of process analysis that describe its interactive nature, and also facilitates examination of the outsourcing that may occur. First, as argued, the experiences of and difficulties with fully dividing software development into stages has led to the adoption of models in which the tasks are not fully partitioned, but are rather depicted as a process with a high level of interaction between the different phases. However, there are still identifiable stages through which the process flows. In fact, their sequential nature is often seen as a precondition for outsourcing. According to Amoribieta et al. (2001, 132), for instance:

> *"a company that outsources software development shouldn't have a taste for "bleeding-edge" technology, which ought to be created in-house since it requires a high number of design-code test-redesign feedback loops".*

Accordingly, software-development projects with high levels of intervening and overlapping phases and iteration seem to be poor candidates for outsourcing, which in turn justifies the analysis of outsourcing in progressive

stages[30]. Secondly, the waterfall model as such does not allow examination of outsourcing varying in scale and scope. Software-development projects are not always necessarily connected to turnkey systems development (see 'total' in Figure 11). In many cases firms need to undertake projects with smaller granularity, for instance the creation of a single component for an existing system. In other words, they may engage in development outsourcing at various levels of selectiveness: the requirements and system design may already exist, and such a process would not involve those phases. The different granularities of software components are discussed further in the following section.

3.2.1 Outsourcing and the strategy of the software firm

Perhaps the impetus for outsourcing in the software industry comes from the highly competitive and volatile environment. Lacity and Hirschheim (1993a) refer to this as the domino effect: companies are increasingly focusing on core competences and are building and developing competences in more focused areas, which in turn coerces competitors to adopt an outsourcing strategy, i.e., to jump on the 'bandwagon'. There is a deep pool of competent suppliers on the global level, which is able to provide software firms with temporal resources or even ready-made innovations, enabling them to focus on core development. According to Helander (2004), the three basic options in developing software components are to make the component in-house, to buy existing components (COTS) from the markets (license), or to "connect" with another company and develop them together (see also Ulkuniemi 2003). As argued, in the present context, software outsourcing entails outsourcing core R&D operations/projects. This involves aspects not covered in the ITO literature, especially with regard to the decision of whether or not to outsource: whereas conventional[31] ITO entails outsourcing strategic yet often non-core activities and processes, software-development outsourcing inherently involves something that is close to the core competence of the firm. This connection to core competence may well be the key restraining factor in the R&D outsourcing of software firms. Nevertheless, Helander (2004)

[30] In fact, the analysis of outsourcing software development by means of the capitalizing model and its progressive stages is also of practical relevance. For instance, Segelod & Jordan (2004, 250-251) found that whenever software-development projects are decomposed into smaller parts, the waterfall model is most often used for producing these modules once they have been decided upon.

[31] Conventional' here refers to IT outsourcing in which the outsourced operations entail supportive functions and processes. Conventional IT outsourcing could be defined as "*a conscious decision to contract out to an external service provider IT activities, processes and/or related services, which are necessary to the operation of the organization.*" (Nyrhinen 2007, 17)

maintains that the identification of core competences is crucial in identifying the need for complementary competence providers, which is of particular importance in the R&D context.

What are the core strategic activities of a software firm and what could it consequently outsource in order to support its core competences while protecting its internal competitive advantage? As argued earlier in this thesis, outsourcing strategies should correlate and support overall strategies and core competences (Dess et al. 1995; Insinga & Werle 2000; Nadler & Tushman 1999; Quélin & Duhamel 2003). Similarly, in terms of software outsourcing, Amoribieta et al. (2001, 132) state that any deals must serve the needs of the company as a whole, in other words they should support its overall strategies. However, it has been noted that, especially in the context of volatile demand and high uncertainty, which are often used to define each other (Williamson 1985), the competences need to be dynamic, meaning that firms have to develop and change their competitive positions reactively or proactively in accordance with the changes in the market (cf. Teece et al. 1997).

Accordingly, in concurrent competition in which dynamic competences may provide its only sustainable edge, the firm's strategies need to evolve constantly. One of the key characteristics of a software organization is that it seems to grow in progressive stages (e.g., Alajoutsijärvi et al. 2000; Ethiraj et al. 2005; Moore 2000; Seppänen 2002). Although this is not uncommon in organizations, a fact of which researchers have long been aware (e.g., Churchill & Lewis 1983; Greiner 1998; Kazanjian 1988; Miller & Friesen 1984; Quinn & Cameron 1983; Scott & Bruce 1987), in the software industry it is often associated with a change in operations and product strategy, which in turn logically has product-development implications. Therefore, in order to understand the outsourcing potential of a software firm, it is essential to follow it through its evolutionary stages of growth. Although this approach has clear limitations, such as the problematic issue of identifying the stage in which it is currently operating, it is useful in framing the general processes of firm evolution and continuous change over time – particularly during the dynamic early stages (Hite & Hesterly 2001). The typical progressive evolution of a software firm and its product offering is illustrated in Figure 12.

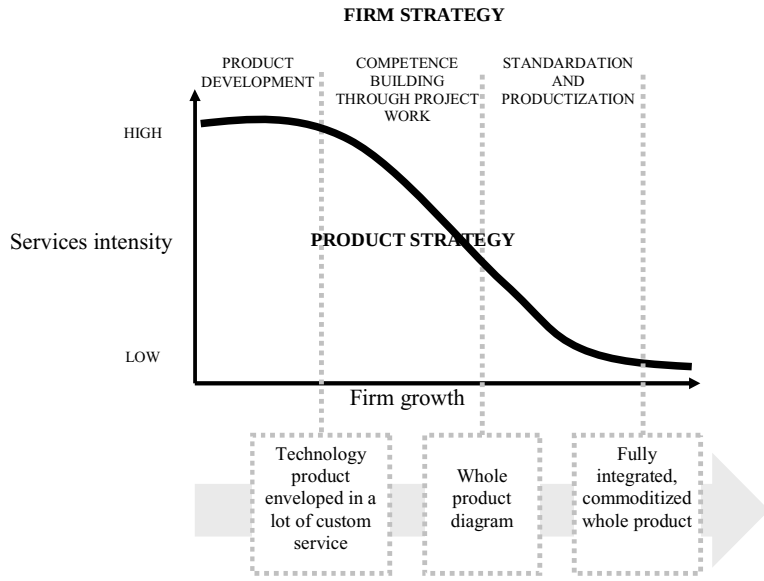

Figure 12 Firm growth and product strategy in the software firm (Adapted from Moore 2000)

At the start of its lifecycle the software product consists of a barely complete core product surrounded by an envelope of customized services, which is needed to make any particular application work (Moore 2000). Prior to this the firm is at the stage of developing this core product, albeit from an incomplete solution. Its strategy at the *product-development* phase is thus focused on building a core product, often consisting of a platform and product interfaces for later customer solutions. The product platform is defined as the technological foundation for further product-development activities and is capitalized in different variations of future product soutions/versions (Mayer, Terzekian & Utterbach 1997; Sääksjärvi 1998). This stage of developing the product platform could be likened to the emergence stage in the literature on the progressive growth stages of entrepreneurial firms (e.g., Gardner, Bird & Starr 1992).

After developing their core product software companies often start to *build competences through project work* (Alajoutsijärvi et al. 2000; Ethiraj et al. 2005; Seppänen 2002). At this stage small companies seek to build relationships with clients because productization comes from the learning and competence building that arises from the projects (Alajoutsijärvi et al. 2000; Sallinen 2002). This phase encapsulates the transition from project work to a whole-product diagram, an amalgam of existing products and services (Moore 2000). Through project work, firms incorporate scalable elements in building a

parameterized software solution for which practically all the necessary components already exist and do not have to be created from scratch. Successful software developed for a single client can later be further developed into a software package and productized as mass-market software (Segelod & Jordan 2004). General growth theories refer to this phase as the early growth stage (e.g., Churchill and Lewis 1983).

The goal in the third life-cycle phase of a software firm is to build a fully integrated, commoditized whole product through *standardization and productization*. The resulting product can be replicated with reasonable consistency and speed, and the work can be leveraged from customer to customer (Moore 2000). As mentioned, productization is often seen as a prerequisite for internationalization and consequently growth (Alajoutsijärvi et al. 2000), mainly because it allows the more efficient use of networks as delivery channels. In general growth theories this is termed as the maturization stage.

However, at this and at the preceding stages it still remains largely unclear how and to what extent growing software firms can capitalize production-related networks in the form of outsourcing and licensing to better succeed in this highly competitive industry. As the product and its characteristics lie at the core of this evolution, it is likely that the outsourcing possibilities relate closely to the product-development activities that are, at each given stage, non-core to the firm. As argued, the evolution of the software firm from the product perspective basically traces the decrease in implementation services and project work and the move towards a more scalable product that can be sold through various channels to mass markets[32]. Figure 13 illustrates the evolution of a software product alongside the growth process (cf. Figure 8 on page 89).

[32] Sallinen (2002) supported this argument earlier. She depicted the evolutionary process of the software firm from a resource firm (purely project-based), to a resource firm with supporting projects and products, and finally to a software-product firm. However, and similarly to Moore (2000), she found that after the growth phase they eventually reintroduce the project (services) aspect in their operations as a way of becoming 'system houses', which are constellations of independent software-development and customer-specific project providers.

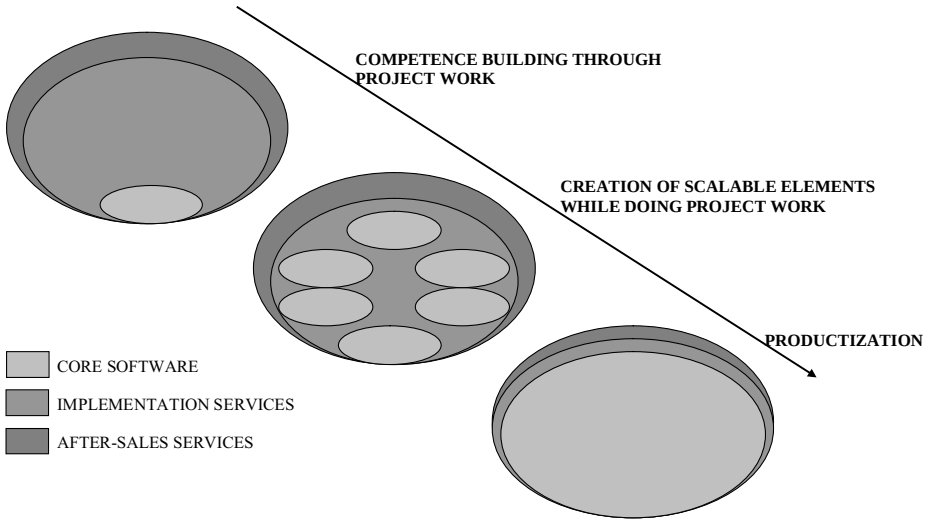

Figure 13 Product evolution in the software industry

In an increasingly complex technological environment, a single firm rarely possesses all the necessary capabilities that will enable it to succeed. Thus there is an increase in the use of external technology resources through various transactional and cooperative mechanisms (Hagedoorn & Duysters, 2002). Yet, it seems that the software firm's need for these external resources changes in line with its growth process. Prior research on the resource-based view has shown that external resource needs vary in accordance with the development and growth phases of the company (e.g., Pettus 2001). Especially in a changing environment, firms must continuously reinvent and upgrade their resources and capabilities if they are to maintain competitive advantage and growth (Argyris 1996; Robins & Wiersema 1995; Wernerfelt & Montgomery 1998). Similarly, prior IB research has shown that the need for resources changes in the course of internationalization. Furthermore, some studies have illustrated that the network structure and network ties evolve during the different growth stages of the firm (e.g., Elfring & Hulsink 2007; Hite & Hesterly 2001). Overall, there is a broad consensus among researchers interested in both strategy and entrepreneurship that networks play a significant role in successful growth (Birley 1985; Jarillo 1989; Larson & Starr 1993; Stuart, Hoang & Hybels 1999). However, as much of this research has focused on illustrating the importance of social networks, little is known about how small firms intentionally capitalize, or should capitalize, the sources of their external resources and capabilities through outsourcing and licensing in order to fulfill their changing resource needs. Accordingly, the existing research provides only limited understanding of how outsourcing

strategies regarding product-development activities correlate with a firm's overall strategy during different phases of its growth and internationalization.

3.2.2 Conceptualizing product-development outsourcing in software firms

It was argued that the fact that software development is often characterized as a process with a high degree of technical divisibility gives it, at least in principle, a certain outsourcing potential (Arora et al. 2001; Fine et al. 2002; Grimaldi & Torrisi 2001; Lall et al. 2004). Although there is an extensive amount of research on how to manage outsourced software development (see Dibbern et al. 2004), only little attention has given to the analysis of the actual outsourcing decision in its breadth and in context, and in which outsourced activities relate to the core development activities of the organization.

Basically, the contractual and procedural options for using external sources in the software industry are either to use external parties for developing software components (outsourcing) or to reuse existing solutions (licensing). Whereas outsourcing, as defined above, entails the transfer of production activities that have or would have been carried out internally to an external party (cf. Ellram & Billington 2001), licensing is defined as a contractual agreement, in which a firm (licensee) acquires the rights to a product, process and/or to manage technology from another firm (McDonald & Leahey 1985). However, conventional technology licensing entails acquiring technology for production purposes, but in the software industry licensing is more often used as a tool to complement the whole product/technology package as solutions are increasingly becoming more and more extensive, and more technologically complex (Jordan & Segelod 2006). Therefore, the licensee may pay a yearly fee for each product sold, and also disburse a royalty to the licensor. In the software industry such licensed instruments are referred to as commercial off-the-shelf (COTS) components (Boehm & Abts 1999).

The difference between these two strategies lies in the fact that whereas outsourcing entails using external knowledge and skills resources to develop software from scratch as per given specifications and instructions, licensing entails buying ready-made functionality in a codified form. The wide spectrum of outsourcing possibilities in the software industry ranges from acquiring temporary labor and skills to offsetting the fluctuating needs of software developers (also referred to as body-renting), and even to deepening the cooperative mode in terms of co-developing a part of an entire system together with the outsourcing vendor.

Various other considerations affect the outsourcing decision. As argued earlier, the four key questions in the software industry cover what, why, where, and how. In other words, firms need to define what is being outsourced (what), what are the underlying motives (why), what is the prospective location of the outsourced activity (where), and what kind of governance and divestment model will be used in the process (how). Seddon et al. (2007, 238) argue that although there is no shortage of literature addressing these questions, so far it has produced only little clear-cut advice on the key to success that lies behind them. This aspect is addressed below in terms of capitalizing external resources for the purpose of software development.

3.2.2.1 What? Categorizing outsourcing objects

The fact is that what is being outsourced relates to the outsourcing objective. Previous research has introduced primary measures such as strategic importance (e.g., Alexander & Young 1996a; Duarte et al. 2004; Quinn 1999; 2000), transferability and asset specificity (e.g., Williamson 1975), and scale and scope (e.g., Greaver 1999; Willcocks et al. 2004) to categorize different types of outsourcing. These three issues and measures are discussed below in the context of software development.

Firstly, as argued, one of the prevailing ways of clustering activities is based on their strategic importance. Reflecting on the notion of core competence introduced by Hamel and Prahalad in 1990, researchers have broadly suggested that firms, especially in fast-moving industries, should focus on value-creating competences and basically outsource the rest (Porter 1996; Quinn 1999), thereby giving rather straightforward suggestions in terms of make-or-buy decision-making. Yet, making such a bipolar distinction between activities prior to outsourcing tends to oversimplify the situation (Heikkilä & Cordon 2002). Consequently, researchers have identified several instances when outsourcing is not profitable even though the activity is not a core one (e.g., Lonsdale 1999; Quinn 1999). Furthermore, the core competence and consequently the analysis of the strategic importance of an activity is highly dependent on the organization at hand, its chosen strategies and its business models: comparative measures based on the core-non-core dichotomy are therefore difficult to impose. Consequently, core-competence-based analysis does not provide many rigorous tools for examining the strategic nature of the outsourced activity, especially in a comparative setting.

For the purposes of this thesis it is proposed that, in the software industry, a sufficient measure of strategic importance, which is irrelevant to company size, is the importance of the outsourced/licensed component to the overall

product offering. For such an analysis, it is further proposed that the activities are classified as embedded, value-added, or customer-specific in terms of the final delivery. Embedded outsourcing, or licensing, could be referred to as an activity that is part of the core solution, and therefore has a greater strategic value to the firm. A value-added activity could be a parameterized module of the whole product diagram (cf. Moore 2000), but unlike an embedded activity, it is something that is not included in all product deliveries. Finally, a customer-specific activity is geared to a single customer, i.e., it is a tailored activity. It is proposed in this thesis that in the software industry these attributes, in parallel to the scale and scope of the activity, may be used to define the strategic nature of the outsourced/licensed object in the software industry.

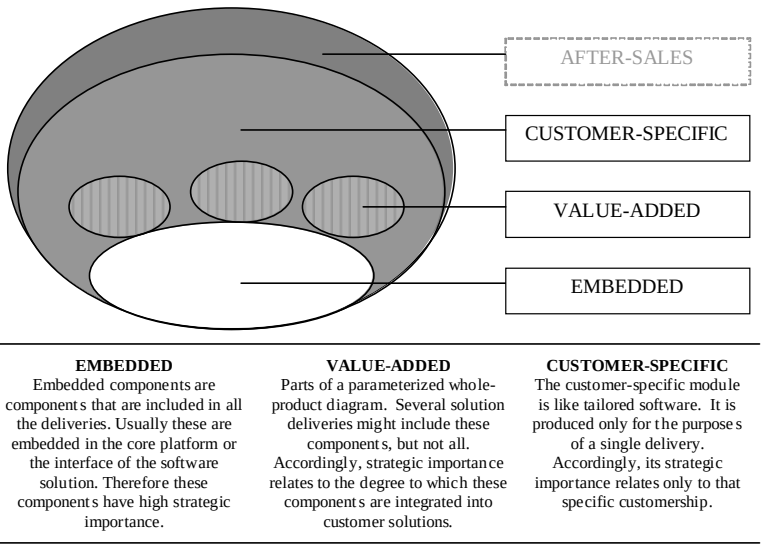

Figure 14 The software product and embedded, value-added and customer-specific outsourcing

Secondly, in terms of transferability, due to the distinguishing characteristics of the software product, what is outsourced in software development is inherently knowledge-intensive. In fact, according to Blacker (1995)

> *"Software development represents highly knowledge-intensive work that requires organizations to increasingly depend on "knowledge workers" who draw upon their cognitive abilities and specialist resources".*

Software-development activities are inherently knowledge-intensive, thereby requiring intensive effort in terms of knowledge management, and in the case of outsourcing, in knowledge transfer to the vendor. Figure 15 below, building on existing literature (e.g., Segelod & Jordan 2004), illustrates the complexity and possible knowledge sources for software product development. In fact, software organizations need to acquire knowledge from various external sources in order to develop new software (Segelod & Jordan 2004). The production process could therefore be considered a highly knowledge-intensive activity resulting in a solution to a certain problem. Hoch et al. (1999, p. 6) refer to software as an intangible product consisting of 'nothing but knowledge in codified form' (see also Segelod & Jordan 2004). Hence, a software product can be only as good as the people making it. The industry is therefore reliant on knowledge as a primary resource, and the applicability of the product is based on the management of the different sources of knowledge. Software production is often referred to as a 'craft' or 'creative activity similar to industrial design (Grimaldi & Torrisi 2001, 1425). As illustrated in Figure 15, the key tasks of a software firm from the production perspective is to collect the existing knowledge from varieties of external sources, disseminate it internally, and act upon it. It is argued that small software firms with scarce and limited resources are limited in terms of obtaining this knowledge (Verhees and Meulenberg 2004), causing them to forge closer relationships with their existing customers.

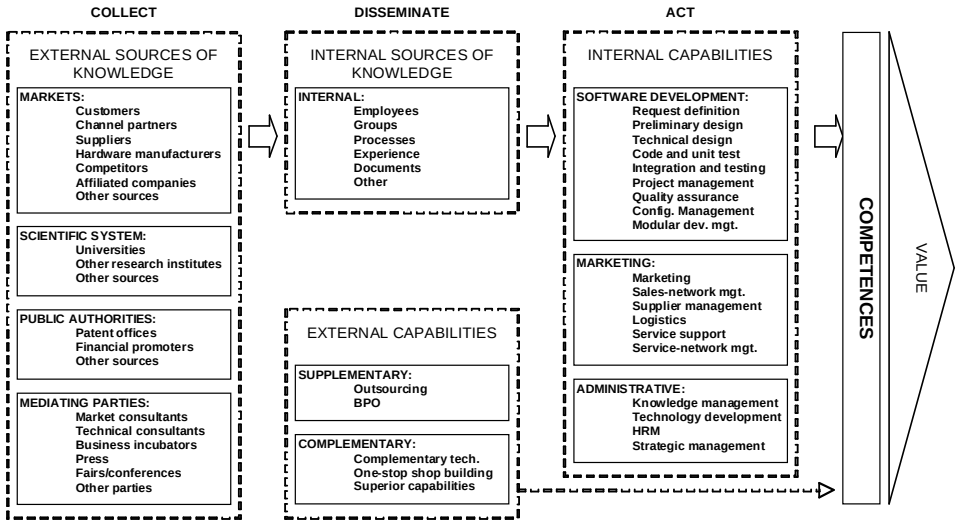

Figure 15 The knowledge-based value chain of a software company (contributing source: Segelod & Jordan (2004))

Yet, neither knowledge intensity, nor asset specificity, nor uniqueness of assets to support the exchange fully correlates with the transferability of the activity. Even tacit and firm-specific knowledge, which are often contrasted to asset specificity, could be made more explicit (Nonaka & Takeuchi 1994), enabling such activities to be transferred across organizational boundaries, i.e. outsourced. Kogut and Zander (1993) propose that the key determinants of the transferability of knowledge relate to three of its attributes: codifiability, teachability, and complexity. In terms of codifiability, it is often argued that software and related processes comprise knowledge that can be easily codified (e.g., Hoch et al. 1999). Technologies, processes, methodologies, skills, objectives, and management systems can be transferred from a client to a developer (Heeks et al. 2001, 58). In principle, different development projects can be specified, providing a blueprint for outsourced work, basically regardless of the task.

The extent to which a task is codified also affects its teachability, as does decreased complexity with respect to outsourcing related to the structure of the system. It could be argued that in order to develop part of a software system, the developers need to understand the system as a whole. This, in turn, is dependent on how the firm has structured and further 'modularized' it. A modular structure in a software system makes it easier to teach the interlinkages that exist within it, for example, and thereby facilitates the more efficient independent design and production of software-development activities (Parnas 1972). In fact, it has been suggested that the tacitness of software development lies in the prior design and programming choices, and in the working practices (Heeks et al. 2001, 58): this relates to the prior actions of the outsourcer and the extent to which internal practices are 'modularized' and documented. According to the above discussion, it seems that transferability, and equally asset specificity, are highly context-dependent measures, which primarily affect the firm's ability to create specifications, as well as the structure of the existing system.

Finally, in terms of scope and scale, there is a wide spectrum of different production activities that could be either licensed or outsourced. In this context, the outsourcing contract size could be considered a simplistic measure. However, such information is often difficult to obtain, especially in small firms, and the measure is highly dependent on the firm's size. Another way of analyzing the scope of the outsourcing is to divide production activities prior to decomposition in accordance with their hierarchical level of complexity. According to Mikkola (2006), complex systems could be divided into four hierarchical levels based on their complexity: system, subsystem, component, and module. Similarly, MacCormack et al. (2006) suggest that the architectural design of a software system could be divided into three

hierarchical levels: subsystem (a group of source files that all relate to a specific part of the design), source file (a collection of programming instructions that performs a related group of instructions), and function (a set of programming instructions that performs a highly specific task). From the managerial perspective, Brown and Wallnau (1998) describe a software system as consisting of three hierarchical component levels: business components, software components, and run-time components. Brown and Wallnau's (1998) classification is adopted in this thesis in order to analyze the different hierarchical levels of a software solution, and consequently the scale of outsourcing/licensing (Figure 16).

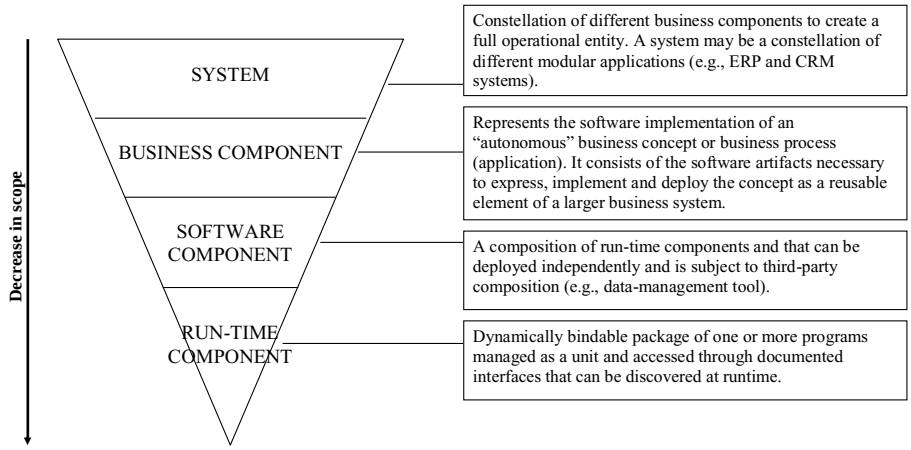

Figure 16 Hierarchical levels in a software solution

As mentioned above, there are several context-related issues that affect the nature of the outsourced activity. Whereas the issue of 'transferability' appears to be dependent on the outsourcing firm, measures of 'strategic importance' and 'scale/scope' allow comparative analysis of product-development outsourcing in the software industry. Yet, in terms of firm size, a few aspects related to what is being outsourced remain open: prior literature has described outsourcing as an incremental learning process in which often non-strategic functions precede strategic functions, and companies broaden the scope and scale of their outsourcing over time (Graf & Mudambi 2005; Hagel & Brown 2005; Maskell et al. 2007; Lewin & Peeters 2006). A logical extension of this argument would imply that small software firms start by outsourcing customer-specific run-time components and end up outsourcing embedded system-level components.

3.2.2.2 Why? Outsourcing motives

Seddon, Cullen and Willcocks (2007) found in their survey of IT managers that Domberger's (1998) four motives of outsourcing - specialization, market discipline, flexibility, and cost savings - also apply to IT outsourcing (see also McFarlan & Nolan 1995). Similarly, in terms of outsourcing software-development activities, Heeks et al. (2001), for instance, argue that outsourcing structured software-development work has substantial cost advantages. Moreover, according to Heeks et al. (2001), outsourcing may enable software firms to achieve process-related flexibility. It also enhances innovation through the capitalization of external knowledge resources, or by enabling firms to focus on core development activities. Hence, it can be assumed that software firms have a variety of motives for outsourcing product-development activities. However, these motives differ in terms of mode of transaction, i.e. licensing versus outsourcing. For instance, from a motivational perspective, according to which outsourcing is often seen as a tool for cutting costs and gaining operational flexibility (Heeks et al. 2001), time-to-market pressures to use COTS components are strong (Boehm & Abts 1999).

Although previous research has concluded that general motives for outsourcing are similar, and that there is a different emphasis depending on the country (Quélin & Duhamel 2002), geographical area (Graf & Mudambi 2005), and industry (Landis et al. 2005) in question, the issue of company size as an outsourcing variable has largely been overlooked. There are at least three reasons why small companies might be expected to have different outsourcing strategies than larger firms, these differences being mainly attributable to their small size. First, without the possibility of large-scale funding, small companies have only limited resources for running operations. Although this drives them towards outsourcing, it also limits it. The scarcity of financial resources restricts the potential, while the scarcity of skill-related resources drives these firms towards it. With regard to licensing, previous research has suggested that small firms are more likely to find it appealing because they lack the resources to develop products internally (Atuahene-Gima 1993; Lowe & Crawford 1983). Secondly, small firms often possess only limited knowledge to support their decision-making. Outsourcing and licensing require knowledge not only of the required objective, but also of the process itself. In fact, recent research results suggest that outsourcing is an evolutionary process that is subject to incremental learning, and that that the outsourcing of small-scale non-strategic activities precedes the outsourcing of large-scale and strategic activities (Graf & Mudambi 2005; Hagel & Brown 2005; Maskell et al. 2007; Lewin & Peeters 2006). Given the limited

knowledge, it is reasonable to expect small companies to be more cautious towards outsourcing and licensing, and to start with smaller non-strategic entities. Further, it has been argued that knowledge related to the outsourcing process mitigates the associated transaction costs (Carmel & Nicholson 2005), which accordingly imposes challenges on small firms in particular in terms of thus achieving cost savings. Thirdly, small firms operate with inadequate volumes to enable them to mitigate outsourcing transaction costs (cf. Williamson 1975) and to achieve scale economies, and this, in turn, reduces the likelihood of making cost-rationalized outsourcing decisions.

Further, in terms of outsourcing development activities, it is likely that motives will differ according to the overall strategies of the firm. For instance, and in terms of the software industry, as firms seek to achieve rapid time-to-market in their product development, they may well seek outsourcing and licensing to support their strategy (McDermott & Handfield 2000). On the other hand, in later phases of growth, software firms may wish to focus on core development activities, and thereby seek to capitalize external resources in order to achieve such a focus and organizational flexibility. However, previous research provides only limited understanding of outsourcing motives in the context of small firms, and of how such motives evolve as the company grows.

3.2.2.3 Where? Choosing the location for the outsourced activities

Offshore software development is one of the most reported practices in global terms (e.g., Amoribieta et al. 2001; Engardio 2006; Heeks et al. 2001). It is argued that although software-development offshoring is far from being new, it was the enormous amount of reprogramming that was required at the turn of the millennium that catalyzed the process of offshore software outsourcing (Amoribieta et al. 2001, 130). In short, global software outsourcing (GSO) entails capitalizing external software-development resources located in a foreign location. In terms of GSO, India has been referred to as the prime location to which firms increasingly allocate development tasks. The choice of India as a primary location choice is motivated by its low-cost structure and high quality of supply relative to other locations such as Singapore, Ireland, China, Hungary and the Philippines (Amoribieta et al. 2001).

Yet, no conclusive results have so far been produced on the factors influencing the final location choice in software-development outsourcing. It terms of capitalizing COTS, location is not an issue as ready-made knowledge is bought often irrespective of the national origin of the vendor. Yet, with regard to outsourcing, the choice of location is one of the key outsourcing

decisions. As was argued earlier on the basis of existing literature on FDIs, researchers have identified four primary factors that influence the location of outsourced processes that can be electronically transmitted (also referred to as Internet-enabled): situational, internal, locational and external (e.g., Graf & Mudambi 2005; Palvia 2004).

In terms of situational factors, which primarily entail different characteristics of the outsourced activity, it is likely that its strategic importance as well as the level of asset specificity affect the location decision. McFarlan (1995), for instance, suggests that highly structured tasks are most suitable for offshore outsourcing, and that less structured tasks should not be taken offshore (see also Amoribieta et al. 2001). Accordingly, activities involving high asset-specificity and a low level of process standardization often require close cooperation with the vendor, which may lead firms to favor a domestic location.

Of the locational factors, the level of infrastructure, and in particular the quality, is often embedded in the evaluation of prospective locations for services that can be electronically transmitted (Metters 2007; Palvia 2004). The labeling of software outsourcing as an Internet-enabled process has been stated as the main reason behind the growing interest in the offshore outsourcing of software development. However, whereas others acknowledge the power of ICT to transcend the limitations of time and space in software development (e.g., Carmel 1999), others argue that reliance on ICT as a means of transferring knowledge is misplaced (e.g., Brown 1998; Hislop 2002). For instance, Heeks et al. (2001, 57) maintain in their case study on offshore software outsourcing that:

> *"…videoconferencing link (when not disrupted by bad weather) could not substitute for face-to-face interaction. It failed to transmit the informal information that personal contact provides, creating a barrier for information synching."*

Nevertheless, evidence of the importance of the infrastructure is provided by Farrell (2005), who found that the level of infrastructure in India was one of the lowest in the countries he analyzed. Nevertheless, as mentioned, India is the most prominent GSO location.

Knowledge-intensiveness in software development has particular relevance in the context of offshore outsourcing in that it involves people from different organizations and countries with different languages and working practices working together (Järvenpää & Leidner 1999, see also Vohra 2003). Accordingly, and in terms of locational factors, it is likely that culture and language will play significant roles in the location decision.

Internal factors include the outsourcing experience of the firms as well as the underlying motives driving the decision. In terms of software

development, as argued earlier, it is likely that these issues also affect the final location decision. India, for instance, has become one of the key GSO locations due to its low labor costs (Amoribieta 2001). Therefore, whenever cost savings are sought, firms need to seek locations in which the comparative cost structure is lower.

It seems that the location decision in software outsourcing is influenced by several different factors. However, it still remains unclear what the primary factors are that influence the final choice in specific contexts. For instance, regardless of the factors involved, it can be concluded that size does matter in location decisions. As Nicholson and Sahay (2004, 360-661) state, larger firms have the resources to make large-scale investments in moving expatriates offshore and installing dedicated high-bandwidth telecommunications links, for instance. Accordingly, it seems that the level and quality of the existing infrastructure may be of more importance to small firms than to large firms. Moreover, as discussed in more detail in the following section, software-development outsourcing often requires collaborative phases. In the case of offshore outsourcing, this quite often translates into on-site visits to the vendor's premises, which incur travel costs. Further, small firms with few employees may find it impossible to release valuable (often management) resources for the purpose of visiting the vendor's premises. Such restraints may lead small firms to favor domestic locations, in spite of the possible comparative advantage of the offshore location.

3.2.2.4 How? Models of software-development outsourcing

It has been found in a recent study that, along with offshoring, the biggest management trend in the IT industry concerns the development and evolution of new outsourcing models (Prisma Research 2006). It was argued earlier that the definition of an outsourcing model entails three key decisions: level of task division (degree of selectiveness), mode of governance (degree of supplier involvement), and the incremental extent of the divestment. Task division basically refers to the mode in which the vendor is integrated into the overall software-development process and the activities are transferred to the vendor. For instance, Willcocks and Choi (2004) suggest that whenever less than 80 percent of the total activity is transferred to the vendor, it is a case of selective outsourcing (see also Van Weele 2000, 54-55; Axelsson & Wynstra 2002, 68-69). In fact, in terms of software outsourcing, the degree of selectiveness (level of task division) directly influences the degree to which the supplier is expected to contribute to the entire process (mode of governance). For instance, Goldsmith (1994, 14) elaborates on task division as follows:

> *"The buyer's definition of requirements should include a detailed design of the system to be programmed. The requirements definition also may include elements such as performance levels, hardware and software environmental constraints and tools and methods to be used. However, it is equally important to be clear on whether the buyer requires the vendor to provide programming services (activity) or a working system that fits the design."*

Basically, the outsourcing model, in terms of the division and mode of governance, culminates in the identification of two distinct points, (1) the point in the software-development process at which the responsibility is transferred to the vendor (point of outsourcing), and (2) the point at which the vendor's deliverables are taken back to the internal development process (point of integration). The tasks involved in the process between these two points are transferred to the vendor (Figure 17).

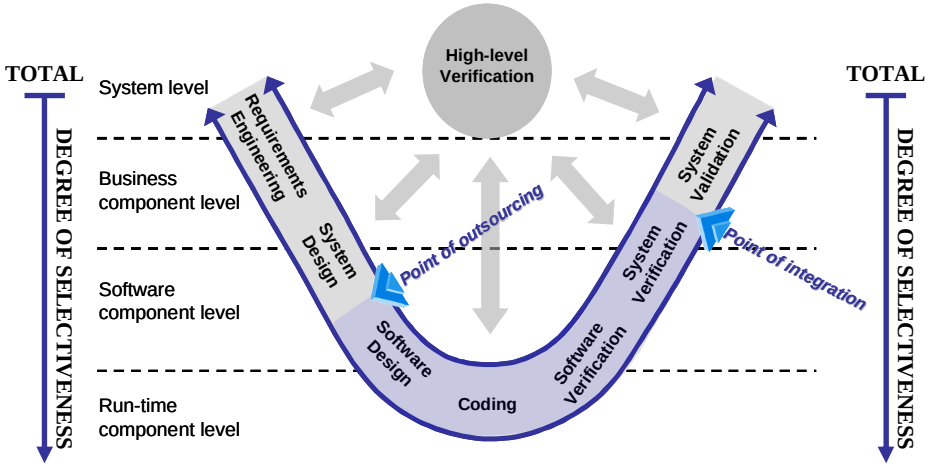

Figure 17 A framework for the outsourcing process (Hätönen & Jantunen 2007)

As illustrated in Figure 17, it is likely that the smaller the component that is outsourced[33], the fewer the software-development tasks that are handed to the vendor: in other words, the more selective the outsourcing becomes. For example, if a runtime component is to be outsourced, the subcontractor will most likely be responsible only for activities related to that specific component. However, it still appears that the way in which design and integration activities are divided between the outsourcing party and the subcontractor varies from case to case. As an example, the outsourcing party

[33] The different component levels in software development were discussed earlier in Chapter 3.2.2.1, and further summarized as Figure 16 on page 107.

may decide to design its low-level components itself before asking the subcontractor to take over the rest of the development activities. On the other hand, a company may leave the detailed design to the vendor. Accordingly, the inability to define uniform handover points in the outsourcing context implies that the responsibilities of the vendor could be defined as activities to be performed in the timeline between the point of outsourcing and the point of integration. However, these points are not strictly determined and may differ significantly from one development effort to another: this is the primary reason for the task division.

Furthermore, it should be noted that there must be continuous collaboration between the outsourcing party and the subcontractor throughout the subcontracting effort. Such collaboration occurs in many forms, ranging from knowledge transfer to high-level validation activities in which the subcontractor's incremental results are integrated and tested as part of the whole system. The mode of governance refers to the information structure of the outsourcing process. In other words, it is quite obvious that the vendor's responsibility cannot be clearly defined, yet firms need to collaborate in certain phases of the process. In deciding on the outsourcing model they should therefore make as effort to identify whether the tasks associated with different phases of the process are done by the company itself, by the vendor independently, or in collaboration. One of the key questions in this context is whether the work is conducted on-site at the customer's premises, off-site at the vendor's premises, or in combination. In the case of offshore outsourcing, this also includes depicting the location at which each step of the software-development process is undertaken (see e.g., Ali-Yrkkö & Jain 2005). Figure 18 illustrates a hypothetical example of this division in a simple waterfall model.

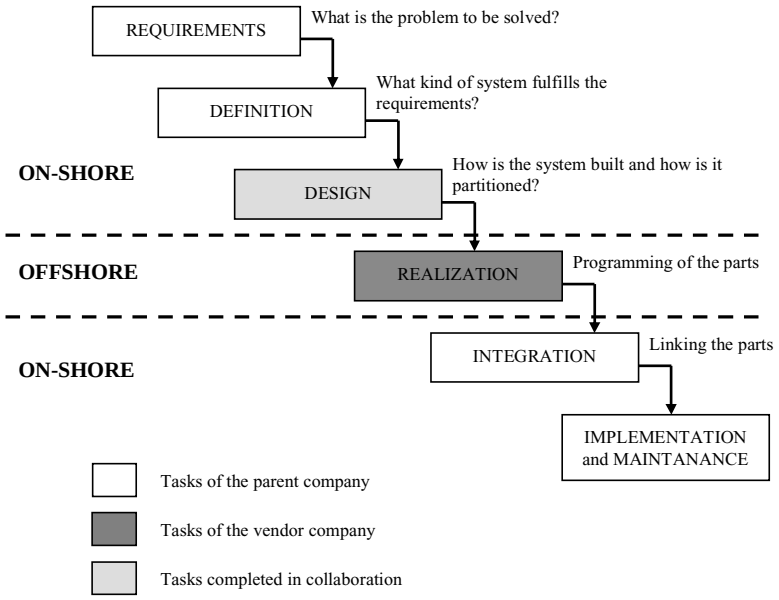

Figure 18 An example of a geographically distributed software-development process

In terms of the incrementality, it has been suggested that firms should start software outsourcing small, at home, and only using external programmers (McFarlan 1995). For instance, small-scale 'body shopping' through having the vendor's staff come over to the client site to complete a minor, non-critical piece of coding (run-time component) or conversion work may constitute a less risky approach to software-development outsourcing (Heeks et al. 2001). As argued earlier, this approach reflects the notion that outsourcing is a learning process involving increases in scope, strategic importance and geographical distance over time (Graf & Mudambi 2005; Hagel & Brown 2005; Maskell et al. 2007; Lewin & Peeters 2006). In the case of ITO, Lacity, Willcocks and Feeny (1996, 14) found that companies engaging in total outsourcing from inception experience significant difficulties. As far as software-development outsourcing is concerned, Amoribieta et al. (2001), for instance, state:

> *"Support projects lend themselves well to building confidence only after a few of them have been carried out successfully should companies entrust development work to an offshore outsourcer – and, even then, it is wise to start with work that isn't critically important."*

Accordingly, and in the context of outsourcing, it may be worthwhile to start with a narrowly defined area of the vendor's responsibilities (see Figure

17), and in time broaden them and thereby the scale and scope of the outsourcing.

It is clear from the above discussion related to the outsourcing decision that several aspects of this process remain unknown. Further, it appears that the small size of the firm is a challenge in several respects.

3.2.3 Managing the implementation in software development outsourcing

The fact that the outsourced tasks in software product development are inherently knowledge-intensive affects the management of software-development outsourcing in several ways. The management phases were therefore further divided into *ex ante* and *ex post* implementation, which are discussed in the following sections.

3.2.3.1 Ex ante implementation

As argued earlier in Chapter 2.2.3, the two key tasks that firms should undertake prior to initiating the transfer of activities are process assessment and supplier assessment. Process assessment was also referred to as the modularization of activities and processes.

Process and product modularity as such has been generally adopted by researchers (e.g., Baldwin & Clark 2000). This applies especially to the software context, and ideas dating back to the turn of the 1970s (Dijkstra 1968; Parnas 1972) have since been adopted by several researchers (Brown & Wallnau 1998; Cusumano 1991; MacCormack et al. 2006; Parnas et al 1984; Stone 1985; Vignone 1980; von Hippel 1990). It has been concluded that system modularization and modular architectures may yield tremendous benefits such as process flexibility in software projects (Baldwin & Clark 2000; MacCormack 2001). Why does successful outsourcing require modularity in system and architectural design structures? In short, it enables the realization of the sought-after benefits whether they are flexibility-, resource- or cost-related. The key to outsourcing in software development lies in the ability to successfully transfer activities to the vendor, and in this context transferring activities could be seen in the light of transferring knowledge. According to Kogut and Zander (1993), the ability to use markets (outsource) is dependent on the complexity, teachability and codifiability of the knowledge that is being transferred. In fact, from this perspective, modularity could affect these aspects in at least three ways, and thereby create

a more suitable setting for the inter-organizational dispersion of software-development activities.

Firstly, modular design structures on the product-architecture level provide a blueprint for the dispersal of software development. One of the key functions of software design is to further understanding of system structures and technologies (Smolander et al 2005, see also Ulrich 1995). According to Mikkola (2003), the extent to which a firm decides to decompose its product architectures and related tasks depends on its scope of knowledge about the system as a whole, in other words its architecture. Dividing and clustering functional entities such as business and software components in the preliminary design of the entire solution gives the firm a better picture of the run-time, software and/or business components that are amenable to dispersion. In addition, modularization of the architecture leads to system documentation. Again, software architecture is assumed to consist of nothing but knowledge in a codified form (Hoch et al. 1999), and how this knowledge is codified and further documented defines the extent to which the product architecture is modular. Knowledge codification is one of the key issues in software-development outsourcing (Grimaldi & Torrisi 2001). Thus modularity in architectural structures decreases the system complexity. It also enhances teachability through documentation, and thereby increases the likelihood of inter-organizational knowledge transfer – in other words – *clarifying and simplifying the point of outsourcing*.

Secondly, according to Schach (2002), maintenance in the form of fault correction (corrective), changes in the client's operations and/or environment (adaptive), and the addition of new capabilities or improvements in performance (perfective) account, on average, for 67 per cent of the total costs of the software-development life cycle. Corrective faults also occur due to the many interdependent linkages and therefore to the 'unmodular' structure of the outsourced component. Companies can increase software-product modularity by reducing the number of design dependencies or rearranging and re-architecting their pattern distribution (MacCormack et al. 2006). Thus the modules that have only few dependencies are likely to be the most applicable to inter-organizational dispersion. Further, modular architectural-design structures and modularization could be expected to lower asset specificity and system complexity, and to reduce the need for fault correction: the lower transaction cost would ensure the realization of the sought-after benefits. Modularity embedded in system-design structures thereby *eases the integration* of externally designed components (point of integration) into the system architecture, as in such cases components could at best be integrated via a simple/single interface.

Thirdly, according to Baldwin and Clark (2000), modularity reflects not only the partitioning and decomposition of the task, but also the design of the interfaces. Interfaces describe in detail how the modules will interact, including how they fit together and communicate (Langlois 2002). This, in turn, allows parallelism in design and testing (Baldwin & Clark 2000; Loch et al. 2001), which enables the identification of mistakes and any disharmonies with the existing system as they occur during the outsourcing process. According to Von Hippel (1990), for instance, nondecomposable systems require development team(s) to receive and use information about what all the other development teams are doing. This emphasizes the need for close cooperation between different teams, and thereby sets various challenges in terms of managing the dispersed product development of software. Accordingly, in the case of outsourcing, it could be concluded that modularity in software product-design structures and processes significantly eases the parent company's task of *controlling and coordinating the entire process* (cf. high-level verification).

Once firms have set up internal structures to support the outsourcing, they need to find a suitable supplier to provide the activity. As argued, selecting the right supplier is the key to a successful of outsourcing agreement (Barthélemy 2003a; Gottfredson 2005). It has been argued that this similarly applies in the context of software outsourcing (Amoribieta et al. 2001). In this case, although there are some industry-specific methods for evaluating possible suppliers, such as the capability maturity model (CMM)[34], it is the prior conceptualization (outsourcing decision) of the outsourced activity that works as the basis of vendor selection (Goldsmith 1994, 15). Furthermore, the small-firm aspect may affect the supplier selection. For instance, prior research on partnering in technology firms has indicated that it is not only the vendor that is expected to provide the necessary expertise: there are several other criteria that emphasize the strategic fit of the supplier (e.g., Child & Faulkner 1998). A supplier that is fit for one firm may not be fit for another. This particularly applies when firms of different sizes are outsourcing. For instance, it may not be advisable for small firms to seek vendors that are bigger than they are, as they will most likely be 'secondary' customers of the outsourcing provider (Gadde & Snehota 2000). In fact, large firms may even be reluctant to exchange resources with smaller firms, as their future is unclear (Gulati 1998). Thus, although it could be argued that the two sets of identified criteria, task-related and strategic compatibility, also apply to software-development outsourcing, it still remains largely unclear how firms in different situations

[34] The capability maturity model is a metric developed by the Software Engineering Institute to specify the level of process maturity associated with a software organization

(outsourcing decisions) choose their outsourcing suppliers for their product-development activities.

It also still remains unclear what kind of tasks software firms might undertake prior to the implementation, and how these changes might assist in later outsourcing management. According to Grimaldi & Torrisi (2001, 1427), the extent to which codifiable knowledge is codified is dependent on the costs and benefits of codification. Although modularity and consequent codification have been found to assist the outsourcing process, modularity is not automatically embedded in the product architectures and production processes. Nevertheless, knowledge codification significantly increases the possibility of capitalizing innovative labor, which leads to economies of scale and dynamic economies in the production of knowledge (Arora & Gambardella 1994; Cowan & Foray 1998). It is likely, especially in small firms seeking rapid growth, that time-to-market targets will supplant the organization's rationalization activities. As Grimaldi and Torrisi (2001, 1430) argue, many small firms still rely on traditional "job-shop, craft like production systems". In such companies, documented knowledge of the software is embedded not only in products (such as processes and programming tools), processes (such as software-development and project-management methodologies, practices (such as norms of communication) and notations (such as the use of flow charts) (Telioglu & Wagner 1999), but also in undocumented knowledge in the form of notes scrawled in the margins of documents and on the blackboard. It is thus more than the documentation specified in formal software-development and quality methodologies (Nicholson & Sahay 2004; Walz, Elam & Curtis 1993). It could therefore be argued that there is a need in entrepreneurial firms to modularize and rationalize architectures and processes with a view to making as much tacit information as possible explicit prior to outsourcing internal activities. The managerial challenges and tasks of undertaking such internal reorganization still remain unclear, however.

3.2.3.2 Ex post implementation

Given the reported challenges connected with outsourcing software-development activities, it is clear that transferring such knowledge-intensive and complex tasks across company boundaries is not a simple task. ITO literature refers to the on-going management of outsourced work as one of the primary determinants of success (Barthélemy 2001). What, then, are the key activities in the management of software-development outsourcing?

Heeks et al. (2001, 55) argue that the key to success in software outsourcing lies in 'synching', more precisely defined as the minimization of gaps in

operations with the subcontractor on the dimensions of coordination/control systems, objectives and values, capabilities, processes, information, and technology. Accordingly, they found that organizational congruence led to success in outsourcing projects. However, the extent of synching required is highly dependent on prior modularization activities, in which tacit and informal information is made more explicit (cf. Heeks et al. 2001).

It could be argued, however, that the key management challenges are not limited to overseeing the outsourcing process, but relate more to the points at which the supplier is assimilated into the development process. As shown earlier, firms need to make intensive efforts in transferring the ownership and responsibility of an activity to the vendor. This transferring of knowledge at the point at which responsibility for the process is transferred to the vendor (point of outsourcing) may involve management issues such as communicating the required development task and synchronizing common processes in order to facilitate fluent task transfer. On the other hand, management tasks also entail establishing procedures for transferring the developed task back to the organization (point of integration), which requires the establishment of processes for the testing, validation and integration of the vendor's deliverables. Perhaps the key task of on-going management relates to ensuring that the entire process is coordinated effectively (high-level verification).

Firstly, as mentioned, one of the key management tasks relates to transferring the activity to the vendor. In the case of software outsourcing this is a question of knowledge transfer (cf. point of outsourcing). In fact, according to Kakabadse and Kakabadse (2000, 717), there is a need to develop a better understanding of knowledge transfer in the outsourcing process. In terms of synching, this entails synching the vendor with the overall product-development process. For instance, Heeks et al. (2001, 56) described a successful software-outsourcing case incorporating a detailed process and project definition and specification development (see also Goldsmith 1994). This ensured that the project methodologies, scope, schedule and deliverables were unambiguously defined and understood by both parties to the exchange, helping to create common processes and an information structure. In fact, as Gumm (2006, 46) states, distributed development often involves challenges related to coordinating the workflow, and accordingly it is vital to clarify who is responsible and for what. In addition, in some cases the vendor needs to be aware of the existing system, especially in terms of the interfaces that are needed in order to bring in the component[35]. It thus seems that one of the key

[35] Such knowledge could also be referred to as "contextual knowledge" of the task (see Apte 1990).

management obligations in software-development outsourcing is to make the vendor's tasks and responsibilities explicit and unambiguous.

On the other hand, as software outsourcing entails decomposing part of the entire development process that is to be integrated into the existing system, these different components need to be continuously monitored until they are accepted and fully integrated (Nicholson & Sahay 2004). Thus, another key management concern is the phase in which the vendor's deliverables are tested, accepted and integrated into the internal processes (cf. point of integration). At this stage the vendor's performance is validated and measured, or in more colloquial terms, clarified in terms of whether it has done all it was supposed to do.

Even though a highly structured and modularized entity enables the parallel design and production of different modules (e.g., Loch et al. 2001), outsourcing software development still requires effective process coordination and monitoring (Eppinger & Chitkara 2006). It has been argued that the key coordination challenges relate to what is being outsourced (the outsourcing objective) and in what way (the outsourcing model) (Gumm 2006, 46). In terms of coordination, much recent research has focused on coordinating offshore software-development outsourcing, and particularly on identifying the potential problems in globally distributed software development (Heeks et al. 2001; Krishna, Sahay & Walsham 2004; Turnlund 2004; Vohra 2003). As offshore outsourcing involves people from different organizations and countries with different languages and working practices working together (Gumm 2006; Järvenpää & Leidner 1999), cross-cultural issues and differences seem to come to the fore, regardless of the scope of the outsourcing model.

Nevertheless, it still remains unclear to what extent modularization assists in transferring software-production activities across company boundaries. In other words, even if the modularity embedded in the product and in the process in which it is developed is helpful, it is likely that the management of such a knowledge-intensive and parallel process as software development does not succeed at arms length: collaboration is needed at many stages. Accordingly, it still remains unclear what the core activities are in the on-going management of software-development outsourcing.

3.2.4 Outsourcing implications for software firms

Coincident with the general results on outsourcing failures, previous research has shown that the outsourcing of software-development activities often falls short of expectations. For instance, Sheremata (2002) found in a recent study

on outsourced software-product-development projects, that only 27 per cent of them met both schedule and product-quality goals. Accordingly, it was concluded that failure was the norm rather than the exception (Sheremata, 2002). Often, this could have been a result of underestimating the hidden costs (Barthelemy 2001). Again, the managerial interest should lie not in the number of failures, but in the insights gained regarding how to achieve set goals: as argued earlier, this is dependent on the correct management of the entire outsourcing process.

However, meeting the pre-determined goals is one thing, but firms may also benefit from outsourcing projects in various ways. For instance, previous research has illustrated that in addition to the widely acknowledged cost savings achieved by outsourcing structured software development (e.g., Heeks et al. 2001), the benefits companies operating in knowledge-intensive and fiercely contested industries could enjoy include accelerated time-to-market (Heikkilä & Cordon 2002; McDermott & Handfield 2000), increased and intensified innovation (Cantwell & Narula 2001; Quinn 1999), internationalization, and consequently growth (Gabrielsson & Gabrielsson 2004; Madsen & Servais 1997). The latter two in particular are hardly ever stated as primary motives for outsourcing. However, Kotabe and Swan (1995), for instance, provide empirical evidence that the products of firms cooperating in the development of high-technology products tend to be more innovative than those of a single firm. Several studies on the software industry have emphasized the importance of external knowledge in developing innovative and more advanced products (e.g., Hagerdoorn 1993; Jordan & Segelod 2006). Customers' suppliers have been identified as the key source of this knowledge, particularly for small software firms (Segelod & Jordan 2004; Woolgar et al. 1998).

In addition, in the context of internationalization, it has been found that the international aspect of inward operations (such as offshore outsourcing) may have serendipitous benefits in terms of further international expansion. For instance, previous studies on international purchasing, sourcing, licensing and franchising have found that in some cases such inward international operations may result in the development of country-related knowledge or location-bound network connections that are helpful in this context (Andersen and Christensen, 2005; Carstairs and Welch, 1982; Karlsen et al., 2003; Korhonen, 1999; Korhonen et al., 1996; Welch, 1990; Welch and Luostarinen, 1993). Yet, in terms of offshore outsourcing, there is little information on how it may facilitate future international expansion.

Accordingly, discussion on the implications of outsourcing should not be limited to the achievement of pre-determined and set goals, and researchers should investigate the secondary as well as the 'hidden benefits' more

thoroughly. Outsourcing may carry several growth and internationalization implications, especially for small firms, which could even be serendipitous. As Harland et al. (2005) suggest, there is a need for more thorough examination of the basis on which the success of outsourcing should be evaluated. Assessing outsourcing performance according to pre-determined measures is important, but firms and researchers alike should also examine the broader implications in terms of overall success.

3.3 The process of outsourcing product-development activities in software firms - the research questions

In general, prior research has indicated that small firms are more dependent on external knowledge acquisition than large companies (Macdonald 1995; Rothwell & Dodgson 1991). Further, it has been argued that suppliers and subcontractors are prime sources of knowledge for software firms (Segelod & Jordan 2004), and they provide a variety of benefits that enable these companies to succeed in the increasingly competitive global environment (Atuahene-Gima 1993; McDermott & Handfield 2000). However, the existing literature gives only limited understanding of how the different outsourcing opportunities and management concerns relate to the context of the software industry. This leads to the purpose of this thesis, which is to examine the process of outsourcing product-development activities in software firms. To this end, a procedural approach to the research goal is adopted, which follows the outsourcing process illustrated earlier in Figure 6 on page 56.

As noted, in the process of outsourcing the first and most important task is to identify the potentially amenable activities (phase 1: internal assessment). This entails identifying the very core competences of the firm, and evaluating whether other activities could be produced externally. However, it was noted that the product strategies of small software firms change along with their growth (Alajoutsijärvi et al. 2000; Ethiraj et al. 2005; Moore 2000; Seppänen 2002). Accordingly, it is likely that their need for external resources evolves alongside the growth process. It has been established that in a changing environment firms must continuously re-invent and upgrade their resources and capabilities if they are to maintain their competitive advantage and growth (Argyris 1996; Robins & Wiersema 1995; Wernerfelt & Montgomery 1998), and that the network structure and network ties evolve in accordance with the different growth stages (e.g., Hite & Hesterly 2001). However, it still remains unclear how a firm's outsourcing strategies change during the different stages of growth. This leads to the first research question addressed in this thesis:

RQ1: Do the overall resource needs and consequent outsourcing opportunities change during the different growth stages of software firms, and if so, how?

Once firms have decided to outsource certain activities, it was established that the next phase is the outsourcing decision, in other words determining what is being outsourced, why, where and how (phase 2: outsourcing assessment). It was argued that these questions have to be addressed as they influence the later choices in the outsourcing process. It was further argued that, despite the extensive research on the outsourcing decision, there is still a lack of insight in terms of its evolution. As mentioned, resource needs shift as the firm grows (Argyris 1996; Robins & Wiersema 1995; Wernerfelt & Montgomery 1998). Accordingly, it is likely that the outsourcing-decision variables change along with this growth. In addition, firm size is a variable that should be incorporated into the analysis of the outsourcing decision. For instance, small firms carry certain disadvantages due to their size and inadequate experience (see e.g., Carmel & Nicholson 2005). These shortcomings in the current research lead to the second research question addressed in this thesis:

RQ2: Do the outsourcing decision-making variables change during the different growth stages of software firms, and if so, how?

As noted, once firms have considered the variables involved in outsourcing decision-making, they often need to make some internal changes in order to build suitable structures (phase 3: ex ante implementation). On the evidence of existing research, it was argued above that prior modularization of products and processes is a great advantage in the outsourcing of software-development activities (see e.g., MacCormack et al. 2006). Yet, there is still limited understanding of the organization-wide changes that could facilitate the outsourcing process. Further, the processes are far from being modular, especially among small software firms (Grimaldi & Torrisi 2001; Nicholson & Sahay 2004; Telioglu & Wagner 1999; Walz, Elam & Curtis 1993). It was also shown that although the factors influencing the vendor selection have been identified, the dynamics and contingencies in different outsourcing situations remain unclear. Given these circumstances, the third research question is as follows:

RQ3: Can software firms increase the probability of outsourcing success prior to implementation – and if so, how - and how do they select the supplier for the outsourced activity?

In terms of the on-going management of software-development outsourcing, previous research has indicated that the management of dispersed product-development activities and of software product development involves a different set of challenges (e.g., Gumm 2006; Heeks et al. 2001; Krishna et

al. 2004; Turnlund 2004; Vohra 2003). However, there is only limited understanding concerning the key management tasks that are associated with the outsourced development of software (phase 3: ex post implementation), particularly when the activity is closely connected to the overall product development of the firm (i.e. software-development outsourcing in software firms). Further, it has been extensively argued that the modularization of product architectures and design processes greatly assists in the management of dispersed product development (Baldwin & Clark 1997; Mikkola 2006; Sanchez & Mahoney 1996; Schilling 2000). Yet, there is only partial understanding of how modularization on different organizational levels assists in managing operations in which ownership and thereby the responsibility for development activity is transferred to an external vendor. Hence, the fourth research question is the following:

> *RQ4: What are the key tasks in managing the outsourced software development, and does prior modularization help in terms of managing the outsourcing implementation?*

Finally, while the success of outsourcing and licensing projects is often assessed in terms of meeting the set targets (phase 4: implications for the firm), it has been noted that outsourcing in knowledge-intensive firms such as software providers may carry wider success implications in terms of growth, internationalization and innovation, for example (e.g., Cantwell & Narula 2001; Gabrielsson & Gabrielsson 2004; Heikkilä & Cordon 2002; Kotabe & Swan 1995; Madsen & Servais 1997; McDermott & Handfield 2000; Quinn 1999). As discussed above, prior research has provided insights into how, particularly among small firms, the established network connections resulting from interorganizational relations may bring wider benefits than initially intended in the creation of what is referred to as a 'value network' (see e.g., Möller et al. 2005). However, this perspective has not been widely adapted to outsourcing relations. As discussed earlier, outsourcing and licensing strategies should be aligned to support the overall strategy of the firm (Dess et al. 1995; Lonsdale 1999; Nadler & Tushman 1999; Quélin & Duhamel 2003), but when the implications and performance are assessed, the implications for the overall strategy of the firm are often overlooked. Accordingly, less is known about how, and more importantly in what way, outsourcing and licensing may facilitate the growth, internationalization, innovation and overall performance of a software firm. This leads to the fifth and final research question addressed in this thesis:

> *RQ5: Does outsourcing facilitate the growth, internationalization, innovation and overall performance of a software firm, and if so, how?*

Although all of the above five research questions are formulated so as to consider certain issues on a yes/no basis in the first instance – whether the phenomenon in question occurs or not – the primary purpose is to examine the root causes of certain phenomena – in other words "how" certain things happen. However it is imperative not to jump to hasty conclusions, and therefore whether or not something happens or has an effect should be established first. The theoretical framework of the outsourcing process described and elaborated in Chapters 2 and 3 provides the structure for the empirical analysis. However, as discussed earlier and a is evident in the research questions postulated above, the framework per se is not the central issue to be revisited in the empirical study, although it again provides the structure for the analysis.

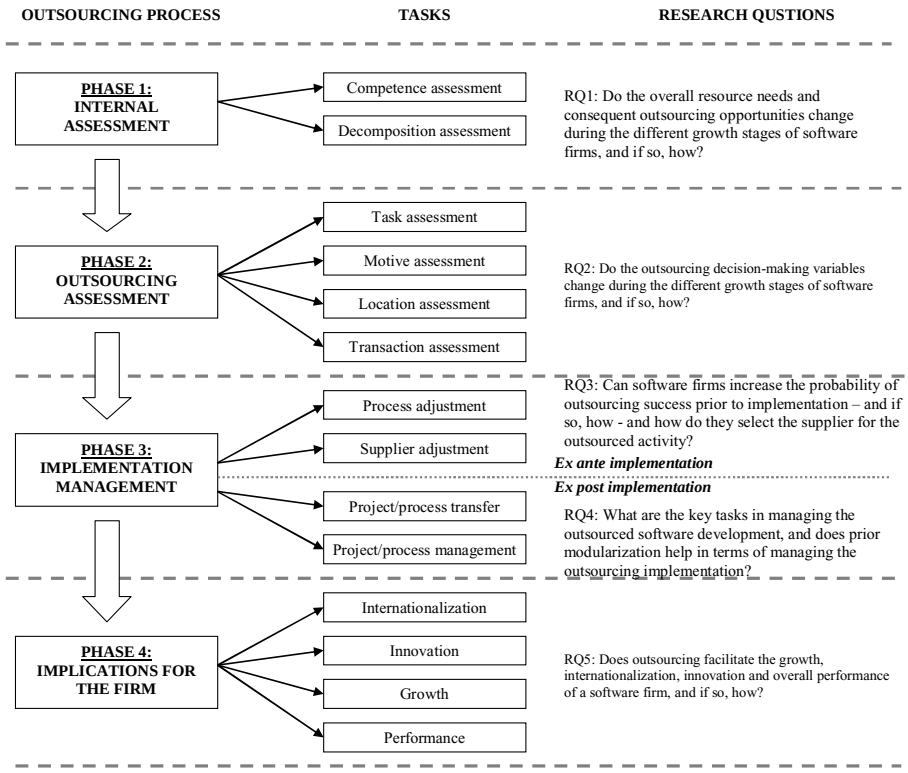

Figure 19 Combining the theoretical framework and the research questions

Figure 19 illustrates the theoretical structures in terms of the outsourcing process and the tasks related to each phase, and the relevant research question. These five questions are examined in the following empirical study. The next

chapter describes the research design, the aim of which was to provide insights into the questions. After this, the results of the empirical study are discussed.

4 RESEARCH DESIGN

The aim of the study lies in building insights for researchers and practitioners in areas in which previous research provides only limited or inadequate understanding. Firstly, in terms of theoretical aim, it is argued that although much research exists on outsourcing, particularly in the context of IT, less is known about outsourcing in the context of small software firms: previous research is strongly biased towards examining the different aspects of this phenomenon through the lenses of MNCs. Further, mainly due to the inherent complexity, researchers have identified several areas of the outsourcing process of which, despite its growing importance, previous research provides only limited or inadequate understanding. These aspects include the initial assessment, the location decision, pre-implementation management, and the performance implications (Bunyaratavej et al. 2007; Doh 2005; Harland et al. 2005; Knudsen & Servais 2005; Kotabe and Murray 2004; Miozzo & Grimshaw 2005, to name a few). Therefore, from the theoretical perspective, the contribution of this thesis lies in further elaborating the phases of the outsourcing process and the management issues in each phase, and further, in shedding light on how the different decision-making variables and management challenges change in the context of software firms. Accordingly, the theoretical aim is to build, refine and develop the current theory base (Eisenhardt 1989a; Yin 1991).

From the managerial perspective, and secondly, outsourcing is undeniably one of the key strategies adopted in order to compete in the current business environment. It is also one of the key issues guiding current research on organizations and their strategies. Yet, in terms of existing research, it is among the most controversial of topics. Given the high political interest, which is attributable to the visible nature of job losses, for instance (e.g., Kletzer 2005), many researchers have come down on the side of either justifying the appropriateness of the strategy or of denigrating it. Yet, the problems of outsourcing are not in the strategy per se, but in the companies that apply it. It was argued above that through the correct follow-through of the outsourcing process companies could achieve game-changing increases in performance levels. As a result, they will create more jobs and wealth to the benefit of the whole of society, even if the outsourced activities are headed abroad (e.g., Gilley & Rasheed 2000). Research on outsourcing should thus be aimed at increasing our knowledge of ‘how to do it right’, rather than

descriptively focusing on the influences of the strategy. In fact, as one of the managers who was interviewed for the purposes of this study stated:

> *"What really interests me in outsourcing from a research perspective is why some succeed and others fail in their outsourcing endeavors. […] I would like to know how I can outsource successfully"*

Accordingly, the purpose of this study from the managerial perspective is to provide a deeper understanding of the outsourcing opportunities in a certain context, and as a result to provide insights for researchers and practitioners on 'how to do it right'.

4.1 Philosophical approach

It is argued that in the social sciences the researcher approaches phenomena through certain explicit or implicit assumptions about the nature of the social world and the phenomenon in question (ontology), and about the basis of knowledge and how the phenomena can be studied (epistemology) (Burrell & Morgan 1988). As these assumptions may influence the chosen research strategy and the methods applied in a given situation (e.g., Pihlanto 1994), it is worth touching upon the issues involved prior to elaborating further on the design and implementation of the empirical research in question.

Yet, it seems that within the philosophy of science, none of the doctrines of the different philosophical schools related to epistemological and ontological issues match per se. This is quite common as it is often noted that it is not even useful to approach research problems through philosophical doctrines, and that it is better to use the methods that are most applicable to each given problem (Arbnor & Bjerke 1997; Toivonen 1999). In terms of philosophical discussion, this study adopts a pragmatic approach, as opposed to the purist approach, according to which the methodological choices are never independent of the assumptions about the ontology and epistemology and the relationship between the actors and their environment (e.g., Hurmerinta-Peltomäki & Nummela 2004; see Burrell and Morgan 1988). Therefore, the aim of the following discussion is to elaborate on the philosophical standpoint of this study through (1) the research problems, (2) the theoretical discipline behind these problems, and (3) the methods applied. These are highly interrelated issues in that research problems often affect the theoretical discipline and the research strategy (applied methods) (Marshall & Rossman 1989; Noordhaven 2004; Yin 1989). Yet, it is not uncommon for researchers working under different epistemological assumptions to approach certain/similar research problems from different strategic standpoints and to adopt different underlying theories.

Firstly, in terms of the research questions, one of the key aspects of epistemological discussion, which also lies behind the general subjectivist-objectivistic dichotomy, concerns context dependency, in other words whether the actors' decisions are influenced by the operating context (determinism) or whether the context itself has no bearing on the decision-making (voluntarism) (Burrell and Morgan 1988). Quite often in business the research context in which the firm operates has an impact on its decision. Accordingly, a quite common view is that no company can operate entirely of its own free will, regardless of others, and its activities are determined to some extent by the situation or the environment in which it is located. In fact, it has even been argued that the initiation of outsourcing often produces a domino effect as a result of the competitive market pressures (Lacity & Hircheim 1993a). As such, this implies determinism, yet the following phase of the process, the outsourcing decision, seems to emphasize voluntarism though rational decision-making (e.g., Quinn & Hilmer 1994). Thus, in the context of this study, I believe that the level of voluntarism, or equally determinism, varies along with the different phases of the outsourcing process, and from a philosophical standpoint the studied phenomenon and respective methods have been considered in terms of their suitability to each setting and the research problem itself (Arbnor & Bjerke 1997, 9). Yet, in general, the research on outsourcing is characterized by high levels of context dependency and overlap, and intervened stages of decision-making (e.g., Graf & Mudambi 2005), which should be taken into account in the selection of the research methods, and accordingly in the epistemological approach to the different aspects of this phenomenon.

Secondly, the philosophical fragmentation shows even within the theoretical disciplines applied in this study. For instance, the network approach is often contrasted with a subjectivist, relativist and constructivist orientation (Tikkanen 1996), while the resource-based view, along with the related competence- and knowledge-based views, are often looked at from a very positivist perspective[36]. On the other hand, the idea that companies are closely interrelated through resource ties and activity links is, of course, the core proposition in the industrial-network approach. This viewpoint is also put forward in the more recent network propositions, which are primarily based on the resource/capability view (RBV) of the firm (Möller et al. 2005), thereby providing a more positivistic vein to the network approach. Further, whereas the industrial-network approach often emphasizes high levels of determinism through the path dependency of network ties, the transaction-cost approach,

[36] Although the network approach per se is not used as a theoretical structure in this study, ideas from it are applied with respect to the 'why' and 'how' questions (see Figure 5 on page 50).

which does not include the determinism of path dependency, emphasizes high levels of rationalism and thereby seems to be a rather voluntaristic approach to outsourcing decision-making. Yet, even the TCE approach takes account of the irrationality of decision-making, i.e. bounded rationality (see Williamson 1975). Accordingly, and without going any further into the eutrophic theory base regarding the outsourcing phenomenon, even the two primary theoretical disciplines of outsourcing decision-making do not allow the possibility, from the theoretical perspective, of adopting a single epistemological research approach.

Thirdly, in pragmatic terms, mirroring the methods and the research approaches that were deemed most suited to the research questions against philosophies of science made the study appear very fragmented from the philosophical standpoint. For instance, if we consider again the objective-subjective dichotomy, which is very common in philosophical analysis, on the one hand this study assumes an empirical and idealist nature through the chosen qualitative approach, but on the other hand the research has some positivistic symptoms and thereby influences from realism and even rationalism. In fact, although it has been argued that not only regulation and radical change, but also objectivism and subjectivism are exclusionary in a single sociological study (Burrell & Morgan 1988), it is common, or even necessary, for interpretive studies to encompass some objectivist features in addition to their subjective elements (Kakkuri-Knuuttila, Lukka & Kuorikoski 2005). In fact, according to the new social realism, which is a current trend in scientific philosophy (see e.g., Fowler 1996), we should not accept antitheses such as objectivism versus subjectivism as they are infertile, but we should drive for synthesis. In fact, the adoption of a realistic approach to inter-organizational relations (such as outsourcing) may help to avoid the recognized pitfalls of a purely positivistic or phenomenological approach, and thereby facilitate a clear and true understanding of the issue under study (Stiles 2003, 296-270). Even the chosen research approach does not determine the epistemological perspective of a study: for instance, a qualitative study referred to as subjectivist often embodies positivistic and thereby objectivistic characteristics (see e.g., Eisenhardt 1989a).

Accordingly, in epistemological terms, as a positivist feature this study adopts the assumption that regularities and causal relationships exist, but only in some cases and in specific areas, which limits the context-related effects. However, whereas the objectivist approach often emphasizes the research methods and thereby tends to incorporate quantitative research, subjectivist research aims at a more hermeneutic understanding and at close contact with the phenomenon, and thus often emphasizes qualitative methods (Hurmerinta-Peltomäki & Nummela 2004, see also Evered & Louis 1981). Consequently,

while the epistemological approach entails positivistic characteristics, in methodological terms this study seems to take a rather constructivist/subjectivist view in emphasizing the contextual issues. However, I believe that cause-and-effect (causality) thinking is often embedded in the individual situation and regularities are therefore largely impossible to construct. If ceteris paribus seems to be nearly impossible to attain in business research, the examination should focus on the influence of the context on the causality. In epistemological terms, the quest for causal relationships and their broader applicability could be identified as an objectivist and positivistic feature of this thesis, but in general, the relativism arising from the highly context-dependent research problem implies a subjectivist mindset. The context dependency of causality is, as often in business economics research, the main and culminating issue addressed in this study, and thus it is believed that careful application of research methods based on both idealism and realism will provide fruitful results and, at best, broader applicability.

4.2 The qualitative research approach

The research process followed in this study could be characterized as one with high interplay between theory and empirical research. Although the primary aim of the thesis lies in inductive analysis and theory building through qualitative research, it is to be noted that research is hardly ever purely inductive or deductive. However, qualitative research more often resembles an abductive discussion between the theory and the collected empirical data (Dubois & Gadde 2002). It is argued that this kind of dialogue between induction and deduction is essential in terms of scientific progression (Babbie 1989, 44).

The identification of the research problems began with a thorough analysis of the existing literature and research on the topic, in other words outsourcing. As the original idea was to take a qualitative approach in the form of case studies, examination of the existing literature was imperative: as Weick (1979), for instance, argues, investing in theory keeps control of the burgeoning set of case descriptions. Further, stronger reliance on theory helps to improve the explanatory power of case studies (Dubois & Gadde 2002; Easton 1995). When the research gaps had been identified a research strategy for the empirical analysis was created.

According to Morgan and Smircich (1980, 498), once the ontological assumptions of the reality encompass more than the world as a concrete structure, and consider human beings as actively contributing to its creation,

quantitative methods become increasingly inadequate. Epistemologically, this kind of relativistic view of the reality that acknowledges the many context dependencies and complexities of the studied phenomena often drives researchers to adopt qualitative methods (Halinen & Törnroos 2005). Accordingly, qualitative methodology was chosen for this study with a view to gaining a deeper understanding of the explored phenomenon.

The tradition of applying qualitative methods in management research dates back to the 1960s (e.g., Chandler 1962), and in terms of international business research to the 1970s (Johansson & Wiedersheim-Paul 1975): such methods have been applied in the social sciences since the early 1900s, however (see Shah & Corley 2006). They are applied extensively in a broad variety of subject areas including psychology, sociology, political science, anthropology, history, economics, urban planning, public administration, public policy, management, social work, and education (Yin 1994). In fact, the collection of subjective data through qualitative methods rather than by relying on more positivistic research traditions was more effective in positioning this study, in other words in management and international business (Noordhaven 2004, 96-96).

Although qualitative methodology has gathered supporters among researchers in wide-ranging disciplines, it is still often unclear to many what the research strategy and concept of 'qualitative research' entails (Shah & Corley 2006). According to Morgan and Smircich (1980, p. 491):

> *"Qualitative research is an approach rather than a particular set of techniques, and its appropriateness derives from the nature of the social phenomena to be explored."*

Accordingly, qualitative methodology or research as a label has no precise meaning in any of the social sciences. Yet, it could be considered an umbrella term covering an array of interpretative techniques for describing, decoding, translating, and otherwise coming to terms with the meaning, not the frequency, of certain more or less naturally occurring phenomena in the social world (Van Maanen 1979). The rationale for applying qualitative research derives from the characteristics of the phenomena to be explored. It has been found useful in terms of creating novel and accurate insights, particularly in areas in which (1) there exists only limited prior knowledge and (2) the extant theory seems inadequate (Benbasat et al. 1987; Creswell 1994; Eisenhardt 1989a; Eisenhardt & Graebner 2007; Locke 2001; Yin 1994), when (3) 'how' and 'why' questions are addressed concerning a contemporary set of events over which the researcher has little or no control (Yin 1994), and in situations in which (4) the explored phenomenon is highly complex and involves many identifiable, yet often unclear context-related interdependencies and relationships (Benbasat et al. 1987; Halinen and Törnroos, 2005; Yin, 1994).

In terms of the empirical study reported in this thesis, all of the listed conditions generally apply.

Firstly, in terms of theoretical novelty, it is argued that the strength of the qualitative study is in the likelihood of its resulting in theory building, development and refinement (Eisenhardt 1989a; Lukka 2005; Yin 1994). Case-study research is particularly suitable in cases in which research and theory are still formative (Eisenhardt 1989a, 547-548; Benbasat et al. 1987, 369). Accordingly, case studies are meaningful in situations in which there is only limited prior knowledge, or the extant knowledge seems inadequate (Eisenhardt 1989a; Yin 1994). When the quantitative approach allows for theory validation through hypothesis testing, it entails limitations in terms of examining phenomena that are complex and novel. In fact, qualitative research, such as case research, often provides a sound basis for further quantitative study by identifying the variables related to a specific phenomenon (Lukka 2005), or by complementing the use of quantitative methods in other ways (Eisenhardt 1989a; Hirsijärvi et al. 1997; Yin 1994). It was shown above that, despite the large amount of research on the phenomenon of outsourcing, several aspects of this complex issue remain inconclusive, especially in the context of SMEs. Accordingly, the conclusion was reached that the current outsourcing theory base, and particularly in this specific context, was inadequate. Overall, size is an important variable that should be incorporated especially into strategy studies (Coviello and McAuley, 1999; Smith et al., 1989), as it is likely to have an impact on the results. Therefore, the qualitative approach was chosen as a means of building theories on the basis of the insights gained from the field-based interviews and the case data (building), and in order to elaborate further upon prior theories or frameworks by making them clearer, adding more details (development), and broadening the scope (refinement) (Eisenhardt, 1989a; Kotabe et al., 2007; Lukka, 2005).

Secondly, as elaborated by Yin (1994), the qualitative approach is suitable not only in specific situations in which the current theory base is inadequate, but also when the ‘how’ and ‘why’ questions concern a contemporary set of events over which the researcher has little or no control. In fact, research questions in general often set the framework within which the methodological choice is made (Denzin and Lincoln 2003; Eisenhardt 1989a; Silverman 2003). As the research questions drawn up for this thesis indicate, the emphasis is on the ‘how’ questions in a contemporary setting, which according to Yin (1994) further justifies the qualitative approach.

Finally, in terms of focus, as Ethiraj and Levinthal (2004) complained, the problem with outsourcing complex systems is that it is not an exact science that will result in an optimal solution. Outsourcing as such is a complex

system, comprising several individuals and organizational parts that operate in a specific context. Accordingly, together with the related decision-making aspects, it is a phenomenon that is argued to have several context-related dependencies. This has driven researchers from the early days until today to adopt qualitative methods in their attempts to promote understanding of this complex phenomenon (e.g., Ang & Straub 1998; Baden-Fuller et al. 2000; Beulen et al. 2005; Cross 1995; Currie and Willcocks 1997; Cullen et al. 2005; DiRomualdo & Gurbaxani 1998; Domberger 1998; Earl 1996; Dubois & Gadde 2002; Lacity & Hirschheim 1993a; Lacity et al. 1995; McFarlan & Nolan 1995; McLellan et al. 1995; Quinn & Hilmer 1994; Sanders et al. 2007; Tayles & Drury 2001). The qualitative approach provides a suitable setting for such purposes, as rich anecdotal description adds depth, comprehensiveness and knowledge to the general picture (Minzberg, 1979; Shah and Corley, 2006).

In sum, qualitative methodology was chosen for this thesis. Outsourcing is a complex issue in itself, which is one reason for adopting such an approach. It could be argued that this, together with its complex and highly context-dependent nature - which should be taken into account in attempts to understand the dynamics involved (Halinen & Törnroos 2005) - make the qualitative approach a sound, and perhaps the only viable basis on which to proceed. In fact, the research process follows the logic of the model for in-depth research on strategic networks devised by Borch and Arhur (1995, 433). Figure 20 illustrates the process from theoretical rationalization to data collection and analysis. This process of collecting the qualitative data and the subsequent analysis are further elaborated below.

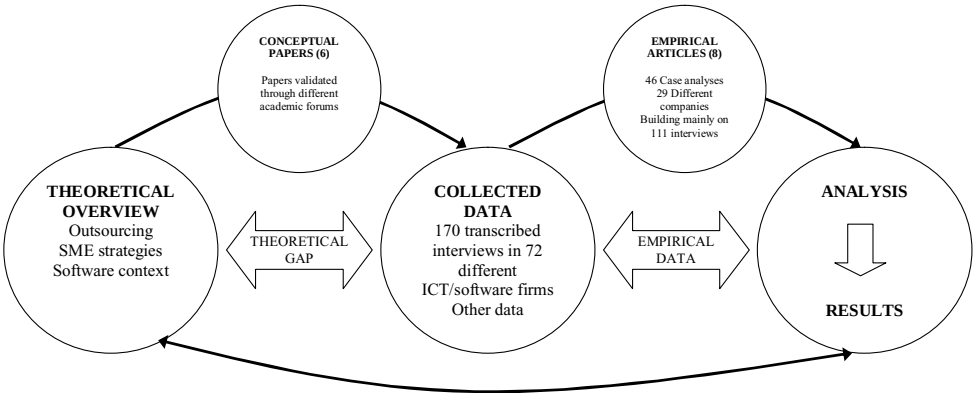

Figure 20 The research process

As illustrated in Figure 20, the research process began with a theoretical overview, basically entailing an examination of existing research on issues related to outsourcing, SME strategies, and the software business as a context. As elaborated earlier, this incorporated relevant research and current theories from the perspectives of strategic management, international business and software business. Several conceptual articles covering these issues were written, basically to validate the research gap. Once the theoretical gap, which was introduced earlier in this thesis, was established, qualitative research was conducted in order to gain insights into the identified limitations. This process of collecting the qualitative data and the subsequent data-analysis process are further elaborated in the following.

4.2.1 Data collection

The data presented in this thesis was collected as part of a Global Network Management research project, which was primarily funded by the Finnish Funding Agency for Technology and Innovation Development (TEKES), and organized in cooperation with Turku School of Economics and Lappeenranta University of Technology. An extensive amount of data was collected during this three-year research project, which lasted from May 2005 to February 2008. The data consists of interviews, secondary materials, internal company reports, and observations, on which the results reported in this thesis are based. The collected data and the analysis are further elaborated in following.

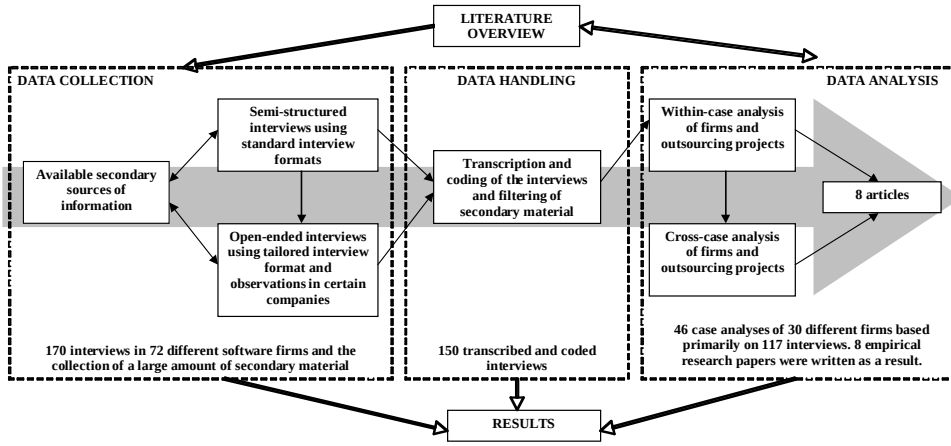

Figure 21 The data collection and analysis

Firstly, and most significantly in terms of data collection, representatives of a total of 72 different Finnish firms from the ICT sector were interviewed between September 2005 and August 2007. Approximately 170 interviews were conducted altogether. This process comprised two distinct phases.

The first interviews were conducted by the researcher[37] using a standard semi-structured interview format. Semi-structured, like open-ended, interviewing entails using a pre-determined structure, which falls in between the completely standardized and the unstandardized format. This strategy involves using a number of questions and specified topics that have been decided beforehand. In a typical semi-structured interview the themes and topics are known beforehand, but there are no fixed response alternatives and thereby the respondents are able to elaborate upon the issues concerned (Berg 2004; Eskola & Suoranta 1998; Hirsijärvi et al. 1997). The interview structure was pre-tested in trial interviews (Hirsjärvi et al. 1997, Silverman 2003, Yin 1994), which were conducted during the start-up phase of the Global Network Management research project in 2005. The purpose of these initial interviews was to identify the firms' outsourcing activities, and further to clarify retrospectively different aspects of their strategies. The interview topics were related to past and current overall development and strategies, internationalization, and different partnering actions (including all varieties of outsourcing and licensing)[38]. This allowed the researcher to gain a thorough understanding not only of the outsourcing strategies of the firm, but also of the context in which each outsourcing decision was made, and further of the implications with regard to the firm's growth, for instance. Understanding the company background enabled the researcher to produce a more thorough analysis of the decisions and choices made. The use of a standardized interview outline also increased the consistency of the collected data (Appleton 1995). The respondents were selected on the basis of their ability to bring insights into the examined areas. Accordingly, CEOs, CTOs, sourcing managers and marketing managers were among the interviewees.

Secondly, following the initial interviews, certain companies were selected in which further interviews were conducted on specific issues. The selection was based on their suitability and theoretical as well as conceptual value to the study (cf. Eisenhardt, 1989a): the companies were able to provide further information about the phenomenon. A specific interview outline was used,

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[37] In some cases the researcher was paired in conducting the interviews. The reasoning behind this researcher/investigator triangulation is explained later in this chapter.

[38] Accordingly, three different standardized interview structures were used in the first phase of the research process so that a thorough understanding of the firms' strategies and operations could be gained: overall strategies, past and future internationalization, and partnering actions including retrospective questions regarding past outsourcing/licensing decisions.

often tailored to a specific firm and situation. There were several underlying reasons for this choice. Firstly, aspects of the outsourcing decisions were more identifiable in some firms than in others. Moreover, as the outsourcing decision was mainly considered retrospectively, some parts of the process were more clearly remembered than others. Further, given the highly context-dependent nature of outsourcing, which is strongly affected by prior product and operational strategies, it was found early on that further scrutiny of the processes/projects required understanding of the context. It was also found that software-development outsourcing often involves persons from different levels of the organization (e.g., programmers, project managers and even the CEO), and it was quickly realized that these persons had a tendency to view the outsourcing from different perspectives. Accordingly, it was difficult to create a pre-determined interview outline that could be used across organizations, or even with different respondents within the same organization. For this reason, the interview outlines were tailored to suit the context, in other words the organization and the interviewee.

In order to increase the credibility of the results, a tape recorder was used to store most of the interview data (Appleton 1995, Silverman 2003, Yin 1994). All of these recorded interviews were subsequently transcribed for further analysis, which resulted in approximately 156 hours of transcribed interview material. Several interviews, mainly in the given number of companies, were not recorded, and notes were taken. Some of these were not transcribed due to the appropriateness of such actions: transcribing is very expensive and time-consuming, and it is worthwhile only when it is considered fundamental to the research (Grönfors 1982, 156). In such cases, notes were taken during and after the interviews, and were then used in the analysis.

In addition to the 170 interviews that were conducted in these two distinct yet to some extent overlapping stages, a rather large amount of data was collected from the case companies through existing internal reports, presentations, and calculations, for example. The interview data was frequently corroborated by some secondary information on the case companies (cf. Hirsjärvi et al. 1997, Yin 1994). In the majority of the firms the researcher had access to internal documents, reports, and contract outlines, which assisted in the case analysis. Secondary sources such as newspaper articles were also analyzed when available, thereby giving a more comprehensive and objective basis, and further validating the interview data. In fact, it is evident from the data-collection process and the amount of data that the researcher was highly involved and inside the firms. Although the strength of qualitative research lies in acquiring in-depth knowledge of the studied phenomenon, the level of participation of the researcher varies. Evered and Louis (1981) describe this continuum as inquiry from inside versus inquiry from outside. The data

collection for this thesis in most cases entailed a high level of participation as many of the firms were involved in the research project (GNM), which in turn allowed the researcher to gain access to internal documents and therefore to gain insights into the phenomena from the 'inside'.

Triangulation was also applied in several forms during the research process in order to increase the possibility of gaining a deeper understanding of the phenomenon under study. Denzin (1979) distinguishes between data triangulation (the use of a variety of sources), investigator triangulation (the use of several researchers), theory triangulation (the use of multiple perspectives to interpret a single set of data), and methodological triangulation (the use of multiple methods to study a single problem). The use of different triangulation methods contributes to the depth and breadth of the results (Denzin & Lincoln 1994, 2), as it enhances the investigator's ability to achieve a more complete understanding of the phenomenon in question (Jick 1979). For instance, as software outsourcing includes several managerial and technical aspects, the researcher in some instances paired with someone with a technical background: although knowledgeable on managerial issues, he lacked a deeper technical understanding. Although the interviews were not focused on the technical aspects of software outsourcing, in some instances the respondents communicated using technical terminology, with which the researcher was not fully familiar.

The next phase after data collection entailed organizing the data for analysis. This is a phase that often demands substantial effort when qualitative methods, as in this case, are used (Hirsijärvi et al. 1997). The transcriptions of the interviews were then further categorized and coded using a simplistic method. As Berg (2004, 38) states, understanding how data can be arranged and managed is very important given the volume of qualitative raw data. Yet, due to the large amount of data, thorough and detailed coding of the entire set was not considered profitable. The interview transcripts were coded on the basis of what was discussed (the discussion topics), what were the key findings from the specific interview (findings), and what theories could be applied to explain these findings (theoretical connection). Further, cross-referencing was carried out if there was relevant information that complemented some of the internal or other secondary material. Although this was not a very thorough or rigorous process, it certainly helped in the further composition of the case descriptions as well as in the data analysis. The data-analysis process is discussed in following section.

4.2.2 Data analysis

The data analysis involved inducting insights from the interview data, and processing the data further in order to gain more in-depth understanding of the phenomenon. Basically, this entailed first conducting within-case analyses[39] of the transcripts (write-ups), and organizing them into descriptive retrospective narratives of each case company (Eisenhardt 1989a; Miles and Huberman 1994, Yin 1994). As mentioned, reflections or other remarks (connected to the secondary material, for instance) were made in the margins of the transcripts, and in some cases separate memos of the key observations from each interview were written (Miles and Huberman 1994). In particular, when the collected data, and thereby the case (project), was found particularly suitable in terms of providing insights into a certain part of the outsourcing process or a specific research question, a separate description and memo was constructed. The case descriptions and separate case memos were in many instances sent back to the respondents, or at best were discussed in a common workshop with the companies' representatives. This allowed the researcher to fill any gaps in the data, and furthermore limited the risk of making subjective interpretations (Appleton 1995, Miles and Huberman 1994, Silverman 2003, Yin 1994).

Once the cases had been analyzed on the basis of the research problems, and the areas in which the cases provided possible insights identified, a cross-case analysis of several[40] firms/projects was conducted (Eisenhardt, 1989a; Miles and Huberman, 1984). This entailed combining the findings from the multiple cases in a single diagram/table in order to identify the differences and similarities. The analysis was based on the prior theoretical structuring of the outsourcing process, which identified the structures and variables according to which further analyses were compiled. The cross-case analyses focused on specific issues regarding the outsourcing process, such as the stage (e.g., pre-implementation), or more narrowly on a specific issue within the stage (e.g., the location decision with regard to the outsourcing decision). This narrowing of the focus enabled the researcher to concentrate on certain specific issues that had a similar theoretical background. As it Weick (1979, 38) complained,

> *"many pseudo observers seem bent on describing everything, and as a result describe nothing."*

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[39] The analysis was either on the firm or the project level, the latter being more prevalent. However, as many of the cases correlated firm strategies and outsourcing/licensing projects, making a clear analytical distinction was a difficult task.

[40] In some instances and in some specific areas, the collected data did not allow the making of cross-case comparisons. For instance, with regard to the 'pre-implementation' stage, only one case company had made some internal changes prior to outsourcing. Such limitations led to relying on single-case analyses in certain areas.

These cross-case, or equally single-case, analyses were further written into reports, which were submitted to academic conferences in order to receive feedback, and further submitted to various academic journals.

4.3 Addressing reliability and validity issues

It has been argued that whereas the qualitative approach has potential in terms of theory development and building due to the depth of understanding it provides, it nevertheless lacks broader applicability. Highly positivistic proponents of case studies argue that the results derived cannot be generalized, nor should case research aim at that (e.g., Eisenhardt 1989a; Yin 1994). For instance Weick (1969, 18) suggested that case studies are too situation-specific and therefore not appropriate for generalization. Similarly, Hartley (1994, 208) argues that although there is a simplistic argument claiming that case studies are meaningful and rich, there is an equally simplistic counter-argument claiming that they are lacking in exactness and reliability, and that they do not address issues of generalizability. It is often argued that case methods succeed better in generalizing to theory rather than to the population due to the methodological limitations (Eisenhardt 1989a; Yin 1994). Yet, the basic premise that qualitative research produces no single objectivist broadly generalizable truth does not mean that the validity and reliability of the results cannot be assessed: it rather advocates analysis in which the criteria should differ from those used in objectivist quantitative approaches (Lincoln & Guba 1985, 289-293; Kirk & Miller 1986, 19). Accordingly, the issues of validity and reliability in terms of qualitative research, and further, in terms of the study in question, are discussed below.

The discussion of validity and reliability has traditionally been restricted to quantitative research (Silverman 2003), and thereby it is often argued that they are not, as such, suitable criteria for assessing qualitative research (Eskola & Suoranta 1998, 211-212). However, it could just as easily be argued that some qualitative studies are more valid and reliable than others. In fact, validity and reliability are the prime determinants of goodness and trustworthiness, and thereby it is advisable to address these issues (Johnson 1997; Lincoln & Guba 1985; McKinnon 1988) despite the unclear guidelines for analyzing the reliability of qualitative research (Eskola & Suoranta 1998, 209). Whether the aim is at generalizing to theory or seeking some level of generalization to the population, validity and reliability are issues that cannot be avoided or compromised in either the conduct or reporting of field research. Failure to do so prejudices the researcher's faith in the results, and furthermore the

researcher's own prejudices may shape the findings of the study and jeopardize the acceptability of the results (McKinnon 1988, 35).

What, then, is validity and reliability, and how can it be defined in qualitative research? In terms of quantitative research validity is defined as

> *"the degree to which a variable corresponds to the concept that it is designed to measure"*

and reliability is

> *"the degree to which variables used to measure concepts yield consistent and repeatable measures" (Zeller & Carmines 1978, 7-8).*

Similarly, in terms of qualitative research, validity refers to the appropriateness and relevance of the methods used, the approaches, the research techniques, the language and the type of writing, for example, given the research object and questions. In other words, the validity of a study could be seen as the extent to which the methods used measure what they are supposed to measure. Validity is to do with whether the researcher is studying the phenomenon she or he purports to be studying. Reliability, on the other hand, concerns whether the researcher is obtaining data on which she or he can rely, and is tightly connected to the execution of the study. The question to be asked when evaluating reliability is whether some other researcher would have produced similar results. The researcher must try to avoid accidental circumstances that might result from the respondent's lack of concern or care, which could prejudice the credibility of those responses. (Kirk & Miller 1986; McKinnon 1988; Yin 1994)

Validity is further classified as external or internal. Whereas internal validity refers to the appropriateness of the chosen method to the theoretical problem, external validity refers to the repeatability of the results and thereby the degree to which their broader applicability can be argued. Therefore, in terms of validity, the epistemological standpoint influences the scope and breadth of the researcher's need to address these questions. If theory is generalized the researcher needs primarily to argue the appropriateness of the chosen method to the theoretical problem (methodological or internal validity). On the other hand, if some level of broader applicability is sought, he or she also needs to consider the validity in this context (external validity). Accordingly, the different epistemological assumptions in quantitative research require researchers to adopt a slightly different approach to the validity and reliability of qualitative research (Lincoln & Guba 1985, 289-293; Kirk & Miller 1986, 19). Thus, validity in qualitative research could be seen as the appropriateness and relevance of the methods, approaches, research techniques, language, type of writing, and so on, to the research object and the research questions (McKinnon 1988, 36.). Further, Johnson (1997), for instance, identified three types of validity in connection with qualitative

research: theoretical validity, descriptive validity, and interpretive validity. Theoretical validity concerns whether the explanation developed from the theory fits the data and is thus credible and defensible. Descriptive validity, in turn, refers to the researchers' ability to report accurately what actually happened. Finally, interpretive validity means the degree to which the interviewees' viewpoints, experiences and thoughts are accurately understood and reported by the researcher (Johnson 1997). All of these aspects are more or less concerned with the appropriateness of the chosen method and the execution of the research process (internal validity) rather than with the broader applicability of the results (external validity).

One of the prevailing ways of addressing issues of validity, in other words trustworthiness, in qualitative research is according to Lincoln and Guba's (1985) classification. Lincoln and Guba (1985, 301-327) distinguish four measures for evaluating the trustworthiness of a qualitative study: (1) dependability, (2) confirmability, (3) credibility and (4) transferability. Similarly, McKinnon (1988, 36-39) argues that various characteristics of interviewing might affect the validity and reliability of the study and thus lead to distorted results, and proposed some avoidance tactics and strategies. The threats include observer-caused effects, observer bias, data-access limitations, and the complexities and limitations of the human mind. The trustworthiness of the study at hand is analyzed in the following in the light of Lincoln and Guba's (1985) measures, bearing in mind the threats pointed out by McKinnon (1988).

Dependability refers to the researcher's ability to present consistently truthful and reliable information about the phenomenon (Lincoln & Guba 1985, 298-299). McKinnon (1988, 36-39) identified at least three threats that may have an effect on the dependability of the results. Firstly, 'observer-caused effects' concern the presence of the researcher in the study setting. The physical presence of the interviewer might result in a change in an interviewee's natural behavior, for instance in situations in which the researcher is measuring employee performance (McKinnon 1988, 36-39). Secondly, the researcher may encounter 'data access limitations', meaning that he or she may not be able to collect all the data related to the phenomena at hand. Such limitations could result from the lack of time or the lack of cooperation by the host: lack of time refers to the fact that the researcher cannot know what happened before the research took place or what will happen afterwards, and lack of cooperation refers to the unwillingness of the target of the study to cooperate, which could occur if the hosts impose restrictions on mobility and access to certain documents, events or people (McKinnon 1988, 36-39). Further, McKinnon (1988) identifies a third threat that could influence the reliability and truthfulness of the gathered

information. ‘Complexities and limitations of the human mind’ relate to the fact that it may not be possible to take the statements subjects make at face value. This means that subjects might consciously seek to mislead or deceive the researcher, and even if they try to be as honest and as accurate as possible, thay are only human, which means that they pay different degrees of attention to different things, they forget things, and they have their own biases, for example. The most important thing for a researcher is to acknowledge the existence of these four threats in order to increase the overall validity and reliability of the study (McKinnon 1988, 36-39).

In terms of dependability, several actions were taken to improve the validity of the study. First, a sufficient amount of time was spent studying the phenomenon. The time span between the first and the last interview sessions was over two years, which allowed thorough analysis of the data and enabled the researcher to rethink the arguments several times, and to conduct further interviews whenever needed (Appleton 1995; Johnson 1997; Miles and Huberman 1994; Yin 1994). During this period he interviewed many people within the organizations in question. This enabled him to gather a large amount of interview data, which in turn increased the likelihood of gathering reliable, truthful and comprehensive information. For instance, in terms of lack of knowledge of the companies’ prior actions, if a respondent did not have historical knowledge of the chosen strategies, he or she was asked to nominate a person who had, and if possible these persons were interviewed. In fact, data triangulation (Denzin 1979) achieved through interviewing multiple persons from several levels of the organization, and corroborating this information with secondary material (internal and external), can be assumed to increase the possibility of gathering comprehensive and reliable information from the study subjects. In terms of data-access limitations, several of the companies had participated in and funded the Global Network Management research project, which meant that they were open to sharing information. In addition, in each company it was agreed prior to the interviews that all revelatory information would be removed from the research papers as well as from this thesis, and the firms are referred to by pseudonyms. This also helped in generating open discussion with the informants (cf. McKinnon 1988).

Confirmability of the results refers to whether someone else could come to the same conclusions about the phenomenon in question. It therefore measures the objectivity of the researcher (Lincoln & Guba 1985, 299-301), or in other words the degree of researcher/observer bias (McKinnon 1988). Observer bias means that an observer’s own beliefs and assumptions may distort the information. The observer’s presumptions about the researched phenomena shape the way in which the research is conducted and analyzed: if the observer

is biased it is what he or she sees and hears that is of concern, and this results in selective perception and interpretation (McKinnon 1988, 36-39).

In order to minimize observer bias a standardized format was used in several of the interviews. These interviews were based on an extensive theoretical background study, which increased the validity of the whole study. A good theoretical overview was made prior to the interviews, which were based on it. The theoretical background created a firm theory base that assisted in the empirical research. This was considered necessary for the validity of the study given the complex nature of the phenomena in question. Moreover, as argued, this meant that the interview outlines were based on theoretical structures and not on the researcher's own beliefs or assumptions. In addition, investigator triangulation was used in order to minimize observer bias (Denzin 1979; Denzin & Lincoln 1994). As mentioned above, several interviews were conducted in pairs, which in turn weakened the researcher's ability and opportunity to lead the respondents to a wanted outcome. Further, several analyses were sent back to the respondents, which enabled them to comment on any subjective interpretations of the examined occurrences (Appleton 1995, Miles and Huberman 1994, Silverman 2003, Yin 1994).

Credibility measures the researcher's ability to provide results that correspond to the reality (Lincoln & Guba 1985, 294-296), which is closely connected to interpretive validity as discussed by Johnson (1997). Accordingly, credibility refers to the researcher's ability to draw credible and accurate conclusions from the collected data.

In terms of this study, several tactics were used to increase the credibility of the results. Firstly, and again, the credibility and accuracy of the interpretations were enhanced by sending the case descriptions, analysis drafts and ready research papers to the informants for comment: the researcher was thus able to receive feedback from the interviewees for the drawing of his conclusions (Appleton 1995, Miles and Huberman 1994, Silverman 2003, Yin 1994). Moreover, during the Global Network Management project several issues related to this study were presented and discussed in several workshops organized in these companies, in which several top mangers participated. These workshops gave the company managers the opportunity to comment on any misinterpretations and to provide further information if the analysis was based on inadequate information. It can be assumed that both of these actions increased the accuracy of the results, and thereby increased their credibility. Further, in order to increase the readers' ability to envision the connection between the reality and the results, several direct quotations from the interviews were used in several publications, as well as in this thesis, to enable the reader to become familiar with the original data (Eisenhardt and Graebner 2007; Silverman 2003).

Finally, and as proposed by Lincoln and Guba (1985, 296-298), *transferability* measures the broader applicability (generalizability) of the results. Lukka and Kasanen (1993, 380) state that generalizability is the key criterion on which to assess the goodness of the study, which refers to whether the reader is assured of the validity of the results or not. Generalizability and credibility interact, although the mode of this interaction seems to vary according to the research approach. Lukka and Kasanen also argue that there are differing views among business-administration researchers concerning the role of generalizability. One view, and the mainstream one, is that generalizing is important, while it is explicitly rejected in other approaches. Generalizing has its limitations, but there are several ways in which the researcher can increase generalizability. The key question is whether the researcher is able to tie his or her analysis to business-administration theories and to other prior research, and especially to the relevant real-world context of the studied phenomena. There is no question that generalizing in studies on business administration is complex and intricate, but is it even necessary? Lukka and Kasanen (1993, 381) pose the question of necessity in the context of generalizing in business-administration research: it might carry significant costs, and truly general results, valid over time and place, are hard to find and when encountered they seem to lack practical relevance. The quest for generalizing has a tendency to lead to a lack of relevance and applicability. Despite the existing controversy, however, there is no continuum with generalizability at one end, and relevance and applicability at the other. Given the right research approach, which is valid and reliable for the studied phenomena, general and applicable results can be attained.

As argued earlier, inherent in this study are the perils of objectivism and thereby positivism. Although there are several opinions on the impossibility of generalizing business-administration research, and especially case studies, it could be argued that it is possible to derive certain law-like statements from qualitative data. However, it is noted that in outsourcing research, which is highly context-dependent, the law-like statements are valid only in a specific context. For instance, in terms of IT, Cullen, Seddon and Willcocks (2005) maintain that because outsourcing can be configured in so many different ways, sound advice for managing one IT outsourcing portfolio may be inappropriate for another. Accordingly, outsourcing really is a phenomenon that is dependent on the context, or as Isaacs (1999, 82) so well put it,

"Two companies, two outsourcing decisions",

However, as argued, this study purports to provide results that can be more widely applied, yet in a specific context. Thereby, and as a conceptual clarification, it is not argued that the results can be generalized as such, but it is suggested that they carry broader applicability (see Alasuutari 1994, 190-

210). It is, of course, obvious that the higher the validity and reliability of the study, the higher the possibility for further generalization. I hope the discussion in this section has provided enough information to assist the reader in making his/her judgment about the reliability and validity of this study, and further about the broader applicability of the results.

4.4 Introduction to the articles

The articles attached to this thesis elaborate further the issues discussed thus far. As explicated above, they provide case studies on specific issues related to the outsourcing process. None of them gives a comprehensive view, but each one provides in-depth and, in most cases, comparative case analyses on specific phases. Accordingly, the aim is to shed light on specific aspects rather than to explore the entire phenomenon. Outsourcing is a complex issue that cannot be comprehensively covered in one research paper or article. The articles attached to this thesis and the case studies within them are therefore intended to provide rich anecdotal descriptions and to add depth, comprehensiveness and knowledge to the understanding of the specific stages of the outsourcing process (see Easton 1995; Minzberg, 1979; Shah and Corley, 2006).

Yet, many of the six primary articles are not limited to one specific area (see Figure 22), and also aim to elaborate the effects of one on another (in most cases the impact of decisions made at a certain stage on the performance of the outsourcing). In addition to these six articles, the thesis also draws on the conclusion reported in another two research papers. As mentioned, the prime reason why the secondary articles are not provided as such in the appendixes is because they are not fully in line with the focus of this study. However, they validate issues regarding the performance implications of outsourcing to software SMEs, and are therefore specified as part of the thesis, even if not attached to it. The key issues covered and the aims of all the articles are briefly summarized below. Figure 22 illustrates how they connect to the outsourcing process, and accordingly what research questions they focus on.

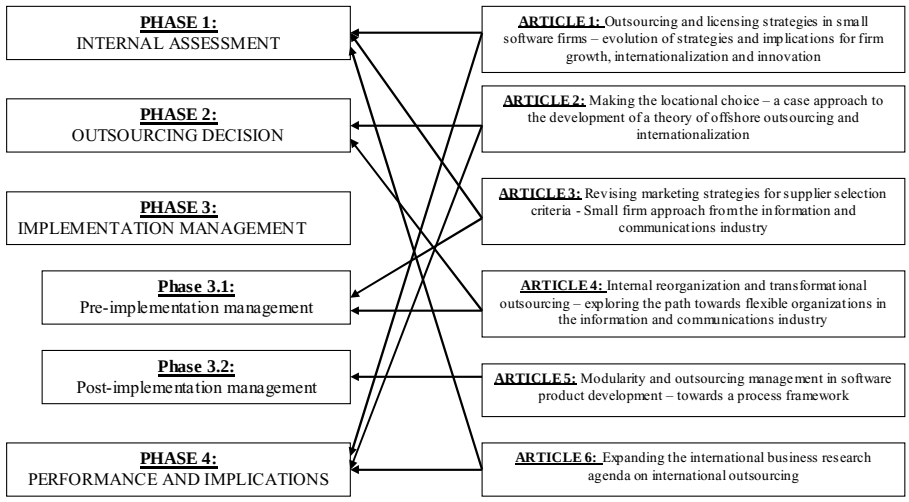

Figure 22 The connection between the outline of the thesis and the articles

Article #1, entitled "Outsourcing and licensing strategies in small software firms – evolution of strategies and implications for firm growth, internationalization and innovation", discusses the changing resource needs of software SMEs. Given the assumption that growth in software firms is traced through the decreasing service intensity of the product (e.g., Alajoutsijärvi et al. 2000; Ethiraj et al. 2005; Moore 2000; Seppänen 2002), the focus in the article is on how these firms may facilitate this process by using external resources through outsourcing and licensing. Accordingly, the primary aim is to show how the outsourcing strategies of small software firms evolve in terms of scale/scope, strategic importance and motives in parallel with their growth (cf. RQ1 of this thesis). The article also provides insights into how the progressive use of external resources may influence corporate innovation, internationalization, and growth (RQ5 of this thesis). The empirical analysis consists of a multiple case study of six small and medium-sized software companies in which a total of 14 outsourcing or licensing projects were identified and further analyzed. This article was solely authored by the researcher.

Article #2, "Making the locational choice – a case approach to the development of a theory of offshore outsourcing and internationalization", is primarily concerned with the location decision with regard to outsourced activities, which is not given adequate attention in the current literature (Bunyaratavej et al. 2007; Doh 2005; Kotabe & Murray, 2004). As argued, prior research on the outsourcing location has confirmed the applicability of Dunning's (1980; 1988; 2000) eclectic paradigm in explaining the decision.

However, it still remains largely unclear whether the same factors that influence the location decision of FDIs (Dunning 1988) also apply to offshoring activity, in which ownership is not a mode of control – especially in the context of small knowledge-intensive firms. This article examines this issue in a process combining theoretical rationalization and the cross-case analysis of two software firms and their offshore outsourcing projects (cf. RQ2 of this thesis). The consequent inductive analysis also reveals some serendipitous inward-outward benefits that may occur as a by-product of the offshore outsourcing, thereby exemplifying the implications of outsourcing in terms of future internationalization (RQ5). This article was solely authored by the researcher.

Article #3, entitled "Revising marketing strategies for supplier selection criteria – a small-firm approach from the information and communications industry", focuses on two issues related to the outsourcing process. The first of these concerns the primary forces driving a small firm to engage in outsourcing. This article examines the kinds of pressures imposed by the competitive environment (primarily customers and competitors) on small firms to seek competitive positioning and focus, and accordingly, outsourcing (although not directly focusing on it, this is connected to RQ1 of this thesis). The second issue under investigation involves the supplier selection for the outsourced components (RQ3), also examining the differences between selection criteria based on the object's strategic importance, scale/scope, and asset specificity. Although the selection criteria and the progressive selection process were derived from interviews with representatives of larger software/ICT firms, it was found that such issues applied equally to the context of smaller firms. The paper provides insights through a cross-case analysis of 12 software firms. It was co-authored, but the researcher was the primary author, and accordingly made the bigger contribution.

Article #4, entitled "Internal reorganization and transformational outsourcing – exploring the path towards flexible organizations in the information and communications industry", provides insights into two separate, yet intervened aspects of the outsourcing process. Firstly, where prior literature provides extensive results on outsourcing aimed at cost savings (transactional) or acquiring resources/skills/ competences that are unavailable internally (resource-seeking), this article examines the third type of outsourcing, which has so far attracted only limited attention (Miozzo & Grimshaw 2005): transformational outsourcing (see Linder et al. 2002; Mazzawi 2004). It thus examines how small software firms can achieve production flexibility through the wider changes in the operational system fostered by outsourcing (RQ2). Secondly, the article examines the process of the prior modularization of activities (pre-implementation management),

which facilitates further outsourcing (RQ3). These issues are elaborated through two single-case studies of medium-sized software firms. As these stages are sequential, the two studies take the form of single cases, yet they complement each other. This article was solely authored by the researcher.

Article #5 is entitled "Modularity and outsourcing management in software product development – towards a process framework". It examines the modularity embedded in software product development and the circumstances under which the successful transfer of activities to an outside vendor is possible. It also discusses the management challenges inherent in the different approaches to software development. It puts forward a framework (illustrated earlier as Figure 11 on page 96) based on the classification of the different hierarchical levels of a software solution (Brown & Wallnau 1998). This framework is then analyzed in terms of three outsourcing projects (two outsourcing and one licensing) in order to identify the management challenges and the process of outsourced product development. Thus the focus of the article is on the nature of the outsourced activity and the task division (RQ2), and further on the related management challenges inherent in the outsourcing implementation (RQ4). Given the connection between engineering and management sciences in the study, observer triangulation was used in order to gain the depth of understanding required for this article (Denzin 1979; Denzin & Lincoln 1994). This, in turn, led to co-authorship: although the researcher was the primary author, the results were analyzed in close cooperation with the co-author.

Article #6, entitled "Expanding the international business agenda on international outsourcing", examines the implications of internationally outsourced work (RQ5). Furthermore, through case analyses of three software firms it provides insights into the market developments that may encourage firms to outsource, or that lead to change in the initial outsourcing strategy (partially connected to RQ1). Although this paper was co-authored, the researcher was the primary author and accordingly made the bigger contribution to it.

The following chapter summarizes the key findings reported in these articles, as well as the overall results of the qualitative study conducted for this thesis. The discussion draws together the findings from the interviews, the single-case analyses, the cross-case analyses, and all the other data that was collected for the thesis. In order to avoid unnecessary replication, at certain points the attached articles are referred so that the reader may consult them for more information and a more thorough discussion of the results.

5 THE PROCESS OF OUTSOURCING PRODUCT-DEVELOPMENT ACTIVITIES IN SOFTWARE FIRMS - FINDINGS AND DISCUSSION

In terms of the benefits of outsourcing, it was widely reported in the interviews that software firms, including small firms, are able capitalize external resources in their product-development process (see e.g., Article #1). This chapter presents the results of the empirical study in the light of the developed model for analyzing the outsourcing process.

In general, the results of the empirical research (see Articles #1 and #5) indicate, similarly to Helander (2004), for instance, that different software-product-development strategies can be broadly divided and further clustered into make, buy, specify, and take, as illustrated in Figure 23. The last-mentioned refers to capitalizing open-source software in product development, and further contributing to the development of such software. This is sometimes referred to as 'crowd sourcing'. However, as this imposes several managerial challenges and implies a specific approach to product development (see e.g., MacCormack et al. 2006; Ruffin & Ebert 2004; von Krogh & von Hippel 2006), the use of OSS in this context falls largely beyond the scope of this thesis[41].

[41] The key determinant and reason why the capitalization of open-source software is not included in the scope of this thesis is that firms applying the TAKE option can acquire an open source with little or no interorganizational interaction. Although this may apply to simple licensing (BUY), it is more common in product-development licensing that there is much more interaction between the transacting parties. Nevertheless, although the use of OSS is not at the core of the examination, it is sometimes referred to when it is relevant.

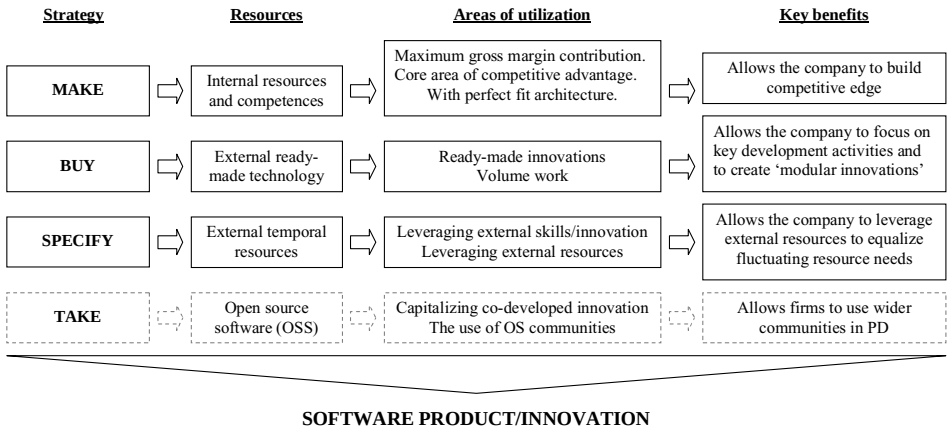

Figure 23 Different strategies for software product development

Accordingly, the three approaches to product development further examined relate to the strategies of 'make', 'buy', and 'specify'. Compared with the common 'make or buy' dichotomy, or in terms of buying options the 'outsource or license' dichotomy, this kind of categorization of product-development approaches more efficiently describes the managerial challenges related to each one. However, it was noted that in some cases the line between these was blurred, as companies may buy existing software components with some tailored customization (specify). Still, the three product-development strategies can be broadly categorized as in Figure 23.

The strategy of *'making'* entails using internal resources to develop software. The activities that a company decides to undertake internally are its very core competences. Often following certain process models such as the waterfall model, firms engage in software-development activities from requirements engineering to integration and testing.

The strategy of *'buying'* basically entails acquiring ready-made functionality in an off-the-shelf manner in the form of COTS components (Boehm & Abts 1999). Such a strategy is discussed in this thesis because in the software industry licensing existing components and integrating them into the company's solution is often a supplementary outsourcing option whenever there are such components on the markets. This option, in contrast to outsourcing, entails adopting the design rules of the vendor. In other words, the firm has little or no influence on the component that is being bought, and thereby the product development of the specific component is highly controlled by the vendor. Obviously, this also has various management implications in terms of product development.

The strategy of *'specifying'*, on the other hand, basically entails conducting any product-development work outside the organization as per given instructions, i.e., outsourcing. In fact, in terms of software product development, outsourcing encompasses various modes according to which firms may capitalize their external pool of resources. In broad terms, the strategy of specifying entails using external resources for internal product-development tasks, which may range from highly specified programming to co-development activities, and further to turnkey projects in which the entire software-development process is basically in the hands of the vendor. Accordingly, the strategy of specifying consists of an array of different operational possibilities.

The following sections discuss ways of capitalizing external resources through buying and specifying, the focus being on the latter, in other words on the outsourcing of product-development activities. The discussion follows the lines of the outsourcing-decision framework that was built in Chapters two and three, and as illustrated in Figure 6 on page 56. It draws together and summarizes the findings of the eight separate articles that were based on the collected data. These findings are considered in the light of the existing theory-base with a view to building new insights and developing the existing theories on outsourcing. The articles contain through analyses of the findings, and are merely referred to in the discussion. When specific cases are discussed reference is made to the article in question.

5.1 Aligning outsourcing strategies during growth

One of the key questions, which is of major interest to researchers, concerns what makes firms seek external involvement in product-development tasks. The results of the study indicate that the primary outsourcing driver lies primarily in the adjustment of the company's strategy fostered by changes and developments in the competitive environment[42]. Firstly, firms seek outsourcing as a result of what Lacity and Hirschheim (1993a) refer to as the domino effect. This means that as some companies, often competitors, are refining their competitive positioning and as a result start capitalizing external resource pools, others are encouraged to do the same. Moreover, globalization puts increased pressure on software firms to refine their operational logic just

[42] From the theoretical perspective this suggests that outsourcing drivers follow the premises of contingency theory (Drazin & Van de Ven 1985; Miller 1981), which assumes that an organization's structure and strategy must fit its context (competitive environment) if it is to survive or to be effective. This means that its structure must be aligned with the external environmental conditions, and its internal resource endowment and strategy in order to positively contribute to its performance.

to ensure their ability to compete. Accordingly, outsourcing has become a tool for survival, as the CTO of one of the SMEs included in this thesis stated:

> *"There is no choice for us but to outsource. If the Chinese can produce similar products at a fraction of the cost we lose our edge to compete. Reliability and added value have no bearing if the price is considerably higher. By outsourcing we are just ensuring our ability to compete."*

Accordingly, it seems that if they are to succeed in global competition, firms have no choice but to outsource (see also Engardio 2006). Moreover, customer demand was found to be one of the key drivers for software firms to seek benefits from outsourcing. This was especially true with small firms targeting their products on MNCs. It has been argued that small software firms seek to gain access to the sales channels of MNCs as they offer internationalization and evolutionary-growth potential (e.g., Gabrielsson & Kirpalani 2004). Further, it was argued earlier that software firms often seek rapid growth and internationalization in order to benefit from the developed innovation and to protect this innovative value from expropriation. This has led to firms internationalizing basically 'overnight', and to the phenomenon of 'international new ventures' or 'born globals' (e.g., Oviatt & McDougall 1994; Madsen & Servais 1997). The established sales channels and changing demands of MNCs may provide this opportunity. Baden-Fuller et al. (2000), for instance, argue that one of the key reasons why companies go into outsourcing is the need to respond to changing customer needs. Indeed, one software-sourcing manager in a large telecommunications firm stated:

> *"At one time we were looking for a supplier for a particular need. We found a capable supplier that was rather big given its personnel of 150. However when we scrutinized it we found that in fact the capability we would be acquiring employed only 30 people, which made them a rather small player in the field. We did not want to buy a capability from a company that had only one fourth of its human resources allocated to that capability… The time for supermarkets has elapsed."*

In fact, customer demand has increasingly led small software firms to narrow their focus, and perhaps to provide larger entities but only using external resources. Outsourcing enables firms to focus on core development issues. In the end, economies of scale depend on volumes/size and focus: if the size is often given or slow to increase, companies can increase their scale economies through narrowing their internal focus. This does not mean, however, that they should not provide their customers with smaller entities. It was found (Article #3) that small firms are also able to increase their scale economies through leveraging external sources of readily available

innovations (COTS), or by leveraging external resources to equalize resource-demand peaks. Accordingly, this enables them to grow without having to build up a mass of inflexible human resources[43].

Yet, it has been argued that as software firms grow in rather distinct progressive stages (Moore 2000), the purpose and the nature of the external resources required also change progressively to support the overall growth strategy. In fact, driven by these external pressures to seek external outsourcing opportunities, firms often seem to align their internal strategies with their outsourcing strategy. What this means is that outsourcing is a supportive tool that can be leveraged to enhance the overall strategy of the firm. For instance, as argued, in the very beginning software firms face pressures to gain rapid time-to-market to protect their commercial value from expropriation (e.g., Oviatt & McDougall 1994). Accordingly, the findings from the interviews and from the cross-case analyses (see Article #1) suggest that outsourcing and licensing strategies are used to achieve such overall targets. As one software manager in a small software firm put it:

> *"It's downright ridiculous not to capitalize on ready-made even strategically important components when developing new software, especially in the beginning phases. In the start-up phase you have enough work to do and if you can buy something ready-made that decreases that workload, do that! What we did was that we licensed a software component at the very beginning. However, after the launch of the first version we started to develop our own solution to replace the licensed component."*

Once firms get their product onto the markets, it seems that the outsourcing strategies, in terms of motives, shift towards achieving a better business focus and operational flexibility (cf. Jarillo 1989). Although the outsourcing strategy is often connected with achieving cost savings (see, for instance, Table 4 on page 66), the analysis revealed that cost savings were the primary motive for outsourcing in software firms only in certain cases. This issue of outsourcing/licensing motives and how they shift along with the growth of the software firm are further discussed in the following section.

Not only are outsourcing and licensing strategies sought throughout different phases to assist the growth process in various ways, it was also found that the active seeking of external sources for undertaking product-

[43] In fact, outsourcing and licensing provide a tool for overcoming a key entrepreneurial dilemma in a globalized economy. For instance, Jarillo (1989, 133) argues that one of the key attributes allowing small firms to gain marker share from larger, more powerful corporations is their flexibility. However, the progressive accumulation of resources that growth often entails almost inevitably brings a loss of the flexibility that made the firm successful in the first place. This, he continues, is an entrepreneurial dilemma that could be overcome by the strategic use of external resources (Jarillo 1989, 133).

development activities[44] in different phases of growth had positive effects on overall performance (as argued in earlier studies, e.g., Atuahene-Gima 1993; Hagerdoorn & Duysters 2002; Madsen & Servais 1997; McDermott & Handsfield 2000),. It was found from a comparative analysis of 10 small software firms (sub-Article #1)[45] that companies capitalizing external resources in their product development and, further, actively trawling the markets for new technologies and suppliers (active purchasing organizations) achieved better results in terms of overall performance and were more internationally established. This indicates that this kind of management attitude towards using external resources in product development, referred to in the Article (sub-Article #1) as supplier orientation, has highly positive implications in terms of company performance (correlation value 0.667). There was also a positive, although weak linear correlation (0.165) between supplier orientation and the stage of internationalization. However, in broader terms this result is inaccurate, as the measures for the stage of internationalization did not cover the inward (supply) side of international activity. In fact, Korhonen et al. (1996) found in their study of Finnish SMEs that the majority of the 593 companies analyzed started internationalizing from the supply side, followed by the market side (exporting). Such findings have also been supported in more recent studies (Servais et al. 2006). Therefore it is likely that incorporating an "inward" variable into the classification of "stages of internationalization" will lead to a much greater linear correlation between supplier orientation and the stage in question. Nevertheless, such inward international activity was found to have positive influences on later market-seeking internationalization. This is discussed further in the following sections.

Nevertheless, these results suggest that firms should not only align their other strategies with their outsourcing strategies, they should also develop their current supplier relationships and seek new external product-development opportunities in order to achieve better overall performance – in other words become active supplier organizations. As Lovendahl and Revang (1997, 757) suggest, in postindustrial competition the difference between organizations is based on their uniqueness in terms of capitalizing assets and

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[44] Axelsson and Wynstra (2002, 19) make the distinction between active and passive purchasing organizations. Whereas passive organizations wait to be visited by suppliers and to be informed of possible solutions, active organizations actively seek and visit suppliers to find the best resources.

[45] During the interviews in these 10 firms, the respondents were given a questionnaire containing 79 items, which they were asked to rank on a seven-point LIKERT scale. The questionnaire examined the company's orientation towards customers, partners (sales), competitors and suppliers. The performance value was based on financial statements from the Amadeus database as well as internal estimates. In terms of internationalization, a combinative value of the number of markets sufficed, and the foreign turnover/total turnover ratio was used (see Hätönen, Ruokonen & Sandberg 2007).

the way they continuously work on improving these relationships. In fact, Jarillo (1989, 146) argued that a managerial approach calling for further research concerns how successful small firms leverage themselves through the use of external resources, and how they gain access to such resources. Active search has become vital: according to the interviewees it is also a question of timing, as the rapid deployment of new technologies may give first-mover advantages, but on the other hand, delay may cause fall-back from current technological developments. As the CEO of a medium-sized software firm put it:

> *"The only regret I have about these licensing decisions is that we have not made them fast enough. In many cases we started to develop our own solution for a problem, a solution which could have been bought ready-made from the markets and was probably even highly advanced. We did not have enough courage and just followed the decisions of our competitors. Such mistakes tied up our valuable and scarce software-development resources, and at worst, blunted any possible competitive edge that could have been attained."*

Baden-Fuller et al. (2000, 286) state, further, that two of the key motives for outsourcing are the fact that a firm has fallen behind its competitors, and that new markets are available because of rapid changes in technology. According to the analysis based on the interviews, disregarding the latter often leads to the former. In other words, if firms do not react to the changes on the markets, they risk falling behind their competitors. In fact, it is recommended here that firms should even be proactive in seeking the markets for alternative solutions and opportunities. Outsourcing and licensing could at best provide a competitive advantage for the company, albeit temporarily, but only if it is among the 'technology adapters'.

The focus in the above discussion was on what initially drives organizations to outsource, but what are the primary reasons why they do not outsource? According to the interviews, the primary barrier is management's attitudes towards the strategy, in other words bounded rationality (e.g., Williamson 1975). In small firms in particular there seems to exist a strong leaning towards internal production, which in turn appears to influence rational decision-making. The so-called Not-Invented-Here syndrome was found to be one of the primary influencers behind the decision not to outsource. In fact, the CTO of a medium-sized US software firm, with experience in selling to Finnish SMEs, stated:

> *"We seem to encounter the Not-Invented-Here Syndrome in Finland. For example in Japan, this is very low. This is one of their biggest strengths, NIH is very low. US is also pretty low on the lower side but Japan is perhaps one of the lowest. If they see good technology, if it is*

> *from Morocco, they've no problems. They will test the technology, they will definitely do all the due diligence but just because it's from Casablanca they don't have any negative associated with it. And that's why SMEs succeeded in Japan pretty well."*

Interestingly, it appears not to be the perceived risk that restrains small firms from outsourcing, but rather the attitudes towards it. This may be a cultural issue, as certain cultures, especially in the software industry, take different approaches to software development (see Cusumano 2004). Nevertheless, the results suggest (see e.g., Articles #1 and #3) that firms should continuously assess their strategies, and accordingly seek to undertake some of their development work with external resources in order to remain innovative and flexible. On the other hand, they should also continuously assess their existing outsourcing relationships. For instance, the case examples given in Article #6 indicate that changes in the external operating environment or in the internal strategy may lead firms to change their existing outsourcing relationships. Accordingly, in other words, firms should continuously assess their product-development strategies, whether they are to make, buy or specify. They should focus on the key development activities and on seeking external solutions for their non-core activities (cf. Quinn & Hilmer 1994).

5.2 The outsourcing decision in software firms

Once a firm has made the initial decision to outsource, it needs to address several relevant questions. This phase was conceptualized as the outsourcing decision. It was found that the small size of the firm definitely had impact on the outsourcing decision-making. This is exemplified in the words of the CEO of a small software firm, for instance:

> *"For a small firm outsourcing really does provide distinct challenges. When you're small your volumes are also small. Outsourcing with small volumes even with good rationales is sometimes unprofitable. Also, when you're small, you create only little business for the much larger outsourcing providers. You really do not have the negotiation power with the vendors as you might have in larger firms."*

This section summarizes the outsourcing decision through the lenses of software firms. The aim of the following discussion, which is based on the framework built earlier in this thesis, is to shed further light on the decision to outsource software product development. The key questions behind this decision were identified as what, why, where and how.

5.2.1 The outsourcing objectives – what to outsource?

In terms of the scope of the outsourced objective, the results of the interviews reveal only little variance between outsourcing projects (Articles #1 and #5). According to the cross-case analyses, software companies capitalize external resources primarily in development projects on the business-component level[46]. This finding is not in accordance with the notion of the incremental nature of the strategy, which suggests that the scope of the outsourced activity increases as the company gains experience of outsourcing as a strategy (e.g. Lewin & Peeters 2006). At least three factors were found to influence the decision to outsource on the business-component level: 1) adequate volumes in order to make the outsourcing profitable, 2) an operational entity that is understandable as such, and 3) competitive differentiation.

First, adequate volumes are needed for cost-control reasons. Although it has been stated that cost savings are hardly ever the primary motive for outsourcing software development, high cost may nevertheless be a restraining factor. Given the small volumes the total cost of outsourcing makes it an unattractive choice: there are several hidden costs such as for vendor search and selection, contracting, and process building (see Barthélemy 2001), which are often related to the initiation (*ex ante*) of the outsourcing relationship. For instance, Cockburn (2002, 81) argues that distributed software development is inherently ineffective since project costs increase in proportion to the time it takes people to understand each other and the development task. Therefore it is argued here that a prerequisite for outsourcing product development is the existence of adequate volumes, as cost savings are likely to accrue in larger outsourcing projects where the ratio of *ex ante* costs decreases in relation to the total costs.

Secondly, as a business component is a functional entity, it is likely that there exists a better setting for knowledge transfer to and from the vendor: functional entities can be better codified and taught to the vendor (Kogut & Zander 1993) than part of a larger entity that has many interlinkages with other parts. This finding is similar to the results reported by Amoribieta et al. (2001, 133) suggesting that good candidates for outsourcing require limited interaction with the different organizational units, and by McFarlan (1995) indicating that highly structured development work is most suitable for outsourcing. It is arguably not only interaction between other units that makes such components suitable for outsourcing, but also the fact that these activities

[46] Represents the software implementation of an "autonomous" business concept or business process (application). It consists of the software artifacts necessary to express, implement and deploy the concept as a reusable element of a larger business system (see Figure 16 on page 107).

are often separate entities of the entire system, often with their own functionality, which thereby enables independent (separate) development and testing (cf. Baldwin & Clark 1997). For example, the CTO of a small software firm stated:

> *"The key to the success of the outsourcing lay in the fact that the vendor understood what they were developing. To understand, they needed to see themselves what they were developing and for what. Outsourcing entities that are functional as such also significantly ease the testing of the results."*

Finally, even though for a specific business component there might exist a ready-made COTS component, companies might turn to outsourcing to create a competitive edge. This is because business components are the core functional components of a software solution, and using COTS components at such a level might lead to genericness of the solution and accordingly make it difficult to build a competitive edge in that area: COTS components are basically available for all, whereas outsourcing entails development based on case-specific customized specifications.

Accordingly, it could be concluded that in small firms the "specify" (outsourcing) option is more viable for entities that are separate and easily attached to the existing software, and carry adequate volumes to drive down the associated transaction costs (cf. Williamson 1975),. In fact, the cross-case analysis of six small and medium-sized software companies and a total of 14 outsourcing or licensing projects (Article #1, see also Article #5) revealed that, largely due to the above-mentioned issues, firms seek to outsource on the business-component level irrespective of their stage of growth and evolution.

However, in terms of the strategic importance of the outsourced objective, as mentioned above, the cross-case analysis indicated that software firms' outsourcing and licensing strategies change as the firm grows (Article #1). As far as the outsourcing objective is concerned, it would seem that in the product-development phase of their lifecycle firms outsource the development or license existing technologies to be embedded in the core-product platform. From a strategic perspective, this enables small software firms to allocate resources to project work, as productization is sought from the learning and competence building that arises from projects (Alajoutsijärvi et al. 2000; Ethiraj et al. 2005; Seppänen 2002). However, in the later phases, the case companies seemed to focus on using external resources for more fluctuating value-added and customer-specific demands. This suggests that outsourcing strategies in small software firms shift from core embedded projects towards more customer-oriented projects in parallel with the firm's growth. In other words, a firm's outsourcing/licensing strategy traces an increasing service intensity, while its overall strategy traces a decreasing service intensity. This

proposed relation between the product and outsourcing/licensing strategies of software firms is illustrated in Figure 24.

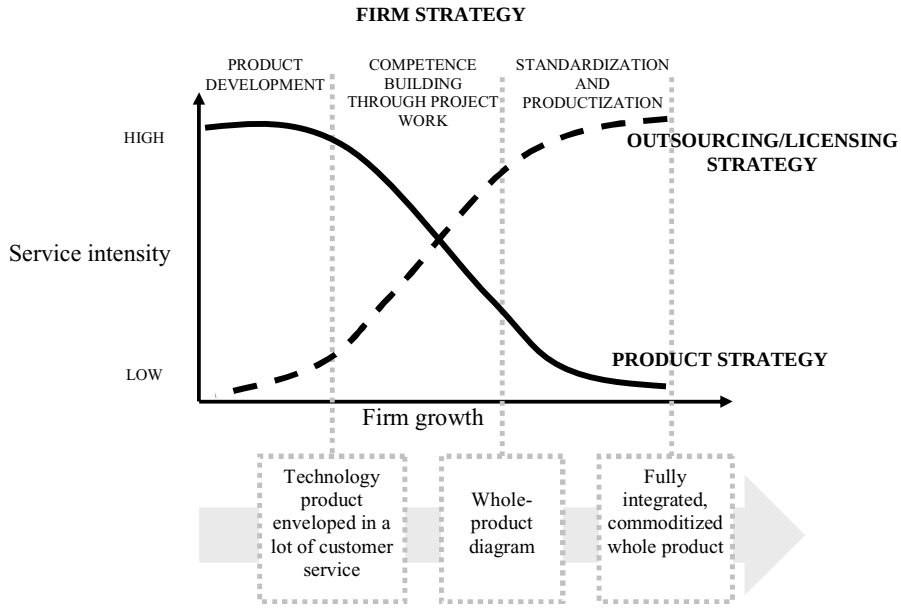


Figure 24 The proposed relation between outsourcing and product strategy

The final measure of the nature of the outsourcing objective was identified as asset specificity (Williamson 1975). As argued, it seems that this measure is highly context-dependent: in fact, it was found to be most dependent on prior actions regarding the software development. Even if a functional entity was being outsourced, if the existing system carried a highly un-modular structure it made the testing and attaching of the outsourced component extremely difficult. For instance, in the context of the outsourcing history of a software firm (Article #4), the CEO of the company stated that the outsourcing was eventually enabled by the modular architectural structure of the software. The software developed for the previous product versions was a tightly interconnected 'lump' of functions. If one wanted to change, add or remove functions from it many other functions in the system were affected, which made such outsourcing options difficult or close to impossible. It was vividly described by the CEO as a

> *"…house of cards that you didn't even want to touch with a long stick as it would have made it collapse."*

One of the key findings regarding asset specificity highlighted in the case analyses (Article # 5) was that not only are modularity, explicitness of

knowledge and process standardization prerequisites for outsourcing, outsourcing as such creates them, thereby providing a sound basis for further outsourcing. Furthermore, outsourcing drives companies towards component-based software engineering (CBSE)[47], which in turn creates embedded modularity in the product-design architectures. This assisted the case companies in their further outsourcing endeavors. The resulting modular design and architectural structures help to explain the continuous and incremental outsourcing within certain companies in the software industry (see e.g., Article #1). Further, although using COTS does not automatically lead to system modularization, it helps the process in that the licensed component needs to be integrated into the system as such, in other words as a separate entity. Furthermore, adopting COTS to modular systems also assists in risk management: if the licensing agreement discontinues it is easier to remove the component from the system. It is therefore plausible to expect that prior outsourcing will decrease the asset specificity of the system, and thereby enable the further outsourcing and/or licensing of product-development activities.

5.2.2 The motives behind the outsourcing decision – why outsource?

The second key decision identified in the analyses relates to the motives behind outsourcing, in other words why firms seek to outsource. Software firms appear to outsource in accordance with the three clusters of motives: transactional, resource-seeking, and transformational, and being small in size carried several implications in terms of outsourcing rationale. The results further indicate that outsourcing motives change in line with company growth. These two findings are discussed in more detail below.

In terms of cost savings, it was found that high transaction costs attributable to various *ex ante* outsourcing costs may prevent small firms from making cost-rationalized outsourcing decisions: such outsourcing is only possible with large volumes. For instance, the CTO of one of the firms stated:

> *"Cost savings were definitely the primary decision-making criterion […] Let's say, for instance, that we paid two-to-three euros per hour for a programmer in the Philippines but over 10 in domestic markets. Of course there are several costs involved in offshore outsourcing such as finding a good supplier, contracting and especially in*

[47] This basically entails building components and assembling applications from sets of other components (Brown & Wallnau 1998). It could be seen as an evolved form of adopting modular design principles in software production (see e.g., Parnas 1972).

teaching the supplier the existing software architecture etc. However, it starts to make sense when you need over 10,000 man hours."

Especially when software firms seek to outsource on a cost basis, locations with a low-cost labor infrastructure are sought (see Doh 2005). However, outsourcing to distant locations incurs higher *ex ante* costs. For instance, in one of the cases of offshore outsourcing analyzed for Article #5, the total costs included *ex ante* costs such as negotiation and contracting, and also flying some of the programmers to the company's premises to familiarize themselves with the existing software architecture, a process that Heeks et al. (2001, 57) refer to as requirements capture. These are just examples of the costs that arose even before the outsourcing took off in practice. It appears from these results that, although it has been argued that outsourcing transforms fixed costs (FC) into variable costs (VC) (Bielski 2004), every outsourcing event has a fixed cost, which decreases according to the volumes concerned (cf. Williamson 1975). In analyzing the total cost of outsourcing firms thereby seeking cost advantages should carefully evaluate the amount of *ex ante* (fixed) costs, and calculate the volumes required to make the total cost of purchasing lower than the total cost of internal production. Figure 25 gives a hypothetical example of this issue. T1 represents the volumes at which the total cost (TC) of purchasing is higher than the cost of internal production and T2 illustrates the volumes after which the outsourcing is rationalized from the cost perspective. At the end of T2 the relationship has reached a mature state and the fixed costs are close to zero.

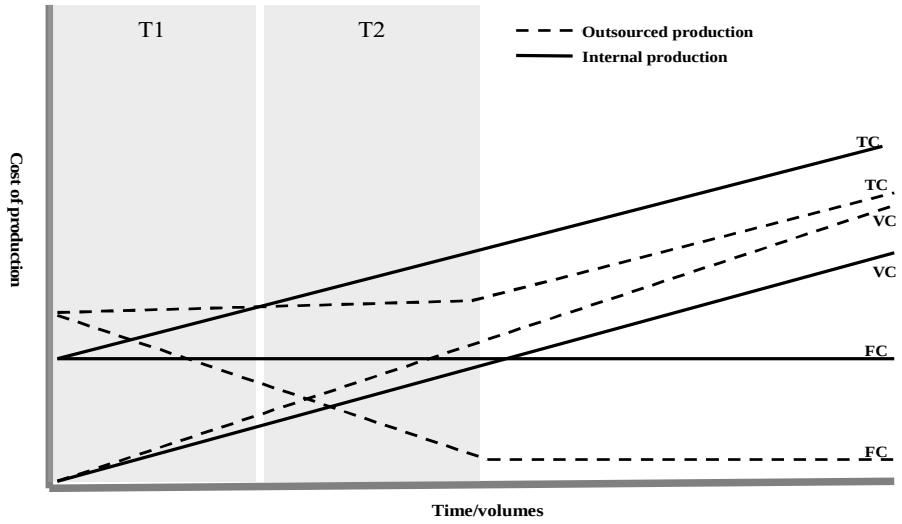


Figure 25 An example of the cumulative cost of outsourcing

In terms of resource seeking, it was found that firms sought superior knowledge and performance as well as rapid-time-to-market through licensing COTS. As an example of the latter in one of the analyzed cases (see Article #1), immediately after its establishment the firm licensed a business component at the very beginning of its product-development process. However, after the first release onto the market it 'insourced' this component by developing it internally. During the product-development phase the firm focused its scarce resources on core development issues and on customer projects, and temporarily licensed the business component required for the total solution.

The final outsourcing was defined as transformational outsourcing, the motivation for which is to change the way a company works in order to achieve a rapid, sustainable, radical improvement in enterprise-level performance (Linder et al. 2002; Mazzawi 2004). It is a tool for stabilizing the fluctuating need for product-development resources. However, in line with some earlier studies (e.g., Morgan 2003), transformational outsourcing was found to be a stage rather than a strategy. In particular (Article # 4), the achievement of flexibility through outsourcing requires the relationship with the vendor to be more or less at the stage when the vendor has a clear understanding of the processes and the existing system of the outsourcer[48]. It was also found (Article #4) that only through the vendor's thorough understanding of the existing architecture and established procedures for cooperation are firms able achieve the flexibility that is sought in transformational outsourcing. This, in turn, often requires that the relationship has evolved to a stable stage.

In terms of overall motives, it was mentioned above that, according to the findings, outsourcing motives change in line with the growth of the firm: this was explicitly indicated in the cross-case analysis of 14 outsourcing or licensing projects in six different firms (Article #1). In terms of outsourcing, it was found that a quite extensive project-based need for labor-intensive resources may often enable software firms in the product-development stage to capitalize their external pools of resources in order to achieve even larger-scale cost savings. This is due to the fact that, given the extensive need for product-development work (volumes), firms are able to mitigate the *ex ante* transaction cost, and thereby achieve cost savings through capitalizing external resources, particularly in low-cost locations (see Figure 25). However, it seems that at later stages, as the need for external resources decreases and simultaneously begins to fluctuate, firms are not able achieve large-scale cost savings. Moreover, as they develop their competences, outsourcing seems to

[48] In fact, this could be viewed as the end of T2 in Figure 25

become a tool that helps them to focus on what matters most, and at the same time to balance out the fluctuating resource need in non-core development areas. Accordingly, along with the growth of the firm, it seems that the outsourcing strategy, in terms of motives, shifts from the transactional towards the resource-seeking and the transformational[49].

Similarly, in terms of licensing, it seems that the motives for technology licensing in the early phases of growth are connected to achieving faster time-to-market and thereby more rapid growth. As illustrated, licensing may be a temporary solution enabling rapid access to the markets, and it allows for the allocation of resources to project work. Later, at the productizing and standardizing stage, it is a tool enabling firms to acquire more advanced technology to complement and extend (value-added components) their existing solution, which in turn extends to the whole product concept.

5.2.3 Choosing the outsourcing location – where to outsource?

As illustrated earlier in Chapter 2, previous research on the outsourcing location decision has built largely on Dunning's (1980; 1988; 1993; 2000) work on FDIs (Bunyaratavej et al. 2007; Graf & Mudambi 2005; Palvia 2004). For the purposes of this thesis, the location decision in the context of software outsourcing was examined through a comparative case analysis of two offshore outsourcing projects in two different firms (see Article #2), named FinaSoft and InsuraSoft. The key findings are summarized in the following. They provide evidence of the factors that influence the location decision in the context of outsourcing software product development.

The cases in the article illustrate two situations in which two Finnish firms, FinaSoft and InsuraSoft, outsourced similar activities to two different locations. The underlying motives in both cases were to save costs and to acquire resources that were hard to get hold of in their current operating markets[50]. One of the focal questions in the cross-case analysis was why two similar companies from the same country of origin outsourcing similar

[49] This kind of development in outsourcing motives could also be explained in terms of the evolution of the relationships. For instance, and as illustrated, achieving process improvements through outsourcing (transformational outsourcing) is possible when the relationship with the vendor is at the mature stage (see also Morgan 2003). In fact, some prior research has identified these motives as progressive in outsourcing management. Gottschalk and Solli-Saether (2006), for instance, propose a maturity model of IT outsourcing according to which the relationship evolves in three progressive stages: stage 1 entails achieving cost advantages, stage 2 entails access to resources and innovation, and stage 3 is a 'partnership' phase in which there are common norms that allow flexibility.

[50] Both firms outsourced product-development activities at the very beginning of their operations (product-development stage), and the extensity of the projects enabled them to achieve the cost savings.

activities with similar objectives and motives ended up outsourcing to geographically, culturally, politically and even economically different locations. The possible underlying factors were examined through the application of the framework illustrated in Figure 7 on page 72. Four different sets of variables with the potential to affect the location decision were identified in the framework: situational factors, internal factors, locational factors, and external factors.

In terms of *situation-specific factors*, one reason could lie in the process standardization and asset specificity of the outsourced task, i.e. the nature of the outsourced activity. FinaSoft had already developed a platform for its products, which was internally documented and had well-defined specifications concerning the outsourced work. The specifications facilitated the teaching of the outsourced task to the vendor, and thereby reduced the asset specificity of the activity while enhancing its transferability (cf. Kogut and Zander, 1993; Williamson, 1975). InsuraSoft, on the other hand, built its software from scratch in a foreign location. The fact that there existed no pre-created processes or specifications for the outsourcing increased the need for close interaction and an on-site presence at the vendor's facilities. In fact, the management team spent four days a week in the company during the initial phase of the agreement. As the CEO stated,

> *"The proximity definitely had an impact on the location decision… think of how much it would have cost for a small company to fly to India (from Finland) every week".*

The need in FinaSoft for a local presence was lower as it had fairly well established processes and pre-created specifications, although in the initial phases they also had one permanent employee more or less posted to the outsourcing company.

This leads to the simple conclusion that, particularly among small firms, geographical proximity does matter in the outsourcing-location decision[51]. Although a number of researchers have referred to the importance of geographical distance as an influence on the decision-making in this context (Graf and Mudambi, 2005), it is often neglected because highly developed information and communications technologies are considered efficient information channels that diminish the importance of geographical location (e.g., Doig et al., 2001). Yet, arguably, some outsourcing could be effectively managed through ICT, which supports the argument that geographical proximity is not a stand-alone generic variable in the outsourcing-location

[51] In this connection, in terms of GSO, Heeks et al. (2001) conclude that"*Western clients seem to fall too easily for the argument that, in a globalized world, distance, boarders, and place no longer matter.*"

decision, and that its impact is moderated mainly by what is being outsourced (situation-specific factors). Similarly, as argued above, it was found in the cross-case analysis that the less process standardization there was, the more inter-firm interaction was required. This, in turn, had an impact on the geographical distance, as frequent on-site visits and posting employees to the vendor's premises incur additional costs. Logically, these costs could be expected to grow in line with the increase in geographical distance. In other words, it appears that the less process standardization there is and the more asset-specific the outsourced objective is, the greater the influence of geographical distance on the location decision.

One of the reasons why the different locations were chosen could lie in the different firm-specific or *internal factors* and the differences between them. These factors included the company experience of internationalization and outsourcing, as well as the outsourcing motives (Graf and Mudambi, 2005). In terms of the cross-case analysis, FinaSoft had some prior outsourcing-related experience due to its ownership structure, whereas InsuraSoft did not have any. It was argued earlier that prior knowledge of outsourcing management decreases the risk and transaction cost of outsourcing abroad. In fact, the software development manager of FinaSoft put it this way:

> *"We had some outsourcing experience prior to this project, which helped us to assess more accurately the costs and risks, and to establish common operating procedures, which in turn helped us to manage the possible risks."*

Accordingly, even though FinaSoft lacked detailed knowledge about the outsourcing location, it had insights into the possible risks and the potential additional 'hidden' costs involved in outsourcing projects, irrespective of the location. Given the fact that an increase in geographical distance often leads to an increase in operational costs and risk due to the greater level of uncertainty, it could be argued that companies with previous outsourcing experience are more receptive towards outsourcing to more distant locations.

In terms of previous experience of the international context, the cases do not allow for further analysis because there was no relevant location-related knowledge and experience in either company that would have influenced the outsourcing decision-making. However, also as argued by Graf and Mudambi (2005), it is quite reasonable to expect that experience in the international arena, particularly in the target location, would decrease the costs associated with operating on that specific market (cf. Hymer 1976). The cost of internationalization per se is influenced by the level of target-market knowledge (Eriksson et al. 1997), and accordingly is lower if the firm possesses prior knowledge. This is similar to outsourcing, and it could thus be further argued that companies are more receptive towards outsourcing if they

have previous experience of it, and that they would favor locations of which they possess prior knowledge.

As argued earlier in this thesis, previous FDI research emphasizes *location-specific* factors such as the infrastructure, country risk, and government policy as primary influencers of the foreign-investment decision (e.g., Dunning 1988). Further, recent findings on GSO are quite inconsistent on the impact of location-specific variables in the decision-making (e.g., Amoribieta et al. 2001; Carmel 1999; Farrell 2005). However, in terms of offshore outsourcing, the results of the cases indicate that location-specific factors had only a limited direct impact on the location decision. Both companies chose comparatively high-risk countries, even with restrictive government policies on foreign ownership in the case of FinaSoft, for example. In fact, and contrary to expectations, the lack of a country-related IT infrastructure ended up being beneficial to InsuraSoft because the absence of old IT architectures meant that it did not need to replace anything and could start from scratch. It has been suggested that the quality of the IT infrastructure has a positive effect on the choice of location for international production (Dunning, 1980; 1988), and also on international outsourcing (Graf and Mudambi, 2005; Palvia, 2004). However, the InsuraSoft case illustrates that an underdeveloped IT infrastructure may be a positive factor in the location decision. Furthermore, in both cases the companies invested in building the IT infrastructure of the supplier company, and the existing infrastructure therefore did not play a direct role.

In terms of *external factors* connected with the location decision, interestingly, the interests of stakeholders were mentioned - even during the interviews that were conducted for purposes of Article #2. For instance, the software development manager of FinaSoft said:

> *"…about these outsourcing decisions, we haven't made them public as it might create a bad image of us in our customers' minds".*

Due to the fact that what was being outsourced, particularly by FinaSoft but also by InsuraSoft, was not visible to their customers, neither firm needed to consider customer needs in the location decision. What they did was to adopt the strategy of being quiet and sensitive about revealing their offshore outsourcing plans (see Kshetri, 2007). In the case of high-visibility activities or processes, firms may need to comply with stakeholder requirements, particularly with regard to customers. In other words, the higher the customer visibility of an activity, the more stakeholder interests need to be considered in the outsourcing-location decision. As software development per se is often invisible to stakeholders, the implication is that, although found in previous research to have a potential effect on a firms' decision to outsource (e.g. Mankiw and Swagel 2006), stakeholder requirements do not significantly

affect the process of outsourcing software-development work, locally or offshore.

In light of the above discussion it appears that the most influential variables in the location decision are situation-specific (situational) and firm-specific (internal). According to the results of the cross-case analysis, the influence works in two ways - either directly or by emphasizing and moderating the importance of other factors. In addition to the direct impact of aspects such as previous location-related experience, the extent to which location-specific and external factors are considered is influenced by other sets of situation-specific and firms-specific variables. For instance, it was only because both companies sought cost savings from the outsourcing agreement, and because the tasks outsourced were somewhat labor-intensive, that low location-related employment costs were valued. Similarly, the nature of the outsourcing objective in terms of process standardization appears to have a great influence on the geographical distance. Furthermore, the extent to which firms need to take the views of external stakeholders into account depends on the visibility to them of the outsourced activity.

Thus, whereas FDI research emphasizes location-specific factors (Dunning, 1988), the results of this analysis suggest that the final choice of location in GSO largely depends on what is being outsourced, why, and by whom. However it was also found that the future-internationalization strategy could also influence the location decision. For instance, Welch and Luostarinen (1993, p. 44) predicted that:

> *"Among individual firms there is a need to use inward moves in a more productive way to promote outward internationalization, perhaps by selecting foreign suppliers in part on the basis of their ability to contribute to an outward strategy."*

Similarly, it is shown in Article #6 that in some cases accumulating market-related knowledge through outsourcing may be one of the primary goals, yet there is practically no prior evidence that firms outsource in order to lower the barriers to international markets, and thereby further rationalize the outsourcing location based on such internationalization objectives. However, FinaSoft explicitly stated that its future internationalization strategy was one of the main factors affecting the location choice. Through the building of a resource pool close to its targeted markets it was able to capitalize on those resources when carrying out customer-specific service work in that area. Therefore, it is likely that a strategic leaning toward future internationalization might play a role in the location decision, thereby placing market-seeking (cf. Dunning, 1993; 2000) motives in the framework. Figure 26 illustrates the developed framework in the context of the choice of outsourcing location.

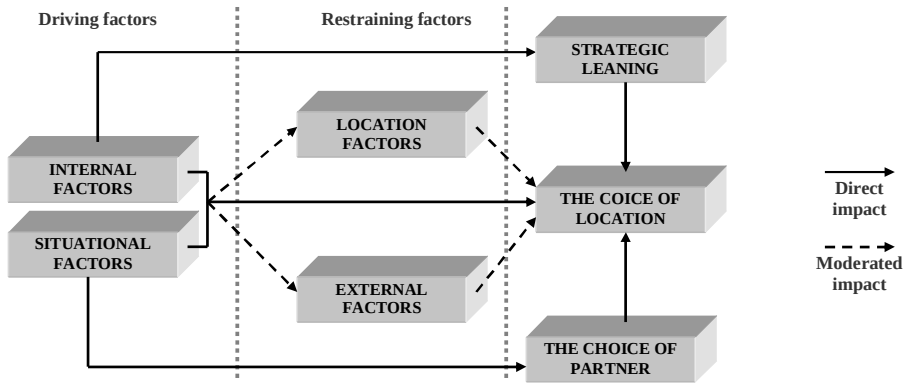


Figure 26 The choice of location for software outsourcing

As Figure 26 illustrates, the primary factors affecting the choice of location were the internal and situational factors, and the extent to which the locational and external factors affected the final choice were influenced and moderated by these two factor sets. In addition, it was argued that the choice of location is never independent of the choice of partner. A major consideration in offshore outsourcing is the extent to which firms choose partners and locations, and more importantly the sequence they follow. In terms of locational choice, if the partner is chosen first, the location decision may well be distorted as the outsourcing company may capitalize on its partner's expert advice (Podoshen, 2004) and, as argued, the location choice is then restricted. FDI research on location decision-making fails to acknowledge the impact of the partner, which is natural given the focus on direct investments.

The cases of FinaSoft and InsuraSoft concerned two different outsourcing and location decisions, yet in both the location (for FinaSoft it was the geographical area) was chosen before the partner. Furthermore, the primary motives of both companies were related to cost savings and the scarcity of resources. As the CEO of InsuraSoft said,

> *"We wanted to find partners in Estonia as it had a large number of capable programmers available at a fraction of the domestic price".*

Thus, it is reasonable to assume that cost-driven outsourcing companies need access to markets that have a low-cost labor infrastructure and adequate skills in terms of task completion (Doh, 2005).

One major question remains, which also affects the later phases of the outsourcing process. When and under what circumstances do firms choose partners prior to choosing the location? The case analysis, backed up by rational argument, would suggest that situational (what is being outsourced) and internal (why) factors influence this primary choice. In fact, previous research on partner selection and management has concluded that these are the

primary determinants in different outsourcing-related partnering decisions (e.g., Barthélemy, 2003; Hussey and Jenster, 2003). In terms of offshore outsourcing, it is logical to expect that when the activities are of low strategic importance and the supplier markets are highly competent, and when the primary motive is to reduce costs, companies decide on the location before choosing a partner.

On the other hand, in cases of high strategic importance and asset specificity, and/or uncompetitive supplier markets, companies are more likely first to seek partners with the required competences and a proven track record before choosing the final location. Although Williamson (1975) suggested that companies should seek internal solutions in situations of uncompetitive supplier markets, in many fast-moving industries such as software, the complexity of the total solution may even drive them to outsourcing some critical activities. If the outsourced task is complex, and thereby requires the vendor to possess substantial skills, cost savings are not the primary motive (resource-seeking): skills and know-how are paramount (Graf and Mudambi, 2005). Indeed, where the partner is physically located is becoming irrelevant. Companies increasingly seek capability enhancement through acquiring knowledge or technology by means of making outsourcing agreements with firms, regardless of their national location (Narula and Hagedoorn, 1999).

Moreover, when outsourcing is aimed solely at bringing about extensive changes in the production system (transformational outsourcing), previous research has indicated that the key is to find a strategically and operationally suitable partner (e.g., Kedia and Lahiri, 2007; Morgan 2003). Whereas traditional outsourcing aims at achieving cost savings or acquiring resources and knowledge that are unavailable internally, the sole idea of transformational outsourcing is to change the way the company operates (Linder et al.; 2002; Mazzawi, 2002). It could be argued that location is somewhat irrelevant in this context as the emphasis is on the vendor's ability to offer flexibility. Hence, in outsourcing aimed at cost savings the choice of location may well precede the choice of partner, and on the other hand, in outsourcing aimed at capability enhancement or process improvement the choice of partner may well precede the choice of location.

5.2.4 A model for outsourcing software development – how to outsource?

It was argued above that firms outsource similar product-development activities through various transactional modes, which in turn implies that there are different aspects to outsourcing management. Further, defining the

outsourcing model entails deciding on issues such as the governance model, the level of task division, and the scale/incrementality of the divestment.

It was found in the case analyses of outsourcing projects that the required governance model is highly connected to the level of task division. Basically, this is connected to the degree of specification of the work. The extent to which the development task is pre-specified, including the task itself as well as any possible interfaces needed to integrate it into the system, defines the level of interaction needed, and thereby the proper governance mode. For instance, according to the cross-case analysis reported in Article #5, firms may have differing governance models for outsourcing similar components - business components. In the two illustrated cases, Maxit Banking Systems and JPS Insurance Management Solutions, both companies undertook outsourcing projects on a business-component level, yet they had totally different approaches to the vendor's participation. Whereas Maxit's plans involved the cooperative development of the software, JPS undertook a process in which the task was highly specified. In both cases, according to the framework developed earlier (Figure 17 on page 112), the point of outsourcing was on the business-component level, yet both companies had different approaches to the management of the activity. In the case of JPS there was much more cooperation in the development process, whereas in Maxit the outsourcing was governed through standardized processes and specifications. Figure 27 illustrates the two cases (Article #5) based on the framework developed earlier, and further illustrates how the responsibilities were divided between the transacting parties.

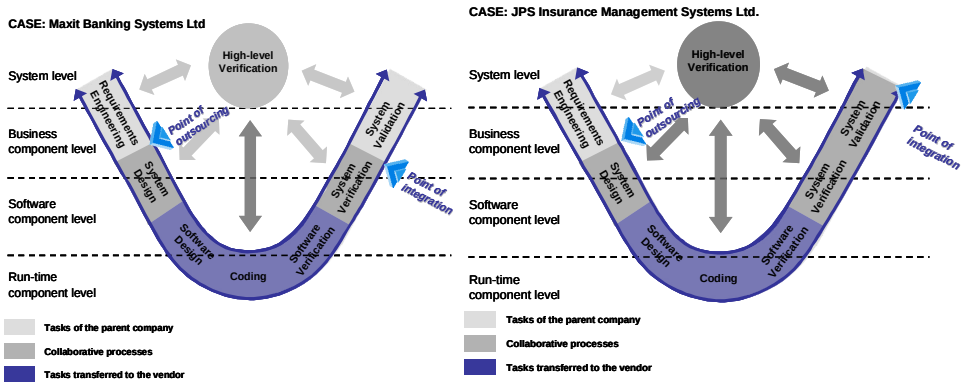


Figure 27 Examples of two outsourcing models

The governance mode should therefore be in line with the degree to which the supplier is expected to contribute to the project. As discussed earlier, there is a difference between outsourcing a specified activity and outsourcing a

solution (a working system, see Goldsmith 1994) in terms of identifying who is intended to design the solution - the outsourcer, the vendor, or in cooperation (task division). The results of the cross-case analysis (Article #5) reveal that the degree of selectiveness is not confined by the decision of the outsourcing scale (business-component level in the case), and there are many ways of outsourcing a particular hierarchical component (see Figure 27). For instance, in the Maxit case the outsourcing was highly structured, and detailed specification and testing procedures were in place. The vendor was expected to perform specific pre-determined tasks, as the CTO of the company stated:

> *"A good outsourcing partner does exactly what you want, nothing more and nothing less"*

This represents the other end of the continuum. In the case of JPS, on the other hand, according to the pre-determined outsourcing model they applied, the vendor should contribute more to the development and design of the process. The vendor's personnel were involved early on in terms of providing insights into the system design. Although there was also collaboration in the system-design phase in the case of Maxit, the idea was to familiarize the vendor's personnel with the existing system as well as with the operating procedures and specifications of the outsourced work. The vendor was not expected to contribute to the design. From the above discussion it appears that the choice of outsourcing model ranges between the structured and the unstructured, regardless of the scale of the outsourced activity. In other words, task division defines the degree of 'research' inherent in R&D outsourcing.

The cross-case analysis revealed, however, that the ability to govern the outsourcing process in a more arms-length manner seems to depend on the outsourcing experience of the company[52]. As the software development manager of Maxit stated, for instance:

> *"We had some outsourcing experience prior to this project, which helped us to assess more accurately the costs and risks, and to establish common operating procedures, which in turn helped us to manage the possible risks."*

Nevertheless, it is essential to plan the outsourcing model prior to implementation. This requires the assessment of internal processes and capabilities. As argued above, the level of process standardization also affects the choice of location. In the case of GSO, as argued by Brown (1998) and Hislop (2002), for instance, it was found that reliance on ICT as a means of transferring knowledge and thereby managing outsourcing relations is

[52] As a theoretical note, Teece (1977), in fact, found that the principal determinant of difficulty and thereby cost in transferring knowledge is dependent on the degree to which the firms possess previous experience in transferring knowledge.

insufficient. In the light of the results it seems that, regardless of the level of specification of the work, the parties need to have cooperative phases in the outsourcing process, especially in transferring the activities to the vendor (point of outsourcing), but also in testing and validating the vendor's deliverables (point of integration). In defining the distribution of activities it seems that firms need to address the question of where (physical location) each task of the outsourcing process will be undertaken. It was found (Article #5) that this is especially important in phases in which activities are transferred from one party to another, i.e. the point of outsourcing and the point of integration. As illustrated in Article #5, the point at which the responsibilities are transferred to the vendor does not necessarily correlate with the point at which the physical location of the development tasks are transferred.

Whereas it was argued that the primary level of outsourcing remains the business-component level, it was found, as in Lacity et al. (1996) and Heeks et al. (2001), that the incremental approach to software-development outsourcing may carry positive implications. What this basically means is that firms undertake a small portion of the project/process prior to transferring ownership of the full activity to the vendor. It was found that firms with limited outsourcing experience in particular had made the strategic choice to test the relationship by means of "trial-up" outsourcing. This trial period provided these firms with knowledge and valuable information about the suitability of their internal processes as well as with the opportunity to establish common procedures. Moreover, this kind of incremental approach to outsourcing enabled firms to 'test' the vendor's capabilities. As a software-development manager responsible for incremental task transfer stated:

> *Outsourcing smaller (run-time) components first is a good way to test the relationship. It's also a good way to test the vendor's capabilities, as you never know whether the vendor is in fact capable of providing everything it promises. […] What we also encountered in the trial period was that there were several flaws in our internal procedures.*

As argued by Amoribieta et al. (2001), information on potential vendors is sketchy. Even negotiation does not necessarily reveal the vendor's ability to perform the outsourced task. In this sense, taking an incremental approach to the outsourcing project may facilitate vendor validation. It provides a tool with which to assess and evaluate the vendor's capabilities before the large-scale divestment of activities, and thereby dilutes the potential risk of selecting the wrong one. The issue of vendor selection is discussed in the following section.

5.3 Outsourcing implementation management in software firms

The results of the interviews indicate that software firms often need to re-organize their operations prior to undertaking outsourcing. In that sense, it seems that strategy (outsourcing) does drive the structure of the firm. Therefore, from the theoretical perspective, the outsourcing contingency theory (cf. Drazin & Van de Ven 1985; Miller 1981) put forward in this thesis states that strategy (outsourcing) does cause firms to modify their structure. The extent to which it does so, however, is moderated by the level of prior outsourcing experience. The following section provides an example of the organization-wide changes a firm (named Datamatic) with limited outsourcing experience needs to take beforehand (see Article #4). It also describes the process of supplier selection, based on a cross-case analysis of three firms (see Article #3). Although this was identified among larger firms, it was later discovered in discussions with managers of smaller software firms that a similar process of supplier selection applied in that context.

5.3.1 The ex ante implementation management of software-development outsourcing

Although several studies (e.g., Amoribieta et al. 2001; Levina & Ross 2003) suggest that the key to outsourcing lies in finding a competitive supplier, it is argued here, without diminishing the importance of the later selection of the right supplier, that firms aiming at bringing about changes in production systems should first take internal measures to build a suitable setting for the interorganizational decomposition of activities. According to representatives of Datamatic, for instance, one of the success factors behind outsourcing lies in its systematic planning and prior internal reorganization of activities and tasks. It is therefore to be expected that prior internal reorganization will have a positive effect on outsourcing success and the realization of its benefits.

As seen in the Datamatic case (see Article #4), companies may need to go through several phases prior to finding a supplier for the outsourced activities. This modularization process could be seen as a program for modifying internal processes and product architectures in order to create the prerequisites for successful outsourcing. Whereas previous research suggests a two-fold distinction in internal modularization (product and organization, see e.g., Baldwin & Clark 1997; Brusoni & Prencipe 2001; Fine et al. 2002; Langlois 2002; Sanchez & Mahoney 1996), it is suggested here, on the basis of the Datamatic findings, that the building of modular structures for later outsourcing falls into three categories of activities based on identifiable

sequential stages. In this case the three sequential, although to some extent parallel, stages were: (1) product design modularization, (2) design process modularization, (3) organizational modularization.

According to the results of the case analysis, the key to *product design modularization* (1) lies in limiting the interdependencies within the product and making explicit as much tacit information as possible . According to Baldwin and Clark (1997), the first step towards achieving a modular structure in the design process is to redefine the cells in the production process. Similarly, the results indicate that this step entails mapping the existing structure of the system first, and further documenting the interlinkages. As the software development manager of Datamatic stated:

> *"At minimum we need to document the software to see what is in there and how they connect to each other. Only then can we see what kind of modules can be outsourced. It's another story if we want to outsource […] in that case we'd most probably have to do a lot more than just documenting."*

Limiting the interdependencies between the different parts of the product(s) (system) allows them to be managed and designed independently, thereby creating outsourcing opportunities. This result is in line with those of previous studies on the modularization of product architectures, which were discussed in earlier chapters (e.g., Baldwin & Clark 1997; Mikkola 2006; Schilling 2000). As in Baldwin and Clark (1997), the re-architecting process illustrated in the Datamatic case mainly entailed undertaking activities for enhancing transferability, such as limiting the interdependencies within and between products and documenting the product architecture. Although it is generally argued that products can be made increasingly modular if the range of compatible components is expanded (increasing the range of possible product configurations, see e.g., Schilling 2000), the Datamatic case revealed that modularization driven by later outsourcing sometimes requires downsizing in terms of possible product variations: the more product variations the firm nurtures the more component variations are needed, which in turn leads to the need for more suppliers to provide them. Datamatic did not want to have several suppliers in its portfolio, but wished to focus on a few with which they could build deeper relationships. According to the CEO of the company, compromising on product variation may eventually lead to greater operational flexibility[53].

[53] Similarly, Helander (2007, 31) found in her analyses that software-development teams used modular architectures as coordination mechanism to generate quick responses to specific customer requests, therby allowing greater flexibility in product development.

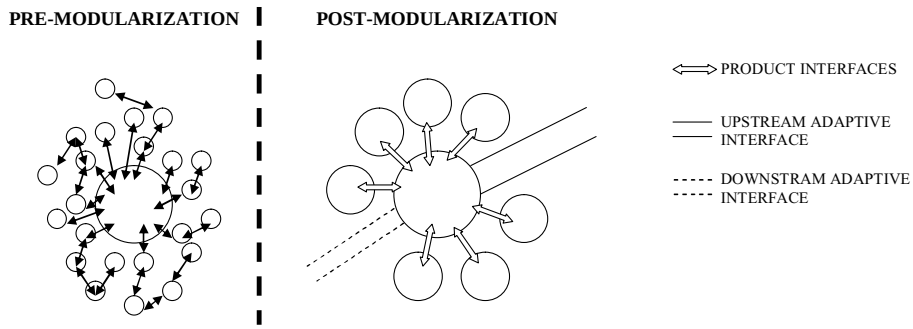


Figure 28 A simplified example of software-product modularization

Building modularity into existing design structures is one thing, but almost all companies need to adapt to the design rules of others, especially small and medium-sized companies, although previous research has illustrated that even large MNCs sometimes need to conform to other people's design rules and principles (see e.g., Nellore & Söderquist 2000). However, in outsourcing decisions size does matter (Nicholson & Sahay 2004). Obviously, this also applies to companies adapting to the higher levels of the system. Datamatic had to adapt to the standards and built interfaces in order to communicate with the systems of large enterprise resource planning (ERP) providers such as SAP and Oracle. Smaller companies also have to adopt the design rules of sub-module providers. For instance, Datamatic decided to license one of its modules from an applications provider. Yet, given the low purchasing power of the client, it needed to build interfaces for the existing solution in order to integrate the licensed component into it. These kinds of adaptive modularizations can be divided into downstream and upstream adaptive interfaces.

Amoribieta et al. (2001, 133) suggest that good candidates for outsourcing require limited interaction with the different units of the organization. However, as the Datamatic case illustrates and as with product architectures, software firms are able to take internal measures to limit the interactions between different organizational units, and thereby create 'prospective outsourcing candidates'. Having achieved product-design modularization, companies should focus on the design process (2). As Sanchez and Mahoney (1996), for instance, suggest, adopting modular architectures in product design does not automatically lead to design-process modularization. Companies need to create visible design rules not only for their products, but also for the processes in which they are produced. According to the Datamatic analysis,

Baldwin and Clark's (1997)[54] three-fold categorization could also be applied in the creation of visible design rules for processes. First (architecture), companies need to decompose their production process into modules in order to define which of the separate activities are independent and what kind of tasks are related to the production of that specific module. Secondly (interfaces), they need to define how these activities (modules) interact with each other in the production process (system). By determining the interconnections, companies are able to define the processes that are embedded (many interconnections with other activities) and those that can be loosely coupled (few interconnections with other activities). Thirdly (standards), companies need to build standards for evaluating the performance and transferability of each of the decomposed activities. This kind of analysis provides them with useful information about the bottlenecks in their processes. Specifying the required outputs of component-development processes allows them to be divided into tasks (von Hippel 1990) that can be performed autonomously and concurrently withn a loosely-coupled structure of development organizations (Sanchez & Mahoney 1996). According to the empirical evidence, in terms of outsourcing the evaluation of performance would be based on metrics such as how much it ties up internal resources and how volatile the resource demand is, whereas metrics concerning process-related knowledge transfer such as codifiability, complexity and teachability could be used to examine the transferability of the process (cf. Kogut & Zander 1993). A similar outline of visible design rules in production processes was created in Datamatic in order to provide a better overview of the different activities and their current performance, and of the interaction between them: if these activities were outsourced, this would assist in defining the control and coordination mechanisms required for successful transfer. This suggests that firms seeking to outsource should align their internal processes in a way that enables them to transfer parts of the process to different locations, or as suggested by Eppinger and Chitkara (2006, 29):

> *"To enable PD activities to be carried out in different locations, there must be a methodology to segregate the work packages for global distribution. For example, where a remote center will be handling tasks in a process that continues to be owned by the "central" PD location, a modular process is needed. This process must be broken down into clear steps, the steps distributed to different locations and the process reconfigured to allow for necessary handoffs, reviews and approvals."*

[54] Architecture, interfaces and standards. See the list on page 79.

The final phase of internal transformation prior to outsourcing could be referred to as creating organizational modularity. This entails, in particular, building management structures to correlate the pursued operational model in order to ensure the coordination of the outsourced activities. If outsourcing is to work, executives must manage it expertly and in a structured manner (Linder 2004). In addition, these structures enable knowledge transfer to and from the company: building interorganizational procedures should limit the amount of parallel work. As the software manager of Datamatic stated with regard to piloting software outsourcing:

> *"When the developed application did not work correctly, the (Datamatic and their vendor) programmers started to communicate directly with each other and eventually solved the bug (problem) in the software. However, they did that without notifying us (program managers) and for several days after we were trying to solve the problem, not knowing that it had already been fixed."*

Although modularity enables parallel design and testing (Loch et al. 2001), the parallelism has to be managed in a controlled way. In practice, as in Datamatic, organizational modularization entailed the re-assigning of management responsibilities for the outsourced production modules by creating the positions of account and outsourcing project managers. As Sawhney, Wolcott and Arroniz (2006, 79) state:

> *"Organizational innovation often involves rethinking the scope of the firm's activities as well as redefining people's roles, responsibilities and incentives."*

In fact, it seems that the correct prior division of responsibilities is a key issue in the further day-to-day management of outsourcing relations. As Amoribieta et al. (2001) found, for instance, companies best manage outsourcing projects by appointing a project/account manager who acts as a point of contact working with the external development organization, overseeing the process implementation, and finally claiming ownership of the externally developed activity. The following quotation from the software development manager of Datamatic is a good example:

> *"We need to reposition our software development team based on the product areas (these areas were identified in the phase of documenting the product) and distribute responsibilities for each outsourcing project according to which area they fall in. These persons responsible for the projects need to claim ownership of the outsourced activity. If there is no divided responsibility and ownership, it's easy to blame the vendor whenever something doesn't work. […] However, it isn't easy to get people to commit to and claim*

ownership for something they have not done. In fact, that's the key management issue in outsourcing."

Once the firm has built its internal structures to support the outsourcing, the next phase consists of finding a supplier to meet the specific need. Our analysis (Article #3) revealed that the search for suppliers was based on criteria such as availability, technical competence, price, strategic fit, the vendor's stability, managerial compatibility, as well as transparency and trust in each other's doings. It seems, furthermore, that these criteria recur in the process of supplier selection. The cross-case analysis of three firms (Article #3)[55] highlighted three progressive stages of screening in the search for prospective suppliers of product-development activities, in which different selection criteria prevail: availability screening, technical screening, and strategic screening (Figure 29).

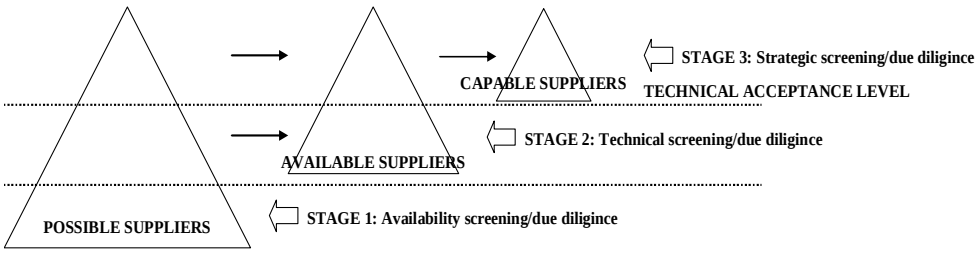


Figure 29 The supplier-selection process for software-development outsourcing

Again in line with Amoribieta et al. (2001), the analysis (Article #3) indicated that potential vendors should be ranked first and foremost on their ability to provide all of the necessary expertise (Stage 1). The initial screening of potential suppliers needs to focus on finding prospective candidates that are simply able to provide the required amount of the component or service in question at the right place and time. The availability criteria are mainly quantifiable. This type of screening can be done via secondary sources such as the Internet, or by sending out a simple query, often an offer proposal (RFP). Other initial contact sources identified include existing databases, existing business relationships, consultants, and conferences and trade fairs. However,

[55] Although Article #3 discusses this staged approach towards supplier selection for product-development activities, because it was derived from an analysis of larger firms from the ICT industry it was later validated in the context of smaller software firms. Discussion of the model with three managers responsible for supplier selection in smaller software firms revealed that these three stages similarly applied in their screening of prospective outsourcing/licensing suppliers. The only difference was that the process tends to be more systematic in larger organizations, whereas although smaller firms follow a similar logic, the process is more implicit and unsystematic.

quantifiable information obtained by means of specific software, for instance, has maximum impact only at the pre-negotiation stage (Tucker and Jones, 2000) – referred to in this thesis as availability screening. For reasons of confidentiality, often the only way of screening prospective partners in software-development outsourcing is through the company's own channels (Kinnula 2006).

Suppliers considered suitable based on the availability screening are then analyzed in terms of their technical competences and capabilities (Stage 2). As Kinnula (2006) found, for instance, the results (see Article #3) indicate that the second step in vendor selection is to evaluate the prospective candidates in terms of their ability to meet the technical criteria and prerequisites. However, contrary to the view that the primary and most conclusive criterion in purchasing innovative components is the technological competence of the supplier (Hoetker, 2005), it was found that the primary selection criterion, with only a few exceptions was technological competence. As one of the interviewed sourcing managers put it:

> *"You do not have to be best-in-the-world to supply us, just have the technology we need"*

Yet, according the analysis, it seems that even technology-intensive firms such as software providers often do not go with the most competent supplier, and there may be what could be called a technical acceptance level that operates as a technological threshold. The companies that are not only available, but also meet the imposed technical requirements, are then analyzed according to another set of criteria, which in the end play a decisive role.

The analysis revealed that the cluster of criteria used to identify suitable suppliers in the final phase of strategic screening were highly context-dependent: what was being bought constituted the right set of criteria in a given situation (Stage 3). Accordingly, it appears to be the prior conceptualization (outsourcing decision) of the outsourced activity that provides the basis for vendor selection (Goldsmith 1994, 15). According to the CTO of one of the case firms, the cornerstone of each technology-supplier agreement lies in the alignment of strategic objectives:

> *"The primary goal is to find a partner [supplier] that is strategically compatible […] each partnering situation is unique, and so are our strategies related to that situation."*

However, it was pointed out that two aspects of the product being purchased had an impact on the supplier-selection criteria: its complexity (equally a product component) and its strategic importance to the client. In other words, the asset specificity and the strategic importance of the outsourced objective seem to be decisive factors in the supplier selection. It is often the case that the more complex the product, the more it requires from the

client in order to get it back or to start constructing it in-house. Williamson (1981) suggested that firms should avoid using the markets, and should prefer integration whenever the supplier market is uncompetitive. However, it was found that in the software industry some components are purchased even when the supplier markets are uncompetitive because the cost of internalizing the process would be too high, or it might even be technologically impossible (Doig et al., 2001). Its strategic importance to the client defines the impact that the component has on its entire product/solution. Strategically important products serve as a basis for the core business of the client's company.

Even with suppliers fulfilling the technological 'threshold' requirements, it was found (Article #3) that in the end different criteria prevailed for different outsourcing objectives. First, if the component was of low strategic importance to the client and of low complexity (asset specificity), price and cost-related factors tended to be dominating criteria because there were usually very many equally capable suppliers. With little difference in the supplier offerings of these non-strategic components, the most cost-efficient supplier was typically chosen: if there is no significant added-value potential in the component, and competitive supplier markets offer substitute components, there may be no other differentiating factors than price. However, in situations in which the supplied component is complex but it still has only limited effect on the overall success of the client, personal criteria such as managerial compatibility and transparency were emphasized as deciding criteria. Due to the fact that in purchasing complex components the interaction between the contracting companies needs to be high, clients sought suppliers with a high level of transparency in order to ensure continuance of supplies. As one interviewee stated:

> *"If we need to have a close relationship with a supplier that provides us with non-strategic components, we'd rather have suppliers we can trust and whom we can be sure have no hidden agendas"*

When the product is not very complex, but is strategically embedded in the processes of the client, technical attributes dominate in the choice of supplier: with components that can be easily replaced and are readily available, even though they are strategically important, the most value comes from their technological attributes. It is different in cases in which the sourced product is complex and strategically important to the client, however, when the most influencial selection criterion is stability. As one representative stated:

> *"We had a project in which we were developing a solution for one of our products with a smaller supplier. Just as the solution was ready, the company was sold to our fiercest competitor, and the IPRs went along with the company. Today with components that are the most strategically important to us we take any necessary actions to ensure*

that we'll get them tomorrow as well, even if that means compromising on price or functionality. "

According to the above discussion related to supplier selection, it seems that while the technical capabilities of the vendor are important, what is being outsourced (the nature of the outsourcing objective) plays the decisive role in the end. This argument is also supported by other findings on vendor selection for technology-intensive products and services, such as software development (e.g., Goldsmith 1994). Indeed, it emphasizes the importance of a prior conceptualization of the nature of the outsourcing objective to the overall success of the outsourcing project. A distorted picture of the nature of the outsourced activity will most likely lead to the wrong selection of supplier for a given situation. However, even if a software firm correctly assesses the nature of the activity and selects the right vendor accordingly, the project may still fail due to the inadequate management of the relationship.

5.3.2 The ex post implementation management of software development outsourcing

It has been argued that one of the primary determinants of outsourcing success lies in the on-going management of the outsourcing process. However, as was shown, the results of the interviews suggest that the management of outsourcing implementation is largely dependent on what is being outsourced, and further on the chosen outsourcing model. Yet, regardless of the differences in outsourcing decisions, it was also found that there were specific issues related to the management process that require increased attention in the outsourcing of product-development activities (Article #5)[56]. These management issues seem to be quite different depending on the chosen broad strategy, in other words whether the firm is acquiring ready-made technology off-the-shelf (buying) or creating software as per given specifications using external resources (specifying). Although it was noted that licensing is often akin to and is seen as a form of outsourcing, mainly due to the substitute role of 'buy' in the two-fold 'make or buy' decision, in terms of managing the outsourcing implementation the two are very far apart. Whereas using COTS components in product development pushes organizations from application development to application assembly (Boehm & Abts 1999), outsourcing

[56] Article #5 provides a cross-case analysis of the on-going management of two outsourcing cases, Maxit and JPS, and one licensing case, C-Soft: the aim was to identify the key issues related to the on-going management of each strategy

pushes them from development to management, thereby imposing different requirements on the on-going management of outsourcing implementation.

Firstly, in terms of buying existing components (licensing) that are ready-made and can be bought as such on the markets, the two key issues concern adaptation and integration (Figure 30). Because these components are pre-made, firms need to adapt to the design rules. When a firm buys a module as such, it also buys the knowledge it embeds (Brusoni & Prencipe 2001). In evaluating the component it needs to build adaptive interfaces with the existing system in order to ease its later integration into the relevant part of it[57]. Further, in terms of integrating COTS components into product development, Boehm & Abts (1999, 136), for instance, suggest that firms generally have no control over the evolution of a COTS product. However, it seems that the relative asymmetries in terms of firm size may be significant regarding who needs to adapt to whose design rules. As the CEO of C-Soft stated:

> *"… of course we wanted to have influence on the component we were licensing, but as a small company we had little influencing power."*

It seems that when the buying firm is smaller than the vendor it is limited in its power to influence the vendor's activities. As mentioned earlier, a small firm creates minor business for the much larger outsourcing providers, and thereby does not have the negotiation power that larger firms might have. In fact, it was found in another licensing case analyzed (Article #6) that, given the relationship between buyer volumes and the amount of business going to the vendor, the higher the volumes, the more willing is the vendor to tailor or customize to the existing system of the buyer. This carries implications in terms of the supplier's COTS selection process for components in smaller software firms.

Regardless of who needs to adapt to the design rules, the second nodal point of managing the implementation in licensing projects entails integrating the component into the existing system. This was found to be a key issue in risk management. If a company embeds the COTS component deeply into the system by using several interfaces that communicate with different parts of it, should the relationship end (e.g., due to acquisition or the bankruptcy of the vendor) removing or replacing that specific component from the system would be very complicated. Thus, although the bought components should fluently communicate with the system, they should be organized in such a way that they can rather easily be removed from it. In fact, it was found that modularity in the system design made this much easier, which emphasizes the importance

[57] The development of adaptive (downstream and upstream) interfaces was discussed in the context of building product-related modularity in the pre-outsourcing phase (see Figure 28 on page 177).

of prior modularization of the system (product modularization) in the process of integrating licensed components (see Articles #4 and #5).

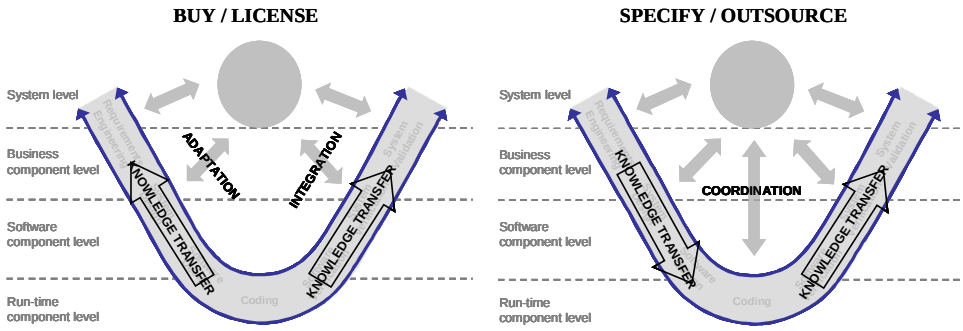


Figure 30 Knowledge flows and key management challenges in licensing and outsourcing

Secondly, in terms of outsourcing, the critical issue in the cross-case analysis provided in Article #5 (the Maxit and JPS cases) was not how to assemble the vendor's developed components, but how to manage the transfer of knowledge and information to and from the vendor and coordinate the entire process. Thus, and in accordance with the proposed framework, the key nodal points of an outsourcing process appear to lie in 1) knowledge transfer to the vendor, 2) knowledge transfer from the vendor, and 3) the coordination of the entire process: in all of these the different aspects of modularity seemed to have positive impacts.

In terms of knowledge transfer the crucial point is to transfer to the vendor the knowledge required for the completion of the task. However, firms need to make their 'wants' explicit, meaning that they need to articulate what the partner is expected to do to what kinds of existing structures. As Goldsmith (1994, 14) found, the results of the cross-case analysis of implementation management in two outsourcing projects (Article #5) indicate that certain requirements should be made explicit in transferring knowledge to the vendor. These include a detailed (in accordance with the outsourcing model) design of the system to be programmed, incorporating the hardware and software, the environmental constraints and the tools and methods to be used; performance levels indicating in detail how the vendor should perform against the SLAs and KPIs; and the vendor's responsibility and degree of involvement in terms of design, in other words whether the buyer requires the vendor to provide programming services (activity) or a working system that fits the design (Goldsmith 1994). In addition, given that outsourcing often entails developing a component to be attached as part of a larger system, it should be made explicit in the knowledge-transfer phase how the developed component links

to the system (interfaces). For instance, in the case of Maxit (Article #5), the external programmers were flown from abroad to the vendor's premises so that they could familiarize themselves with the existing architecture of the system, and thereby gain an understanding of how the applications they were supposed to develop should communicate with the system and through what kind of interfaces. In sum, this phase in software-development outsourcing entails providing the vendor with a detailed understanding of what it is expected to do (specifications, performance expectations, degree of involvement) and for what purposes (interfaces, hardware and software constraints).

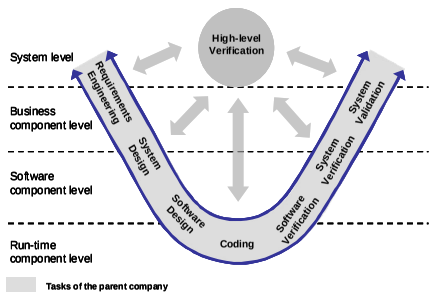
The other nodal point of the outsourcing process in terms of management is when the externally developed part of the system is transferred from the vendor to the outsourcing company, i.e. knowledge transfer from the vendor. Once the vendor has completed the programming of the specific component/task, checks should be made to ensure that it complies with the requirements and expectations set in the phase of transferring knowledge to the vendor. Accordingly, this phase entails the analysis of the vendor's deliverables. For instance, the outsourcing company needs to have processes in place for testing the developed component independently and as a part of the system. For instance, in the case of Maxit, the first series of independent testing was conducted in the vendor's premises by a representative of the company. The component was then sent back to the vendor's premises, where it was tested as part of the system. In addition to establishing testing procedures, it was found in the interviews that the knowledge transferred from the vendor should also cover processes for validating that the vendor has met all the requirements assigned to it. For instance, the phase of knowledge transfer from the vendor should include approval of the developed code and the related documentation: this would ensure that the software has been developed as per given instructions concerning the tools and methods used, and that the documentation was as agreed. In sum, this phase is one of validation, making sure that the vendor has done all that was required of it.

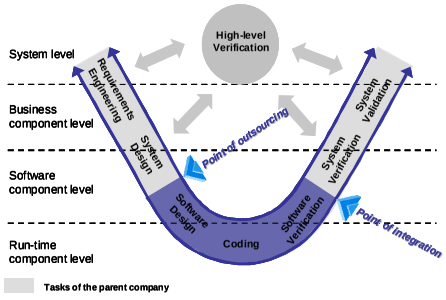
However, it is not enough that these two distinct phases are managed efficiently. In outsourcing, as opposed to licensing, when an external vendor provides something that is specified for the purposes of the company, it is essential for the process to be coordinated between the point of outsourcing and the point of integration. Companies are hardly ever able to specify the outsourced task in such way that the vendor is able to carry it out independently. Instead, as reported (see e.g., Grimaldi & Torrisi 2001, 1438; Nicholson & Sahay 2004, 336), it seems that successful software-development outsourcing projects usually require intensive sharing of information throughout the process - not least because external development projects often

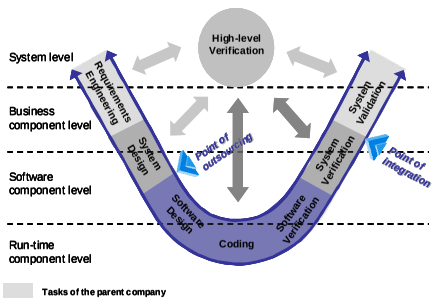
run in parallel with internal development projects. Although prior software modularization may faciitate the parallel design and testing of different parts of the system (e.g., Loch et al. 2001), it is still the interfaces that need to communicate with each other. Further, in some cases the vendor's deliverables are incrementally tested as a part of the system, which in turn requires coordination with regard to the outsourced activity: the firm thus needs to build an 'information structure' in order to manage the coordination. It was stated that there should be a single point of contact in the outsourcing company. This should be someone who claims ownership of the outsourcing process, including the deliverables of what has been developed externally. As discussed earlier (see also Article #4), although outsourcing relationships require both organizations to communicate with each other on various levels, there have to be some procedures in order to avoid parallel work (see, for instance, the quote on page 179).

Accordingly as licensing COTS could be seen as a strategy of 'buying', outsourcing is a strategy of 'specifying' as it entails articulating the needs to the vendor. It was found in both cases (Maxit and JPS in Article #5) that this was ensured through the establishment of collaborative processes throughout the outsourcing period. Collaborative practices had a vital role in transferring knowledge to the vendor. However, as both of the cases illustrated, the need for collaboration did not stop there: the collaborative relationship remained active throughout the outsourcing period. It was evident both in the verification of the subcontractor's deliverables and in the form of high-level verification (coordination), when incremental results produced by the subcontractor were integrated and tested as a larger entity. Furthermore, collaboration was also the key issue in transferring the created knowledge from the vendor. For instance, in the case of Maxit, software-testing procedures were established at the vendor's premises to ensure transfer of knowledge back to the company. In both cases, although the requirements were articulated to the vendor through specifications, close cooperation and a local presence were needed to ensure the successful flow of knowledge throughout the process.

Overall, on the basis of the above discussion, it seems that prior modularization of product architectures and processes on the organizational level assist in the later management of outsourcing implementation. This result is in line with findings in earlier studies that modularization on different levels positively enhances the ability to cope with the dispersed design and management of software-development activities (see e.g., Baldwin & Clark 1997; Mikkola 2006; Schilling 2000). The key management tasks and responsibilities involved in each software-product-development strategy, as well as the implications of modularization, are illustrated in Figure 31 below.







MAKE	BUY	SPECIFY
- **Management role** in applications development	- **Management role** in applications assembly	- **Management role** in applications management
- **Key management responsibilities** entail the coordination of internal development process	- **Key management responsibilities** entail adapting to the existing design principles of the supplier and integrating them in the existing solution	- **Key management responsibilities** entail the coordination of dispersed application development by ensuring fluent knowledge transfer to the vendor and subsequently from the vendor
- **Key managerial tasks** include building internal processes for flow of information between different development phases	- **Key managerial tasks** include conducting suitability and performance testing for the prospective component and to build interfaces for the component for integration	- **Key managerial tasks** include building processes for overall cooperation (operating procedures), processes for knowledge and task transfer to the vendor (specification creation procedures), and processes for knowledge and task transfer from the vendor (testing and validation procedures).
- In respect to **modularity**, adopting to the principles of CBSE not as vital if the development is not dispersed within the organization	- Prior **adoption to modular design principles** eases especially in the phase of integrating the component to the existing structures. Further, as COTS components are more often functional and well-defined entities, integrating them most likely leads to increase in the modularity of the system	- Prior **adoption to modular design principles** eases significantly the transfer of tasks to the outsourcing vendor, and also in the integration of the externally developed modules. Further, outsourcing well-specified and defined modules and integration of them leads automatically to modular design structures in the system architecture

Figure 31 Make, buy or specify – different approaches to the management of software development

In terms of on-going management, it seems that the most influential variable of the outsourcing decision is the chosen location. It was found that, especially in small firms with possibly limited experience of operating with foreign cultures, the management of the outsourcing relations was delicate. Many of the cases analyzed for the purposes of this thesis entailed outsourcing offshore, and most of the difficulties encountered in managing the implementation, especially in terms of coordination, were found to be related to cultural differences[58]. As the CTO of a small software firm put it:

> *"Everything nearly always works well when you outsource domestically. However, with certain activities it just makes sense to outsource them to countries in which they can produce them at the highest quality and for the lowest cost. This is the first and biggest challenge for us in terms of outsourcing, because working with foreign cultures there are so many things that can go wrong!"*

It appears from the interviews that the more international experience the company, or its managers, has of operations in general, the fewer difficulties it encounters in managing the outsourcing implementation., Although the results do not clearly indicate increases in scale or scope in the offshore-outsourcing portfolio (Article #1), the implication is that as a form of internationalization it is a learning process - as suggested in earlier research on market-related internationalization (Johansson & Vahlne 1990). It also seems that prior outsourcing experience greatly assists in managing the outsourcing process, and decreases the need for intensive interaction. As illustrated above (see also Articles #4 and #5), it could be argued that prior outsourcing experience not only encourages firms to opt for modularity in the product architecture, processes and organization, it also gives them an understanding of how to manage the outsourcing implementation and of the difficulties they may encounter. This, in turn, helps them in establishing implementation procedures. Nevertheless, for outsourcing to be successful firms need to devise implementation-management procedures based on the overall situation (what is outsourced, why, where, how, and by whom), without underestimating the importance of written contracts, which should at minimum describe in detail the vendor's responsibilities and expectations during the whole process

[58] It was found that cultural differences led in several cases to miscommunication. For instance, it was said that the Asian culture is such that when people encounter a problem they hardly ever ask and just put it aside. It was also found in the context of communicating with Indian vendors that one had to understand what they meant, not what they said. In terms of communication, Vohra (2003, 110) vividly describes how in the Indian cultural context "Yes" actually means, "I've heard you", and "I think so" means "No". Obviously, misinterpretation may lead to poor results.

between the point of outsourcing and the point of integration (performance in the outsourcing contract, see Appendix 1[59]).

5.4 The evaluation and implications of outsourcing software-development activities

As discussed in earlier chapters, in terms of assessing vendor performance, there is a variety of measurement criteria on which to evaluate outsourcing agreements, such as the ability to meet agreed cost structures, the ability to stay on schedule, and the number of bugs in a certain code sample (Amoribieta et al. 2001). However, the key measure according to which the vendor's performance is evaluated relates to the relevant service-level agreements (SLAs). Basically, SLAs define the key performance indicators (KPIs) for the outsourcing process/project, which basically derive from the outsourcing decision (motives), and which are mutually agreed with the vendor (contract). Accordingly, the outsourcing performance goals and thereby the overall performance should be evaluated on the metrics laid out during the decision phase, and they should be customized to the specific outsourcing case. Different agreements should be evaluated on the basis of the underlying goals of the project/process. Yet, given that firms often have different measures of performance with different emphases, the balanced rating method may sometimes be the best one to use[60].

Although it is important to evaluate the performance of the specific outsourcing process/project, it was found that assessment should extend beyond that. The interviews and (cross-)case analyses revealed that outsourcing and licensing product-development-related activities may carry implications in terms of the firm's overall success and performance. As mentioned, the outsourcing in software firms should be aligned with their overall strategies. Therefore, in evaluating its performance they should more broadly assess how the outsourcing enhanced their overall strategies, as initially planned. The findings quite extensively report that, especially for

[59] Appendix 1 provides a framework for crafting the outsourcing contract. The framework is based on the classification devised by Platz and Temponi (2007), who divided contractual issues into four different categories (elements): performance elements, financial elements, human-resource elements, and legal elements. A preliminary framework was thus drawn up, which was then discussed in the interviews with the company managers. This list of possible issues to be included in the outsourcing contract was developed by asking each interviewee to add items if he or she thought something was missing (snowballing).

[60] In fact, some companies with more outsourcing experience had developed a balanced scorecard (see Kaplan & Norton 1992) for evaluating vendor performance. Different performance attributes were used to measure performance related to cost, innovation, and flexibility/time. Each measure is given a weighting according to the primary KPIs of the specific outsourcing agreement.

software SMEs, outsourcing and licensing may carry direct or indirect implications in terms of their growth, internationalization and even innovation (see Articles #1, #2, #3 and #6). The key findings related to these areas are discussed below.

5.4.1 Implications for firm growth

In terms of growth it was argued that for software SMEs MNCsales channels provide opportunities for evolutionary growth (Gabrielsson & Kirpalani 2004). However, it seems (Article #3) that MNCs are increasingly demanding that their suppliers are also strictly focused on key technological areas, and possess flexibility in production. Outsourcing and licensing enable this focus while retaining flexibility[61], and in turn, provide a better basis on which to gain access to these channels and thereby to growth. Access to the global resource pool through outsourcing may even provide small firms with production-related flexibility, and thereby more possibilities for undertaking even large development projects, and as shown in Articles #1 and #2 for instance, possibly at only a fraction of the internal costs. In fact, it is shown that in some cases small software firms may possess more external than internal development resources at the very start of their operations in order to give them more rapid time-to-market. As small firms often have limited financial resources, GSO may give them access to a larger pool within their financial limitations. This, in turn, may set in motion a more rapid development cycle (see e.g., Article #1). It was further argued that, due to the high demand for resources in the product-development phase, software firms are able to mitigate the *ex ante* costs of offshore-outsourcing development work, and accordingly to achieve cost benefits (cf. Carmel & Nicholson 2005).

The case findings also explicitly indicate, as in earlier studies (e.g., Atuahene-Gima 1993; McDermott & Handfield 2000), that outsourcing and licensing may enable faster product development and thereby time-to-market, which has been referred to as one of the key survival factors in software firms (e.g., Oviatt & McDougall 1994). The following example illustrates the importance of this issue, as also mentioned above. Immediately after its establishment, one of the analyzed case companies (see Article #1) licensed a business component at the very beginning of its product-development process. However, after the first market launch it immediately 'insourced' this component by developing it internally. In the product-development phase it

[61] In fact, outsourcing and licensing provide a tool for overcoming the entrepreneurial dilemma (Jarillo 1989)

focused its scarce resources on core development issues and customer projects, and temporarily licensed the necessary component, which was readily available on the market.

In addition to the direct growth implications, outsourcing and licensing 'coerce' companies into utilizing such a strategy to adopt modular design structures, which in turn may provide small software firms with indirect benefits. As illustrated earlier, their product strategies, which often change in line with their growth, shift from customer-specific projects towards modular whole-product diagrams and further to standardized solutions. This kind of productization is often referred to as a prerequisite for the internationalization and continued growth of software SMEs (e.g., Alajoutsijärvi et al. 2000) due to the fact that aiming towards a scalable product offering allows the use of different network opportunities for sales and marketing. In terms of outsourcing and licensing, it was found that firms utilizing such strategies arrived more rapidly at a productized offering, which in turn enabled more rapid growth. Thus the modularization of the solution, which occurs as a by-product of capitalizing external resources, may indirectly help in crossing over the chasm into which many software companies fall (see Moore 2000). Thus, as Sanchez (1999, 92) concluded:

> *"When managed strategically, modular process, product, and knowledge architectures enable firms to create greater product variety, introduce technologically improved products more rapidly, bring new products to market more quickly, and lower the costs of product creation and realization."*

5.4.2 Implications for firm internationalization

In terms of *internationalization*, engaging in outsourcing or licensing across national boarders entails internationalization per se. Such internationalization through product development is often referred to as inward internationalization, as opposed to outward internationalization. Inward international operations refer to supply-related operations and could be seen as the mirror image of outward, market-related operations (Korhonen et al., 1996). Whereas outward internationalization refers to the various means of penetrating foreign markets (Welch and Luostarinen, 1993), inward operations cover a multiplicity of forms, such as the importation of goods and services, finance and technology through franchising, licensing, direct investments, alliance agreements, and the like (Luostarinen and Welch, 1990). In fact, Korhonen et al. (1996) found that small firms more often start from the supply side, very often followed by outward operations such as exporting.

Yet, it is argued that a further reason why this kind of inward internationalization has been considered important, especially in the SME context, is because it could have unintentional (indirect) positive effects on subsequent outward internationalization. For instance, previous research has established that prior inward international operations could affect internationalization mainly in terms of (1) enhancing host-country-related network connections (Andersen and Christensen, 2005; Karlsen et al., 2003; Korhonen, 1999) or (2) creating country-related experiential knowledge that would help further internationalization efforts (Carstairs and Welch, 1982; Karlsen et al., 2003; Welch, 1990; Welch and Luostarinen, 1993).

This happens, first, as a byproduct: when undertaking sourcing-initiation and management activities firms often develop their foreign-market contact networks, and this may result in "an outward selling move at some later date or the creation of a network contact through which a 'fortuitous' order might eventuate." (Welch and Luostarinen, 1993, p. 46, referring to Bilkey, 1978; Czinkota and Tesar, 1982; Rosson and Reid, 1987) Like customers, suppliers with international connections also represent a potential linking point from the domestic arena to international markets, often unknowingly. Such path dependency in the internationalization process is often discussed by network theorists (e.g., Håkansson and Johanson, 1992; Johanson and Matsson, 1988). In terms of the cases analyzed for the purposes of this thesis, it was widely found that companies experienced such serendipitous (indirect) connections. The cases descriptions showed (see e.g., Article #2) that through the offshore outsourcing of product-development activities firms were able to create location-bound network connections to various industrial and governmental actors, which turned out very useful in terms of future sales growth and further international expansion.

Not only do prior inward activities create network connections with third-party institutions, it is also possible that inward-outward connections arise from the initial buyer-supplier relationship. For instance, Welch and Luostarinen (1993) concluded that whatever form inward internationalization takes, it inevitably sets up a relationship with the potential to broaden over time, even to include some movement in the opposite direction. In fact, in terms of offshore licensing/outsourcing, it was found (see case Company C in Article #6) that because outsourcing agreements, unlike clear sourcing arrangements, are more often constructed horizontally rather than vertically, and are more strategically than transactionally aligned, they may become deeper alliances that transcend the initially agreed scale and scope. Such an increase in commitment was identified in several buyer-supplier relationships in the analyzed companies (see also Article #2).

Secondly, small firms often face various uncertainties that restrain internationalization. These may well be related to a lack of knowledge of the international arena, which is why the process is often sequential and increases in commitment over time – as the early staged models suggest (Johansson and Vahlne, 1977; Johanson and Wiedersheim-Paul, 1975; Luostarinen, 1979). However, Korhonen et al. (1996, p. 322) maintain that, as a prelude, the increased knowledge of and experience in the international arena acquired by taking a number of actions associated with inward operations could reduce the perceived obstacles and generally lower the uncertainty and consequently the cost of a later outward move (cf. Hymer, 1976; Eriksson et al. 1997). What they suggest is that as firms undertake inward operations such as importing, sourcing or licensing, they are able to absorb market-related knowledge, which is often readily adaptable to similar demands on the outward side. They state that this knowledge can be absorbed through activities that may involve trips to foreign markets, the investigation of alternative suppliers and prices, negotiations with foreign suppliers, negotiations and procedures for establishing foreign operational modes, and the learning of foreign-trade techniques, for example (Korhonen et al., 1996). Further, previous inward operations may provide useful information about the market potential in the international arena (Carstairs and Welch, 1982; Welch, 1990). Again, the analysis revealed that this kind of experimental learning about the markets and market conditions applied in the case companies (Article #2 and #6). Through the intensive on-site presence that is often required in offshore outsourcing, the companies were able to absorb information about the demand conditions and the market developments. This implies that the offshore outsourcing of product-development activities may facilitate global growth, as Eppinger and Chitkara (2006, 24) recently suggested:

> *"Locating some PD activities in selected international locations can give companies access to critical information about markets in those regions. By using local engineers, companies make direct connections with potential new markets."*

The results also indicate that offshore outsourcing may not only pave the way for future internationalization endeavors, it may equally help in preventing possible de-internationalization, in other words withdrawal from certain markets (see e.g., Benito & Welch 1997). An analysis of seven cases in which small software firms had de-internationalized (Ruokonen et al. 2007) showed that the prime reason was because they had insufficient or distorted information about the market potential for their products in the targeted markets. Thus, prior offshore outsourcing may operate as a preventative measure in that accumulating knowledge on international market conditions

and developments through earlier offshore outsourcing most likely decreases the possible risk of later internationalization failure.

In addition to the above, it has been argued that outsourcing may influence later internationalization through the operational effects of the strategy. One particular benefit of offshore outsourcing is the development of an agile, focused organization that can internationalize more rapidly (see e.g., Barthélemy, 2003), even if the focus of the business transformation is on the divestment of non-core and peripheral activities, i.e. outsourcing per se. Outsourcing has often been found to create operational flexibility (e.g., Linder et al., 2002; Mazzawi, 2002), which in turn could enhance the ability to compete in international markets, and even fuel initial internationalization decisions: the more business portfolios a company decides to nurture, the more it is required to allocate resources among them (Hagel and Singer, 1999). In the context of small firms in particular, focusing on selected business portfolio(s) allows them to focus their scarce resources correctly and thereby to internationalize more rapidly and with less risk. Again, in terms of the case analyses, it was explicitly stated that the flexibility gained through outsourcing and licensing had facilitated the internationalization process (Articles #1 and #2). Gaining long-term operational flexibility was referred to on several occasions as one of the benefits of outsourcing. As mentioned, such flexibility in several product areas gives the small software firm a key competitive edge in terms of gaining access to MNC sales channels (Article #3), and thereby more rapid international expansion.

5.4.3 Implications for innovation

It has been argued that every outsourcing possibility offers not only growth but also the opportunity to improve in terms of innovation (Quinn 1999). Although the impact of outsourcing and licensing on innovation is a measure that is not easily operationalized, certain direct and indirect effects of using external resources in the innovation process were identified in the analysis.

First, as innovations in the software industry are becoming more complex (Jordan & Segelod 2006), companies could use ready-made COTS components in their product development and focus on the core development issues, and by implication on their core innovative development activities. In particular, as the CEO of a small software firm stated, small firms with limited resources should focus on the areas of the system in which they want to build their competitive edge, and license components that can be bought from the markets. Especially with larger and more complex systems, small firms cannot do everything while remaining innovative, or as Quinn (2000) put it,

companies cannot alone out-innovate every competitor. Licensing, especially value-adding and customer-specific modules, enables firms not only to create modular innovations (see Baldwin & Clark 2000; Langlois 2002) through the mixing and matching of external components, but also to focus on core software development throughout their different life-cycle phases. Aiming at such a focus and flexibility through the outsourcing and licensing of these non-embedded software modules was found, in the analysis, to be one of the prime motives for adopting such strategies.

Secondly, in addition to the fact that using external resources enables small firms to focus on their most innovative activities, suppliers are also a possible source of innovation, yet an often overlooked one. For example, it is impossible for small firms with technologically complex solutions to stay at the cutting edge in several different technological areas at the same time (Quinn 2000). In fact, of the five licensing cases analyzed in Article #1, the primary motive in four of them was to increase innovation or to acquire technology that was currently beyond their competence. While outsourcing also enables firms to access innovative resources, it may as a strategic option also limit innovation. The degree of specification of the outsourcing project restricts the vendor's opportunity to contribute, while overly detailed specifications limit the freedom to innovate (see also Gadde & Snehota 2000; Quinn 1999). Accordingly, this kind of restriction, especially in the software industry in which product development is a process involving several overlapping and iterative phases, limits the likelihood of supplier-generated innovation in the production process. However, as argued, the innovation potential of the supplier is dependent on the chosen outsourcing model, in other words on the degree to which the vendor is allowed and expected to participate in the development and design of the outsourced activity. The productivity and innovativeness of the outsourcing relationship is dependent on the model through which the company chooses to access and capitalize supplier resources (see also Araujo, Dubois & Gadde 1999). Whenever the supplier is supposed to develop the activity, its motives (SLAs and KPIs) should be aligned with this goal. For instance, previous research suggests that strict cost-driven motives in outsourcing discourage suppliers from taking any interest in innovation development as they seek to minimize internal costs (Miozzo & Grimshaw 2005). Similarly, in the light of the results, it is likely that highly detailed specifications and strict cost drivers will have a negative effect on the innovation process in the future. Firms seeking supplier-generated innovation therefore need to align their outsourcing objectives and models accordingly.

5.4.4 Summary of the direct and indirect implications of outsourcing software-development activities

As discussed above, outsourcing may offer several benefits to growing software firms. These benefits may be either intentional or serendipitious, but are more often the latter as firms fail to incorporate the possibility of wider benefits into their outsourcing decision-making. Figure 32 summarizes the direct and indirect implications of outsourcing and licensing for firm growth, internationalization and innovation, as discussed above (Article #1).

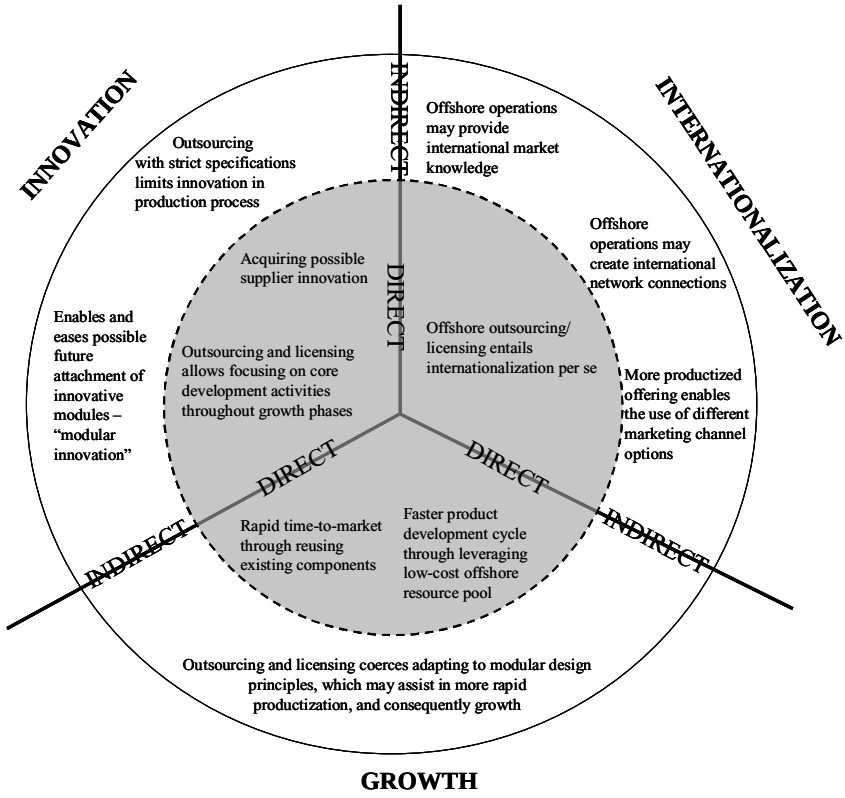


Figure 32 Direct and indirect implications of outsourcing and licensing for innovation, growth and internationalization

The implication of all of the above findings is that capitalizing external resources in product development may be very beneficial to software firms in terms of their overall performance. Hence, it is suggested here that firms should further assess the possible benefits of outsourcing and licensing, and take them into account in the initial make-buy-specify decision-making. In fact, the case of FinaSoft illustrated in Article #2 provides a good example of

this. The company combined its future internationalization strategy with its outsourcing strategy, which was mutually beneficial. By taking a broader perspective on its outsourcing decision-making it was able to benefit more from the outsourcing project. The fact that benefits related to growth, innovation and internationalization are often serendipitous (indirect) is a consequence of the inadequate assessment and analysis of the broader outsourcing/licensing benefits.

6 CONCLUSIONS

There are several implications in this thesis that are relevant to the existing research base and to practitioners. From the theoretical perspective, the aim was to give new insights mainly in the areas of strategic management and international business, but also to the existing research on information systems management. The key implications are discussed in this chapter.

6.1 Theoretical contribution and suggestions for further research

There is no denying that outsourcing is one of the key management strategies in the current competitive situation. As illustrated in the theoretical chapters of this thesis, there is a vast amount of research on this complex issue. This study aims at stretching the boundaries of several different research streams, and thereby opening up avenues for possible future research. Given that the theoretical aim lies in theory building and development (Eisenhardt 1989a; Yin 1991), propositions for further research are put forward. The following discussion summarizes the key theoretical contributions in terms of the sequential stages of the outsourcing process, and introduces propositions that could be applied in future research on outsourcing – particularly in the context of software and small firms, but also in a wider perspective.

The key theoretical thread running through this thesis was laid down by Jarillo (1989) in the late 1980s, but it has since only been taken up sporadically. Jarillo suggested that small entrepreneurial firms could overcome what he refers to as 'entrepreneurial dilemmas' through capitalizing their external resources: as firms seek to grow, the progressive accumulation of resources that growth often entails almost inevitably brings a loss of the very flexibility that made them successful in the first place (p. 133). Although it has recently been illustrated that not all small firms are growth-oriented (Nummela et al. 2005; Pulkkinen et al. 2005), it has been widely shown that in small software firms in particular, which is the focus of this study, there is an increasing tendency to grow and internationalize rapidly in order to leverage the full potential of the developed innovation (Moen 2002, Madsen and Servais 1997, Oviatt & McDougall 1995). Often the need to grow and consequently to internationalize is, to a large extent, caused by the fact that home markets provide only limited market potential (Knight & Cavusgil 2004,

McNaughton 1996, Moen 2002, Sapienza et al. 2003, Crick and Spence 2005). In general, it has long been noted that in such a process small entrepreneurial firms need to access external resources (e.g., Jarillo 1989), and further that the need for these resources changes in line with the growth process (Argyris 1996; Pettus 2001; Robins & Wiersema 1995; Wernerfelt & Montgomery 1998). It has also been noted that networking may give small firms access to these external resources, and consequently assist in this growth process (Birley 1985; Elfring & Hulsink 2007; Hite & Hesterly 1001; Jarillo 1989; Larson & Starr 1993; Stuart et al. 1999). Nevertheless, prior research has largely focused on the impact of social networks, and it still is largely unclear how small software firms are able to capitalize their external resources for the purposes of product development through various contractual mechanisms.

An in-depth empirical analysis of small software firms was conducted, the main focus of which was on this gap in the current theory base regarding strategic management and international business research. The analysis was based on the developed framework of an outsourcing process, illustrated in Figure 6 on page 56 of this thesis. The outsourcing process, with insights gained from existing process models (Greaver 1999; Momme 2002; Momme & Hvolby 2002; Francheschini et al. 2003; McIvor 2000b; 2005; Van Weele 2005; Zhu et al. 2001), was described in terms of four distinct yet intervening phases: internal assessment, the outsourcing decision, implementation management, and evaluation. It was also argued that the implementation-management phase could be further divided, on the basis of a sequence of activities to be carried out, into pre-implementation and post-implementation. For the data collection, the complexity of the studied phenomenon was the main reason for choosing a qualitative approach that would provide novel insights into the research questions that were set out at the end of the theoretical overview (cf. Benbasat et al. 1987; Halinen and Törnroos, 2005; Yin, 1994).

A total of five research questions were developed in order to guide the analysis. These questions followed the developed framework of the outsourcing process. Figure 33 summarizes the key findings with respect to the five questions regarding the different phases of the process.

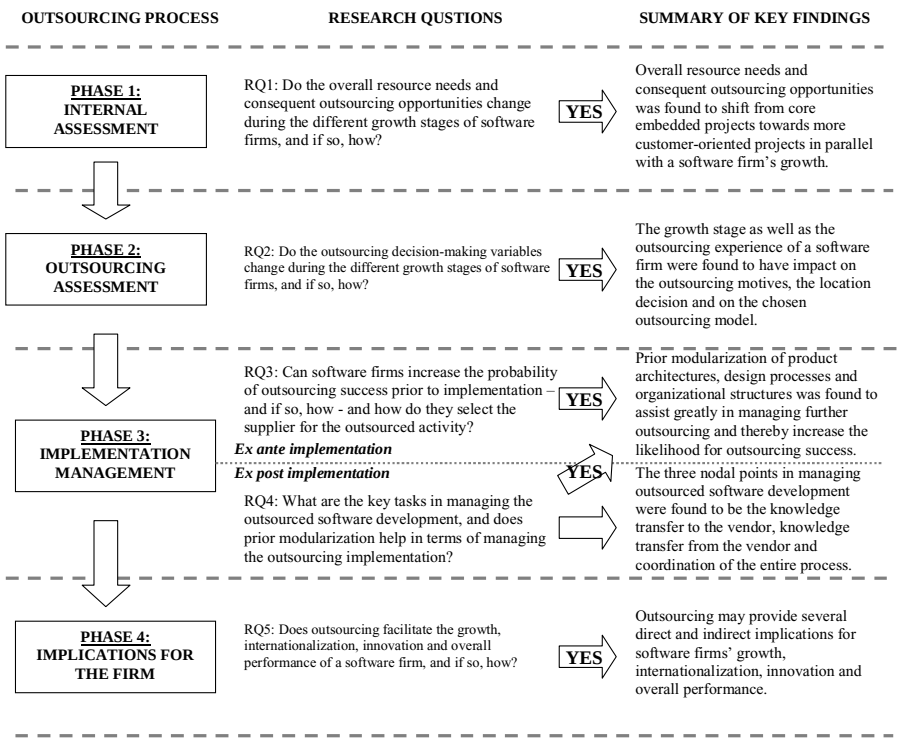


Figure 33 The research questions and a summary of the key findings

In addition, the results provide insights that could be formulated as propositions to assist and guide future research on the topic. The propositions are discussed below with regard to each phase.

The first phase of the outsourcing process was identified as internal assessment. This entails making the basic choice of whether to carry out a certain activity internally or to seek external alternatives. The widely adopted view is that, in order to preserve core competencies, core activities should stay in-house while non-core activities could be outsourced (e.g., Hamel & Prahalad 1990; Bettis et al. 1992; Porter 1996; Quinn & Hilmer 1994). However, it has been argued that it is often the external factors that initially drive firms towards capitalizing external resources. As in earlier studies (Lacity &Hirchheim 1993a; Baden-Fuller et al. 2000), the results of the empirical study imply that it is primarily the intensive competition and increasing pressures pushed down the value chain by MNCs to remain flexible and to narrow internal focus that has led software firms to seek resources across company boundaries. Hence the first proposition:

Proposition #1: The primary drivers for outsourcing in the software industry are competitive pressures and customer demand

In fact, it has been argued that firms in fast-moving industries cannot out-innovate every competitor (Quinn 2000). The results of this thesis support such an argument, and further imply that it is essential for small firms to focus their scarce resources on key value-adding development activities, and actively to seek external sources to provide value in non-critical areas. A further preliminary finding is that firms that are active in seeking external sources for undertaking product-development activities perform better than those that do not. Accordingly, it seems that among small software firms, active purchasing organizations perform better than passive purchasing organizations (see Axelsson & Wynstra 2002). Hence the second proposition:

Proposition 2: Software firms that actively seek external opportunities (active purchasing organizations) for undertaking product-development activities perform better than those that do not (passive purchasing organizations)

Nevertheless, it has been argued that the need for external resources is not constant, and that firms need different resources in terms of nature and scale/scope as it grows (e.g., Jarillo 1989). Accordingly, whereas prior research has provided several staged models of small-firm growth (e.g., Churchill & Lewis 1983; Greiner 1998; Kazanjian 1988; Miller & Friesen 1984; Quinn & Cameron 1983; Scott & Bruce 1987), the results of this study suggest a progressive model of capitalizing external resources in the growth process.

Despite the suggestion in prior research that firms outsource larger entities as they gain experience of the process, in terms of the outsourcing object, in other words what is being outsourced, the results of the cross-case analyses indicate that the scale of the outsourced activity remain on a similar level (business component), irrespective of the size or growth stage of the firm. As argued in earlier studies on software-development outsourcing (e.g., Amoribieta et al. 2001; McFarlan 1995), the reasoning was that as business components are often understandable as such they are often highly structured, which facilitates their dispersed production. Moreover, business components are entities that carry adequate volumes to drive down the relative *ex ante* transaction costs that accumulate from the vendor search-and-selection process, for instance (see Carmel & Nicholson 2005). Even though cost saving is often not the primary motive behind software-development outsourcing, high cost was stated as one of the primary barriers. These conditions and findings give rise to the third proposition (see Article #1):

> *Proposition 3: In software firms, irrespective of their stage of growth, entities that are understandable as such and carry adequate volumes are most suitable for outsourcing.*

Although it is proposed that the scale of outsourcing does not shift in line with growth, it seems from the results that the strategic importance of the outsourced activity as well as the underlying motives for the outsourcing, in other words what is being outsourced (strategic importance) and why (motives) shift. First, contrary to some earlier findings (e.g., Lewin & Peeters 2006; Maskell et al. 2007), it seems that software firms begin by outsourcing more critical components, and gradually shift towards outsourcing more value-adding customer-specific components. Similarly and secondly, the results indicate that the motives for outsourcing product-development activities shift from cost savings towards gaining a better internal focus and operational flexibility. Hence:

> *Proposition 4: The outsourcing strategies in software firms shift from outsourcing core activities for cost-cutting reasons towards outsourcing value-adding and customer-specific activities in order to achieve a better business focus and operational flexibility*[62].

In terms of licensing, the results similarly suggest that the inclination towards buying ready-made technology (COTS) shifts in software firms in terms of strategic importance and motives in line with the growth of the firm. As found in earlier studies on technology licensing in small firms (e.g., Atuahene-Gima 1993), the primary motive for licensing in the early phases is to achieve rapid time-to-market and to speed up the innovation process. As with outsourcing, given that a firm's operational strategy is to provide project work for its customers, software firms seem to license core components in their early phases of growth. However, the results indicate that as these firms grow, they shift towards licensing value-adding components to improve innovation and to create 'modular innovations'. Hence:

> *Proposition 5: The licensing strategies in software firms shift from licensing core activities in order to speed up the innovation process and to achieve rapid time-to-market, towards licensing value-adding activities in order to improve innovation*[62].

Figure 34 below sets out in more detail the propositions concerning the shifting of outsourcing and licensing strategies with respect to the previously identified phases of progressive growth in software firms (see e.g., Alajoutsijärvi et al. 2001; Ethiraj et al. 2005; Moore 2000; Seppänen 2002). Accordingly, it is argued in this thesis that while software firms' overall

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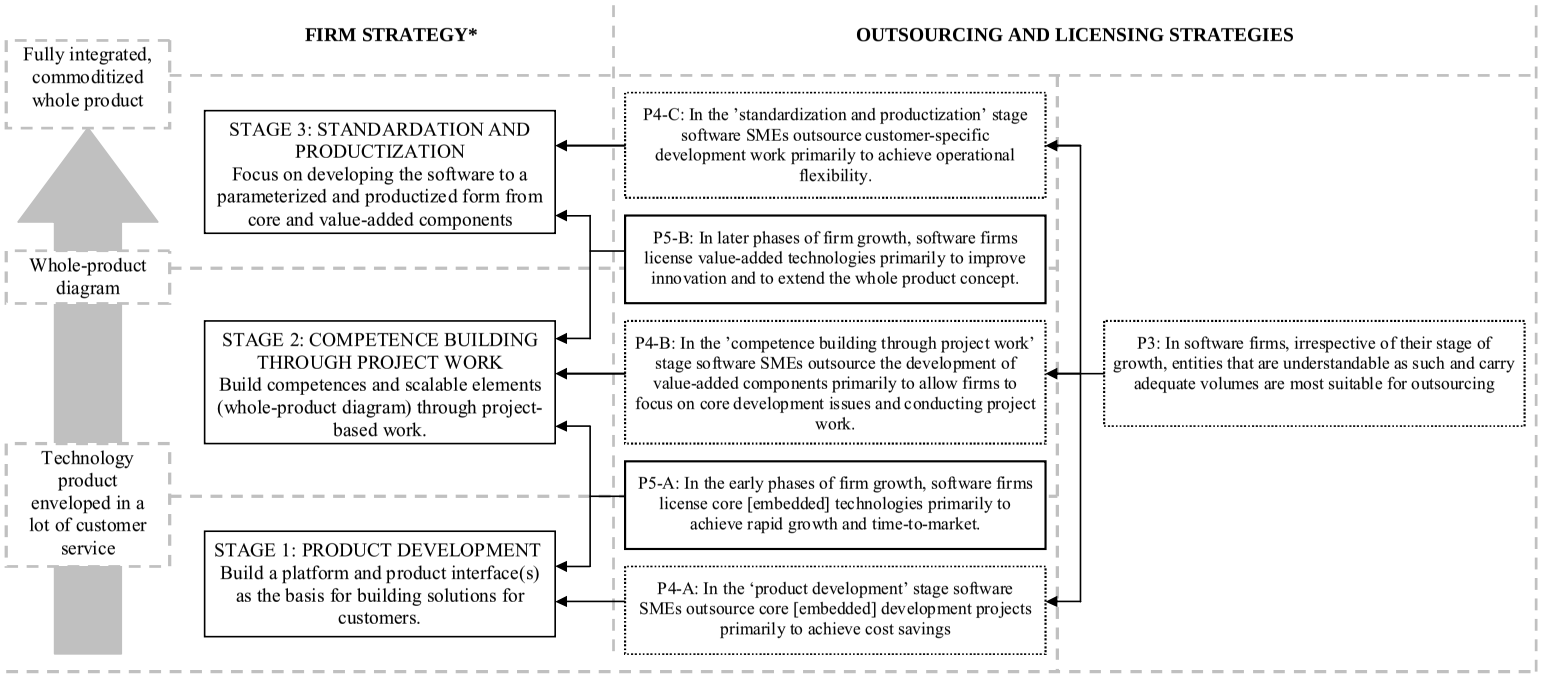
[62] More detailed propositions (4A-C, 5A-B) regarding the different growth phases are illustrated in Figure 34.

strategies show decreasing service intensity, the outsourcing/licensing strategies supporting them best show increasing service intensity. This is illustrated through the more detailed (sub-)propositions (P4A-C and P5A-B) in Figure 34.



* Sources: Alajoutsijärvi et al. 2000; Ethiraj et al. 2005; Moore 2000; Seppänen 2002

Figure 34 The proposed evolution of outsourcing and licensing strategies

In terms of the location decision (where), regardless of the growing importance of offshore outsourcing among different research disciplines, current research is limited (Bunyaratavej et al. 2007; Doh 2005; Kotabe & Murray 2004). Previous studies on the location decision (e.g., Graf & Mudambi 2005; Palvia 2004; Podoshen 2004), all of which build strongly on Dunning's eclectic paradigm (e.g., 1980; 1988; 1993; 2000), have identified factors influencing the final choice of outsourcing location. These factors are as follows: situational factors including the nature of the outsourced activity and customer expectations; internal factors including experience and outsourcing objectives (motives); locational factors including the infrastructure, country risk, government policy and human capital; and factors including all the requirements of the different stakeholders (Graf & Mudambi 2005; Palvia 2004). Yet, there is practically no empirical evidence concerning the dynamics between these factors. What are the most dominant factors that have the most influence on the final choice of outsourcing location, and under what conditions? It was found in a comparative examination of two similar outsourcing cases that what was being outsourced (the outsourcing objective) and why (outsourcing motives) had the most influence. Hence:

> *Proposition 6: The location decision of software-development outsourcing is primarily dependant on what is being outsourced and why.*

In terms of the outsourcing model, one of the key issues concerns the transferring of task(s) to the vendor. It was found that at this point the key task in defining the model was deciding on the point of outsourcing and integration, in other words what part of the development process was outsourced to the vendor. There is also a need to define the model in which the physical production is transferred and decomposed. Prior studies have identified two basic strategies for decomposing activities to the external vendor: a one-time hand-off (big bang) and a gradual and incremental transfer through increasing the vendor's responsibility over time (incremental) (e.g., Lacity et al. 1996). The former was found to require prior experience in managing outsourcing processes. The results of this thesis suggest that outsourcing is an incremental learning process, and thereby prior knowledge about the risks and possible problems increases the ability to create management processes. Hence:

> *Proposition 7: For software companies with little prior outsourcing experience, the incremental approach towards task transfer has positive implications for the overall success of the outsourcing project.*

Once software firms have conceptualized the outsourcing activity and have decided on the chosen location and outsourcing model, the next stage is to

implement the strategy. The stage that has arguably been undermined by prior research is the pre-implementation management of the outsourcing. Despite the widespread evidence that internal modularization has several benefits in terms of managing later outsourcing relationships (Baldwin & Clark 1997; Mikkola 2006; Sanchez & Mahoney 1996; Schilling 2000), few attempts have been made to identify the wider changes that firms need to go through prior to outsourcing (Miozzo & Grimshaw 2005). As in earlier studies (e.g., Baldwin & Clark 1997), the results of this thesis indicate that these actions could be divided into three clusters of modularization: product, process and organization. It appears that prior modularization in these areas carries positive implications in terms of the management of the outsourcing relationship, and accordingly increases the probability of success. For instance, it was shown that adopting modular principles in product architecture and internal processes decreases the asset specificity of the activity, and thereby increases the transferability of the development tasks. Further, creating modularity on the organizational level and redefining responsibilities ease the management of dispersed development activities. All of this suggests that:

> *Proposition 8: Prior product, process and organizational modularizations ease the decomposition and management of software-development outsourcing and thereby increase the probability of overall outsourcing success.*

One of the key tasks of pre-implementation management concerns vendor search and selection. Prior research has established that prospective vendors are analyzed based on task-related and compatibility criteria (e.g., Baden-Fuller et al. 2000; Child & Faulkner 1998). However, despite earlier staged models of vendor selection (e.g., Hughes et al. 1998), there are inconclusive results concerning the dynamics between these criteria, in other words what are the most important in outsourcing software development. The results of this thesis suggest that the process of vendor screening and selection is a progressive one in which firms first seek prospective available candidates possessing the required technical competences, and which are then analyzed based on their strategic suitability to the situation. Accordingly, it seems that in software-development outsourcing the deciding criteria concern the strategic compatibility of the vendor, rather than its technical abilities. Hence:

> *Proposition 9: Vendor selection for outsourced development work is a progressive process in which the prevailing criteria are based on the strategic suitability of the technically capable vendor.*

Once firms have selected the vendor and have signed a contract outlining the commonly agreed outsourced task and its performance metrics, the next stage is to transfer the production of the activity. It was found that the key

areas of managerial challenge lie in transferring activities to the vendor (point of outsourcing), integrating them back into the internal product development (point of integration), and coordinating them throughout the process (high-level verification). From the theoretical perspective, the results of the thesis indicate that, particularly in the outsourcing of software development, the more the vendor is expected to contribute to the design and further development of the activity, the more cooperation is needed in managing the outsourcing process. Reflecting earlier arguments (Gadde & Snehota 2000; Quinn 1999), the results of this thesis imply that outsourcing with strict pre-created specifications and process outlines limits the need for collaboration in the outsourcing process, but it also limits potential supplier-generated innovation. Accordingly:

> *Proposition 10: In software-development outsourcing the more the vendor is expected to contribute to the outcome, the more collaborative the approach shold be to managing the implementation.*

The performance and outcomes of the outsourcing project/process should be evaluated at the outset. It was argued that the metrics according to which the vendor's performance is assessed are created in line with prior outsourcing conceptualizations, in other words what is being outsourced and why. However, while this is explicit, the existing literature does not address the wider implications of outsourcing to the required extent. This thesis provides initial evidence on how outsourcing may, although often in serendipitous manner, facilitate firm growth, internationalization, and innovation.

First, in terms of growth, it seems that outsourcing and licensing in software firms, particularly in the early phases, carry several direct growth implications. Through capitalizing its external global resource pool in developing software and reusing (licensing) existing solutions the firm is able to shorten the initial development cycle and get the product more rapidly onto the markets. Throughout the growth process outsourcing enables software firms to grow without having to build up a large mass of inflexible human resources. Further, it was found that capitalizing external resources could have indirect long-term benefits regarding the growth process. As argued earlier, outsourcing and, to some extent licensing, encourages software firms to adapt to modular product structures. This, may allow them to build the structures of a productized offering more rapidly, which in turn facilitates the wider use of networks as delivery channels. Accordingly:

> *Proposition 11: The exploitation of external resources in product development has positive effects on the growth rate of software firms.*

Secondly, in terms of internationalization, in addition to the fact that offshore outsourcing entails internationalization per se, the results indicate, in line with those of earlier studies (e.g., Andersen & Christensen 2005; Carstairs

& Welch 1982; Karlsen et al. 2003; Korhonen et al. 1996; Korhonen 1999; Welch 1990; Welch & Luostarinen 1993), that offshore outsourcing may facilitate further internationalization through so-called inward-outward connections. It was found that previous offshore outsourcing created location-bound network connections and market-related knowledge that helped further market-related internationalization. Especially in SMEs, in which the person(s) are involved with outsourcing and marketing decision-making (Korhonen et al. 1996; Wiedersheim-Paul et al. 1978), the collection and dissemination of this knowledge occurs simultaneously, and thereby is more likely to carry wider implications in terms of further internationalization. Further, inherent in the context of the software industry, in which every product-development outsourcing project entails a vast amount of knowledge transfer and close interaction between the outsourcing parties, is the potential for software SMEs to absorb their location-bound knowledge and create location-bound network connections. Further, the fact that outsourcing as such creates operational flexibility also helps the process of internationalization. Accordingly, in terms of IB research and one of its prime areas of focus, the internationalization of firms, this thesis offers several suggestions for further research, at the same time setting out preliminary propositions by way of guidelines. Overall:

> *Proposition 12-A: Previous offshore-outsourcing experience has a positive effect on the degree and success of outward expansion.*

On the other hand, it was found that prior offshore outsourcing and the consequent accumulation of international knowledge may protect firms from making drawn-out and poorly planned internationalization decisions that could lead them to withdraw their international operations, i.e., to de-internationalize (see e.g., Benito & Welch 1997). The results provided in this thesis suggest that the prime reason why software firms de-internationalize is due to insufficient or distorted knowledge about international market conditions. Again, prior offshore outsourcing enables the collecting of information on market conditions before embarking upon market-related internationalization, thereby decreasing the risk of future de-internationalization. Hence:

> *Proposition 12-B: Software firms with prior offshore outsourcing experience are less likely to withdraw their international activities*

Finally, in terms of innovation, the results imply that outsourcing and licensing offer several opportunities for improving innovation. Firstly, software firms could look for ready-made innovations on the markets, which would also allow them to focus on their core development activities. In addition, in terms of outsourcing, suppliers could be a source of innovation. Particularly in areas in which the firm lacks competences and knowledge, using specialized outsourcing providers will enable it to capitalize its

resources with the best possible knowledge. Overall, the results suggest that firms should not try to out-innovate every competitor, and should rather focus on core development activities and use outsourcing and licensing in areas in which they lack knowledge, or which are otherwise peripheral. Accordingly:

> *Proposition 13: Outsourcing and licensing have positive impacts on the level of innovation in software firms' products*

To conclude, the above propositions summarize the key implications of the results of this thesis from the theoretical perspective. Perhaps the main argument is that software firms that implement outsourcing and licensing in their strategic decision-making are more likely to succeed in today's highly competitive software markets. This gives a partial answer to the question that Peng (2004) argues will be the leading issue in future IB research: what determines the international success and failures of firms. Accordingly, it is proposed here that the careful and dynamic capitalizing of external resources enables firms to prosper in the globalized economy, or in other words:

> *Proposition 14: Software firms that carefully and dynamically assess the possibilities to use external resources to undertake product-development activities throughout their growth processes are more likely to succeed in increasingly globalized competition.*

The following table summarizes the key theoretical implications and contributions, and the developed propositions regarding them, in the different phases of the outsourcing process.

Table 6 A summary of the theoretical implications and the developed propositions

PHASE	KEY THEORETICAL IMPLICATIONS AND CONTRIBUTIONS	PROPOSITIONS
Internal assessment	• Idetification of the key drivers for adopting outsourcing strategy in the software industry • Introduction of the initial evidence of changes in the external resource needs of growing software firms, and of the relation between an outsourcing 'orientation' and overall firm performace	P1, P2
Outsourcing decision	• Identification of the key factors, variables and managerial considerations in the decision-making regarding software-development outsourcing • Development of an emergent theory on how the outsourcing decision-making variables change during the different growth stages of software firms	P3, P4 (A-C), P5 (A-B), P6, P7
Implementation management	• Introduction of insights into how pre-implementation management eases the decomposition and management of software-development outsourcing, and thereby increases the probabilty of outsourcing success • Development of an emergent theory of staged vendor selection in software-development outsourcing	P8, P9
	• Introduction of insights into the key tasks regarding the management of outsourcing reations in different outsourcing situations	P10
Evaluation	• Introduction of novel insights into and developments in the emergent theory of how outsourcing facilitates the growth, internationalization, innovation and the overall performance of a software firm	P11, P12 (A-B), P13, P14

As Table 6 shows, the key theoretical implications of this thesis relate closely to and are aligned with the research questions (for the research questions see Chapter 3.3). It is hoped that these implications for existing outsourcing theories will guide researchers in their future studies on this complex topic. The results of this thesis are not, however, confined to theoretical implications, and also provide insights for practitioners and policy makers alike. The following chapter discusses and summarizes the managerial implications.

6.2 Implications for practitioners and policymakers

Outsourcing is not a fad. On the contrary, it seems that the current evolution of outsourcing markets has created possibilities for firms that have not previously been able to capitalize the full potential that an outsourcing strategy can provide. In fact, the distinguished management strategist Peter F. Drucker recently stated:

> *"If you ask me what is the fastest growing industry in America – it's outsourcing." (see Corbett 2004, 3)*

It is not only the US that is being hit by the outsourcing wave. The increasing trend towards specialization has created a domino effect, in which companies are coerced into cooperating with other firms in order to succeed. Yet, many of them have severe shortcomings related to this development. The fundamental restructuring of industries and organizations carries enormous implications for executives and managers, as the skill sets they need to do their jobs have changed dramatically and will continue to do so in the future (Corbett 2004). In a recent study, 80 percent of the IT managers questioned wanted to outsource, yet 70 percent stated that they did not have the knowledge to do so (Meta Group, see CGO). The general managerial purpose of this thesis was to redress this shortcoming by providing managers with insights into the process of outsourcing product-development activities. Outsourcing has risen to be a key managerial competency, which unfortunately remains underdeveloped in many organizations.

The results of this thesis offer several managerial considerations, particularly for small and medium-sized firms. First and foremost, there is a need for change in management attitudes towards outsourcing, especially among small technology-focused firms. In this context, not-invented-here mentality is a form of bounded rationality. Outsourcing is an efficient tool for achieving success in the current globalized competition. As the founder Forbes Magazine, B.C. Forbes, once stated:

> *"If you don't drive your business, you will be driven out of business."*

The results of this thesis suggest that small firms should more actively seek possibilities beyond 'invented here'. They should change from being passive purchasing organizations, waiting to be visited by suppliers and to be informed of possible solutions, and become active in searching for and visiting suppliers in order to find the best resources (see Axelsson & Wynstra 2002, 19). Accordingly, they should seek to identify the opportunities that lie in external resources, in other words aim for a blue-ocean outsourcing strategy (cf. Kim & Mauborgne 2004). Those that have applied such a strategy, according to the results of this thesis, are more likely to succeed in the highly turbulent and globalized environment.

The results also suggest that outsourcing should become part of the strategic decision-making of the company. Nothing is constant in today's business, with the exception of change. Strategies are not static, including those aimed at capitalizing external product-development resources. Software firms should continuously assess their core development tasks, and seek external sources of resources and readily available technology. This study does not promote the blind-sighted outsourcing of product-development activities, however. Firms

should rather carefully assess the applicability of each one. The results indicate that there are several ways in which product-development activities can be outsourced. Prior conceptualization of what is actually being outsourced is therefore essential before further decisions on vendor selection and managing the outsourcing relation, for instance, are made. The key issue is that you cannot successfully outsource something that you do not fully understand – you cannot outsource a problem.

Further, managers should be aware of the several processes according to which firms can outsource similar product-development activities. There is not one way to outsource an activity – one size does not fit all! It is essential for firms to choose the right operational model for each outsourcing project based on external issues (what is being outsourced, why and where), as well as on their internal competences regarding outsourcing project management. For instance, if a firm wants the vendor to innovate on its behalf, using overly detailed specifications and strict cost targets is not the best way to go about it. Further, it seems that firms with limited prior outsourcing experience are most likely to need to build collaboration with the vendor throughout the outsourcing process. As indicated, outsourcing is a learning process in which the ability to create common processes is highly dependent on prior knowledge of the risks and the cornerstones of the outsourcing strategy.

From the managerial perspective, one of the key results of this thesis relates to what was referred to as ‘modularization’ prior to outsourcing. The inability to capitalize external resources may be due to inadequate internal processes or an ‘unmodular’ product architecture, yet these are not something it is necessary to live with. It was found that software firms could take several internal measures to increase their chances of outsourcing success. Firstly, creating modular product architectures significantly eases the decomposition and further integration of separate activities. If a company has this kind of architecture with several interlinkages, outsourcing becomes difficult. Secondly, if a company has blurry and undefined processes, how is it able to outsource one of them? Software firms seeking to outsource should have processes in place that also take into account the use of external resources. Thirdly, and finally, firms should rearrange their internal responsibilities to support the use of external resources. Even though outsourced entities are ‘not-invented-here’, they should be treated as if they were.

In terms of the on-going management of the outsourcing process, the results indicate that software firms should pay particular attention to three areas: task transfer to the vendor (specifications, teaching, training, requirements), task transfer from the vendor (testing, integration), and coordination. Accordingly, it essential to design and create common structures and procedures to the point

at which the vendor's responsibility starts and ends, covering how the vendor's actions are coordinated between these points.

Finally, from the managerial perspective this thesis has illustrated that, in addition to being aware of and carefully assessing the hidden costs and risks of outsourcing, firms should also take into account in their outsourcing decision-making the possible 'hidden benefits'. It was shown, for instance, how firms could benefit from outsourcing beyond their initial targets. Engaging in international activities through outsourcing leads to the widening of the corporate network, which may facilitate further expansion. It was also found that the outsourcing and licensing of external resources could provide a positive setting for rapid growth, as well as for increasing product-related innovation. Firms often engage in outsourcing or licensing with a view to cutting costs or improving internal processes in order to gain production-related flexibility. Yet, it is suggested here that, particularly with regard to capitalizing external resources for the purposes of product development in small software firms, managers involved in the decision-making should take into account the wider benefits of possible outsourcing.

Further, acknowledgement of this link between inward and outward internationalization may require some governments and other policy makers to rethink the ways in which they promote improved international performance in companies, which was noted by Welch and Luostarinen as long ago as in 1993. Whereas market-related internationalization is often promoted by home governments, offshore outsourcing is typically and more often restricted. Yet, the results of this thesis suggest that promoting any form of foreign activity such as offshore outsourcing facilitates the international expansion of firms in various ways, and thereby provides a better basis on which small firms can prosper in increasingly globalized markets. Overall, policy makers should pay increasing attention to promoting and developing small firms' sourcing capabilities, which seems to have become an inescapable feature of modern business and, moreover, a necessity in order to prosper in what is inherently global competition.

This study provides insights for managers and decision-makers in various companies, perhaps even in several industries. Yet, due to its focus, managers of small firms, especially in the software industry, stand to gain most from the results. From the managerial perspective this thesis tackles an important issue in the software business – the purchasing of software-development services. The results provide several insights for managers of software firms into how to investigate, instigate, manage and evaluate outsourced product development. They also offer managerial implications from a more strategic perspective. For instance, it is suggested that small software companies should constantly analyze their internal capabilities and seek external means of innovation

though outsourcing product-development activities or finding existing solutions from the markets. Yet, the blind-sighted enthusiasm towards outsourcing that prevailed in the 1990s is by no means recommendable. Do not jump on the bandwagon because there is one; jump on the bandwagon if it provides you with strategic benefits. One of the key findings of this research is that firms should take a strategic approach towards outsourcing, and continuously assess the possibilities of capitalizing it as a strategic tool. It is not a tool that gives instant success, but it may help firms to prosper in an increasingly globalized and fiercely contested marketplace.

7 SUMMARY

Since the early 1990s outsourcing has become one of the most prevalent topics of academic research in several different research streams. From the theoretical perspective, the evolution of outsourcing practice has cumulatively expanded the underlying theory base used to explain different aspects of this complex phenomenon. It seems that no single theory suffices, and researchers should adopt a holistic approach. The brief literature overview reported in this thesis, for instance, identified 14 different theories that are intensively applied merely to answer the few key questions regarding outsourcing.

Despite the extensive amount of research, several aspects remain understudied. This is partly due to the evolution of the outsourcing markets, which has enabled firms that have not previously had access to them to capitalize this strategy. The evolution of the current supplier base has opened up new possibilities, especially for small and medium-sized firms. Particularly in the areas of technology and innovation development, it seems that SMEs are increasingly being forced to focus on more narrowly defined niches, and to find external sources to provide certain product-development activities. Given the aim to fill some of these research gaps, this thesis complements prior research by *examining the process of capitalizing external resources for product development in (small) software firms*.

The theoretical thread behind the key argument and focus of this work was laid down in the late 1980s by Jarillo (1989), but it has since been picked up only sporadically by researchers. Jarillo states, simplistically, that entrepreneurial firms need to access external resources in order to achieve sustainable and rapid growth. Later it was noted that several types of social networks are key determinants of growth in small firms. Further, as far as software firms are concerned, much is known about how they can capitalize these networks in market-related operations. Far less is known about how small firms are able to capitalize networks for production purposes, however. Furthermore, even though it has been noted that the need for resources changes in line with the growth of the firm, even less is known about how these networks are accessed during different phases of its growth. This may be due to the fact that this has only recently become a strategic option for software SMEs.

The research questions arose from the theoretical analysis, and were further investigated through empirical analysis. Mainly due to the complexity of the

issues to be explored, a qualitative approach was chosen for the data collection. The empirical data collection consisted primarily of conducting 170 interviews in 72 different software firms, which was corroborated with various secondary data. This provided the basis on which several within- and cross-case analyses were conducted in order to examine the issues under study.

This introduction summarized the key results of the case analyses. The thesis comprises a collection of six articles, and more thorough analysis of the results is to be found in them. Propositions for further research were derived from the results. It is hoped that these propositions, as well as the more detailed versions provided in the articles, will guide researchers in their future studies on this complex topic. Although the chosen qualitative approach sets limitations in terms of the broader generalizability of the findings, it is assumed that the developed results will provide insights for further research endeavors. Arguably, there are several issues that still call for further investigation. From the research perspective, it is proposed that outsourcing should be at the core of future research, as it seems to be one of the key determinants of success in future competition: indeed, it may well determine the international success of firms. Accordingly, and particularly from the entrepreneurial perspective, outsourcing as a research topic should not be overlooked.

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APPENDIX 1

The potential contents of an outsourcing contract

The findings concerning the outsourcing contract are presented in a four-fold distinction based on Platz and Temponi's (2007) classification: performance (1), exchange of money (2), human resources (3) and legal elements (4) (also for contracting issues in software business see Warsta 2002).

<table>
<tr>
<td>1) Performance - Service levels and quality

• SLA definitions
  o Quality
  o Quantity
  o Time schedule and milestones
  o Delivery procedures
  o Maintenance services
• KPI definitions
  o Based on the SLA definitions, firms are able to create KPIs, which assist in further evaluation of vendor/project success and thereby may assist in defining performance incentives or penalties.
• Information structure
  o Channels of information
  o Basis of informing
• Delivery and acceptance process
  o Testing procedures and levels of acceptance
  o On/off-site acceptance
  o Defects after acceptance</td>
<td>2) Financial elements

• Price and payment
  o Description of the object of transaction
  o Pricing model
    ▪ Fixed flat rate
    ▪ Activity Based Costing (ABC)
    ▪ Cost Plus model
    ▪ Flat fee and cost plus
  o Definition of direct and indirect costs (particularly with Cost Plus model)
    ▪ Cost categorization and leveling
  o Additional unexpected costs
    ▪ Delegation and leveling
• Procurement and purchases
  o Cost definition (direct vs. indirect)
  o Cost delegation and leveling
• Terms of payment, penalties and recovery of sums due
  o Terms of payment
  o Penalties for delays and defects
  o Recovery of sums due and debt collection</td>
</tr>
<tr>
<td>3) Human resource elements

• Project management
  o Training procedures
  o Recruitment
  o Transfer of personnel
  o The use of third parties (assignment and sub-contracting)
• Risk management
  o Vendor related competition restrictions
  o Personnel related competitive restrictions</td>
<td>4) Legal elements

• Transfer of rights
  o IPR
  o Intellectual property indemnity
  o Patents
  o Licenses
• Data protection and confidentiability
  o NDAs
  o Competition clauses
• Liability and warranty
  o Product liability (PSSL, Limitation of liability)
  o Warranty
• Terms of disengaging (term and termination)
  o Contract term
  o Clauses for pre-termination
  o ”Termination for convenience”
• Resolution of conflicts
  o Jurisdiction
  o Arbitration
  o Alternative dispute resolution (ADR)
• Force Majeure clauses</td>
</tr>
</table>

ARTICLE 1

Hätönen, Jussi

Outsourcing and licensing strategies in small software firms – evolution of strategies and the implications for firm growth, internationalization and innovation

Accepted with minor changes (conditional acceptance) for Technology Analysis and Strategic Management

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OUTSOURCING AND LICENSING STRATEGIES IN SMALL SOFTWARE FIRMS

Evolution of strategies and implications for firm growth, internationalization and innovation

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ABSTRACT

Current literature contains extensive results on the possibilities for capitalizing different outsourcing strategies. However, previous research suffers from shortcomings on how these overall possibilities and benefits of outsourcing apply to the context of small and medium sized companies in several industries, and in particular, how the outsourcing strategies correlate to a firm's overall strategy during different phases of growth. Through the theoretical structuring and empirical analysis of 6 small and medium sized software companies and a total of 14 outsourcing or licensing projects, this article provides evidence and further develops the current theory-base on how small computer software companies are able to capitalize on and benefit from using external research-oriented product development related resources during different stages of their growth process. The results of this article are composed into a framework introducing propositions and testable hypotheses for future research.

1. INTRODUCTION

The current trends in outsourcing have dramatically altered product development in industries as diverse as automobiles, aerospace, telecommunications, computers, pharmaceuticals, healthcare, energy systems and software[1,2]. In several industries the outsourcing market has evolved to the stage where practically every business activity or process can basically be bought off the markets from external suppliers through various transaction mechanisms, irrespective of the industry or the size of the firm[3,4].

However, especially in industries with an increasingly complex technological environment, a single firm rarely possesses all the necessary resources and capabilities needed to succeed, and therefore outsourcing has been touted as a highly effective strategy, particularly in fiercely contested and fast moving sectors with ever shortening life-cycles - such as software[5,6]. Accordingly, there has been a constant increase in the use of external technology resources in software firms, which have been provided through a variety of contractual agreements[7], such as outsourcing and licensing. Despite the fact that an extensive amount of research and literature exists on the practice and the benefits of outsourcing among various research disciplines such as management, international business and information systems to name but a few[8,9,10], it still suffers from shortcomings in some areas and contexts.

This study aims at complementing previous research in such areas where there is currently only partial understanding. Firstly, despite the amount of previous research on outsourcing benefits, previous studies provide only limited empirical evidence on how the reported benefits apply to the context of small and medium sized software companies [SMEs]. Even on general level, current research carries a strong bias in examining this strategy through the lenses of larger multinational corporations, although it has been

suggested that in terms of outsourcing, the small firm aspect provides a different set of managerial challenges[11]. Secondly, through existing research we have only a little understanding of how outsourcing strategies correlate to a firm's overall strategy during different phases of growth. Prior studies have shown that external resource needs vary in accordance with the development and growth phases of the company[12]. Furthermore, some studies have illustrated that network structure and network ties evolve along with the different growth stages of the firm[13]. However, despite some prominent work on identifying the external sources of knowledge in software development[14,15], less is still known about how small firms capitalize these sources of external konwledge and capabilities through outsourcing and licensing to fulfill their changing needs for resources.

The purpose of this article is to address these shortcomings in current outsourcing research through a research question of how small software companies are able to capitalize on and benefit from using external research-oriented product development related resources during different stages of their growth process. This research question carries a two-fold structure. Firstly, this article examines the practice of outsourcing in software SMEs, more specifically, **how outsourcing and licensing strategies change over the course of a software firm's growth (RQ1)**. Secondly the research examines the motives and broader benefits of outsourcing within the context of small and medium sized software firms, with a purpose to examine **how outsourcing may influence a software firm's innovation, growth and internationalization processes (RQ2).** This article builds on theoretical structuring and the theory development case research of 14 outsourcing or licensing cases in 6 software firms. The aim of this article is to provide managerial insights into the examined areas and further develop propositions for future

outsourcing and licensing research, as well as create testable hypotheses that can be applied also in future quantitative research on this area.

2. CAPITALIZING EXTERNAL RESOURCES IN SOFTWARE SMEs

The increasing trend towards outsourcing in the information and communications technology industry has created various market related possibilities for small software firms[16]. In the ICT industry the pieces from the scattered multinational corporations' [MNCs'] value chains caused by large-scale outsourcing can be and have been picked up by SMEs as the industry structure has become favorable for narrowly focused small niche players[17].

However, market-related possibilities are not the only gains brought about by industrial fragmentation for small software firms. In this fast-moving and knowledge-intensive industry, small firms increasingly seek out the possibilities of using non-internal means for undertaking product development related activities, mainly through the use of licensing existing software components or outsourcing the development of structured parts of the software development process. In fact, organizational boundaries have become an obsolete unit of analysis regarding development innovations, and the new engine of growth lies in outsourcing innovation[1] – not less among small software firms. Yet, in a study by Grimaldi and Torrisi (2001)[18], they found that over 70% of the external linkages of European software companies were market-related. This can be logically explained through the pressures set by increasingly shortening product life-cycles to achieve global market access for software products rapidly after their development in order to protect the innovative value from expropriation (e.g.[19]).

In contrast, Grimaldi and Torrisi (2001)[18] found in their study that product development related and research-oriented operations accounted for only about 24 per cent. Accordingly, much more focus has been placed in current literature on the possibilities, challenges and management of market-related partnerships in software SMEs[20,21,22,23,24], while capitalizing of external research-oriented resources in SMEs have been studied to a lesser extent. Some earlier research has examined outsourcing in software SMEs from the perspective of identifying the potential sources of external knowledge for software development[14,15] or examining the challenges of adopting a strategy in this context and how to mitigate these challenges[11], but to lesser extent about the possibilities the strategy can provide for small software firms.

To understand and to identify the possibilities and challenges of outsourcing within this specific context, this article first discusses the process of outsourcing in the context of software firms in general. This discussion is then taken to the level of small software firms in order to build theoretical structures for the empirical analysis. In the following chapter, the methodology of the chosen case approach is provided, after which an analysis of the results is provided. This article closes with a summary and some managerial and theoretical implications derived from the results.

2.1. Outsourcing and licensing in the software industry

One of the key questions lies in the fact that what drives software firms to seek out possibilities to undertake product development activities across their company boundaries – that is – the motives for outsourcing? In addition to the widely reported cost savings of outsourcing structured software development work[25], previous research has concluded that outsourcing can provide companies operating in knowledge-intensive and fiercely

contested industries with benefits such as accelerated time-to-market[26], increased and intensified innovation[27,28,29], internationalization and consequently growth[8,30,31]. Regardless, cost savings still seem to be prominent motives for accessing external resources in the software industry.

Another general question relates to mechanisms according to which software firms can gain access to these resources. The two broad options for accessing external sources for software product development entail either using the resources of external parties for developing software components [outsourcing], or the reuse of their existing solutions [licensing]. Where outsourcing entails the transfer of production activities, that have been previously conducted internally, to an external party[32], licensing is defined as a contractual agreement, in which; a firm [licensee] acquires the rights to a product, process and/or manages technology from another firm[33]. However, conventional technology licensing entails acquiring technology for production purposes, but in the software industry licensing is more often a tool to complement the whole product/technology package as solutions are increasingly becoming more and more extensive, as well as more technologically complex. Therefore, in addition to a possible yearly fee, for each product sold by the licensee, it also disburses a royalty for the licensor. In the software industry, such licensed instruments can be referred to as commercial off-the-shelf [COTS] components[34].

The distinction of these two strategies lies in the fact that whereas outsourcing entails using external knowledge and skill resources to develop software from scratch as per given specifications and instructions, licensing entails buying ready-made functionality in a codified form. The wide spectrum of outsourcing possibilities in the software industry ranges from acquiring temporary labor and skills to smoothen the

fluctuating needs of software developers [also referred to as body-renting] to deepening cooperative modes, in which part of an entire system is co-developed with the outsourcing vendor.

From a management perspective, licensing shifts software organizations from application development towards application assembly[34], and outsourcing development work moves software organizations from application development towards application management[35]. Furthermore, from a motivational perspective, in which outsourcing as a general strategy is often seen as a tool to cut costs and to gain operational flexibility[9,36], time-to-market pressures exert a strong pressure for applying COTS components within a firm's solutions[34]. However, especially in the software industry these strategies are more often supplementary options to one another and therefore they should be considered to be different means of capitalizing external resources.

In addition to the two contractual possibilities of undertaking 'external innovation', there exists a wide spectrum of different production activities, in terms of scope and scale, which can either be licensed or outsourced. These then affect overall decision-making. In general, the nature of the outsourced activity or process has been found to be the key determinant throughout outsourcing decision-making, e.g. the make-or-buy decision [whether or not to outsource][9], the outsourcing location decision [where to outsource][37,38], and the coordination decision [how to manage outsourcing relations][39]. Therefore, prior to any comparative analyses on outsourcing projects, it is imperative to classify the various outsourcing situations based on their nature. Yet, there seems to be no straight consensus among researchers on what constitutes the variables for clustering the different activities and processes in outsourcing decision making. Although researchers have suggested measures such as asset specificity[40], strategic importance[27,41], process

standardization and visibility to customers[37] as variables, these aspects have a tendency to vary between industries and thereby rigorous, cross-industrial tools for measuring such aspects have been found to be difficult to introduce.

One of the basic measures for analyzing the nature of the outsourced activity is through the **scale and scope** of the outsourcing. For such purposes, the outsourcing contract size can be seen as a simplistic measure. However, such information is often difficult to attain, especially among small firms, and such a measure is highly dependent on the firm's size. Another view on analyzing the scope of the outsourcing suggests dividing production activities prior to decomposition in accordance with their hierarchical level of complexity. Mikkola (2006)[42] suggests that complex systems can be divided into four hierarchical levels based on their complexity; system, subsystem, component, and module. Similarly in the software industry, MacCormack et al. (2006)[43] suggest that the architectural design of a software system can be divided into three levels in a hierarchical fashion. The levels are; a subsystem level [a group of source files that all relate to a specific part of the design], the source-file level [a collection of programming instructions that performs a related group of instructions], and the function level [a set of programming instructions that performs a highly specific task]. From more of a managerial perspective, Brown and Wallnau (1998)[44] suggest that a software system consists of three hierarchical levels of components; business components, software components, and run-time components. In this article, Brown and Wallnau's classification (1998) will be adapted to analyze the different hierarchical levels of a software solution, and consequently the scale of outsourcing/licensing [Table 1].

Take in Table 1

In addition to the scale and scope of the activity, one of the prevailing ways to cluster activities is based on their **strategic importance**. By reflecting on the notion of core competence introduced by Hamel and Prahalad in 1990[45], researchers have broadly suggested that firms, especially in fast moving industries, should focus on value creating competencies and basically outsource the rest[27,46], thereby giving rather straightforward suggestions regarding make-or-buy decision making. Yet prior to outsourcing, making such a bipolar distinction between activities tends to oversimplify the decision making situation[26], and consequently, researchers have identified several occasions in which outsourcing is not profitable, although the activity is not considered to be core for the firm[27,47]. Furthermore, the core competence and consequently the analysis of the strategic importance of an activity is highly dependent on the organization at hand, its chosen strategies and business models, and therefore comparative measures based on the core-non-core dichotomy are difficult to impose. Therefore, the core competence based analysis does not provide many rigorous tools for examining the strategic nature of the outsourced activity, especially in a comparative setting.

For the purposes of this article it is proposed that in the software industry, a sufficient measure for strategic importance, that is irrelevant to company size, is the analysis of the importance of the outsourced/licensed component to the overall product offering. For such analysis, this article proposes a classification of activities into embedded, value-added or customer specific to the final delivery. Embedded outsourcing, or similarly licensing, can be referred to as an activity which is a part of the core solution of the company, and thereby has a greater strategic emphasis for the firm. A value-added activity is something that might be a parameterized module of the whole product diagram

(cf.[48]), but in contrast to an embedded activity, is something that is not included in all the product deliveries to customers. The customer-specific activity is something that is applied only for the purposes of a single customer, i.e., a tailored activity [Table 2]. This article proposes that in the software industry these attributes, in parallel to the scale and scope of the activity, may be used to define the strategic nature of the outsourced/licensed object in the software production.

Take in Table 2

2.2. Outsourcing in small and medium sized software firms

As illustrated above, from the perspective of motives and benefits, outsourcing can basically provide cost, time, flexibility and resource related benefits[9,36]. Similarly in the software industry outsourcing highly structured work can be effective, especially in reducing transaction costs[25] and the use of external technology resources can provide operational flexibility, improved innovation and a more rapid development cycle and thereby speed-up time-to-market[7,28,34].

Although previous research has concluded that the motives for outsourcing are similar, it is noted that they have a different emphasis depending on the countries[9], geographical areas[37] and industries[49] in question, it has largely overlooked the issue of company size as an outsourcing variable. However, at least three reasons can be rationalized as to why small companies in general have different outsourcing strategies to larger firms. These differences are mainly due to the liability of these companies' small size. First, excluding the possibility of large scale funding, small companies have only limited resources for running operations. Although this fact drives companies towards

outsourcing, it also limits it. The scarcity of financial resources limits the possibilities for outsourcing and, controversially, the scarcity of skill related resources drives these firms towards outsourcing. With regard to licensing, previous research has suggested that small firms are more likely to find licensing appealing because they lack the resources to develop products internally[28,50]. Second, small firms often possess only limited knowledge to support their decision making. Outsourcing and licensing requires knowledge not only of the required objective, but also of the process itself. In fact, recent research has suggested that outsourcing is an evolutionary process subject to incremental learning, concluding that the outsourcing of small-scale non-strategic activities precedes outsourcing in large-scale and strategic activities[10,37,51]. If there is only limited prior knowledge of outsourcing, it is plausible to expect that small companies are more cautious towards outsourcing and licensing and eventually they start with smaller non-strategic entities. Third, small firms have inadequate volumes in their operations to be able to mitigate the outsourcing transaction costs (cf.[40]) and to achieve scale economies through outsourcing, which thereby decreases the possibility for making cost rationalized outsourcing decisions.

Regardless, previous research has shown that small software firms can overcome these challenges and capitalize outsourcing as a strategic option in their product development[11]. But what are the needs of software SMEs for external resources and technologies? Previous outsourcing research has concluded that outsourcing strategies should be aligned with the overall strategies of the company[9,52]. Even the broad notion that companies should focus on their core competencies and outsource the non-core ones[46] suggests that companies should outsource activities that are not strategically important to them. However, in today's hypercompetitive environment, that prevails in

several industries, these 'core' competencies are hardly ever static, but companies need to adapt to the current needs of their operating environment [cf. dynamic capabilities[56]]. Accordingly, as the competencies and capabilities of software firms change and evolve as these firms grow[53,54,55] it is plausible to expect that the outsourcing/licensing strategies of these firms also change and evolve in parallel with this growth. Therefore, company size should not be treated as an irrelevant factor, but as a variable that influences the product and marketing strategies of a firm, and consequently strategies concerning the capitalization of the external sources which provide the resources required.

Such presumption leads to the question; how do strategies for outsourcing and licensing change along with the growth process of software firms? As a distinctive factor in the software industry, and of small software firms, the operational and product strategies have been found to evolve extensively along with their growth[53,54,55]. Thus, in order to understand this it is essential to track the typical lifecycle stages of such companies. Although the approach of analyzing firms through progressive stages of firm evolution and growth has clear limitations, such as the problematical issue of identifying the stages a firm is currently operating, it provides a useful approach in framing the general processes of firm evolution and continuous change over time – particularly during the dynamic early stages of the firm[13].

In terms of the context of this study, Moore (2000)[48] suggests that one way to describe the lifecycle of a software firm is to say that it traces the increasing evolution and integration of the whole product. Software firms often grow through service intensive strategies towards productized strategies, and later back towards service intensive strategies. Accordingly, the growth of a software firm is best analyzed through the evolution of the product offering. Following Moore (2000)[48], this article suggests a three-

fold life cycle development of a software organization, in which firms move from service intensive product strategies towards fully integrated, commoditized whole product. The phases prior to achieving a commoditized whole product are here defined as product development, competence building through project work, and standardization and productization [Figure 1].

Take in Figure 1

At the outset of the software product lifecycle, the whole product consists of a barely complete core product surrounded by an envelope of custom services, which is needed to make any particular application work[48]. A firm's development phase prior to this is to develop this core product, albeit from a solution providing perspective that is incomplete. Accordingly, the firm strategy at the **product development** phase is laced around building a core product, often consisting of a platform and product interfaces for later customer solutions.

After the development of the core product, software companies often start to **build competencies through project work**[53,54,55]. In this phase, small software companies seek to build relationships with clients because productization is sought from the learning and competence building that arises from the projects[53]. This phase encapsulates the transition from project work to a whole product diagram, an amalgam of existing products and services[48]. Through project work, firms' strategies incorporate building scalable elements to build a parameterized software solution, a solution in which practically all the needed components already pre-exist and are not created from scratch.

The goal of the third lifecycle phase of a software firm is to build a fully integrated, commoditized whole product through **standardization and productization**. After developing competencies and a series of scalable elements through project-based

work, software firms often start bundling these elements into a parameterized whole product diagram and further towards more standardized solutions. As a result, the product replicates with reasonable consistency and speed and the work can be leveraged from customer to customer[48]. Such productization is often seen as a prerequisite for internationalization and consequently growth mainly because productization enables the more efficient use of networks as delivery channels. This is because productization includes a shift from unique service-intensive customer projects towards more tangible standardized products aimed at international mass markets[53]. However, at this stage, as well as at the stages prior to this, it still remains largely unclear how and to what extent growing software firms can capitalize production-related networks in the form of outsourcing and licensing to better succeed in this highly competitive industry (RQ1). Further, as lamented earlier, previous research provides only a partial understanding of the impacts that outsourcing and licensing have on the growth, internationalization and innovation processes of a small software firm (RQ2). The following empirical analysis aims at providing insights into these aspects.

3. METHODOLOGY OF THE EMPIRICAL RESEARCH

The empirical part of this article aims at theory development through case research. Case research is a form of qualitative research, the aim of which is often to build on a theory on the basis of the insights gained from field-based interview and case data. The general purpose of theory development case research is not to seek generalizations from the case data, but to introduce novel and often initial insights for further investigation.

It has been argued that qualitative case research is useful in terms of creating novel and accurate insights, particularly in areas in which (1) there exists only limited

prior knowledge or (2) the extant theory seems inadequate, or in situations (3) in which the explored phenomenon is highly complex and involves many identifiable, yet often unclear context-related interdependencies[57,58]. Although vast amounts of literature exist in the areas of outsourcing and technology licensing, it was argued that only limited empirical evidence exists on outsourcing in the context of software SMEs, and particularly on how outsourcing strategies evolve over time along with firm growth [RQ1], and how the outsourcing implications apply to this specific context [RQ2]. In fact, the case approach has been touted to be purposeful in situations where 'how' questions are addressed in order to explore a current phenomenon in a real-life context[58]. In terms of the context, when examining outsourcing, which is a phenomenon that is difficult to separate from its context, but necessary to study within it to understand the dynamics involved in the setting, a case study approach offers the depth and comprehensiveness required for an understanding of the specific phenomenon and further theory development[59,60]. Thus given the area and the context of the inquiry, it can be justifiably argued that case research provides the depth of understanding required for a meaningful approach to this study.

The case companies for this article were selected purposefully based on pre-determined criteria. The purposeful selection of the case companies enabled choosing firms that were able to provide novel insights into the research topic. Two main criteria were set beforehand in considering the candidates' suitability and theoretical as well as conceptual value to the study[57]. Firstly, and obviously, firms that had embarked on outsourcing or licensing during their growth process were targeted; particularly ones that had outsourcing and licensing experience throughout their growth process. Secondly, although the software industry entails several firms that combine tangible

product/components and software [embedded software], only companies whose operational strategy focused on the production of intangible software were purposefully targeted. Selecting companies with a similar operational strategy increased the comparability of the results. As a result 6 firms [SoftComp1 through 6] that met these criteria were selected and further analyzed for the purposes of this study. Within these firms, a total of 14 outsourcing and licensing cases were identified and further analyzed. Table 3 summarizes the key information of the selected case companies and the data collected from them.

Take in Table 3

These six companies were selected on the basis of how they apply to the explored phenomenon and on the basis of comparative value for the research problem (see[57]). All the analyzed 6 software companies have focused, in principle, on single main product offering throughout their history, which enabled retrospective analysis of the evolution of the firms' strategies parallel to the evolution of their product offering. In addition, in the time of analysis all of the case companies could still be considered as SMEs, as even the largest of them (SoftComp 6) had turnover of just over 35 Meur.

In these 6 companies an extensive in-depth analysis was conducted during 2006, which entailed conducting 22 interviews [appr. 60 minutes each] and collecting data from the available secondary sources. The secondary sources included for e.g. company materials as well as articles in local newspapers. The purpose of the interviews was to clarify these firms' present and prior actions, including aspects such as strategy, internationalization, growth, outsourcing etc. For such purposes, the top management [CEO, CTO, CMO etc.] in each company was interviewed [see Table 3]. The respondents were selected on the basis of how they were able to provide information about the areas

being studied. The aim of the interviews was to gather comprehensive insights about the evolution and growth of the companies as well as their past strategies for outsourcing and licensing. The interviewees were asked firstly to describe the outsourcing/licensing project(s), and secondly evaluate the direct and indirect outcomes of the project. A pre-made interview structure was used to guide the interviews. Although the interviews consisted primarily of the current managers of the case companies, as the outsourcing practices were studied retrospectively, on a few occasions the former owners/CEOs were interviewed to gather historical insights into the company and possible outsourcing projects.

After conducting the interviews in these six firms, the collected data was transcribed and further coded. Then, a within case description of each company, and each project, was constructed. In these descriptions, the outsourcing projects were categorized based on the created theoretical structures. Firstly, based on the hierarchical level of each outsourcing/licensing project [see Table 1] and based on the type and strategic importance of the outsourced objective [see Table 2]. Secondly, the outsourcing and licensing projects were categorized on the basis of their occurrence in their lifecycle [see Figure 1]. Also, in the analysis of the individual cases, the possible effects on innovation, growth and internationalization were analyzed.

The next step of the research process was to conduct a cross-case analysis[57,61], in which the findings from all the cases were compiled in a single diagram/table in order to identify their differences and similarities. Basically this entailed classifying the outsourcing and licensing projects into a single table according to the scale, type and stage of occurrence on the basis of the developed theoretical structures. This

classification enabled a cross case analysis and further theory development based on the case data. A summary of the cross-case analysis is presented in Table 4 in the following chapter. In the following chapter the results of the cross-case analysis are presented.

4. LICENSING AND OUTSOURCING IN SMALL SOFTWARE FIRMS

The empirical research consisted of the analysis of six small and medium sized companies [named SoftComp 1 through 6], in which retrospectively five licensing and nine outsourcing projects were identified and consequently analyzed. In Table 4, these projects are divided on the basis of their occurrence in the identified evolution phases; product development, competence building through project work, and standardization and productization. Furthermore, for each project a short description is provided and they are further clustered based on the identified metrics of the nature of the outsourcing objective [see Tables 1 and 2] as well as the primary motives.

Take in Table 4

The first research question aimed to examine how outsourcing and licensing strategies change over the course of a software firm's growth. In respect to outsourcing motives, previous research has rather conclusively reported that the prime motive for outsourcing is to cut operational costs[36,9]. Although cost savings were also one of the key motives in the analyzed outsourcing projects, especially in the later phases of a small firms' lifecycles, the results from the cross-case analysis reveals that motives such as the ability to focus on core development issues and achieving operational flexibility were stated in most cases as primary. The fact that cost rationales were predominant in the early stages of software firms' growth is perhaps due to the characteristics of software product development. In the stage of new product development in a software firm the

need for development resources is most likely the highest. Accordingly, the high need for resources [high volumes] enables small firms to mitigate the transaction cost associated with outsourcing [cf.[11,40]], which in turn enables achieving cost savings through outsourcing. As stated by the CEO of SoftComp1.

> "Cost savings were definitely the primary decision-making criterion […] Lets say for instance that we paid 2 to 3 euros per hour for a programmer in the Philippines but over 10 in domestic markets. Of course there are several costs involved in offshore outsourcing such as finding a good supplier, contracting and especially in teaching the supplier the existing software architecture etc. However, it starts to make sense when you need over 10 000 man hours."

Accordingly, the quite extensive project based need for labor-intensive resources may often enable software firms in the stage of product development to capitalize the external pool of resources in order to achieve even large-scale cost savings. However, it seems that in later stages, as the need for external resources decreases and simultaneously becomes more fluctuating, firms are not able achieve large scale cost savings, and moreover, as firms develop their competencies, outsourcing seems to become a tool to focus on what matters the most and simultaneously to equalize the fluctuating resource need in non-core development areas. For instance, the CTO of SoftComp3 stated the following about their decision to outsource during the stage they were productizing their software

> "It was never about cutting costs! […] We wanted to outsource all what was not core for us. What we wanted was to achieve business-as-usual but with a better business focus – flexibility was the key."

Further, in terms of the outsourcing objective, the results lead to suggest that in the product development phase of their lifecycle, firms outsource the development or license existing technologies to be embedded in the core product platform. From a strategic perspective, this enables small software firms to allocate resources to conducting project work, as productization is sought from the learning and competence building that arises from the projects[53,54,55]. However, in the later phases, the case companies seemed to focus on using external resources for more fluctuating value-added and customer-specific demands. This result leads to the suggestion that outsourcing strategies in small software firms shift from core embedded projects towards more customer-oriented projects in parallel with firm growth. This, in parallel with the earlier analysis of outsourcing motives, lead to the following propositions:

P1-A: In the 'product development' stage software SMEs outsource core [embedded] development projects primarily to achieve cost savings.

P1-B: In the 'competence building through project work' stage software SMEs outsource the development of value-added components primarily as it allows the firm to focus on core development issues and conducting project work.

P1-C: In the 'standardation and productization' stage software SMEs outsource customer-specific development work primarily to achieve operational flexibility.

With regard to licensing, cost drivers were not found to be an issue, but the two domain motives were as they included; increasing innovation through the acquisition of ready-made technology [COTS] and increasing time-to-market by focusing on core development issues and licensing COTS components to complement the solution. These implications are in line with earlier studies on licensing technology in small firms (e.g.[28,34]). In fact, the use of third-party components in software development, throughout

the stages of growth, was highly encouraged by the companies that had experience of it. For instance, the CEO of SoftComp4, company, which had licensing experience throughout its different phases of growth, stated that

> "The only regret I have about these licensing decisions is that we have not made them fast enough. In many cases we started to develop our own solution for a problem, a solution which could have been bought ready-made from the markets and was probably even highly advanced. We did not have enough courage and just followed the decisions of our competitors. Such mistakes tied up our valuable and scarce software development resources, and at worst, blunted any possible competitive edge that could have been attained."

Similarly the software development manager of SoftComp 1 suggested that in the early stages of product development

> "It is downright ridiculous not to capitalize on ready-made even strategically important components when developing new software, especially in the beginning phases. In the start-up phase you have enough work to do and if you can buy something ready-made that decreases that workload, do that! What we did was that we licensed a software component at the very beginning. However, after the launch of the first version we started to develop our own solution to replace the licensed component in our solution."

Based on the results it seems that the motives of technology licensing in the early phases of software firm growth connect to achieving a faster time-to-market and thereby more rapid growth. For instance, as will be later illustrated in more detail, the components that SoftComp1 licensed in the product development phase it later developed internally. Thereby, licensing can be a temporary solution to access the markets rapidly

and it allows for the allocation of resources to project work. Later, when productizing and standardizing the solution, licensing is a tool firms can use to acquire more advanced technology to complement and to extend [value-added components] their existing solution, which in turn enables software firms to extend their whole product concept. Accordingly, the following propositions for further research can be made.

P2-A: In the early phases of firm growth, software firms license core [embedded] technologies primarily to achieve rapid-growth and faster time-to-market.

P2-B: In later phases of firm growth, software firms license value-added technologies primarily to improve innovation and to extend the whole product concept.

Accordingly, it may be argued that as a company's product strategy moves from being service intensive towards a standardized solution, controversially the outsourcing and licensing strategies seem to move from core development issues towards more customer-specific, and accordingly, more service-intensive issues. Such a finding is, as such, contradictory to earlier propositions that outsourcing is an incremental process in which the outsourcing of non-strategic activities precedes the outsourcing of strategic activities[10,37,51]. The proposed relationships and evolution of firm, product and outsourcing/licensing strategy in a small software firm is represented as shown in Figure 2 [see also Figure 1].

Take in Figure 2

Although this result was rather distinct, some embedded parts of the software were licensed and outsourced also in the later phases of the lifecycle. Based on the interviews in these firms, two explanations were identified for these projects. First, by providing project work companies such as SoftComp2 and SoftComp3 encountered a

situation in which some customer-specific tailoring was being replicated from project to project. Therefore, it became justifiable and reasonable to develop a scalable module to be embedded in the core solution to substitute this tailoring need. Furthermore, because the firms wanted to maintain their current level of software developers, they turned to outsourcing which provided the firms with a source of flexible workforce. Second, it was found in the interviews that as new technologies emerge in the software industry, companies often need to make the decision to make or buy. For instance, SoftComp6 had developed practically their entire solution internally. However, as they had productized their offering and consequently internationalized, the company discovered that for one of their modules [a business component], there existed a more technologically advanced supplier, and as a consequence, they licensed and replaced that module in their solution. In fact, geographical expansion may instigate licensing decisions as, in parallel with growth and internationalization, small software firms may become more aware of the advanced technologies available on the global markets.

In terms of the scale and scope of the outsourced objective it was found in the analysis that there was no notable difference between the lifecycle phases of the company. The primary scope of outsourcing, and similarly licensing, lay in the business component level. Again, this finding is not aligned with the suggested incremental nature of the strategies. In the interviews at least two different yet to some extent interrelated factors were mentioned as influencing the decision to outsource at the business component level; 1) operational entity - which is understandable as such, and 2) adequate volumes in order to make the outsourcing profitable. With regard to volumes, as was also argued above, it was noted that for small firms the volumes are often small and therefore outsourcing smaller entities carries a high transaction cost due to the several *ex ante* costs

related to outsourcing. Even though in many cases low cost was not a primary motive, in some cases a high cost was stated as a restraining factor. In respect to the operational entity, outsourcing structured and separate entities, which are understandable as such, increases the ability to teach and codify the task (cf.[49]). For instance the software development manager of SoftComp1 stated that

> "The key to the success of the outsourcing lay in the fact that the vendor understood what they were developing. To understand, they needed to see themselves what they were developing and for what. Outsourcing entities that are functional as such also significantly ease the testing of the results."

Accordingly, it may be proposed that in small firms, for entities which are separate and easily attached to the existing software and carry adequate volumes to drive down the associated transaction cost (cf.[40]), the 'buy' [outsourcing] option becomes more viable. While it may be argued that these preconditions apply to the context of larger firms as well, it can be proposed that:

> **P3**: In software firms, irrespective of the stage of growth, outsourcing entities that are understandable as such and carry adequate volumes are most suitable for outsourcing.

Although incremental growth in outsourcing distance or in the scale and scope of the outsourcing objective could not be supported in the analysis provided in this article, it was found, however, that prior outsourcing and/or licensing assisted in later outsourcing/licensing endeavors. The analysis revealed three main reasons as to why companies that have prior outsourcing experience shift more sensitively towards the 'buy' option in their later make-or-buy decisions. First, they possess knowledge about the outsourcing and/or licensing process. Outsourcing and licensing are rather complex

processes entailing tasks such as; vendor search, evaluation and selection, the conducting of an accurate risk/benefit analysis, ensuring task transfer, undertaking change management and so on. Repeating this process results in lower transaction costs[63]. For instance, it was stated by representatives of SoftComp1 that as they had built outsourcing processes in the product development stage, later outsourcings were much more organized and painless. Secondly, they have created internal processes and product architectures in such a manner that it assists the later transfer of production activities. Modularity in product architectures and in the design process has been found to significantly ease outsourcing[64,65,66]. However, previous research has shown that modularity not only provides a suitable setting for outsourcing, but outsourcing also creates it[35]. This is due to the fact that to ensure a successful transfer, as well as dispersed management and the design of activities, firms need to adapt to modular design principles[64]. SoftComp4, for instance, capitalized a pool of different suppliers for customer-specific development work in their stage of productization. Such dispersed development was to a large extent enabled by the modular design and structure of the developed software, according to the CEO of the company. Thereby, firms that have had previous outsourcing experience have adopted some level of modularity in their product architectures and development processes which, in turn, may significantly ease later outsourcing in several different areas. Finally, an established working relationship with an outsourcing vendor provides a solid foundation for further outsourcing. For instance, it was stated by the CTO of SoftComp3 that:

> "…after we had successfully outsourced the development of the system component [application in the phase of 'competence building through project work'], we were pondering whether to outsource the maintenance of the software

application. The knowledge of our software architecture, design etc. had been built to the vendor and the fact that they knew our processes and how we operated made the decision actually rather easy."

5. IMPLICATIONS OF LICENSING AND OUTSOURCING FOR GROWTH, INNOVATION AND INTERNATIONALIZATION

The second goal [RQ2] of this article aims to elaborate how outsourcing may influence and facilitate small software firms' innovation, growth and internationalization processes. The importance of this topic lies in the fact that in addition to the need to develop innovations to succeed in the globalised marketplace, rapid growth and internationalization are often referred to as the key determinants behind the success and survival of small software firms[16,17,19,20,22,31]. The results from the case analyses indicate that in relation to growth, innovation and internationalization, capitalizing external production-related resources through outsourcing or licensing may provide widespread direct and indirect benefits for small and medium sized software companies.

First, in respect to **growth**, the results of the cases explicitly indicate, in a way similar to earlier studies[28], that outsourcing and licensing can enable faster product development and thereby time-to-market. In fact, as an example to illustrate the importance of this issue, immediately after the establishment of the firm in 2001, SoftComp1 licensed a business component at the very beginning of their product development process. However, after the first release was launched on the market, they 'insourced' this component by developing it internally. In the product development phase the firm focused its scarce resources on core development issues and on conducting

customer project work, and temporarily licensed the business component needed for the total solution.

In addition to licensing, outsourcing can provide a foundation for more rapid growth for small software firms. Access to the global resource pool through outsourcing can provide even small firms with production-related flexibility, and thereby more possibilities for undertaking even large development projects, and as shown, possibly at only a fraction of the internal costs. For example, SoftComp1 had in the years 2002 and 2003 approximately 60 permanent employees, but simultaneously it had 80 external developers working for them in a factory in Manila. By using only internal resources, the company CTO later calculated that the development process, on top of all the other required development work, would have taken about three years to complete, but through outsourcing the project had lasted approximately only a year and the cost savings were roughly estimated to be close to 70 per cent. Similarly, it was stated by the CEO of SoftComp5 that at the inception of the firm in 1993 they were able to acquire labor-related resources for product development at a cost 10 times lower than that they would have paid in their domestic market, which basically meant that with certain financial resources they were able to develop the software 10 times faster than if done domestically.

In addition to the direct implications for growth, outsourcing and licensing 'coerces' companies utilizing such a strategy to adapt to modular design structures, which in turn may provide small software companies with indirect benefits. As illustrated earlier in figures 1 and 2, small software firms' product strategies, which often change parallel to growth, shift from customer-specific projects towards modular whole product diagrams and further to standardized solutions. Such productization is often referred to as

a prerequisite for the internationalization and continued growth of software SMEs[53], due to the fact that such a strategy towards scalable product offering enables the use of different network possibilities for sales and marketing. In relation to outsourcing and licensing, it was found that utilizing such strategies more rapidly achieved the structures of productized offering, which in turn enabled more rapid growth opportunities. Thereby the modularization of the solution, which occurs as a by-product from capitalizing external resources, may indirectly help in crossing the chasm into which many software companies fall (see[48]). All of the discussion above leads to the hypothesis that:

> **H1**: Outsourcing and licensing in the product development stage has a positive impact on the growth rate of small software firms.

In addition to growth, it has been argued that every outsourcing possibility offers possibilities for improving **innovation**[27]. Although the impact of outsourcing and licensing on innovation is a measure that is not easily operationalized, certain direct and indirect implications of using external resources in the innovation process can be illustrated based on the analysis.

First, as innovations in the software industry are becoming more complex, companies can use ready-made COTS components in their product development and focus on the core development issues, thereby enabling firms to focus on core innovative development activities. In particular, as was stated by the CEO of SoftComp4, small firms with limited resources should focus on the areas of the system in which they want to build their competitive edge, and license components that can be bought from the markets. Especially with larger and more complex systems, small firms cannot do everything while remaining innovative. Licensing, especially value-adding and customer specific modules, does not only allow firms to create modular innovations (see[64,67])

through the mixing and matching of external components, but also enables the company to focus on its core software development throughout the different life-cycle phases. Aiming at such a focus and flexibility through the outsourcing and licensing of these non-embedded modules of the software was found, in our analysis, to be one of the prime motives for adopting such strategies. Thereby, in terms of innovation, it may be hypothesized that:

> **H2**: Licensing and outsourcing throughout the growth stages has a positive impact on the level of innovation of the product.

Secondly, in addition to the fact that using external resources enables small firms to focus on their most innovative activities, suppliers are also a possible source for innovation, yet an often overlooked one. For example, among small firms with technologically complex solutions, it is impossible to stay at the cutting edge in several different areas of technologies at the same time[1]. In fact, out of the five licensing cases analyzed for this article, four had the primary motive of increasing innovation or acquiring technology, in which the company lacked competencies. However, using outsourcing as a strategic option may limit innovation. According to the CTO of SoftComp1,

> "…in order to achieve cost savings a good outsourcing partner does exactly what you want, nothing more and nothing less".

Yet, such restrictions, especially in the software industry where product development is a process with several overlapping phases, limits the possibility for supplier generated innovation in the production process. Previous research has suggested that strict cost driven motives in outsourcing lead to the fact that the supplier does not take any interest in innovation development, as they seek to minimize internal costs[76].

Thereby it is plausible to expect that highly detailed specifications and strict cost drivers may carry a negative effect for the innovation process in the future. It was argued earlier that whereas cost savings are predominant in the early stages of software firms' growth, other motives such as achieving flexibility were found to be dominant in the later stages. This leads to the hypothesis that:

> **H3**: Outsourcing in the early stages of growth is less likely to result in supplier generated innovation than outsourcing in later stages of growth.

Although offshore outsourcing and licensing embodies **internationalization** per se [inward internationalization], the results from the case interviews suggest that outsourcing may carry indirect and also implicit benefits for the outward, sales-driven [equally market-driven] internationalization process. The results indicate that small software firms can implicitly benefit from offshore outsourcing; as such operations might create locational network connections and market-related knowledge that assist in later market-seeking internationalization. In the cases of SoftComp1 and SoftComp5, which both undertook rather large scale offshore outsourcing projects in their product development stages, SoftComp1 in early 2000 and SoftComp5 in the mid 1990s, the representatives of these companies stated that they had experienced indirect benefits from outsourcing in their market-seeking internationalization. For instance, the CEO of SoftComp5 stated that as they were developing [through external sources] their software in Estonia they gained valuable information about local market developments, which at the time were not ready for the solutions SoftComp5 was producing. However, as the markets evolved, they were able to bring their solution onto the Estonian markets, and in fact, had some customer references which they had acquired through the created social networks. Accordingly, especially within the context of small firms, in which the same

person(s) are often involved in both exporting and importing[68], it may be possible to decrease the cost of further internationalization through acquiring market-related knowledge and creating location-bound network connections, which, as shown, can result as a by-product of prior outsourcing. A clear indication of the indirect benefits is that for SoftComp 1, alongside Europe, Asia is currently its biggest market area, and SoftComp 5 has a strong foothold in the Baltic states; both of the areas being highly unlike targets for early internationalization of a small software firm.

It was stated that the underlying reason for such benefits is that the successful outsourcing of knowledge-intensive activities requires that companies rely on closer supplier relationships which often entail an on-site presence in the supplier company. Through this presence, these companies were able to absorb market-related knowledge and to create country-related network connections, which assisted in further internationalization. Such inward-outward connections have been previously studied and demonstrated in the context of franchising, licensing and sourcing[68-74]. However, outsourcing is a slightly different phenomenon due to the fact that it often entails closer relationship building, common risk sharing and is more horizontally than vertically aligned[75]. However, in the closer analysis of SoftComp1 and SoftComp3 it seemed that the collaboration and the on-site presence was most intensive in the early stages of growth in the larger outsourcing projects. Thereby it may be hypothesized that

H4: Outsourcing, particularly in early growth stages, has a positive impact on the later degree of internationalization of the firm.

Figure 3 summarizes the experienced direct and indirect implications of outsourcing and licensing to growth, innovation and internationalization in the case companies.

Take in Figure 3

6. SUMMARY AND CONCLUSIONS

According to Harvard Business School professor Howard Stevenson (see[77]) entrepreneurship entails "the pursuit of opportunity beyond the resources currently controlled." However, current research has provided us with only partial empirical evidence on how entrepreneurial firms, such as small software firms, can capitalize on external resources and sources of knowledge to better succeed in today's highly competitive and globalised markets. To address this shortcoming of current literature on the subject this article examined how the widely reported benefits of outsourcing apply to the context of small and medium sized software companies, and furthermore, how outsourcing strategies correlate to a firm's overall strategy during different phases of growth.

From theoretical perspective through the analysis of nine outsourcing and five licensing cases, this article provided initial evidence on how small and medium sized software companies have capitalized external resources in different phases of their growth process. The results from the cases suggest that although the primary motives for outsourcing remain the same with small and large companies, the emphasis on them is different. Whereas prior literature has indicated that the primary motive for outsourcing in general among large companies is more often cost rationalized[9], the results argue that aside from the product development phase small software firms are unable to mitigate the high transaction cost of using external resources, and thereby small companies more often tap external resource sources in order to acquire skills, knowledge, capabilities or

operational flexibility in order to speed up the innovation process and therefore time-to-market.

In addition to describing outsourcing activities in software SMEs, the results of this paper unveil a new aspect to the concurrent research on outsourcing, which is that the motives [why] and the outsourcing objectives [what] seem to vary in the different lifecycle and development phases of small and medium sized software firms. Furthermore, it was argued that outsourcing and licensing may provide firms with wide-spread direct and indirect benefits in terms of a firm's growth, internationalization and innovation. These results provide several insights for the managers of small software firms, particularly on how they are able to capitalize external sources of skills and resources in their growth process.

From a theoretical perspective this article provides initial evidence for further academic research on adopting outsourcing and licensing strategies in small software firms. To summarize, the results propose that during the growth of a small and medium sized software firms the resource needs change and in some cases these resource needs can be complemented through transaction mechanisms. However, the results propose that the stage of growth affects the way these firms access these resources. In these issues this article formulated initial propositions and hypotheses that could be used and tested in further research. These are summarized below in Figure 4.

Take in Figure 4

From managerial point of view the results of this article provide insights that may be useful especially for those responsible for decision-making in growing software firms. The key managerial argument of the results lies in that managers of growing software SMEs should continuously assess the internal resource needs, and consequently, assess to

identify the evolving possibilities to capitalize external resources to undertake some of the development work. The results of the case studies indicate that even small software firms can overcome the 'liability of smallness' and small volumes, and accordingly benefit from capitalizing external resources in product development. In addition, based on the case analysis, it can be advised that where it is essential to recognize the hidden costs of outsourcing, firms should also acknowledge the possible 'hidden benefits' of outsourcing. Using external resources for undertaking product development activities may lead to indirect benefits that may increase the firms' level of innovation, assist in the internationalization process, and possibly accelerate the overall growth of the firm.

In terms of the applicability of the results, although it is quite evident that the resource needs change as firms grow irrespective of their industry, the results provided in this article can as such be only applied to the specific industry of software. This is largely due to the specific and quite distinctive characteristics of software business where the growth can be traced through the evolution of firms' product strategies. However, the results provide broader insights in terms that whenever the growth of a firm affects the product strategy, it can be expected that the firm needs to reassess its outsourcing strategy as well. Further, in terms of limitations of the result's applicability, many of the constructs such as the life-cycle phase of the outsourcing/licensing agreement, as well as the scale and the strategic importance of the outsourcing, could not be quantified and thereby they were based on the interviewer's own analysis as well as the managers' own judgment. In that sense, the results of this article may seem to lack validity.

Regardless of these limitations regarding the applicability of the results, the purpose of this article was not to provide utterly conclusive results, but merely to provide insights for further research and for practitioners on a subject which has not received

enough attention and for which only limited knowledge is available. To those purposes, this article has provided results that create a sound basis for future research, as well as managerial-decision making in small software firms.

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Table 1 Hierarchical levels of a software solution

SYSTEM	BUSINESS COMPONENT	SOFTWARE COMPONENT	RUN-TIME COMPONENT
Constellation of different business components to create a full operational entity. A system may be a constellation of different modular applications (for ex. ERP and CRM systems).	Represents the software implementation of an "autonomous" business concept or business process (application). It consists of the software artifacts necessary to express, implement and deploy the concept as a reusable element of a larger business system.	A composition of run-time components and that can be deployed independently and is subject to third-party composition (for ex. data management tool).	Dynamically bindable package of one or more programs managed as a unit and accessed through documented interfaces that can be discovered at runtime.

Table 2 Type and strategic importance of an outsourcing objective

EMBEDDED	VALUE-ADDED	CUSTOMER-SPECIFIC
Embedded components are components that are included in all the deliveries. Usually these are embedded in the core platform or the interface of the software solution. Therefore these components have high strategic importance.	Parts of a parameterized whole product diagram. Several solution deliveries might include these components, but not all.	Customer specific module is like tailored software. Such a module is done only for the purposes of single delivery

Table 3 Summary of the selected cases

COMPANY	EST.	PRODUCT/INDUSTRY	ANALYSIS
SoftComp1	2001	Develops web- and mobile-based customer interface management products for different financial institutions. The company's solutions enable financial institutions to move business towards these virtual channels.	Interviews: 4 (CEO, CTO, Mktg. Manager, Soft. Dev. Manager) Projects analyzed: 3 (2 outsourcing and 1 licensing)
SoftComp2	1989	Develops solutions for managing personnel and materials flows as well as for labeling and marking of products, including software applications as well as the required labeling [applicators] and reading [terminals] devices for comprehensive solutions.	Interviews: 4 (CEO, CTO, Production manager) Projects analyzed: 1 (outsourcing)
SoftComp3	2001	Develops technology-based solutions such as language labs, teaching software for ICT classrooms, virtual classroom solutions and classroom management solutions for language teaching and technology-enhanced teaching in educational institutions.	Interviews: 3 (Former owner/manager, CTO, CEO) Projects analyzed: 2 (2 outsourcing)
SoftComp4	1977	Develops computer-aided design software for the manufacturing industry as well as the building and construction industries. Their products are developed mainly for the structural and interior design of houses.	Interviews: 5 (CEO, CMO, CTO, Prod. Dev. Manager, Former owner) Projects: 4 (3 licensing and 1 outsourcing)
SoftComp5	1992	Develops software solutions for life and pension, and property and accident insurance companies. The company provides insurance companies with a comprehensive IT solution for integrated insurance management.	Interviews:2 (current CEO, former CEO/owner) Projects: 3 (3 outsourcing)
SoftComp6	1966	Develops and sells 3D modeling software (CAD) mainly for construction and engineering offices. The company's product portfolio includes applications for structural and façade design as well as for conducting different structural calculations.	Interviews:4 (CMO, CTO, Vice president BU) Projects: 1 (1 licensing)

Table 4 Case and project descriptions

LIFECYCLE PHASE	MODE OF TRANSACTION	UTILIZING COMPANY	OBJECTIVE		PRIMARY MOTIVES	SHORT PROJECT DESCRIPTION
			Strategic Importance	Scale/Scope		
Product development	Licensing	SoftComp1	Embedded	- Business component	- Time-to-market, - Focus on core development issues	Increased time-to-market by acquiring ready-made technology needed for the software solution
		SoftComp4	Embedded	- Software component	- Increased innovation	Increased innovation by acquiring state of the art technology
	Outsourcing	SoftComp1	Embedded	- Business components	- Cost savings - Time-to-market	Counted 70 per cent cost savings through large scale outsourcing of functional modules to Asia
		SoftComp5	Embedded	- System	- Scarce resources - Cost savings	Acquiring low cost external resources from Estonia to develop the entire system from scratch
Competence building through project work	Licensing	SoftComp4	Value-added	- Business components	- Increased innovation - Technology acquisition	Acquiring technology required by some clients
	Outsourcing	SoftComp1	Customer-specific	- Business components - Software components	- Flexibility - Cost savings	Outsourcing to Asia all the customer-specific work needed for providing tailored customer solutions
		SoftComp2	Embedded	- Business components	- Focus on core development issues - Flexibility	Outsourced the re-development of specific components of the existing software
		SoftComp3	Value-added	- Business component	- Flexibility	Outsourced the maintenance of one of their applications to Hungary
		SoftComp5	Embedded	- System	- Scarce resources - Cost savings	Entire system development was outsourced to Estonia
Standardation and productization	Licensing	SoftComp4	Value-added	- Business component	- Whole product concept - Technology acquisition	Licensed technology that could be added to their solution
		SoftComp6	Embedded	- Business component	- Technology acquisition	Replaced their existing application as they found more competitive supplier
	Outsourcing	SoftComp4	Value-added	- Business component	- Focus on core development issues - Flexibility	Outsourced a highly structured component to a local supplier
		SoftComp3	Value-added	- Business components	- Focus on core development issues - Flexibility	Outsourced locally the development of an application
		SoftComp5	Customer-specific	- Business components	- Flexibility	Outsources customer specific work to a pool of suppliers in Europe

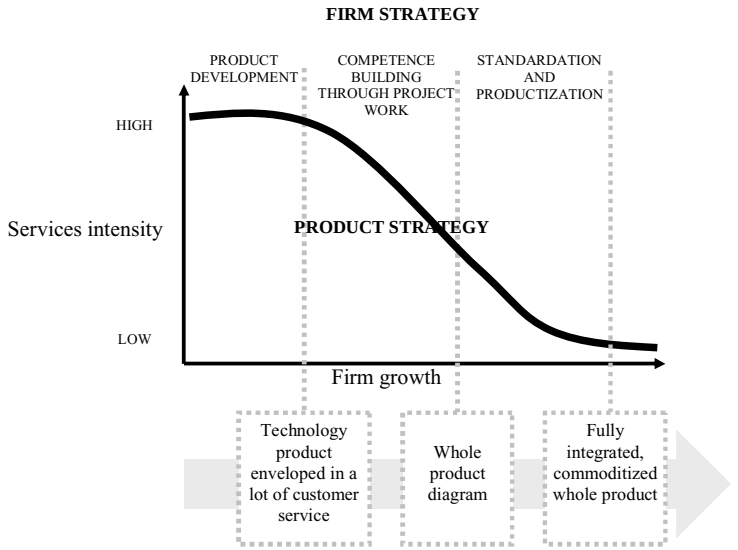

Figure 1 Firm and product strategy in the growth process of a software firm (Adapted from Moore 2000)

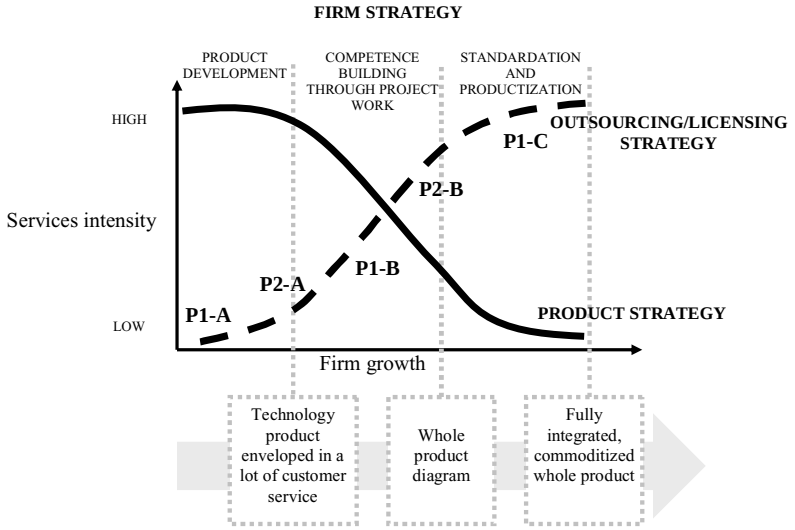

Figure 2 The proposed relation of firm, product and outsourcing strategy in a software firm

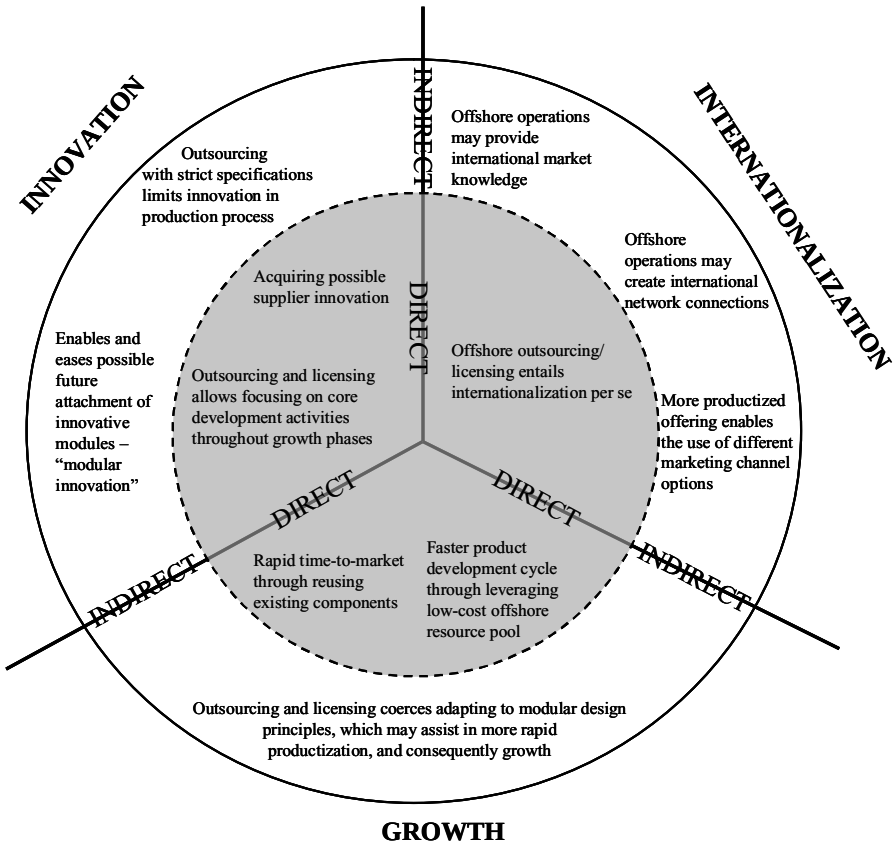

Figure 3 Direct and indirect implications of outsourcing and licensing on innovation, growth and internationalization

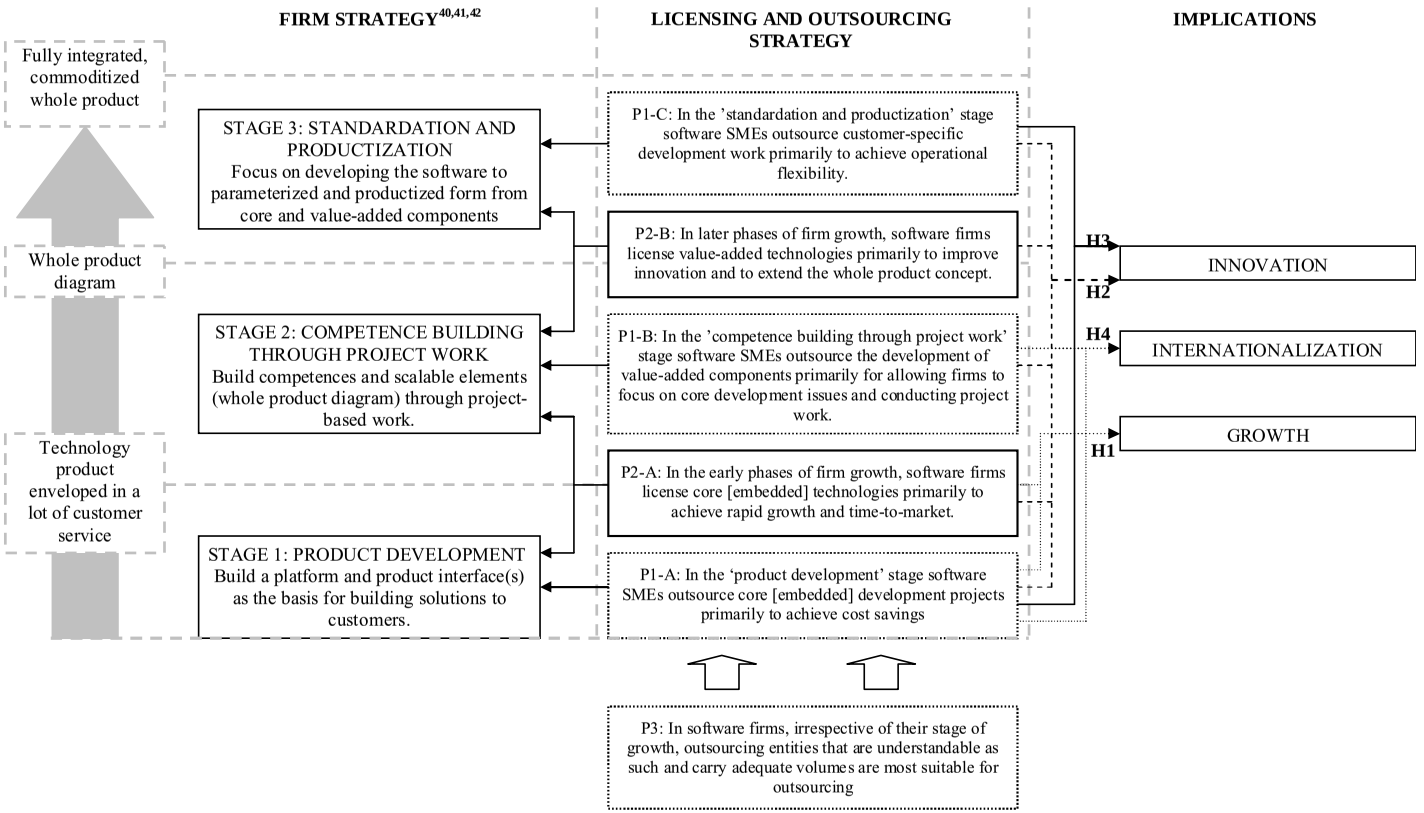

Figure 4 Summary of the proposition and hypotheses

ARTICLE 2

Hätönen, Jussi

Making the locational choice – a case approach to the development of a theory of offshore outsourcing and internationalization

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MAKING THE LOCATIONAL CHOICE

A case approach to the development of a theory of offshore outsourcing and internationalization

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ABSTRACT

Offshore outsourcing is one of the most sustained management strategies of the 21st century, and researchers are paying attention to this contemporary, yet complex and controversial phenomenon. Despite the increasing amount of research, from the theoretical and managerial perspectives several important aspects remain inconclusive. The focus in this article is on theory development in two complex areas. The first concerns the location, the idea being to identify the factors that influence the final decision, in which ownership is not the mode of control. Secondly, the aim is to explore whether offshore outsourcing facilitates international expansion. Through a process of theoretical rationalization and inductive case analysis propositions are arrived at according to which non-locational factors most heavily impact the firm's decision to outsource offshore and its subsequent internationalization. The results indicate that this subsequent internationalization may be a by-product of offshore outsourcing, or it may be an intentional strategy. The article thus adds new aspects to the existing theory on outsourcing decision-making, which forms the basis of an emergent theory for future academic research.

Key words: Outsourcing, offshoring, location decision, internationalization, inward-outward connections

1. INTRODUCTION

Outsourcing is a phenomenon that has been one of the most sustained (Lewin and Peeters, 2006; Sanders et al., 2007) yet controversial trends over the past few years (Venkatraman, 2004), and consequently researchers have found it attractive. In particular, offshore outsourcing has become one of the mainstays of several different research disciplines, including international business, strategic management, supply-chain management, and information systems (e.g., Dibbern et al., 2004; Maskell et al., 2005). In spite of its growing importance in various disciplines, however, several aspects remain unclear (Ramamurti, 2004). One of these concerns the making of the location decision, which, despite the recent growth in interest, has still received limited attention (Bunyaratavej et al. 2007; Doh, 2005; Kotabe and Murray, 2004).

Even on the conceptual level, offshoring and offshore outsourcing often create confusion among researchers and practitioners. This is because offshoring as a concept has been used to describe these two similar yet distinct phenomena (Pyndt and Pedersen, 2006). In order for a strategy to be referred to as offshore outsourcing, two conditions have to be met. Firstly, the location of the activity has to be transferred to a foreign country. Although the term 'offshore' is used to describe the transfer of a production activity, an offshore operation may be wholly owned by the parent company or it may be outsourced to a specialized provider (Hagel and Brown, 2005). Accordingly, 'offshoring' covers multiple modes of foreign involvement located on a market-hierarchy continuum. In research terms, the fundamental difference between offshore outsourcing and other offshore modes is that in the former the firm transfers ownership of the process to a vendor. Simultaneously, control shifts from internal hierarchical to contract-based governance. Thereby, and secondly, there has to be a simultaneous transfer of ownership and control, which means that the activity is carried out by an external supplier [externalized] rather than an in-house unit [internalized] (Pyndt and Pedersen, 2006). Accordingly, offshore

outsourcing as a concept refers to the transfer of production activities previously carried out internally to an external party located in a foreign location (e.g., Barthélemy, 2003).

Although it is quite obvious that forfeiting the hierarchical control of an activity raises different managerial concerns, different aspects of offshore outsourcing are often explored in the light of various theories and existing research on making ownership-based [equally captive] foreign investments, i.e. foreign direct investments [FDIs] (see e.g., Graf and Mudambi, 2005; Hätönen and Ruokonen, 2007). For instance, the application of Dunning's (1980; 1988) eclectic paradigm facilitates elaboration when the specific advantages of ownership (O) and location (L) apply, but not the advantages of internalization (I) (Hätönen and Ruokonen, 2007). In other words, companies benefit from producing an activity abroad, but not if they use internal resources. There exists no "internalization advantage" when the benefits of external production outweigh those of internal production (Dunning, 1988), and as a consequence companies shift towards 'buying' instead of 'making'. However, although much research on offshore outsourcing leans on FDI literature (e.g., Graf and Mudambi, 2005; Bunyaratavej et al., 2007; Palvia 2004), with regard to the location decision it still remains largely unclear whether the same factors that promote ownership-based offshoring encourage the firm to make an outsourcing investment in which ownership and thereby hierarchical control is passed to the foreign vendor/partner. This leads to the first research question addressed in this article:

Research Question 1: What factors influence the offshore-location decision when ownership of the activity is transferred to the foreign vendor?

When a company forfeits control of an activity, in contrast to captive offshoring, a key variable comes into play that may influence the location decision: the right choice of partner is often seen as the key to success in outsourcing agreements (e.g., Amoribieta et al., 2001). Arguably, the choice of location cannot be separated from the choice of partner: they are two

interrelated and intervening processes (Graf and Mudambi, 2005). However, it is equally likely that in some circumstances the partner or the location is chosen first (Doh, 2005; Narula and Hagedoorn, 1999). The second research question elaborates on this contingency and sequence :

Research Question 2: When and under what circumstances do firms choose partners prior to choosing the location?

Although the factors behind the final location decision and the sequence in which firms choose partners prior to choosing locations remain unclear, previous research has shown rather conclusively that the primary motives for offshore outsourcing relate to cutting costs, acquiring skills or resources that are unavailable internally, and improving and rationalizing internal processes (Levin and Peeters, 2006, see also Heikkilä and Cordon, 2002; Kakabadse and Kakabadse, 2002; Quélin and Duhamel, 2003). According to the current FDI research, such motives are related to the seeking of resources, rationalization and efficiency concerns, and the search for strategic assets (Dunning, 1993; 2000; also 1980; 1988). However, these motives do not support the fourth main, and perhaps the most common, type of foreign-investment activity in terms of ownership-based offshoring, which is market seeking[1]. This leads to the third question addressed in this article:

Research Question 3: Does an internationalization-focused strategy affect the choice of offshore-outsourcing location?

Regardless of whether or not such strategic leaning affects the location choice, previous research has identified strong links between 'inward' and 'outward'[2] internationalization in that

[1] Market-seeking motives of FDIs refer to motives aimed at expanding the firm's international market presence. For instance, setting up a wholly-owned foreign sales subsidiary is a market-seeking FDI

[2] Inward international operations refer to supply-related operations and could be seen as the mirror image of outward, market-related operations (Korhonen et al., 1996). Whereas outward internationalization refers to the various means of penetrating foreign markets (Welch and Luostarinen, 1993), inward operations cover a multiplicity of forms such as the importation of goods and services, finance and technology through franchising, licensing, direct investments, alliance agreements, and the like (Luostarinen and Welch, 1990).

previous inward operations such as sourcing, licensing and franchising in a given country influence the initiation and/or success of the future degree of internationalization (Andersen and Christensen, 2005; Carstairs and Welch, 1982; Karlsen et al., 2003; Korhonen et al., 1996; Korhonen, 1999; Welch, 1990; Welch and Luostarinen, 1993). However, it still remains largely unclear whether such inward-outward connections[3] apply to offshore outsourcing as a somewhat distinct strategy from other inward operational modes. This leads to the fourth and final research question addressed:

Research Question 4: Does offshore outsourcing facilitate the future degree of internationalization, and if so under what conditions?

In addressing these questions the article is structured as follows. First, the relevant literature on the location decision related to offshore outsourcing and consequent internationalization is reviewed, and then developed further by means of an empirical study. The chosen method and the research context are described, and the reasoning behind the choices explained. The data-collection and analysis process is introduced, and the two exploratory case studies on InsuraSoft and FinaSoft are presented. The results are then contrasted with the concurrent literature, and suggestions for further research are given. The article closes with a summary, and some implications for managers, researchers, and policy makers.

2. OFFSHORE OUTSOURCING AND FIRM INTERNATIONALIZATION

Every outsourcing venture, whether it is offshore or on-shore, begins with a simple make-or-buy decision (e.g., Graf and Mudambi, 2005). Basically, in terms of rational decision-making, for outsourcing to be a viable option the benefits of using external suppliers need to outweigh those

[3] Inward-outward connections refer to various ways in which inward operations in some way influence and facilitate the later international expansion of the firm, i.e., outward internationalization.

of maintaining internal production. In fact, the reason why companies outsource has been one of the basic questions driving the research (Hätönen and Ruokonen, 2007). In effect, the aim is to explain the underlying motives behind outsourcing decisions and thereby the rationale of choosing to 'buy' instead of 'make'.

Building on theoretical disciplines such as transaction cost theory (e.g., Coase, 1937; Williamson, 1975), the resource-based view (e.g., Barney, 1991; Wernerfelt, 1984) and theories of the organization and the firm (e.g., Caves, 1971; Hymer, 1976), previous research has identified three main motives for outsourcing. The first of these concerns *cost savings*, including lowering operational costs, controlling costs, and freeing resources for more profitable business units. The second is related to *process improvement*, and the need to concentrate on core competences, to achieve flexibility through internal reorganization/transformation, to accelerate projects, reduce the time to market, gain access to a flexible workforce, and to sharpen the business focus. Thirdly, *capability enhancement* includes obtaining access to resources that are unavailable internally, and to high-caliber/skilled labor, improving the service quality, acquiring ready-made innovations, compensating for the lack of a particular expertise in-house, and gaining access to new technology/skills (e.g., Heikkilä and Cordon, 2002; Kakabadse and Kakabadse 2002; Quélin and Duhamel, 2003).

The question of 'where to outsource', which often follows the initial make-or-buy decision[4], has recently gained momentum in research on offshore outsourcing (Bunyaratavej et al., 2007; Doh, 2005; Graf and Mudambi, 2005; Hätönen and Ruokonen, 2007; Kotabe and Murray, 2004; Palvia, 2004). Given that the benefits of externalization need to outweigh those of

[4] However, dividing these decisions into recurring, sequential stages oversimplifies the decision-making process, as in some cases these decisions are parallel and interrelated. Moreover, in some cases the economic changes in a foreign location may even facilitate the initial make-or-buy decision. However, given that the aim is to study the outsourcing-location decision, the dynamics and the contingencies between the make-or-buy and the location decision are not discussed, and for the purposes of the study these processes are assumed to be sequential.

internalization, the basic rationale, as with direct investments, is that production activity in a foreign location should be advantageous relative to home-market production (Dunning, 1988), and should bear the additional costs and risks associated with operating in a foreign and often unknown environment (Hymer, 1976). Whereas internal pressures are more often the initial drivers for outsourcing, several external and location- and case-specific variables also influence the final location choice.

As mentioned, previous studies on the choice of outsourcing location largely build on Dunning's (1980; 1988) framework concerning the location decision for international production [FDI]. He described several location-specific variables or locational advantages that could favor home or host countries. However, whereas Dunning (1988) takes a somewhat linear approach, researchers on outsourcing see it more as a reciprocal process in which the location consideration transcends the location-specific variables. For instance, Graf and Mudambi (2005, p. 258) suggest that in terms of offshore outsourcing, three sets of factors afffect the location's attractiveness: (1) location-specific, (2) firm-specific, and (3) situation-specific.

According to FDI research, location-specific variables are the key determinants in the location choice (e.g., Dunning 1988). Similarly, recent research on offshore outsourcing has identified various *location-specific* considerations: the availability of advanced telecommunications [ICT infrastructure], telecommunications costs, a labor pool of sufficient quality, labor costs, government financial incentives and regulations, the political and legal environment, an attractive living environment, low occupancy costs, access to good transportation, and the language and culture (Bunyaratavej et al., 2007; Doh, 2005; Graf and Mudambi, 2005; Kshetri, 2007; Palvia, 2004; Richardson and Marshall, 1999).

However, some of these factors have only a limited bearing on the location consideration when an activity is outsourced. In the case of offshore outsourcing, in which a company delegates

certain activities to outsider providers instead of using internal governance mechanisms, it eliminates the headaches associated with problems such as staffing, transferring personnel, acquiring the necessary equipment, keeping up with the government legislation, and following the taxation regulations. Still, firms need to consider government policies and legal regulations because they may be restrictive in terms of transferring activities across national boarders. On the other hand, an established legal system might provide a level of security that could positively influence the location decision (Kshetri, 2007). Furthermore, as firms need to secure the continuity of supplies of the outsourced activity, they need to consider any possible related country risk, although some researchers suggest that the spreading of an outsourcing portfolio to different countries reduces risk and increases potential rewards (Vestring et al., 2005).

In fact, many of the location-specific factors identified in previous FDI research, such as language and culture [culture], transportation and the ICT infrastructure [infrastructure], and certain governmental policies [government policy] as well as the political and legal environment [country risk], similarly apply to considerations of the outsourcing location. Thus, to a certain extent and under different conditions, it could be argued that many but not all of these variables apply to the location decision. According to Graf and Mudambi (2005), however, Dunning's (1988) framework does not include a human-capital dimension incorporating workforce size and availability, outsourcing vendor experience, technical skills, and compensation levels, for instance. Therefore, the location-specific factors influencing the choice can be further clustered in terms of infrastructure, country risk, government policy, culture, and human capital.

Firm-specific factors that may have an impact on the outsourcing location are closely related to two basic aspects of the decision-making: why the decision was made and by whom (see Graf and Mudambi, 2005). 'Whom' here refers to the situation-related experience of the outsourcing firm, which may be market or task related. It is plausible to expect companies to be

more receptive to outsourcing if they have previous experience of it, and to favor locations of which they have knowledge. Moving production to another country incurs costs associated with acquiring information regarding cultural, political and economic differences, for instance (Hymer, 1976). These costs could be reduced given firm-specific advantages in the form of prior knowledge of the location (Buckley and Casson, 1976; Erikson et al. 1997; Hymer 1976), which in turn would make that specific location more appealing.

Experience of managing outsourcing processes and relations also affects location choice, and indeed the cost of offshore outsourcing. In fact, previous research suggests that outsourcing is often a strategy that is subject to incremental learning, in which near-shore locations precede far-shore locations and non-strategic functions precede strategic functions (Graf and Mudambi, 2005; Hagel and Brown, 2005; Maskell et al., 2005; Morgan, 2003). This could be explained in terms of experiential learning related to outsourcing-process-related issues such as vendor search and selection, contracting, process management, and risk management. The ability and knowledge of those responsible for the outsourcing process not only make the choice more viable, but also decrease the associated risk and transaction cost of outsourcing abroad. Accordingly, prior management experience could explain the varying importance of geographic and cultural distance (Graf and Mudambi, 2005), and thereby affect the location decision.

The underlying outsourcing objectives [motives] as a firm-specific factor could also affect the location decision (Graf and Mudambi, 2005). This is an important variable throughout the entire decision-making process regardless of whether firms outsource for reasons connected to cost advantage, capability enhancement, or process improvement. Companies outsourcing on a strict cost basis are more likely to seek locations with a low-cost-labor infrastructure, whereas those aiming to enhance their capabilities are more likely to look for high levels of know-how and knowledge (Doh, 2005). Thus, the firm-specific or internal factors that affect the choice of

location include outsourcing and location-specific [international] experience, and consequently knowledge, as well as the underlying motives.

Situation-specific factors relate to the characteristics of the specific outsourced activity or process. The nature of this activity has been referred to as one of the key decision-making and management determinants (e.g., Hussey and Jenster, 2003), not least of the location decision (Graf and Mudambi, 2005; Palvia, 2004). One of the most commonly used variables describing the nature of the outsourced task is its strategic importance. Whether an activity is strategic or not is broadly defined by its impact on the firm's overall operations (e.g., Alexander and Young, 1996; Quinn and Hilmer, 1994), which in turn probably has an impact on the chosen location: as with most strategic activities firms are more likely to prefer locations with less country-related risk, for instance (Graf and Mudambi, 2005). The nature of the outsourced activity also includes its transferability, in other words its asset specificity and the level of standardization. The ease of inter-organizational transfer may influence the choice of location in that transferring more complex and uncodified tasks involving non-standardized processes requires intensive effort in terms of training the outsourcing vendor in the production process (cf. Kogut and Zander, 1993; Williamson, 1975). Therefore, the nature of an outsourced activity, mainly in terms of its strategic importance, process standardization and asset specificity, affects not only the make-or-buy choice (Williamson 1975), but also the location decision.

Furthermore, Graf and Mudambi (2005) suggest that customer visibility, the degree of interpersonal interaction, and customer convenience vary depending on the outsourced business, and that customer expectations also need to be included with the situation-specific factors that may affect the final location decision.

Although not often mentioned in previous studies, given the potentially controversial and even political nature of the phenomenon, it would be unwise to exclude *external factors* in the

form of stakeholder impact from the location-decision-making process. In fact, and mainly due to the visible nature of job loss resulting from outsourcing (Kletzer, 2005), different stakeholder groups such as customers, governments and different NGOs have adopted measures to restrain offshore outsourcing (see e.g., Kshetri, 2007; Venkatraman, 2004), which is something companies should consider prior to making their final decisions. In fact, Kshetri (2007) suggests that companies should adopt certain measures in response to increased union and public pressure against offshore outsourcing. Complying with stakeholder requirements incurs a cost, which in turn probably influences the choice of location, although the main stakeholder concern seems to lie in the choice between a domestic and a foreign location. Figure 1 summarizes the above-mentioned factors influencing the outsourcing-location decision.

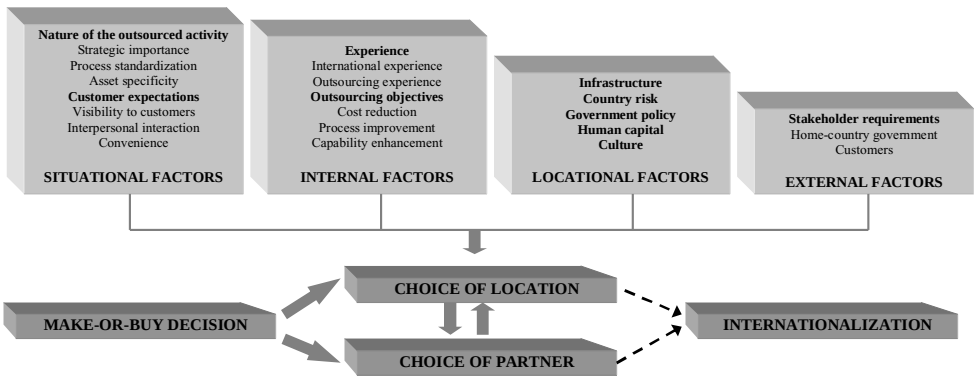

Figure 1 The factors influencing the outsourcing-location decision (main sources: Graf and Mudambi, 2005; Palvia, 2004)

In addition to the factors illustrated in Figure 1, one of the focal questions in location choice is whether it precedes the choice of partner or vice versa. This, for obvious reasons, is not addressed in research regarding FDI location decisions. In the end, the choice of outsourcing location and partner are reciprocal and highly interconnected (Graf and Mudambi, 2005). Yet, in some cases companies may seek capability enhancement through acquiring knowledge or

technology by means of making outsourcing agreements with firms regardless of their national location (Narula and Hagedoorn, 1999). On the other hand, firms may want to tap locational advantages such as a low-cost labor infrastructure (Doh, 2005), and thereby seek partners from a specific location.

Nevertheless, prior research has concluded that choosing the right partner is the key to success in offshore outsourcing (e.g., Amoribieta et al., 2001). However, what is unclear is whether, and if so to what extent and, most importantly, under what conditions firms narrow down the choice of geographical location prior to making their partner choice. In other words, do they choose their location based on their partner's expertise, or do they seek partners in a chosen location? In some cases the partner might influence or even make the final choice. According to Podoshen (2004), firms will choose their business partners, and use their expert advice in deciding on the final location, yet few will leave the decision to them. Nonetheless, when the choice of partner precedes the choice of location, the latter may well be greatly if not fully influenced by the former.

Regardless of the location or the sequence in which it and the partner are chosen, offshore outsourcing always results in internationalization. When a firm chooses a different outsourcing location it engages in international operations, which could be considered internationalization per se. However, researchers often tend to overlook this mode (Korhonen et al., 1993; Welch and Luostarinen, 1993), given the strong bias and emphasis on exploring the ways in which companies develop their outward international operations (e.g., Bilkey and Tesar, 1977; Luostarinen, 1979; Johansson and Vahlne, 1977). However, some early studies recognized sourcing and purchasing [supply-related] as an important form of internationalization (see e.g., Johanson and Mattson, 1988; Welch and Luostarinen, 1988). Whereas early staged models suggest that international operations begin with exporting activity (Johansson and Vahlne, 1977;

Johanson and Wiedersheim-Paul, 1975; Luostarinen, 1979), Korhonen et al. (1996) found that small firms more often start from the supply side, very often followed by outward operations such as exporting.

Why is internationalization through the supply or inward side, such as offshore outsourcing, of any importance to researchers and practitioners? Not only has it been argued that supplier involvement, particularly in industries characterized by rapid product and process changes and intense cost and quality competition, has a positive influence on overall performance (McDermott and Handfield, 2000), it also seems that the international aspect of the inward operations has serendipitous benefits in terms of the further international expansion of the company. For instance, previous studies on international purchasing, sourcing, licensing and franchising have found that in some cases such inward international operations may result in the development of country-related knowledge or location-bound network connections that assist in the further international expansion of the company (Andersen and Christensen, 2005; Carstairs and Welch, 1982; Karlsen et al., 2003; Korhonen, 1999; Korhonen et al., 1996; Welch, 1990; Welch and Luostarinen, 1993). Yet, in terms of offshore outsourcing, there is little information on how it may facilitate future international expansion. For instance, unlike licensing and sourcing, outsourcing agreements often entail a long-term relationship with a high degree of risk-sharing and in which cost is not the only decision-making criterion (Embleton and Wright, 1998; Loh and Venkatraman, 1992). Thereby it is plausible to expect that the serendipitous benefits of outsourcing also differ from those of licensing and sourcing, for instance.

3. METHODOLOGY

3.1. Research design

Eisenhardt (1989) argues that the main idea and the purpose behind case research lies in theory development. Accordingly, this article utilizes the case approach with a view to making a contribution in the area of theory building, refinement and development. The case approach is viable for such purposes as rich anecdotal description adds depth, comprehensiveness and knowledge to the understanding of a specific phenomenon (Minzberg, 1979; Shah and Corley, 2006). Case research is a form of qualitative research, the aim of which is often to build on a theory on the basis of the insights gained from field-based interview and case data [building], or to elaborate further upon a prior theory or a framework by making it clearer, adding more details [development], or broadening the scope [refinement] (Eisenhardt, 1989; Kotabe et al., 2007; Lukka, 2005).

It has been argued that qualitative case research is useful in terms of creating novel and accurate insights, particularly in areas in which (1) there exists only limited prior knowledge or (2) the extant theory seems inadequate, or in situations in which (3) the explored phenomenon is highly complex and involves many identifiable, yet often unclear context-related interdependencies (Eisenhardt, 1989; Halinen and Törnroos, 2005; Yin, 1989). Not only is there limited prior knowledge of the issue in question, and a certain amount of deficiency in the extant theories, the phenomena explored in this article are also highly complex, which supports this kind of qualitative approach.

With regard to the first research question [RQ1], "*What factors influence the offshore-location decision when ownership of the activity is transferred to the foreign vendor?"*, the purpose of the case studies was to identify the factors behind the location decision and therefore to further refine and develop the existing theory in the context of non-ownership-based foreign investment, i.e. offshore outsourcing. As argued earlier, although the factors affecting the FDI location decision identified by Dunning (1980; 1988; 1993; 2000) are widely used in the context

of offshore outsourcing, many of them do not logically apply when production is organized in a foreign location but via market mechanisms. With respect to the second research question [RQ2] "*When and under what circumstances do firms choose partners prior to choosing the location?"* the purpose of the case studies was to develop contingency theory with regard to these two decisions. Although the decisions are highly interrelated, the cases aim at elaborating situations and circumstances in which one is chosen over another. The purpose of the third and fourth research questions, "*Does an internationalization-focused strategy affect the choice of offshore-outsourcing location?*" [RQ3] and, "*: Does offshore outsourcing facilitate the future degree of internationalization, and if so under what conditions?" [RQ4],* was to identify all the possible effects offshore outsourcing may have on internationalization, and any strategic leanings related to future internationalization. Whereas the focus in RQs one and two is on theory development and refinement, RQs three and four are aimed primarily at theory building through the identification of novel insights from the case data.

3.2. The research context

The choice of research context was based on its suitability for the purposes of the study. The cases were eventually chosen from the software industry, and small firms were targeted. There were two main reasons for this choice.

Firstly, software companies provided a fruitful context in that the technological complexity and time-to-market pressures drive them to outsource more and more activities and projects during the early stages of their growth. In fact, rapid time-to-market and internationalization have been found to be among their main success factors (e.g., Bell, 1995; Coviello and Munro, 1997). Companies in this industry cluster, therefore, often engage in both

internationalization and outsourcing from their inception, thereby providing a suitable setting for tracing inward-outward connections (Welch and Luostarinen, 1993) [RQ3 and RQ4].

Secondly, small firms with only limited expansion in the past provide an appropriate context for the analysis of the decision-making concerning the outsourcing[5] location. Larger MNCs, for instance, may already possess market-related knowledge of prospective locations on account of prior sales activities, or they may even have a sales subsidiary that could eventually shift the location decision to those markets. They may also have established working relationships with outsourcing providers, which may encourage them to use locations in which such providers are active. All in all, in the context of MNCs, there is a risk that there are many more path dependencies behind the location decision, which in turn make it difficult for the researcher to isolate it and to assess its full complexity in terms of outsourcing [RQ1 and RQ2].

Furthermore, the targeting of small firms was appropriate in terms of theory development because outsourcing has, to a large extent, been examined in the context of large, often multinational corporations, leaving small and medium-sized enterprises [SMEs] under-researched. As small companies, especially in industries with shorter and shorter product lifecycles, need to grow and to rapidly internationalize (e.g., Coviello and Munro, 1997; Jones, 1999; Oviatt and McDougall, 1994), often relying on network relationships in the process (e.g., Coviello, 2006), the few attempts to scrutinize outsourcing practices in this context have produced limited findings on the impact of offshore outsourcing on the growth and internationalization of firms. Overall, size is an important variable that should be incorporated

[5] As outsourcing in small companies often leads to a significant increase in the production scale of the activity, within this context the strict definition of outsourcing could not be used in the search for possible candidates. For the purposes of the case selection, outsourcing was defined as the transfer of activities that had previously been conducted internally to some extent, or would have been conducted internally if not outsourced (see Gilley and Rasheed, 2000).

into strategy studies (Coviello and Mc Auley, 1999; Smith et al., 1989), especially when different internationalization strategies are involved (George et al., 2005).

3.3. Data collection and analysis

Within this context, the case companies were selected purposefully based on pre-determined criteria. The two main criteria were set beforehand in considering the candidates' suitability and theoretical as well as conceptual value to the study (Eisenhardt, 1989). The first was that they had outsourced abroad prior to or parallel with their internationalization process: when companies have gone through a process of inward internationalization before the outward move, the cumulative effects of one move on another are more traceable (Welch and Luostarinen, 1993) [RQ3 and RQ4]. The second criterion was that the companies had outsourced similar activities with no prior supplier engagement, thereby ensuring comparability of the location decision and increasing the potential explanatory power [RQ1 and RQ2]. For the purposes of this article, two cases that met these criteria were selected for further analysis.

InsuraSoft and FinaSoft were chosen for further examination. Following the case identification and selection[6], three supplementary interviews [approximately 90 minutes each] were conducted in these companies in early 2007. The interviewees were asked first to describe the outsourcing process, after which the researcher asked additional questions following a prepared interview outline [semi-structured interview]. In both of the companies the CEO was interviewed first, and he was then asked to identify another person in the company who had complementary knowledge of the issue in question. In FinaSoft, this was the software-development manager, who had been primarily responsible for the outsourcing project. The

[6] Three semi-structured interviews were conducted in the case companies in the process of identifying their conformity and suitability for this study [two in FinaSoft and one in InsuraSoft].

InsuraSoft CEO stated that he was responsible for managing the project, and that interviewing additional individuals would not provide complementary knowledge. The validity and reliability of the findings were ensured by employing various tactics prior to the interviews in order to minimize observer bias and data-access limitations (cf. McKinnon, 1988). For instance, it was agreed not to reveal the companies' real names or to give rigorous descriptions of their fields of operation.

The interview data were transcribed and coded, and the case descriptions were compiled. The next step was to conduct a cross-case analysis (Eisenhardt, 1989; Miles and Huberman, 1984) in which the findings from both cases were compiled in a single diagram/table in order to identify the differences and similarities. Although the primary focus was on inductive analysis, the identified theoretical factors, particularly related to RQ1, were helpful in the cross-case analysis. When the inductive cross-case analysis led to the identification of differences, and of the possible factors behind these differences, the cases were analyzed on the basis of the existing theoretical structures. The following empirical part follows this linear structure, first in giving the case descriptions and then in providing a comparative analysis in the light of existing theories.

4. CASE DESCRIPTIONS

4.1. InsuraSoft Ltd

InsuraSoft Ltd [hereafter InsuraSoft] provides a comprehensive software solution for life and pension, and property and accident insurance companies. With its portfolio of products it provides a comprehensive IT solution for integrated insurance management. Today the products are based on a single platform enabling the fast introduction of new insurance products, a multi-channel customer service, and a low operating cost. In 2005, with a staff of 82, the company achieved a turnover of EUR 6.4 million, over half of which accumulated from foreign markets.

When the company was established in 1992, the two founders moved from management positions in large software companies to become entrepreneurs. They had an idea, and to pursue this idea, they established the company HQ in Helsinki, Finland. Immediately after the establishment they discovered two major obstacles to starting the business. Firstly, in order to meet the complex needs of insurance companies any comprehensive solution needed to be extensive and would therefore require a large amount of labor-intensive work. In Finland this 'work' was not only expensive, but also elusive as at the time hiring 30 software engineers was not a straightforward task. Secondly, they realized that in order to develop a solution that met the needs of their potential clients, they needed to cooperate closely with a potential customer [insurance company] from the product-development phase onward. However, the potential customers in Finland already had established IT systems and thus were reluctant to cooperate, as this would have required changing their entire systems and relying on a small software producer.

To overcome these obstacles they made the decision to outsource the entire production of the software, from its inception, to Estonia. The managers realized that Estonia possessed such skills and know-how, and that the labor was ten times cheaper than Finnish labor at the time. Moreover, Estonia was geographically close, and it was acknowledged that an intensive on-site presence would be needed for the successful completion of the outsourcing project. After screening the market they found a local partner that was originally a joint venture between the Socialist Soviet Republic of Estonia and an Australian tractor company, but instead of waiting for orders from Australia it started to make software for the Finnish company. At first there were approximately 15 people employed. According to the CEO, the reason why they went to Estonia had nothing to do with the fact that they wanted to go and conquer its insurance software markets. Their motives were rather connected to their production needs. Know-how and resources were available at a fraction of the cost in the home country. Thus, the main drivers

behind the outsourcing were scarce resources [money and know-how] and the main motive was cost.

The company's initial plan was to develop the software and exit the market. However, as software development is a somewhat continuous process, and the arrangement was working well, they made the strategic choice to increase their market commitment by setting up a wholly-owned subsidiary. Furthermore, they concluded that at the time Estonia was a rapidly growing market with potential. The decision to increase market commitment was made within a year of the initial outsourcing decision. As the markets grew the company realized it was in a situation of competitive advantage by virtue of being a first mover.

By the time InsuraSoft had been operating for a couple of years it had forged several connections with local companies and government agencies. This culminated in a signed tripartite arrangement with an Estonian bank, and another with another investment bank to establish a life and pension insurance company. At that time, foreign ownership in banks and insurance companies was highly restricted by the government. InsuraSoft embarked upon the project because it wanted to create a life-insurance solution, which it had previously lacked. The fact that there was no IT infrastructure for such a solution meant that it was able to create one without any hindrance. Although this joint company never began operations, the case company was able to develop a software solution, which was afterwards sold to several companies in the Baltic States.

4.2. FinaSoft Solutions Ltd.

FinaSoft Solutions Ltd. [hereafter FinaSoft], established in 2001, is a leading software producer for financial institutions. The company develops web- and mobile-based customer interface management products for different financial institutions. Its software solution could be referred to

as semi-tailored, which means that although there is a ready-made product, the final delivery requires a certain amount of service work, including integration, customer tailoring, installation, and training. Therefore, as the company has only limited resources for these tailoring projects, it relies very much on systems integrators as its channel partners. In 2005, with 63 personnel, it achieved a turnover of close to EUR 2 million, of which almost 95 per cent was generated abroad.

Following the second release of its software-product platform in 2002, FinaSoft faced a situation in which it needed to produce functional modules for the platform. These modules constructed the visible functional entity of the software, which used the platform to perform certain actions. Driven by pressures to bring the product rapidly onto the market, and by resource limitations - both financial and product-development resources in terms of personnel, the company eventually decided to outsource this task to Manila in The Philippines in early 2003. This was not the only option, but the company was also considering setting up a software factory somewhere in Asia as a greenfield investment. However, the management concluded that it would be more expensive to set up a development factory with limited process knowledge, than to use an existing provider of software-outsourcing services with well-established processes and procedures.

As is often the case in outsourcing software development, the endeavor was a project-based outsourcing deal with its advantages and disadvantages. Generally, the main advantage is that companies can capitalize on their external resources in order to level off the internal demand peaks for personnel and knowledge, and therefore achieve cost savings. In this case the peak was extreme as the need for software development was large. In fact, it was later calculated that the development of the functional modules required a total of 14,000 man-days. At best, the company, which had approximately 60 permanent employees in 2002 and 2003, had 80 external

developers working for it in the factory in Manila. Accordingly, after the outsourcing it estimated that it was able to cut costs by approximately 70 per cent compared with the cost of development work done domestically and in-house.

However, as mentioned, there are also disadvantages with such project-based outsourcing - one of which is commitment. Often, as in this case, outsourcers are required to commit to providing a certain amount of resources, in other words they are required to buy a certain number of man-days per year. Especially in this case when the duration of the development project could not be accurately predicted, this caused inflexibility and additional costs. However this was acknowledged by the FinaSoft managers beforehand. They made the decision that when the software development project ended they would start using the created resource and knowledge pool to provide for customer projects in the Asian area, which had already been identified as their next area for international expansion. In this way they could iron out the inflexibility, but more importantly they could ensure that all the knowledge that had been created in the outsourcing partner did not vanish and could be further capitalized upon at the customer interface. Today, alongside Europe, Asia is its biggest market area.

5. OFFSHORE OUTSOURCING IN INSURASOFT AND FINASOFT – A COMPARATIVE ANALYSIS

Table 1 summarizes the key issues related to the outsourcing-location decision, together with the experienced inward-outward connections in each of the firms. These connections were categorized as implicit or strategic, implicit referring to the more serendipitous and unplanned, and strategic to those that were acknowledged and planned before the outsourcing occurred. The issues in Table 1 are elaborated further in the following sections.

CASE	Primary decision (location/partner)	Main factors affecting the location choice	Implicit inward-outward connections	Strategic inward-outward motives
InsuraSoft	Location (Estonia)	- Cost savings - Resources - Geographical distance	- Market knowledge - Network connections - First-mover advantages - Flexibility	
FinaSoft	Location (Asia/Philippines)	- Cost savings - Resources - Future int'l strategy	- Flexibility	- Resource-pool creation - Network connections

Table 1 Case summaries

5.1. The outsourcing-location decision

The cases illustrate two situations in which two Finnish firms, FinaSoft and InsuraSoft, outsourced similar activities to two locations. The underlying motives in both cases were to save costs and to acquire resources that were hard to get hold of in their current operating markets. One of the focal questions considered in the cross-case analysis was why two similar companies from the same country of origin outsourcing similar activities with similar objectives and motives ended up outsourcing to geographically, culturally, politically and even economically differing locations. The possible underlying factors were examined through the application of the framework illustrated in Figure 1. Four different sets of variables were found potentially to have an effect on the location decision: situational factors, internal factors, locational factors, and external factors.

In terms of *situation-specific factors*, one reason could lie in the process standardization and asset specificity of the outsourced task, i.e. the nature of the outsourced activity. FinaSoft had already developed a platform for its products, which was internally documented and had well-defined specifications concerning the outsourced work. The specifications facilitated the teaching of the outsourced task to the vendor, and thereby reduced the asset specificity of the activity while enhancing its transferability (cf. Kogut and Zander, 1993; Williamson, 1975).

InsuraSoft, on the other hand, built its software from scratch in a foreign location. The fact that there existed no pre-created processes or specifications for the outsourcing increased the need for close interaction and an on-site presence at the vendor's facilities. In fact, the management team spent four days a week in the company during the initial phase of the agreement. As the CEO stated, *"The proximity definitely had an impact on the location decision… think of how much it would have cost for a small company to fly to India [from Finland] every week"*. The need in FinaSoft for a local presence was lower as it had fairly well established processes and pre-created specifications, although in the initial phases they also had one permanent employee more or less posted to the outsourcing company.

This leads to the simple conclusion that, particularly among small firms, geographical proximity does matter in the outsourcing-location decision. Although a number of researchers have referred to the importance of geographical distance as an influence on the decision-making in this context (Graf and Mudambi, 2005), it is often neglected as highly developed information and communications technologies are considered efficient information channels that diminish the importance of geographical location (e.g., Doig et al., 2001). Yet, arguably, some outsourcing could be effectively managed through ICT, which supports the argument that geographical proximity is not a stand-alone generic variable in the outsourcing-location decision, and that its impact is moderated mainly by what is being outsourced [situation-specific factors]. As illustrated above, we found in the cross-case analysis that the less process standardation there was, the more inter-firm interaction was required. This, in turn, had an impact on the geographical distance, as frequent on-site visits and posting employees to the vendor's premises incur additional costs. These costs could be expected to grow along with the geographical distance. In other words, it appears that the less process standardization there is in the outsourcing, the greater the influence of geographical distance on the location decision.

One of the reasons why the different locations were chosen may lie in the different *firm-specific or internal factors* and the differences between them. These factors included the company experience of internationalization and outsourcing, as well as the outsourcing motives (Graf and Mudambi, 2005). In terms of the cross-case analysis, FinaSoft had some prior outsourcing-related experience due to its ownership structure, whereas InsuraSoft did not have any. It was argued earlier that prior knowledge of outsourcing management decreases the risk and transaction cost of outsourcing abroad. In fact, the software development manager of FinaSoft put it this way: "*We had some outsourcing experience prior to this project, which helped us to assess more accurately the costs and risks, and to establish common operating procedures, which in turn helped us to manage the possible risks.*" Accordingly, even though FinaSoft lacked detailed knowledge about the outsourcing location, it had insights into the possible risks and the potential additional 'hidden' costs involved in outsourcing projects, irrespective of the location. Given the fact that an increase in geographical distance often leads to an increase in operational costs and risk due to the greater level of uncertainty, it could be argued that companies with previous outsourcing experience are more receptive towards outsourcing to more distant locations.

In terms of previous experience of the international context, the cases do not allow for further analysis because there was no relevant location-related knowledge and experience in either company that would have influenced the outsourcing decision-making. However, also as argued by Graf and Mudambi (2005), it is quite reasonable to expect that experience in the international arena, particularly in the target location, would decrease the costs associated with operating on that specific market (cf. Hymer 1976). The cost of internationalization per se is influenced by the level of target-market knowledge (Eriksson et al. 1997), and accordingly is lower if the firm possesses prior knowledge. This is similar to outsourcing, and it could thus be

further argued that companies are more receptive towards outsourcing if they have previous experience of it, and that they would favor locations of which they possess prior knowledge.

As argued earlier in this article, previous FDI research emphasizes *location-specific factors* such as infrastructure, country risk, and government policy as primary influencers of the foreign-investment decision (e.g., Dunning 1988). However, in terms of offshore outsourcing, the results of the cases indicate that location-specific factors had only a limited direct impact on the location decision. Both companies chose comparatively high-risk countries, even with restrictive government policies, with regard to foreign ownership in the case of FinaSoft, for example. In fact, and contrary to expectations, the lack of a country-related IT infrastructure ended up being beneficial to InsuraSoft because the absence of old IT architectures meant that it did not need to replace anything and could start from scratch. It has been suggested that the quality of the IT infrastructure has a positive effect on the choice of location for international production (Dunning, 1980; 1988), and also on international outsourcing (Graf and Mudambi, 2005; Palvia, 2004). However, the InsuraSoft case illustrates that an underdeveloped IT infrastructure may be a positive factor in the location decision. Furthermore, in both cases the companies invested in building the IT infrastructure of the supplier company, and the existing infrastructure therefore did not play a direct role.

In terms of *external factors* connected with the location decision, interestingly, the interests of stakeholders were mentioned - even during the interviews that were conducted for this article. For instance, the software development manager of FinaSoft said, "*…about these outsourcing decisions, we haven't made them public as it might create a bad image of us in our customers' minds*". Due to the fact that what was being outsourced, particularly by FinaSoft but also by InsuraSoft, was not visible to their customers, neither firm needed to consider customer needs in the location decision. What they did was to adopt the strategy of being quiet and

sensitive about revealing their offshore outsourcing plans (see Kshetri, 2007)[7]. In the case of high-visibility activities or processes, firms may need to comply with stakeholder requirements, particularly with regard to customers. In other words, the higher the customer visibility of an activity, the more stakeholder interests need to be considered in the outsourcing-location decision.

In light of the above discussion it appears that the most influential variables in the location decision are situation-specific [situational] and firm-specific [internal]. According to the results of the cross-case analysis, the influence works in two ways - either directly or by emphasizing and moderating the importance of other factors. In addition to the direct impact of aspects such as previous location-related experience, the extent to which location-specific and external factors are considered is influenced by other sets of situation-specific and firms-specific variables. For instance, it was only because both companies sought cost savings from the outsourcing agreement, and because the tasks outsourced were somewhat labor-intensive, that low location-related employment costs were valued. Similarly, the nature of the outsourcing objective in terms of process standardization appears to have a great influence on the geographical distance. Furthermore, the extent to which firms need to take the views of external stakeholders into account depends on the visibility to them of the outsourced activity.

Thus, whereas FDI research emphasizes location-specific factors (Dunning, 1988), the results of this analysis suggest that the final choice of location largely depends on what is being outsourced, why, and by whom. On the evidence of the above cross-case analysis and discussion, the following two propositions for further research, which are largely in line with findings of Graf and Mudambi (2005), are put forward:

[7] In fact, because of this, both of the companies demanded that all of the revelatory information was removed to prevent their identification.

[P1-A] The primary factors influencing the outsourcing-location decision are firm-specific and situation-specific in terms of what is being outsourced, why and by whom.

[P1-B] The extent to which external and locational factors are considered in the location decision is dependent on and moderated by the situation- and firm-specific factors, specifically in terms of what is being outsourced and why.

5.2. The relation between the choice of location and the choice of partner

A major consideration in offshore outsourcing is the extent to which firms choose partners and locations, and more importantly the sequence they follow. In terms of locational choice, if the partner is chosen first, the location decision may well be distorted as the outsourcing company may capitalize on its partner's expert advice (Podoshen, 2004) and , as argued, the location choice is restricted. FDI research on location decision-making fails to acknowledge the impact of the partner, which is natural given the focus on direct investments.

The cases of FinaSoft and InsuraSoft concerned two different outsourcing and location decisions, yet in both the location [for FinaSoft it was the geographical area] was chosen before the partner. Furthermore, the primary motives of both companies were related to cost savings and the scarcity of resources. As the CEO of InsuraSoft said, "*We wanted to find partners in Estonia as it had a large number of capable programmers available at a fraction of the domestic price"*. Thus, it is plausible to expect that cost-driven outsourcing companies need access to markets that have a low-cost labor infrastructure and adequate skills for task completion (Doh, 2005).

One major question remains, however. When and under what circumstances do firms choose partners prior to choosing the location? The case analysis, backed up by rational argument, would suggest that situational [what is being outsourced] and internal [why] factors

influence this primary choice. In fact, previous research on partner selection and management has concluded that these are the primary determinants in different outsourcing-related partnering decisions (e.g., Barthélemy, 2003; Hussey and Jenster, 2003). In terms of offshore outsourcing, it is logical to expect that when the activities are of low strategic importance and the supplier markets are highly competent, and when the primary motive is to reduce costs, companies decide on the location before choosing a partner.

On the other hand, in cases of high strategic importance and asset specificity, and/or uncompetitive supplier markets, companies are more likely to first seek partners with the required competences and a proven track record before choosing the final location. Although Williamson (1975) suggested that companies should seek internal solutions in situations of uncompetitive supplier markets, in many fast-moving industries such as software, the complexity of the total solutions drives them to outsourcing even some critical activities. If the outsourced task is complex, and thereby requires the vendor to possess substantial skills, cost savings are not the primary motive: skills and know-how are paramount (Graf and Mudambi, 2005). Indeed, where the partner is physically located is becoming irrelevant. Companies increasingly seek capability enhancement through acquiring knowledge or technology by means of making outsourcing agreements with firms, regardless of their national location (Narula and Hagedoorn, 1999).

Moreover, when outsourcing is aimed solely at bringing about extensive changes in the production system [process improvement], previous research has indicated that the key is to find a strategically and operationally suitable partner (e.g., Kedia and Lahiri, 2007; Morgan 2003). Whereas traditional outsourcing aims at achieving cost savings or acquiring resources and knowledge that are unavailable internally, the sole idea of transformational outsourcing is to change the way the company operates (Linder et al.; 2002; Mazzawi, 2002). It could be argued

that location is somewhat irrelevant in this context as the emphasis is on the vendor's ability to offer flexibility. Hence, the following propositions are put forward:

[P2-A] In outsourcing aimed at cost savings the choice of location precedes the choice of partner

[P2-B] In outsourcing aimed at capability enhancement or process improvement the choice of partner precedes the choice of location.

5.3. Outsourcing, location choice, and firm internationalization

As mentioned, choosing to transfer production activities across national borders, even through outsourcing, constitutes internationalization per se. Accordingly, both of the cases are examples of companies often referred to as "international new ventures" or "born globals" in the current literature (e.g., Jones, 1999; Oviatt and McDougall, 1994), even though they began their international operations through offshore outsourcing (InsuraSoft to Estonia and FinaSoft to the Philippines). They both realized the benefits gained from offshore outsourcing for their later [outward] internationalization.

Can a strategic leaning toward internationalization per se affect the choice of location in offshore outsourcing? For instance, Welch and Luostarinen (1993, p. 44) predicted that, "Among individual firms there is a need to use inward moves in a more productive way to promote outward internationalization, perhaps by selecting foreign suppliers in part on the basis of their ability to contribute to an outward strategy". Similarly, Hätonen and Ruokonen (2007) suggest that in some cases accumulating market-related knowledge through outsourcing may be one of the primary goals, yet there is practically no prior evidence that firms outsource in order to lower the barriers to international markets, and thereby further rationalize the outsourcing location based on such internationalization objectives. However, FinaSoft explicitly stated that its future

internationalization strategy was one of the main factors affecting the location choice. Through the building of a resource pool close to its targeted markets it was able to capitalize on those resources when carrying out customer-specific service work in that area. Therefore, although market-related knowledge and network connections more often accumulate as a byproduct of a supplier agreement, it is plausible to expect that a strategic leaning toward future internationalization might play a role in the location decision, thereby placing market-seeking (cf. Dunning, 1993; 2000) motives in the framework. This leads to the following proposition:

[P3] Future internationalization strategies have an impact on the final choice of outsourcing location.

It is argued that a further reason why this kind of inward internationalization has been considered important, especially in the SME context, is because it could have unintentional positive effects on subsequent outward internationalization. For instance, previous research has established that prior inward international operations could affect internationalization mainly in terms of (1) enhancing host-country-related network connections (Andersen and Christensen, 2005; Karlsen et al., 2003; Korhonen, 1999) or (2) creating country-related experiential knowledge that would help further internationalization efforts (Carstairs and Welch, 1982; Karlsen et al., 2003; Welch, 1990; Welch and Luostarinen, 1993).

That happens, *first*, as a byproduct: when undertaking sourcing-initiation and management activities firms often develop their foreign-market contact networks, and this may result in "an outward selling move at some later date or the creation of a network contact through which a 'fortuitous' order might eventuate." (Welch and Luostarinen, 1993, p. 46, referring to Bilkey, 1978; Czinkota and Tesar, 1982; Rosson and Reid, 1987) Like customers, suppliers with international connections also represent a potential linking point from the domestic arena to international markets, often unknowingly. Such path dependency in the internationalization

process is often discussed by network theorists (e.g., Håkansson and Johanson, 1992; Johanson and Matsson, 1988). In terms of FinaSoft and InsuraSoft, both companies experienced such serendipitous [implicit] connections. InsuraSoft in particular, as the case description showed, was able to create location-bound network connections to various industrial and governmental actors, which was very useful in terms of its future sales growth and further international expansion.

Not only do prior inward activities create network connections with third-party institutions, it is also possible that inward-outward connections arise from the initial buyer-supplier relationship. For instance, Welch and Luostarinen (1993) concluded that whatever form inward internationalization takes, it inevitably sets up a relationship with the potential to broaden over time, even to include some movement in the opposite direction. In fact, in terms of offshore licensing/outsourcing, Hätönen and Ruokonen (2007) found that because outsourcing agreements, unlike clear sourcing arrangements, are more often constructed horizontally rather than vertically, and are more strategically than transactionally aligned, they may become deeper alliances that transcend the initially agreed scale and scope. In fact, such an increase in commitment was identified in both of the case buyer-supplier relationships. In InsuraSoft this led to the establishment of a wholly-owned subsidiary through the acquisition of the vendor. The FinaSoft relationship also evolved in terms of direction in that the vendor eventually started providing implementation services to the local customers, having previously been used only for production purposes.

Secondly, small firms often face various uncertainties that restrain internationalization. Often these are related to a lack of knowledge of the international arena, which is why the process is often sequential and increases in commitment over time – as the early staged models suggest (Johansson and Vahlne, 1977; Johanson and Wiedersheim-Paul, 1975; Luostarinen, 1979). However, Korhonen et al. (1996, p. 322) maintain that, as a prelude, the increased

knowledge of and experience in the international arena acquired by taking a number of actions associated with inward operations could reduce the perceived obstacles and generally lower the uncertainty and consequently the cost of a later outward move (cf. Hymer, 1976; Eriksson et al. 1997). What they suggest is that as firms undertake inward operations such as importing, sourcing, or licensing, they are able to absorb market-related knowledge, which is often readily adaptable to similar demands on the outward side. They state that this knowledge can be absorbed through activities that may involve trips to foreign markets, the investigation of alternative suppliers and prices, negotiations with foreign suppliers, negotiations and procedures for establishing foreign operational modes, and the learning of foreign-trade techniques, for example (Korhonen et al., 1996). Further, previous inward operations may provide useful information about the market potential in the international arena (Carstairs and Welch, 1982; Welch, 1990).

This kind of experimental learning about the markets and market conditions applied especially to InsuraSoft. Through its intensive on-site presence it was able to absorb the demand conditions and the market developments. As the markets emerged, it was able to respond to the need rapidly. In fact, being already on the market with its own production facility gave it a first-mover advantage. Moreover, having operated for a while, even though not with sales operations, it had developed a reputation as a respected employer, which in turn greatly helped its later sales activities.

In addition to the above, it has been argued that outsourcing may influence later internationalization through the operational effects of the strategy. One particular benefit of offshore outsourcing is the development of an agile, focused organization that can internationalize more rapidly (see e.g., Barthélemy, 2003), even if the focus of the business transformation is on the divestment of non-core and peripheral activities, i.e. outsourcing per se.

Outsourcing has often been found to create operational flexibility (e.g., Linder et al., 2002; Mazzawi, 2002), which in turn could enhance the ability to compete in international markets, and even fuel initial internationalization decisions: the more business portfolios a company decides to nurture, the more it is required to allocate resources among them (Hagel and Singer, 1999). In the context of small firms in particular, focusing on selected business portfolio(s) allows them to focus their scarce resources correctly and thereby to internationalize more rapidly and with less risk.

FinaSoft and InsuraSoft even experienced operational effects, which were stated to have facilitated their later internationalization. In both cases the outsourcing carried direct implications with regard to more rapid time-to-market. Both firms needed a rather extensive amount of temporary resources. They were able acquire these through offshore outsourcing, thereby initiating a more rapid development cycle and facilitating operational flexibility. In fact, gaining long-term operational flexibility was stated as one of the benefits of outsourcing, especially within InsuraSoft. As the FinaSoft case showed, the activity-based nature of the outsourcing could have caused inflexibility, but the company was able to turn that to its benefit: the fact that the supplier's resources can be utilized in either product or customer-solution development has created a flexible resource pool. It is therefore to be expected that, in the end, operational flexibility has a positive effect on a company's internationalization.

In fact, the reported widespread connective and operational benefits experienced by FinaSoft and InsuraSoft, as found in earlier studies (Hätönen and Ruokonen, 2007), leads to the following proposition:

> *[P4-A] Prior experience of offshore outsourcing has a positive effect on the future degree and success of internationalization.*

However, the case analyses leave open one important question regarding the impact of outsourcing on the future degree and success of internationalization, i.e., why InsuraSoft experienced wider serendipitous benefits than FinaSoft. For instance, only limited market knowledge was absorbed through the outsourcing agreement in FinaSoft, whereas InsuraSoft was able to collect a vast amount of information on market developments, legal-policy developments, and labor laws, for instance.

Such differences in the ability to absorb market-related knowledge could be explained through the intensive on-site presence of InsuraSoft. Welch and Luostarinen (1993, p. 50), for instance, suggested that the nature and extent of the inward internationalization process in terms of company involvement could lay foundations that would subsequently assist in an outward move. In general, outsourcing differs from other inward modes in terms of the increasing requirements for more intensive cooperation (Korhonen et al., 1996). This is because the inter-organizational transfer of such activities may often require the building of intensive cooperation and commitment between the parties in order to ensure the successful transfer of the ownership of the outsourced activity (e.g., Barthélemy, 2001; Hussey and Jenster, 2003). Such cooperation may involve several common meetings, an on-site presence, and even the long-term temporary or permanent transfer of employees, all of which may add to the accumulation of local market-related knowledge. It is therefore reasonable to expect that cooperation and a consequent physical presence will lay the foundations for absorbing market-related knowledge. Further, the need for inter-personal interaction appears to be influenced by the asset specificity of the product and the standardization of the transfer process (see Kogut & Zander 1993), i.e. the nature of the outsourced activity.

With regard to the network connections made through outsourcing, representatives from both companies stated that they had benefited from the outsourcing agreement. However,

InsuraSoft established network-related connections from a much wider perspective, incorporating government agencies and horizontal and vertical industries, whereas FinaSoft was limited to the supplier level. The owner-manager of InsuraSoft stated that they were able to create these connections because they were so physically involved in the process. Accordingly, with regard to the ability to exploit inward-outward benefits, the following proposition is put forward:

> *[P4-B] The extent to which firms are able to benefit from serendipitous [implicit] inward-outward connections is affected by situational factors, specifically the nature of the outsourced activity [what is being outsourced].*

6. DISCUSSION AND CONCLUSIONS

Guidelines regarding the choice of outsourcing location have largely followed theories concerning the location of direct and captive offshoring investments, particularly Dunning's (1980; 1988) eclectic paradigm. According to Cantwell and Narula (2001), while the tenets of the eclectic paradigm have remained the same, it is its application to particular issues covering new operational modes such as outsourcing that has led to its evolution, given the need to incorporate new ideas and approaches. Similarly, Graf and Mudambi (2005) state that, given its significance, Dunning's framework for examining international production is instructive in terms of viewing the outsourcing location through the lens of international production.

Yet, in terms of choosing the location, prior research provides only limited empirical evidence on whether the same factors that lead a firm towards ownership-based offshoring encourage it to make an offshore outsourcing investment, in which ownership and thereby hierarchical control is passed to the foreign vendor/partner [RQ1]. As illustrated, in comparison with FDI decisions, the choice of an outsourcing location is more often seen as a reciprocal yet recursive process, in which the influencing factors transcend location-specific considerations. In

fact, according to the analysis reported in this article, the driving and primary factors behind the decision are not location-specific such as the infrastructure, the country risk, government policy and human capital, as often implied in FDI research, but rather situational and internal, i.e. to do with what is being outsourced and why, and what kind of related experience the company possesses [P1-A]. Accordingly, it is suggested that factors such as the nature of the outsourced activity and the outsourcing objectives have a primary influence on the location decision. It is further proposed that the extent to which external and location factors need to be considered is dependent on and moderated by situation- and firm-specific factors, specifically what is being outsourced and why [P1-B]. This is, to a large extent, in line with some earlier results (e.g., Graf and Mudambi, 2005).

Therefore, just as Hätönen (2006), for instance, suggests that the decision concerning the outsourcing location is preceded by the questions of 'what' and 'why', these results suggest that what is being outsourced and what kind of incentives are involved fundamentally influence the choice. Location-specific and external factors appeared to have an exclusionary role in the decision-making process, meaning that only after the initial choice has been made can the locational factors be fully analyzed. For instance, poor-quality or high-cost labor, or restrictions imposed by the local government, may make companies revoke their initial decision.

Similarly, the case analyses suggest that the initial choice of whether to fix the location or the partner first [RQ2] is also dominated by the underlying outsourcing motives. It was argued that only in the case of cost-driven outsourcing and a competitive supplier base are firms likely to prioritize location over the partner [P2-A]. This was because when the outsourcing motive concerns capability enhancement or process improvement [transformational outsourcing], the location of the vendor is unimportant as the benefits it offers are firm-related and not location-bound [P2-B]. For instance, it has been argued that firms seek capability enhancement through

outsourcing agreements, regardless of location (Narula and Hagedoorn, 1999). Similarly, with regard to process improvements, it is not a question of locational advantage, but rather one of developing a partnership through intense involvement with a strategically suitable outsourcing provider (Kedia and Lahiri, 2007; Morgan 2003). In such cases, even though the vendor might operate in multiple countries, the location decision is highly influenced, or at least confined, by its operational locations.

Accordingly, the factors driving the location decision emphasized in prior research on captive [ownership-based] offshoring were found to have some bearing on the outsourcing-location decision, either directly or through other factors. The question remains, however, whether firms have market-seeking motives or, as postulated, whether a strategy leaning toward internationalization affects the choice of location [RQ3]. In fact, the case of FinaSoft shows that in some cases companies also strategically outsource and choose a location based on future internationalization plans [P3]: thus they have market-seeking motives (cf. Dunning, 1993; 2000). According to the analysis these motives include creating a resource pool close to the targeted markets, fostering the ability to absorb local market conditions, and creating an agile organization that enables firms to internationalize more rapidly.

Further, in terms of internationalization, previous research has shown that many inward operational modes such as licensing and franchising may result in serendipitous inward-outward connections that facilitate the firm's international expansion (e.g., Welch and Luostarinen, 1993). However, less is known about whether, and if so under what conditions, offshore outsourcing as a somewhat distinct strategy will lead to future success in terms of the degree of internationalization [RQ4]. Hätönen and Ruokonen (2007), for instance, hypothesized that previous outsourcing in a given country has a positive effect on the success of outward expansion to it. The results reported in this article support this hypothesis by illustrating the widespread

benefits of offshore outsourcing, and thereby suggest that prior experience of it has a positive effect on the future degree and success of internationalization [P4-A]. This is mainly facilitated by the created network connections, the absorption of market-related knowledge, and the development of a flexible, yet international organization that can respond more rapidly to international opportunities.

With the exception of the increased flexibility, it was found that what is being outsourced [situational factors] and why [internal factors] have the biggest impact on the extent of the possible inward-outward connections. In fact, according to the current literature, it is primarily these factors that often define the closeness of cooperation required between the contracting parties (e.g., Hussey and Jenster, 2003; Kedia and Lahiri, 2007). This, in turn, was seen as the key determinant behind the ability to create location-bound network connections and to absorb market-related knowledge, and thereby create serendipitous inward-outward connections in general [P4-B].

Table 2 The contributions of this article to theory development

AREA OF CONTRIBUTION	CONTRIBUTIONS OF THE ARTICLE	DEVELOPED PROPOSITIONS FOR FURTHER RESEARCH
Offshore outsourcing • Offshore outsourcing location decision (RQ1) • The sequence in which firms choose partners and locations (RQ2)	• Development of an emergent theory to reformulate the dominance of non-locational factors in offshore outsourcing location decisions • Development of an emergent theory to emphasize the connection of outsourcing motives to the sequence in which partners and locations are chosen	[P1-A] The primary factors influencing the outsourcing-location decision are firm-specific and situation-specific in terms of what is being outsourced, why and by whom. [P1-B] The extent to which external and locational factors are considered in the location decision is dependent on and moderated by the situation- and firm-specific factors, specifically in terms of what is being outsourced and why. [P2-A] In outsourcing aimed at cost savings the choice of location precedes the choice of partner. [P2-B] In outsourcing aimed at capability enhancement or process improvement the choice of partner precedes the choice of location.
Internationalization • The connection between firms' internationalization strategy and the choice of offshore outsourcing location (RQ3) • The connection between offshore outsourcing and the degree of firm internationalization (RQ4)	• Introduction of novel insights according to which future internationalization strategies affect the offshore outsourcing location decision • Development of a emergent theory that prior offshore outsourcing experience facilities international expansion, and that the extent to which firms are able to benefit from these inward-outward connections is moderated by the outsourcing situation	[P3] Future internationalization strategies have an impact on the final choice of outsourcing location. [P4-A] Prior experience of offshore outsourcing has a positive effect on the future degree and success of internationalization. [P4-B] The extent to which firms are able to benefit from serendipitous [implicit] inward-outward connections is affected by situational factors, specifically the nature of the outsourced activity [what is being outsourced].

Table 2 summarizes the theoretical areas of contribution of this article regarding offshore outsourcing and internationalization. It further encapsulates the theoretical developments as well as the propositions derived from the research questions and related to the progressive stages of the location decision, from the factors affecting the choice of location to the possible international effects of offshore outsourcing. The results provide implications for future research and for practitioners, which are summarized in following chapter.

7. SUMMARY AND IMPLICATIONS

This article addresses four research questions related to the location decision and the consequent effects on internationalization of a non-ownership-based offshoring strategy, i.e. offshore outsourcing, which in current research have not received the attention they deserve. What factors influence the location decision [RQ1]? When and under what circumstances do firms choose partners prior to choosing the location [RQ2]. Does a strategy leaning toward internationalization affect the location choices [RQ3]? Does, and if so under what conditions, offshore outsourcing facilitate the success of the future degree of internationalization [RQ4]? The case approach was used to build, develop and refine the existing theory surrounding these issues due to its ability to provide comprehensive and in-depth knowledge. The results presented are encapsulated into propositions based on which a theory for further research is put forward. Furthermore, the findings provide insights that managers, practitioners, and policy makers, might find useful.

In terms of the theory, the article provides evidence that non-locational factors most heavily impact the firm's decision to outsource offshore and subsequently to internationalize. In the light of the results, it seems that situational and internal factors such as 'what is being outsourced' and 'why' dominate not only the location decision, but also the sequence in which firms choose a partner, whether prior to the location or vice versa. The case results also indicate that strategic leaning toward internationalization may have an effect on the choice of location, which brings in a new variable and factor to studies on the location decision. Moreover, it seems that not only does prior experience of offshore outsourcing have a positive effect on the future degree and success of internationalization through several serendipitous connective benefits, the extent to which firms are able to benefit from these inward-outward connections is also influenced by non-locational factors. All of these results are indicative of an emergent theory that could be helpful in future research on outsourcing-location decisions, as well as on the

effects of further international expansion. Theoretical rationalization and induction from the case data gave rise to propositions that it is hoped will be of use in future endeavors to capture the aspects of this complex phenomenon.

Although the emphasis in this article is on creating novel insights in order to develop current theories, one of the key implications for managers and policy makers relates to the effects of the outsourcing-location choice on future internationalization. As shown, offshore outsourcing involves not only risks and hidden costs (see e.g., Barthélemy, 2001), but also hidden benefits. Especially within the context of small firms, in which the same person(s) are often involved in both exporting and importing (Korhonen et al., 1996; Wiedersheim-Paul et al., 1978), it may be possible to decrease the cost of further internationalization through prior outsourcing. The fact that such benefits are more often hidden and implicit is due merely to the failure to incorporate the possible inward-outward effects into the location decision-making. Further, acknowledgement of the link between inward and outward internationalization may require some governments and other policy makers to rethink the ways in which they promote improved international performance in companies (Welch and Luostarinen, 1993). Whereas market-related internationalization is often promoted by home governments, offshore outsourcing is typically and more often restricted. Yet, the results of this analysis suggest that promoting any form of foreign activity, such as offshore outsourcing, may facilitate international expansion in various ways, and thereby provide a better basis for small firms in particular to prosper in increasingly globalized markets.

Although the results reported in this article derive from a case analysis involving two small firms, we would not discount the possibility of their applicability to larger firms. However, it should be noted that the context and the size of the firm require an emphasis on certain factors in the location decision. For instance, the fact that larger firms are more likely to have prior

international experience may push then towards a market they know. Furthermore, they may have established working relationships with outsourcing providers, which may encourage them to use locations in which such providers are active. Nonetheless, both of these are factors of the progressive location decision, which is also discussed, and which should be noted in interpreting these results in different contexts. We are confident that our findings and developed theory will contribute to the further practical application of academic research on offshore outsourcing, a topic that continues to attract increased academic and managerial interest.

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ARTICLE 3

Hätönen, Jussi – Ruokonen, Mika

Revising marketing strategies for supplier selection criteria – small firm approach from the information and communications industry.

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REVISING MARKETING STRATEGIES FOR SUPPLIER SELECTION CRITERIA

Small firm approach from the information and communications industry

ABSTRACT

Purpose – Mainly due to their size, SMEs in the ICT industry are often at a disadvantage in supplier evaluation and therefore in the MNC supplier selection process. We will illustrate how they have realized their weakness and have created innovative strategies for alleviating the uncertainties associated with SMEs and thus for overcoming these natural disadvantages.

Methodology/approach – Our method of analysis could best be described as multiple-comparative-case analysis. We have based our paper on existing literature, which is then assimilated into the analysis in the process of theory fulfillment and refinement.

Findings - This paper offers both theoretical and managerial insight by showing that SMEs do not have to accept their weak position in supplier markets, and that they can change the status quo by adjusting their strategies. Our findings show that innovative strategies potentially offset the disadvantages of supplier smallness in the ICT industry.

Originality/value – Strategies aimed at fighting disadvantages as such have been addressed by marketing scholars only to a limited extent. The originality of our paper lies in its focus on identifying strategies that are aimed at diminishing the strategic weakness of the company rather than those aimed at building strategic strength.

Research limitations/implications – We chose a qualitative research method as it facilitates theory building and development in areas in which the extant theory seems inadequate or the phenomenon being examined is complex. Qualitative research also potentially enhances managerial knowledge by providing best-practice information.

Practical implications - We provide insights which hopefully encourage SMEs in the ICT industry not to see their small size as weakness, but as a potential advantage in the form of increased responsiveness, flexibility, and service level compared to their larger rivals. However, to capitalize this advantage, we illustrate that SMEs in the industry should aim at increased focus on their core competences and simultaneously seek creative ways to remain competitive in the supplier markets.

Keywords ICT industry, market orientation, selection criteria, SME, supplier strategies

Paper type Case study

INTRODUCTION

Many small and medium-sized enterprises (SMEs), especially in the information and communications technology (ICT) industry, seek to enter international business space soon after their establishment (Oviatt and McDougall, 1994). In order to achieve such goals in this highly volatile industry they often have to utilize and leverage the established sales channels provided by multinational corporations (MNCs) in an attempt to ensure rapid and substantial growth, revenues and cash flow. These channels may also promote learning, technology and evolutionary growth (Gabrielsson and Kirpalani, 2004). Supplying MNCs is not a simple task, however, and small companies fiercely compete with each other in order to gain access to these established networks. They often need to adjust their strategies according to the selection criteria imposed by the client because, mainly due to their small size, they have several disadvantages as supplier candidates. In this paper we explore the issue of 'supplier' market orientation in ICT, which has arguably received only limited attention in the current literature. Through comparative case studies we will illustrate that within these small ICT companies targeting the sales channels of MNCs, the approach to market orientation varies according to the product complexity.

We begin the paper with a brief introduction of the relevant literature, followed by a short overview of the chosen methodology. In the empirical part we firstly introduce the identified supplier-selection criteria imposed by the client according to the nature of the product, then we examine how SMEs in the ICT industry have made their strategies more market-oriented in order to alleviate their weaknesses in the face of these criteria. The paper ends with a summary and discussion based on the analysis.

OUTSOURCING IN THE ICT INDUSTRY AND THE OPPORTUNITIES FOR SMES

With the continuous shortening of product lifecycles companies can no longer master all aspects of their value chain (Varis et al., 2005). The time of the fully vertically integrated company has elapsed, and even functions that were once critical are now handled through (out)sourcing agreements, mainly because they are suddenly being offered by new, specialized competitors that can do them better, faster and more efficiently (Hagel and Singer, 1999). MNCs tend to start outsourcing when the supply base offers a location, process technology, or a skill set, for example, that would be hard to acquire or reproduce (Doig et al., 2001). In fact, outsourcing has been touted as a highly effective strategy, especially in fiercely contested and fast-moving sectors such as ICT, where the impact of globalization has been particularly prominent (Fine, 1998; Nummela et al., 2005). For, as Sturgeon (2002) argues, especially in conditions of volatile demand, rapid technological change, and increasingly extensive and elaborate production geographies, modular production networks yield greater economic performance than other models. Globalization, improving information and communications links, falling interaction costs, and the birth of specialized vendors and global access to them are providing ICT companies in particular with an unprecedented opportunity to capitalize on the expertise of more focused companies and thus to restructure their businesses (Doig et al., 2001). Furthermore, the increasing technical complexity and diversity make it difficult for companies to stay at the cutting edge in several areas at the same time (Quinn, 1999), and more use is being made of external technological resources through strategic alliances, for instance (Hagedoorn and Duysters, 2002).

While MNCs are disentangling their value chains and looking for efficient suppliers to provide value components for their final products, SMEs have been given unparalleled global opportunities. The industry structure has become favorable for narrowly focused small niche players (Preece et al., 1999). Whereas the high volumes required in the traditional manufacturing

industries call for suppliers of adequate size as well, in the ICT industry, excluding the tangible components, the volumes and thus the size of the supplier are often not the decisive factor. For instance, the resources required to provide software are very often the same for one million copies and one copy (Katz and Shapiro, 1985). Thus in many areas, SMEs can also meet the production quantities required by MNCs in this sector, although they still have many strategic disadvantages compared with their larger competitors, such as the ability to spread R&D costs.

Regardless of the volume-related advantages and disadvantages, small companies are also at a major disadvantage against their larger competitors in the outsourcing markets. Smallness is a liability, and large companies are often reluctant to share resources with smaller firms, as their future is unclear (Gulati, 1998). Again in the ICT industry in particular, where (out)sourcing decisions are more often driven by the need to acquire technology, knowledge or skills rather than by cost considerations, these decisions are more likely to carry strategic overtones. Although it might be easy to switch suppliers of power adapters to printers, for instance, it is more difficult to switch suppliers of a software component that is deeply embedded in the core software of the client. Unlike existing goods, technology and innovations cannot be obtained in one-off one-time anonymous transactions, but they require time to develop (Hoetker, 2005), and thus the cost of switching suppliers increases.

A MARKET ORIENTATION IN SMALL ICT COMPANIES

The literature on market orientation dates back to the beginning of the 1990s, when the construct was developed to describe the implementation of the marketing concept (Kohli and Jaworski, 1990). Basically it entails gathering customer- and competitor-related information, disseminating it throughout the organization, and using it in the decision-making to fulfill the needs of the current market (Kohli and Jaworski, 1990; Narver and Slater, 1990). The level of market

orientation falls along a continuum of decisions made on the basis of the market needs, and it is thereby a way of involving customers in the overall marketing decision-making. In fact, it is more than just bringing customer needs into the strategic decision-making; it is a specific form of organizational culture that focuses on delivering products valued by customers through the ongoing monitoring of market conditions and the adaptation of organizational responses (Grewal and Tansuhaj, 2001).

What, then, is market or customer orientation in the context of small ICT companies? For several reasons, the existing research is only of limited assistance in addressing this question. These companies face several different obstacles to being market or customer oriented. These obstacles are more often connected to their scarce and limited resources, which limit the possibilities of obtaining knowledge (Verhees and Meulenberg, 2004). In addition, if they do manage to obtain information about the markets, it may very rapidly become obsolete because of the high market and technology uncertainty (Ruokonen and Hätönen, 2006). Although this applies irrespective of the size of the firm, it is more of a challenge in small firms with limited resources because gathering this information may take a long time. Yet, it has been noted that small firms also possess strengths in relation to large firms. Where it may take longer for SMEs to gather the information, its internal dissemination may be difficult and time-consuming in large and more bureaucratic firms. Furthermore, the planning flexibility enabled by the small size may assist in the adaptation of the organizational responses to the market conditions (Alpkan et al., 2007).

In conclusion, small ICT companies are increasingly aiming at the sales channels of MNCs in the field, and the resulting partnership may provide both parties with promising new business. The notion of the "whole product" prevails in the ICT industry, which basically refers to a constellation of different technologies. As MNCs increasingly focus on the core technologies,

there are opportunities for suppliers that can provide the niche technologies required for the 'whole product'. A supplier market orientation could enhance access to this channel, which is often seen as a gateway to rapid growth in the ICT industry (Gabrielsson and Kirpalani, 2004). However, current research has provided only limited empirical evidence in terms of the requirements imposed by MNCs on small firms and, moreover, of the strategies adopted by SMEs to meet these requirements. The aim of the following empirical analysis is to increase our understanding in these two areas, thereby creating both managerial and theoretical insights.

RESEARCH METHOD AND DATA COLLECTION

The empirical part of this paper could be best described as a set of intensive case studies. This method was chosen for the depth of understanding it provides. The strength of the case approach lies in its potential for subsequent theory development, and it is most applicable in situations in which the extant theory seems inadequate or the phenomenon in question is complex (Eisenhardt, 1989; Yin, 1994). Especially with business relationships, which are difficult to separate from their context but have to be studied within it so as to promote understanding of the dynamics involved, the qualitative approach provides an efficient tool for thorough exploration (Halinen and Törnroos, 2005). Under these conditions, and given the research problem, the case study provides a viable approach for increasing theoretical and managerial knowledge.

Although no separate case descriptions are provided, the study is based on an intensive close-up analysis of the strategies of 12 ICT companies, which for the purposes of this paper are divided into two categories: 1) clients and 2) vendors. First, three multi-national companies (Clients A, B and C) are presented in terms of their motives and selection criteria in the sourcing of software, technological components and, on a few occasions, hardware. These companies, which represent fields other than the ICT sector, were selected in order to open up a broader

perspective on the phenomenon. Two of them could be referred to as original equipment manufacturers (OEM) producing various products, and one as a systems integrator (SI). The characteristics of the client cases are illustrated in Appendix 1. Secondly, we examine eight 'vendor' companies which are or are seeking to supply companies such as A, B and C (see Appendix 1 for the case descriptions). These companies are analyzed in terms of how they have adapted their strategies to meet the supplier criteria of larger companies.

As mentioned earlier, in order to increase our overall understanding of the supplier and vendor strategies of the selected ICT companies, we chose a qualitative-case-study approach. The cases were selected on the basis of their explanatory power and availability (Eisenhardt, 1989). First, we sought vendors with experience in dealing with smaller counterparts, and consequently, small firms with experience in selling to larger customers. Secondly, we sought companies that were willing to participate and speak openly about these issues. Following a series of initial contacts, a group of 12 companies was formed (see Appendix 1). The primary method of data collection in these companies was face-to-face interviews with the CEOs, CMOs, COOs, CTOs, and other employees who were involved in the strategic decision-making and thus had relevant knowledge. Since the research team had limited access to the companies, the persons interviewed were selected merely based on their availability for the study, given that they were part of the top management of the firm. Approximately 30 topic-based interviews were conducted, each comprising a set of open-ended questions (see Appendix 1). Each of the persons was interviewed once for the purposes of this study. The sessions (approx. 90 minutes each) were tape-recorded and subsequently transcribed. Secondary sources of information (in the form of brochures, presentations and web-sites, for example) were also utilized in order to improve the reliability and validity of the findings, but also to provide complementary viewpoint of the strategies of the companies. The collected secondary source information confirmed many of the conclusions made

by the researchers based on the interview data, particularly in the case of the SMEs studied as they often list their long-term strategic goals in these materials.

The analysis of the data was conducted in several phases. After transcribing the interview tapes each researcher became familiar with the data by reading through all the transcripts carefully and independently. The emerging themes related to the topic of the research were identified from the transcripts, and both researchers broadly agreed on their significance. The researchers then jointly conducted a within-case analysis on each company (Eisenhardt 1989). The themes that emerged from the interviews were reorganized into descriptive narratives, which helped us in identifying the key events and the historical background of each company. In the final phase of our analysis we carried out a cross-case comparison in order to reveal the similarities and differences (Eisenhardt 1989) between the studied companies. The reasoning between the theory and the data was not entirely inductive or deductive (Yin 1994), but included several iterations between them (Eisenhardt 1989). In doing that we were aiming at a very careful identification of all potential indicators of the methods how SMEs diminish their disadvantage of small size, and also at linking the found indicators closely with our theoretical arguments. In the following chapters, the results of the analysis are presented.

SUPPLIER SELECTION CRITERIA IN THE ICT INDUSTRY

As specified in the definition (Day, 1999; Narver and Slater, 1990), market orientation basically encompasses the clarification of customers' current needs and acting upon them. Accordingly, the needs of customers in supplier-client relationships are equivalent to the imposed selection criteria, which reflect the current needs of the client. It has been argued that the primary selection criterion in purchasing innovative components is the technological competence of the supplier (Hoetker, 2005). However, in today's highly competitive supplier markets there are likely to be

two or more that are technically equal, and other criteria therefore have to be used for the final selection in such cases. In our analysis we identified the main selection criteria in the ICT industry as follows:

- Availability
- Technical competence
- Price
- Strategic fit
- Stability of the company
- Managerial compatibility
- Transparency and trust in each others' doings

A successful technology-based supplier partnership requires a high degree of due diligence (Amoribieta et al., 2001), which often falls into separate stages. We identified three distinct phases of supplier screening in ICT sourcing: availability screening, technical screening, and strategic screening (Figure 1). Although the idea of such a partitioned selection process is not entirely new, it facilitates further analysis of MNC requirements as well as the SME's strategies in responding to them.

Take in Figure 1

STAGE 1: Availability screening of potential suppliers

Amoribieta et al. (2001) state that potential vendors should be ranked first and foremost on their ability to provide all of the needed expertise. Similarly, we found that the first supplier needs to be able to provide the required extent of the component or service in the right place and at the right time. The availability criteria are basically quantifiable, and can be conducted via secondary sources such as the Internet or by sending out a simple query, such as an offer proposal. However, quantifiable information that can be obtained by means of specific software

has maximum impact only at the pre-negotiation stage (Tucker and Jones, 2000) – the stage we refer to as availability screening.

STAGE 2: The technical screening of potential suppliers

Suppliers meeting the availability criteria are then analyzed based on their technical competence and capabilities. Despite the view that the primary criterion in purchasing innovative components is the technological competence of the supplier (Hoetker, 2005), we found that, with a few exceptions, it was enough in itself. As one of the interviewed managers in Client B put it,

> *"You do not have to be best-in-the-world to supply us, you just have to have the technology we need."*

Yet, according to our analysis, we suggest that MNCs do not often go with the most competent supplier, and that there is often what we like to call a technical acceptance level that operates as a technological threshold. We then analyzed companies that were not only available but that also met the technical requirements of the MNC on another set of criteria, which in the end play a decisive role.

STAGE 3: The strategic screening of potential suppliers

Of the companies we found capable, we noted that the cluster of criteria used in the selection process, and especially in the strategic screening phase, were highly context-dependent - in other words what was being bought constituted the right set of criteria in a given situation. According to the CTO of Client C, the very cornerstone of each technology-supplier agreement lay in the alignment of strategic objectives:

> *"… the primary goal is to find a partner [supplier] that is strategically compatible […] each partnering situation is unique, and so are our strategies related to that situation."*

However we were able to pinpoint two factors of the product that was being purchased that had a great impact on the supplier-selection criteria: complexity [equally a product

component] and strategic importance to the client. *Component complexity* here refers to the number of suppliers providing a technologically similar or substituting product, as it is plausible to expect that the more complex the product, the less there are available suppliers on the market. Regarding the component complexity, Williamson (1981) for instance maintains that firms should avoid using the markets and choose integration whenever the supplier market is uncompetitive. Also, it is often the case that the more complex the product is, the more it requires from the client to regain it or to start constructing it in-house. We found, however, that in the ICT industry some components are purchased from the markets even in situations of uncompetitive supply because internalizing the process would be too costly or even technologically impossible (Doig et al., 2001). The *strategic importance* to the client in turn refers to the impact the component has on their entire product/solution. Strategically important products serve as the basis for the core business of the client's company.

Take in Figure 2

With suppliers that fulfilled the technological threshold requirements we found that, in the end, different criteria prevailed in different product ranges (Figure 2). First, when there was low strategic importance to the client and low component complexity (Q1) price- and cost-related factors tended to dominate as in these situations there existed a large number of equally capable suppliers. When there was little difference in the offerings of these non-strategic components, the most cost-efficient supplier was typically used: if there is no significant possibility of adding value to the component and competitive supplier markets are offering substitute components, there may be no other differentiating factors than price. However, in situations in which the supplied component is complex but still has only a limited effect on the overall success of the client (Q2), personal criteria such as managerial compatibility and transparency were emphasized

as the deciding criteria. Due to the fact that when it comes to purchasing complex components the interaction between the contracting companies needs to be high, clients sought suppliers with high levels of transparency in order to ensure continuance of supplies. As one interviewee in Client C stated:

> "*If we need to have a close relationship with a supplier providing us with non-strategic components, we'd rather that were with a supplier we can trust and who we can be sure has no hidden agendas*"

When the product is not very complex, but it is strategically embedded in the client's processes (Q3) the technical attributes dominate the choice of supplier: the highest value in components that are easily replaceable and readily available, even though they are strategically important, lies in their technological attributes. Yet, it is different in cases in which the sourced product is complex and strategically important to the client (Q4), when the most influential selection criterion is supplier stability. As one representative of Client C stated:

> *"We had a project in which we were developing a solution for one of our products with a smaller supplier. Just as the solution was ready, the company was sold to our fiercest competitor, and the IPRs went along with the company. Today with components that are of most strategic importance to us we take any necessary actions to ensure that we will also get them tomorrow, even if that means compromising on price or functionality. "*

SUPPLIER STRATEGIES FOR RESPONDING TO THE MNC's REQUIREMENTS

We found that partnering with SMEs instead of larger suppliers often carried greater uncertainties, and was thus disadvantageous. As discussed above, uncertainty often makes access to resources or sales channels problematic for new firms because others, especially MNCs, are often reluctant to exchange resources with a company facing an uncertain and hazardous future (Gulati, 1998). However, what we encountered was a situation in which the SMEs had identified their weaknesses of smallness and had introduced strategic measures to overcome them. In fact,

this is what supplier-market orientation in essence entails (Kohli and Jaworski, 1990; Narver and Slater, 1990). Once the market information from the MNCs has been generated and disseminated, i.e. the selection criteria established, it is the task of the SMEs to respond to the requirements. In this section we discuss the strategies aimed at meeting the requirements of MNCs at each supplier-screening stage, i.e., availability, technical and strategic (see Figure 1).

STAGE 1: Being available with limited resources

As the initial supplier screening is often conducted via secondary sources, mainly the Internet but sometimes even through software developed for such purposes, companies wishing to supply MNCs should post clearly relevant data such as products supplied, cost, and availability. Although this seems self-evident, it could be argued that only a small number of these companies really know what information the MNCs require and seek in the selection process.

Further, as mentioned earlier, if they are to thrive in an increasingly competitive environment, companies should not try to master everything, and should focus on their core competence area(s). We found that what was being demanded by concurrent competition was also demanded by the customers. It was clearly stated by the MNCs that SMEs in the ICT field that are aiming to supply MNCs should have a clear product focus. In fact, in many cases this focus was the key element in getting past the availability screening of the client (see Figure 1). As the person responsible for software purchasing in Client A stated:

> "*At one time we were looking for a supplier for a particular need. We found a capable supplier that was rather big in comparison, with 150 employees. However when we scrutinized this candidate we found that, in fact, the capability we were acquiring employed only 30 people, which in turn made them a rather small player in the field. We didn't want to buy a capability from a company that committed only one fourth of its human resources to it…The time for supermarkets has elapsed*."

The MNCs have realized that if the supplier of a component, service or capability has several product focuses, it requires alternative resource commitments, as Hagel and Singer (1999) observed. It has to be recognized that economies of scale are a function of size and focus. When the size is given, companies can increase their scale economies by narrowing their focus. Given their narrow niche focus, SMEs stand a better chance of competing against their larger competitors in these circumstances.

However, in some cases the MNC might want to acquire components in a one-stop-shop manner. Suppliers providing such a comprehensive service are also referred to as turnkey suppliers (Sturgeon, 2002) - which does not mean that they have to do everything internally as they can build a 'virtual' mass. Although the MNCs do not want to form partnerships with SMEs, this does not mean that the product is not good. As the representative of Client A stated:

> "*In some cases when a prospective technology supplier comes to us with a very good product I say that 'it's very nice, but I don't want to buy it from you. Don't get me wrong, I like your product. I just don't want to add another supplier to our portfolio. You should try one of our component suppliers.*'"

Every partner interface requires investments in both time and money, and thus, as discussed above, MNCs often look at one-stop-shop models and, consequently, turnkey suppliers in their partner agreements. This kind of requirement has caused an increase in the number of systems integrators and the different levels of suppliers (i.e. first- and second-tier suppliers). However, it is possible for an SME to become such a supplier. For instance, Supplier 5 provides its customers, MNCs, with radio-frequency-identification reading devices (RFID), identification tags, and some hardware, and what this company is largely focused on is the software that is in the reading devices. Everything else is, to a great extent, acquired through supplier arrangements. Thus the value added as far as the client is concerned is not limited to the software development, but also includes the process by connecting the second-tier suppliers. Through

building a network of component suppliers around its core competence the company has made itself "available" to several larger customers seeking to buy larger entities.

STAGE 2: Passing the technological threshold

As discussed above, technological competence more often operates as a threshold requirement rather than a definitive selection factor. In the end, technical superiority is a wavering concept, but many companies still attach their competitive advantage to it. It is dangerous to expect no competition in any given technology. Furthermore, SME managers should remember that the competition is often with the in-house department of the company or with companies providing substitute rather than identical products. As the representative of Client A stated:

> "*Many try to tell us that they have state-of-the-art technology. Then we start to examine it and we find out that it is bulk for us, that, in fact, it is something that is offered to us by several other suppliers in several parts of the world. Their competitors might be even more advanced …As small firms are so strongly focused on their innovations they think they are unique.*"

Assuming technical superiority is risky, as then customer needs, i.e. market orientation, are often supplanted by the technical drivers. Other than selling products that are technologically not that complex but carry high strategic importance to the client (Q3 in Figure 2), technological competence was not found to be the decisive factor. Although SMEs should secure a certain technological level in order to pass the threshold requirements of MNCs, they should bear in mind that the final selection criteria are based on the strategic objectives of each sourcing situation.

STAGE 3: Adjusting to the strategic requirements of MNCs

As discussed earlier, the very cornerstone of each technology-supplier agreement lies in the alignment of strategic objectives. Above we quoted the CTO of Client C, who stated that the primary task of MNCs is to find a strategically compatible supplier for each specific partnering situation, and we clustered these situations broadly in a matrix of component complexity and strategic importance (Figure 2). Accordingly, the marketing task of SMEs seeking to supply companies such as Client C is to pin down their strategic objectives related to the sourcing situations in the product area in which they are operating. In addition to the required focus as an overall strategy, we encountered several other strategies that had been developed in order to reach the status of an MNC supplier. The main ones were staying flexible, creating a value proposition, benchmarking, and de-committing (Figure 3). Although all of these were connected to all of the identified quadrants in the matrix, they were considered the most important in the represented product cluster. Each of the quadrants is discussed in more detail below.

Take in Figure 3

Quadrant 1: *Stay flexible*

Price-based competition is fierce in the ICT industry. SMEs do not often stand a chance when they compete on price because economies of scale often lead to cost advantages, and hence it has been stated that larger companies carry comparative advantage over SMEs in cost-based competition. Similarly, when an SME is providing products that are less complex and, at the end of the day, are not of high strategic importance to the client, the only way to stay competitive is to be flexible in adapting to changing customer needs, because then they could add value to the customers' processes that the larger competitors cannot, even under price-driven competition. For instance, Supplier 5 stated that one of their sustainable edges, albeit temporal, was to remain flexible towards all of the systems integrators. They were seeking to mass customize their

products, which would basically encompass customization based on best practices. Nevertheless, some level of customer-specific customization remains, as the CEO of the company stated:

> "*…we need to remain flexible, because even with mass customization someone might want their RFID reader in black, pink or with a specific logo. If we want to supply this company we need to paint these readers black and with a specific logo, if required.*"

Having made quite extensive investments in relationship management on a SME scale, the company is examining what is required by the customers, i.e. generating market intelligence. By introducing mass customization within limits it is able to minimize costs while remaining flexible. Hence, as it is following the desires of its clients, it is being highly market-oriented.

Quadrant 2: *Create a value proposition*

Here, the product offered is not critical to the client's business, but it can add value to the end product. In fact, if the technical component that is being offered is not part of the client's core business, the client might not have any idea about its applicability. Thus, it is imperative for the supplier to articulate the possible added value it can provide to the client – or its clients. For instance, Supplier 9 sells value directly to financial institutions through decreased call-center costs as a result of their mobile banking solution, although their customers are multinational systems integrators such as Client B. However they still have to propose adding value to the system. As the business development manager of Supplier 9 stated:

> "*System integrators are basically slave drivers and their product is their consultancy. If you eat away some of the total pie, which is building solutions for the customer, they need to be somehow… they need incentives to use this set of tools. It is reduction of either the risk or the process time, or of the costs of the total project. So these three factors are the incentives for the SI to utilize the product instead of having to build everything from scratch, because you get the biggest margin from using your own people. That is the fine balance there.* "

Accordingly, the task is not only to offer value to the end customer, and the company must also create value for the SI or OEM because it has an option of building the product from scratch. To be profitable and reasonable for the client, the added value should surpass the cost of partnering, which has to be clearly articulated to the prospective customer. Therefore, SME managers should think not only about what the product can do, but also about how it could benefit the customer and its customers. The value proposition should not only concern the customer's customers, it should also contain value propositions for both (all) parties involved. As the representative of Client C stated:

> *"In the short run either party can disguise the situation to such an extent that there is a win-win situation, although the reality is different. However, this situation eventually reveals itself and this will cause distrust between these parties, which eventually leads to the dissolution of the partnership. Thus every partnership should transparently aim at a win-win situation from the beginning."*

In our interviews with MNC representatives it was repeatedly stated that transparency of actions lowers uncertainties and thus becomes a decisive factor in the long run in supplier relations within the ICT industry.

Quadrant 3: *Innovative benchmarking of the technical attributes*

If an SME is seeking to provide an MNC with a product that is strategically embedded in its processes or product, but can be easily replaced in the production processes, the choice of supplier is often a question of mere technical superiority. However, due to the limited resources of these companies, using a specific third party to benchmark the product against those of their competitors can be costly, especially in solutions with several separate technical attributes. Therefore, as mentioned by Verhees and Meulenberg (2004), the limited resources of SMEs are problematic in terms of obtaining knowledge and, in this case, of adopting a market orientation per se. However, many of the SMEs in our analysis had found very inexpensive means of

objectively benchmarking their products, and thus of obtaining technical references. *First*, the use of universities and research laboratories, which is quite common in the ICT industry, provides an excellent product-testing opportunity at a fraction of the market price. *Secondly*, SMEs can use different specialists on the same level in the same industry to test separate product attributes. For instance, Supplier 6 had tested the usability of their electric design tool for computer aided design (CAD) software on electrical engineers by giving them a free copy, and in return they agreed to give feedback. *Thirdly*, companies can benchmark the attributes of potential clients. As supplier deals are often made following a process of competitive bidding involving the technical analysis of the products, the company acquires indispensable information. In gathering this material, the sales force that is in contact with the prospective clientele should be instructed to collect and report all the information, even from lost bids (see also Gordon et al., 1997). Although this cannot be used as such as a reference, it could be used as a tool for making future decisions concerning resource commitments in product development.

Quadrant 4: *Decommit in order to lower the MNC's barrier*

Although rated the best technologically, Supplier 2 lost a competitive bid for a database solution because it was too small in the eyes of the client. The client chose a database from a global giant corporation instead because of its stability. This is, in fact, a big issue for many SMEs operating in the ICT industry. One of the main reasons why companies are reluctant to purchase software solutions, especially complex and strategically important ones, from a small producer is that they do not want to become too dependent on one company, which might be sold, bought or go bankrupt in the near future, even though they may have the best price or technological attributes. As one manager of Client C stated after learning from their mistakes:

> *The problem with start-ups, especially the ones with venture capital invested in them, is that in some cases they are not even supposed to live their own lives […] the sole purpose of many of the small companies is to grow rapidly, and then to get sold to a larger company."*

Because SMEs often cannot guarantee stability they have come up with several actions to lower the barriers erected by MNCs to purchasing these complex and strategic components from them. One such strategy could be referred to as technological de-commitment. Although some level of commitment is nearly always seen as a prerequisite for transferring capabilities or complex products (Hussey and Jenster, 2003), in the software industry for instance, it might carry negative effects as well due to the complex nature of the products that are often embedded deep into the customers' processes. For instance, the owner and CEO of Supplier 1 stated:

> "*One of our competitive edges is that even though we commit to the relationship with our partners, they do not become dependent on us. We have won several contracts by explaining to the customer that if you don't like us, you can easily get rid of us.*"

What Supplier 1 has chosen to do is to technologically modify its product so that it can easily be removed from the customer's processes and thus the provider can easily be changed. They have found that the need for commitment in purchasing from a small supplier might be a negative issue in the ICT industry, and diminishing long-term interdependency might thus be a good way forward.

SUMMARY AND IMPLICATIONS

We have witnessed large-scale de-integration in the ICT industry as MNCs increasingly focus on their core technologies and processes, and outsource the non-core value-adding activities and niche technologies. This industrial fragmentation and modularization has opened up opportunities for SMEs focused on these niche technologies or value-adding activities. However, due to their size, even though they are technologically competent, small companies often carry natural

disadvantages, especially in the final phases of supplier selection in MNCs. By acknowledging these defects and adjusting their strategies for coping with them, SMEs may overcome or diminish many of these weaknesses.

To sum up, from managerial perspective, we suggest that SMEs of the ICT industry should not see their small size as weakness but as potential advantage in the form of increased responsiveness, flexibility, and service level compared to their larger rivals. In general, we suggest for the managers and decision-makers of SME to focus on their core competences to stay in the edge of state-of-the-art knowledge and to be creative in lowering the barriers to the supply the MNEs in the industry. In addition, the analysis in this article provides managerial insights on the specific actions how SMEs in the ICT industry can mitigate and even overcome the possible weaknesses and competitive obstacles they face in the supplier markets. It is shown that the different strategies that can be undertaken depend on how complex the product or component is, and on the other hand, on what is the overall strategic impact of the component to the client.

This paper has addressed this issue of the supplier market orientation of small ICT companies aiming at the supply channels of larger MNCs. Although it seems that its contribution is largely managerial, we believe we have added to the theory base of current research by filling several of the existing gaps. In other words, regardless of the stated importance of the established sales channels of MNCs to SMEs in the ICT industry, too little effort has gone into clarifying how these SMEs can overcome their natural disadvantages in terms of supplier requirements and gain access to MNC networks. What we have illustrated is that although smaller companies might carry major disadvantages against larger providers according to some supplier-evaluation criteria, they have not settled for the status quo, and they can and in the course of history have developed new innovative strategies for overcoming or diminishing these defects. The empirical study reported in this paper consisted of an analysis of 12 case companies. This qualitative

approach enables thorough understanding of phenomena that have not faced extensive investigation, yet it leaves a channel open for further research as the broader applicability of these results remains to be confirmed.

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Appendix 1 Case descriptions and persons interviewed in each company

COMPANY	INDUSTRY/PRODUCT	TYPE/VALUE CHAIN POSITION	SIZE (EMPLOYEES)	SCALE OF OPERATIONS	TARGET OF SOURCING/SUPPLY	PERSONS INTERVIEWED
Client cases						
Client A	Telecommunications	OEM	Large (>1000)	Global	Software, components	Sourcing Director
Client B	Telecommunications, software development	Systems integrator	Large (~500)	International	Software	CEO, Head of Business Development, Head of Consulting Unit, Sales Director
Client C	Security, telematics	OEM, systems integrator	Large (~550)	Global	Software, hardware, components	Business Development Director
Supplier cases						
Supplier 1	Software (Portals)	Semi-tailored software	Small (~20)	Local (Finland)	Software	Marketing Director, CTO and COO
Supplier 2	Software (Absorbed database software)	Semi-tailored software	Medium (~71)	Global	Software	Head of EMEA, CTO, Marketing Director, Sales Director, Head of R&D
Supplier 3	Software (mobile content management)	Standardized software	Small (~3)	International	Software	CEO, Sales Director
Supplier 4	Marking and data capture systems	2nd tier systems integrator	Medium (~64)	Local (Finland)	Software, hardware	Head of Business Development, CTO
Supplier 5	Security Identification	Hardware and automation	Small (~25)	International	Software, hardware	CEO, CTO, Sales Director, Sales Manager
Supplier 6	Software (CAD and data management)	Application developer	Small (~25)	International	Software	CEO, Sales Director
Supplier 7	Telecommunications	Consulting	Medium (~46)	International	Consultation services, software	CEO, Marketing Director, Head of Business Consulting, Head of Technology Consulting
Supplier 8	Software (Security)	Standardized software	Small (~10)	Local (Finland)	Software	CEO, Head of Marketing
Supplier 9	Software (Mobile banking)	Standardized software	Medium (~66)	Global	Software	Head of Business Development, SVP of Software Development, Head of Marketing

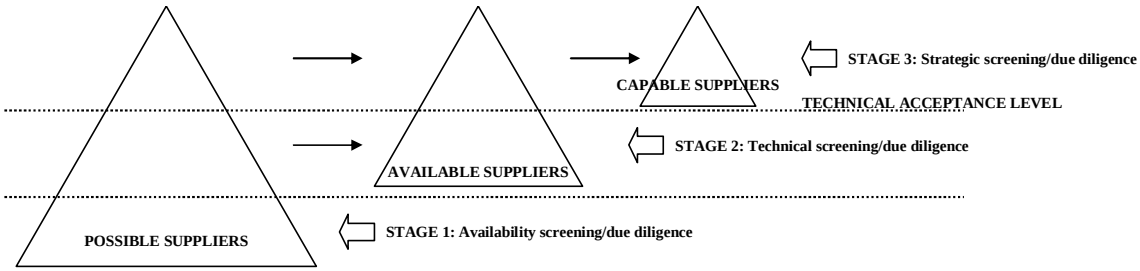

Figure 1 The MNC supplier-selection process for technical components

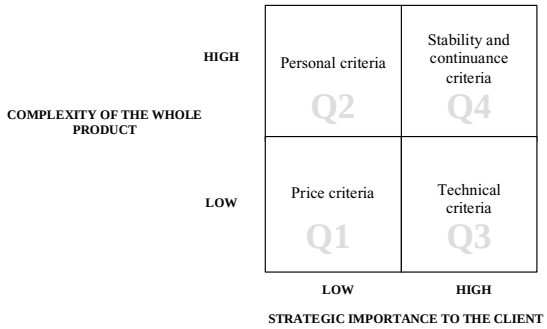

Figure 2 Selection criteria in different product ranges

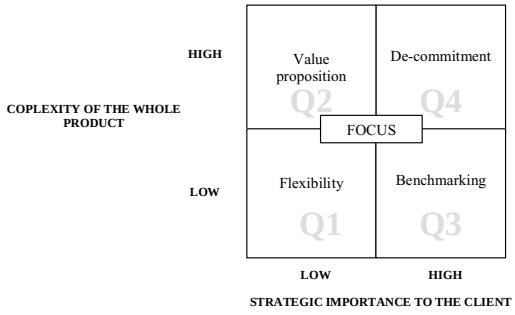

Figure 3 Overcoming strategies in each product area

ARTICLE 4

Hätönen, Jussi

Internal reorganization and transformational outsourcing – exploring the path towards flexible organizations in the information and communications industry

A revised version of a paper presented at the 39th EGOS Colloquium, Vienna, Austria, July 2007

INTERNAL REORGANIZATION AND TRANSFORMATIONAL OUTSOURCING
Exploring the path towards flexible organizations in the information and communications industry

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ABSTRACT

Rapid technological change and competitive intensity are increasingly driving organizations to adapt more flexible organizational forms, which entail specialization and consequent outsourcing of non-core activities. This article examines the management issues prior to achieving flexible organizational structures, which are conceptualized as internal reorganization [outsourcing transformation] and transformational outsourcing. The results from two exploratory case examples from the information and communications industry provided in this article indicate that prior to large scale outsourcing of production related activities companies go through a clarification of strategic focus and further internal transformation consisting of three sequential stages, during which prerequisites for further interorganizational decomposition [outsourcing] of these activities are built.

KEY WORDS

Modularity, Transformational outsourcing, Modularization, ICT industry, Flexibility

1. INTRODUCTION

Globalization and consequent competitive intensity imposes several challenges for firms across industries. Particularly in industries of rapid technological change and high volatility firms need to be able to adapt rapidly to the changes in the surrounding marketplace. At the extreme, it has been argued that in such industries only the most flexible firms will survive the concurrent competition (Achrol, 1997; Hayes and Pisano, 1994; Lawton and Michaels, 2001; Miozzo and Grimshaw, 2005). Nevertheless, flexibility has become one of the key components of success in concurrent competition and globalised marketplace. For instance, Mazzawi (2002) aggravates that

> *"Volatility has become an inescapable and permanent feature of the entire business world and companies are increasingly alive to the need to become adaptive enterprises – fast, flexible and agile".*

Although flexibility has for long been considered as an important dimension of success, many authors have argued that it has recently become more vital (see Schilling and Steensma, 2001). Flexibility enables firms to respond to a wide variety of changes in the competitive environment in an appropriate and timely way (Volberda, 1996). The quest for flexibility has led firms in versatile and diverse industries such as automotive, software, aerospace, telecommunications, computers, pharmaceuticals, chemicals, healthcare, financial services and energy systems to change the way they compete mainly by reorganizing their production activities (Carson, 2007; Dahan and Hauser, 2002; Quinn, 2000).

Accordingly, one of the key management issues in today's competitive environment is how to create such organization, which is able to adapt to the ever-changing business environment. A quarter of a century ago, Hennart (1982) stated that internal organization

allows faster adaptation to change because internal trades can be changed without the need to obtain the assent of all the parties to the transaction. However, the general concurrent view is quite the opposite. Today, large-scale downsizing, vertical disaggregation and outsourcing[1] are seen to create more flexible firms focused on a core technology and process, laced in a network of strategic alliances and partnerships with suppliers, distributors and competitors (Achrol, 1997). According to Miozzo and Grimshaw (2005)

> "*vertical disintegration and specialization is perhaps the most significant contemporary organizational development of the corporation*."

In fact, outsourcing and consequent vertical disintegration has been widely noted as one of the most sustained management trends of the past decades (Fill and Visser, 2000; Sibbet, 1997). Yet, in parallel with increased competitive intensity, the strategy of outsourcing has also evolved. Where 'traditional' outsourcing aims at cost savings or acquiring resources unavailable internally, new phenomenon of transformational outsourcing aims at changing the entire paradigm – targeting the flexible and adaptive enterprise (Mazzawi, 2002). Increased specialization and consequent vertical disintegration has created a new form of organization, ones that are often referred to as modular organizations[2], in which where tightly integrated hierarchy is supplanted by loosely coupled networks of organizational actors (Schilling and Steensma, 2001).

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[1] Outsourcing is commonly defined as transfer of production activities that have been previously conducted internally to an external party (e.g. Ellram and Billington, 2001).

[2] In pursuit of describing these flexible and dynamic organizations, researchers have introduced several different concepts for these 'new' organizational forms such as 'hollow corporation' (Pastin and Harrison, 1987),'virtual organization' (Chesbrough and Teece, 1996; Davidow and Malone, 1992), 'network organization' (Coulson-Thomas, 1991; Miles and Snow, 1986), 'modular organization' (Dess et al., 1995; Sanchez and Mahoney, 1996; Tully, 1993), 'barrierless organization' (Ashkenas et al., 1995; Dess et al., 1995; Schilling and Steensma, 2002), 'starburst organization' (Quinn, 1999), and 'shamrock organization' (Morgan, 2003). Although these concepts are sometimes represented in slightly different light, they generally represent same phenomenon (Schilling and Steensma, 2001). Thereby for clarification and coherency, in this article such organizational structures are referred to as modular.

Current research has suggested that a prerequisite for achieving modular organizational structures lies in prior reorganization of internal structures, process which is often referred to as modularization of activities. According to Kotabe et al. (2007) modularization is the degree to which firms implement the concept of modularity at both the product and process levels. In other words, modularization entails the decomposition of product architectures and internal processes into smaller granularities, enabling them to be designed and produced independently (Baldwin and Clark, 1997). However, current research on modularization and modular organizations carries a discontinuation. That is, where modularization is defined as a process of decomposing a complex system into smaller subsystems that can be designed independently yet function together as a whole (Baldwin and Clark, 1997), modular organization in turn was defined as an organization where tightly integrated hierarchy is supplanted by networks of organizational actors (Schilling and Steensma, 2001). However, it has been noted that the adoption of modular product and process architecture does not automatically lead to a modular organizational pattern (Brusoni and Prencipe, 2001; Miozzo and Grimshaw, 2005; Sanchez and Mahoney, 1996). This imposes an important gap in the current research.

Aiming at fulfilling this gap, this article intends to contribute previous studies on modularity, modularization and outsourcing by *deepening the understanding of the wider program which a firm need to go through in order to transfer the organization into a more dynamic and flexible unit [modular organization]*. The aim and structure of this article is two-folded:

Firstly, and perhaps more importantly, this article intends to unveil and provide understanding of the process of internal reorganization that is required for decomposing internal activities [see Fig. 1]. Previous research has illustrated the difficulty in designing

modular production systems in comparison interconnected systems and consequently provided tools for modularization of internal activities (e.g., Baldwin and Clark, 1997). However, such studies provide only scattered and partial results of the wider organizational changes that firms need to undertake prior to organization-wide transformation. That is, modularization is often seen as a tool to manage *internal* complexity by decomposing activities into smaller sub-systems (Mikkola, 2006), or it is often focused on specific modules (see Kotabe et al., 2007). Yet, only limited empirical evidence exists on the company-wide modularization process completed for the purpose to assist in further outsourcing. Thereby the first research objective is *to examine the process of internal reorganization [organizational modularization] which primarily aims at building suitable structures for interorganizational decomposition of production activities [outsourcing]*.

Take in Fig. 1

The second objective of this article, as illustrated in Fig. 1, is to examine the process of transformational outsourcing, how it differs from other forms of outsourcing, what kind of benefits it can provide for companies utilizing such strategy, and what it requires from existing organizational structures. Although outsourcing as a concurrent phenomenon has recently been under wider scrutiny by researchers of several research streams (see Hätönen and Ruokonen, 2007), only little attention has been paid to outsourcing that aims at wider changes in production systems towards emergent organizational forms (Miozzo and Grimshaw, 2005), i.e., transformational outsourcing. Linder et al. (2002) define transformational outsourcing "…as a program to change the way a company works by using outsourcing to achieve a rapid, sustainable, radical improvement in enterprise level

performance.", but much remains unknown about this 'program'. This leads to the second objective of this article, which focuses on *examining the process of outsourcing which aims at wider changes in production systems towards emergent organizational forms [transformational outsourcing]*.

2. LITERATURE REVIEW ON MODULARIZATION AND OUTSOURCING

2.1. Modularization of products and processes for outsourcing

In line with the current developments, literature has provided quite extensive results on the benefits yielded by modular organizational forms (e.g., Davidow and Malone, 1992; Dess et al., 1995; Sanchez and Mahoney, 1996; Schilling and Steensma, 2001, 2002). Benefits therein have been described such as organizational flexibility (Baldwin and Clark, 1997; Schilling and Steensma, 2001), product change and variety (Baldwin and Clark, 2000; Brusoni and Prencipe, 2001), improved innovation (Baldwin and Clark, 1997), reduced design and development time (Ulrich and Eppinger, 1999), and enabled parallel design and testing (Loch et al., 2001), just to name but a few.

But if modularity brings all the stated advantages, why aren't all products and processes modular? In their seminal article, Baldwin and Clark (1997) respond to this controversial issue simply by stating that modular systems are much more difficult to design than comparable interconnected systems. Therefore, much recent work has been examining modularization of products and processes (e.g., Baldwin and Clark, 1997; 2000; Brusoni and Prencipe, 2001; Langlois, 2002; Mikkola, 2003, 2006; Sanchez and Mahoney, 1996; Schilling and Steensma, 2001, 2002), which simplistically entails decomposing the system into smaller sub-units that can be managed and designed independently; yet function together as a whole (Baldwin and Clark, 1997). Yet, much of this research focuses

on analyzing the effects of modularization in managing internal complexity (e.g., Sanchez and Mahoney, 1996), or on a descriptive level, how it enables coupling and recombining modules from various sources for various customer configurations (e.g., Schilling, 2000). Yet, as argued, in this article we aim at increasing our understanding on building modular structures that not only assist in managing internal complexity, but on how building modularity that assist also in transferring activities to external vendors. In the following, we address the connection between modularity and outsourcing. Such modularization can be referred to as outsourcing transformation, which can be defined as a program to rearrange internal processes and product architectures in order for creating structural prerequisites for successful organizational transformation through outsourcing.

Although it has been rather conclusively stated that high degree of modularity embedded in product and organizational structures significantly eases outsourcing (e.g., Mikkola, 2003), previous research has provided only scattered results on the reasons why modularity enables the realization of benefits from outsourcing. Building on previous findings on modularity, at least five separate yet to some extent overlapping reasons can be put forward as to why modularization enables successful third-party dispersion of activities, and in other words, outsourcing.

1. *Enabling independent design, production and management of activities*. On its most abstract level, system modularity refers simply to the degree to which a system's components can be separated and recombined (Schilling, 2000). Modularization enables disentangling and decomposition of components and activities from the system. Through limiting interdependencies between the subsystems [modules] that communicate with each other through simple interfaces, subsystems can be

designed and managed independently and are thereby amenable for outsourcing (Baldwin and Clark, 1997; Mikkola, 2006).

2. *Enabling parallel design, production and management of activities.* It is not enough that activities can be managed independently, but for successful outsourcing there needs to exist a possibility for parallel design and production of activities. Even though certain activities can be performed independently, if the activities have many ties with other activities in the system, the production is deemed to be sequential. Sequential nature of the production process imposes several difficulties for outsourcing (see McDermott and Handfield, 2000). For instance, if various parts of the production and design processes of the entire system interlink, decomposing an activity would acquire a vast amount of cooperation and consequently coordination. However, when the system is becomes decomposed in smaller subsystems that operate independently and communicate with each other through standard interfaces, modularity enables parallel and sequential design, production and testing of the outsourced activity (Loch et al., 2001).
3. *Increasing the transferability of activities.* Modularization coerces firms towards establishing visible design rules to the design process (Baldwin and Clark, 1997). Such design rules enable more fluid transfer of activities as they improve teachability and codifiability of the activity and thereby decrease the complexity of the transferred activity (cf. Kogut and Zander, 1993). Even tacit knowledge can be made explicit and transferred relatively freely across national and organizational boundaries (Nonaka and Takeuchi, 1994). Through the visible design rules, modularization can be expected to manifest the existing design architectures and thereby increase the transferability of activities.

4. *Enhancing the management of dispersed activities*. Modularization simplifies coordination of the decomposed activities (Sanchez and Mahoney, 1996; Schilling, 2000). If an outsourced activity is embedded to the entire production process, management of such relationship would involve individuals throughout the value chain process. Well-defined interfaces allow individuals working on particular components to work in whatever departmental configuration they deem most desirable, and still be assured that the components will interact effectively (Schilling, 2000).
5. *Decreasing the transaction cost from attachment of new activities*. Schilling (2000) proposed that the adoption of increasingly modular product designs may result in both the further differentiation of firm capabilities and the development of diverse technological options. Modularization enables attachment of activities to the system. Decomposing the internal activities into modules which communicate through standard interfaces eases significantly the attachment of possible new modules to the system. This may shift the company to lean towards 'buy' in future make-or-buy decisions.

Even though modularity can be seen to assist in the process of outsourcing in various ways, according to Schilling (2000) modularity is not prominently embedded to the system, but systems that were originally tightly integrated may be disaggregated into loosely coupled components that may be mixed and matched, allowing much greater operational flexibility. Such a process can be described as modularization of the design structures. Previous research has concluded that modularization can occur in two basic levels; 1) in product design architectures [creating product modularity], and 2) in the processes these products are designed [creating organizational modularity] (e.g., Baldwin and Clark, 1997;

Brusoni and Prencipe, 2001; Fine et al., 2002; Kotabe et al., 2007; Langlois, 2002; Sanchez and Mahoney, 1996).

Products (1) can be made increasingly modular both by expanding the range of compatible components [increasing the range of possible product configurations] and by uncoupling integrated functions within components [making the product modular at a finer level] (Schilling, 2000). Such uncoupling basically entails breaking up the system into discrete modules that communicate with each other through standardized interfaces or rules and specifications (Langlois, 2002). The key is to decrease the complexity of the system by decomposing the complex tasks of the system into simpler independent units that communicate with each other through standard interfaces without compromising the overall performance (Mikkola, 2006), and by limiting the interfaces between those modules into minimum (Baldwin and Clark, 1997). As stated by (Langlois, 2002), complexity is a matter both of the sheer number of distinct parts of the system comprises and of the nature of the interconnections and interdependencies among those parts.

Not only is it sufficient that products as such are modular, but also the process in which they are produced must be modular for successful interorganizational transfer of production activities. Managing product modularity requires an intense effort of knowledge and *organizational* (2) coordination (Brusoni and Prencipe, 2001), and therefore it is plausible to expect that to capitalize on the full spectrum of benefits enabled by modularity in product architectures, companies must adopt modularity in their design process as well. Modularization of product designs can pave the way for similar modularization of organizational designs (Ethiraj and Levinthal, 2004), thus facilitating the coordination of activities via an “information structure” rather than hierarchy and managerial authority (Sanchez and Mahoney, 1996). Such structure delineates the lines of authority and seeks to

minimize redundant information flow, reduce conflicts, and improve coordination (Ethiraj and Livinthal, 2004).

As illustrated, modularity within the product architectures not only enables economies in product design but also greatly simplifies their coordination (Schilling, 2000), enabling independent and dispersed design and management of different modules. If all components must be tightly integrated and optimized for each other, their production often requires that all individuals involved in such design and production also work in close contact. A firm that creates well-defined standard interfaces can allow the individuals working on particular components to work in whatever departmental configuration they deem most desirable [even if that means that the departments are highly autonomous], and still be assured that the components will interact effectively (Schilling, 2000). However, though previous literature makes a strong prediction that product and organizational modularity correlate (see Brusoni and Prencipe, 2001), research has shown that this is not automatically the case (Brusoni and Prencipe, 2001; Sanchez and Mahoney, 1996). Nevertheless, companies need to take separate actions to reorganize internal activities and processes in order to correlate the changes made in the product architecture. According to Baldwin and Clark (1997) to compete in a world of modularity, leaders must redesign their internal organization. In order to create superior modules, they need the flexibility to move quickly to market and make use of rapidly changing technologies, but they must also ensure that the modules conform to the architecture. Such ability entails not only possessing organizational dynamic capabilities[3] but also requires adapting to modular design principles in both the product architecture and organizational structure.

[3] Dynamic capabilities can be defined as "the firm's ability to integrate, build and reconfigurate internal and external competence to address a rapidly changing environment" (Teece et al., 1997).

2.2. Transformational outsourcing – Building flexibility through outsourcing

As argued, the inconsistency with current research is that the modularization of products and processes does not automatically lead to the creation of modular organization: instead, firms also need to outsource these 'modularized' activities. According to Miozzo and Grimshaw (2005) it has been widely argued that firms outsource activities because they can either save on costs or focus on core competences, but as mentioned, little attention has been paid to wider changes in production systems towards emergent organizational forms. Whereas 'traditional' outsourcing is referred to as one of the great management ideas of the 20th century (Sibbet, 1997), transformational outsourcing has been recently referred to as a growing phenomenon of the 21st century (Engardio et al., 2006). Despite this, Linder (2004), e.g., argues that only a few companies have successfully implemented an outsourcing strategy aimed at radical change and enterprise transformation, as moving business to an adaptive state is a very significant task requiring highly substantial skills (Mazzawi, 2002).

But what entails transformational outsourcing, and how does it differ from 'traditional' outsourcing? Linder (2004) similarly defines transformational outsourcing as a strategy that seeks a rapid, sustainable, step-change improvement in enterprise level performance. Accordingly, based on Linder (see also Linder et al., 2002; Mazzawi, 2002), transformational outsourcing from the motivational perspective can be defined as a process of outsourcing where the main motive is not to cut costs or acquire resources but rather to transform the entire organization into a more dynamic, adaptive and flexible economic unit. A comparison of 'traditional' and 'transformational' outsourcing is presented in Table 1.

Take in Table 1

As transformational outsourcing seeks to achieve modular organizational structures, the eventual benefits yielded by this strategy are similar to those of modular organizations. As stated by Mazzawi (2002), contrary to "traditional" outsourcing which focuses on sweating assets harder or acquiring capabilities that do not internally exist, transformational outsourcing is about changing the paradigm, i.e. targeting a new adaptive and modular enterprise (Mazzawi, 2002). However, in contrast to the notion of Linder (2004) and Mazzawi (2002) that transformational outsourcing is a more or less strategic option similarly to traditional outsourcing, Morgan (2003) suggests that transformational outsourcing is rather a phase that can be achieved through evolution and incremental learning. Morgan argues that the path to transformational outsourcing entails following five specific landmark stages:

1. *Embryonic stage*. Companies seldom outsource value-added activities and basic commodity-type offerings for rudimentary cost-saving purposes in order to fix immediate problems.
2. *Developmental stage*. Companies seek to deploy outsourcing to areas which are more central to business processes.
3. *Consolidation and inter-linking outsourcing stage*. Companies adopt an over-arching outsourcing strategy which is designed to dovetail their business strategizing. At this stage, outsourcing is considered a key strategic resource.
4. *Business process outsourcing stage*: Key process activities are outsourced with full contractual responsibility granted to the outsourcing vendor.

5. *Bespoke and custom-built frameworks stage*. Outsourcings become hybrid forms of entrepreneurial venturing where strategic alliances occur to create a new independent business entity. They are designed to be distinct but they offer the companies the benefit of releasing resources to focus upon the key competencies.

According to Morgan (2003, also Amoribieta et al., 2001; Maskell et al., 2005), as knowledge builds and capabilities develop, outsourcing organizations can build greater levels of commitment to their partners and gradually expand the proportion of activities that are outsourced. Especially in areas of knowledge-intensive activities, outsourcing does not entail a single substitution of internal services but rather a more complex process of knowledge transfer that requires reciprocal learning and interaction (Miles, 2003). Accordingly, transformational outsourcing may not be a substitutive option for 'traditional' outsourcing but a highly evolved stage of relationship which can be characterized by high levels of trust and commitment with the supplier (Morgan, 2003). This is due to the fact that the transactions involved in transformational outsourcing are typically large, complex, strategically and operationally important, and should thereby rely on close relationship with the supplier (Mazzawi, 2002). Therefore, in relation to traditional outsourcing, it may be argued that transformational outsourcing is preceded by the learning process from 'traditional' cost and resource driven outsourcings. Although from slightly different perspectives, such incremental learning and sequential progress in the outsourcing strategy has been noted by several other researchers as well, by suggesting, e.g., that offshore outsourcing represents a sequential learning process in which cost advantage motives precede differentiation advantages and near-shore locations precede far-shore outsourcing (Amoribieta et al., 2001; Graf and Mudambi, 2005; Hagel and Brown, 2005; Maskell et al., 2005).

2.3. Modularization and transformational outsourcing in the ICT industry

Outsourcing and consequent systematic shift towards the disintegration of vertically integrated firms in the direction of modular design structures has occurred throughout the value chains in diverse industry sectors including aircraft (Brusoni and Prencipe, 2001), the automotive field (Tully, 1993; Mikkola, 2003, 2006) and power tools (Utterback, 1994), but nowhere is this development more starkly noticeable than in the area of innovation and technology development (Cantwell and Narula, 2001). In fact, the modular design principles have been widely adopted by firms in the ICT industry[4] (e.g., Baldwin and Clark, 1997; Langlois and Robertson, 1992; Miozzo and Grimshaw, 2005; Schilling, 2000; Sturgeon, 2002). For instance, in the management of software and programming, modularization for managing complex systems dates back to the turn of the 70s (Dijkstra, 1968; Parnas, 1972), ideas which has since been widely adopted by researchers (Brown and Wallnau, 1998; Cusumano, 1991; MacCormack et al., 2006; Parnas et al., 1985; Stone, 1985; Vignone, 1980; von Hippel, 1990). In addition to software production, modular designs have also been illustrated in several more tangible product areas in the ICT industry, such as personal computers, telecommunications devices and IT systems (Langlois and Robertson, 1992; Miozzo and Grimshaw, 2005).

But why have modular design principles been widely sought and adopted by organizations in the ICT industry? Globalization, improving information and communications links and declining interaction costs, among other things, are providing companies – especially those in the fast moving industries – unprecedented possibilities to

[4] The ICT industry can be defined as "a family of electronic technologies and services used to process, store and disseminate information, facilitating the performance of information-related human activities, provided by, and serving the institutional and business sectors as well as the public-at-large" (Cohen et al., 2002).

exploit the resources of more focused business enterprises and thereby restructure their businesses (Doig et al., 2001). In the ICT industry, perhaps the drive towards flexible organization structures is one of the strongest, as in this dynamic field the impact of globalization has been largely discernable (Nummela et al., 2005). Linder (2004) argues that organizations that need to launch and scale rapidly in order to succeed are prime candidates for transformational outsourcing. Similarly, Sturgeon (2002) states that especially in the context of volatile demand and rapid technological change, such modular production networks yield greater economic performance than other models (see also Achrol, 1997; Baldwin and Clark, 1997; Miles and Snow, 1986). For this reason, outsourcing has been touted as a highly effective strategy, especially in fiercely contested and fast-moving sectors such as ICT (Fine, 1998). On the general level, Schilling and Steensma (2001) suggest that the prime catalysts for modular organizational forms are (1) availability of standards, (2) technological change, and (3) competitive intensity, all of which have been widely noticed in previous research focusing on the ICT industry[5][6][7].

Despite the extensive amount of evidence of modularity and outsourcing in the ICT industry, much still remains unknown about the wider process firms need to undertake in order to shift from tightly integrated hierarchy to loosely coupled modular organizations in which internal governance mechanisms are supplanted by networks of organizational actors. The ICT industry provides a prime area for focus further research, as companies that seek to grow rapidly – especially in fast moving and fiercely contested industries – do not frequently build their processes or product architectures in a modular manner which would

[5] For *availability of standards* embedded in products and processes, see, e.g., Arora et al., 2001; Baldwin and Clark, 1997; Lall et al., 2004; Langlois and Robertson, 1992; Sturgeon, 2002.
[6] For the intensity of *technological change* and its impact on modular organizational forms, see, e.g., Hagedoorn and Duysters, 2002; Madsen and Servais, 1997; Quinn, 1999; Venkatesan, 1992.
[7] For *competitive intensity*, see, e.g., Cohen et al., 2002; Fine, 1998; Nummela et al., 2005.

consequently be transferable, but they often need to adopt internal measures for building transferability before outsourcing can successfully occur. Also, it is argued that the modularization of product architectures in technology-intensive and knowledge-driven organizations occurs in parallel with the firm's growth, since companies first build their knowledge base through project work and later start productizing this knowledge into scalable modules while further adopting modular design principles (Alajoutsjärvi et al., 2000; Ethiraj et al., 2005; Moore, 2000; Seppänen, 2002). This transformation of internal processes that provide suitable settings for outsourcing – especially within the context of small and medium sized firms – is something that has been largely overlooked by the former research. Therefore, to increase our understanding of this complex area, in following two exploratory case examples are provided, which aim at developing and further elaborating this phenomenon..

3. RESEARCH METHOD AND CASE DESCRIPTIONS

The empirical part of this article consists of in-depth case analyses of two medium-sized companies [Datamatic and EduTech[8]] in the ICT industry. Although the two cases were selected to describe and illustrate the same phenomenon, they represent situations where companies are in different phases in adopting modular design principles. Therefore, the aim of the cases is not to carry out comparative cross-case analysis: rather, the attempt is to describe two differing phases towards modular organization structures; 1) internal reorganization [outsourcing transformation] and 2) transformational outsourcing. The cases

[8] Due to the fact that the discussed issues in this paper entail parts of their current strategies, the company names have been changed. Such an agreement reduced the researcher's data access limitations with respect to the case companies concerned (see Mckinnon, 1988).

were selected from the embedded[9] software industry on the basis of their possible explanatory power and how they fit the conceptual categories (see Eisenhardt, 1989). This is because products consist of both hardware and software in the embedded software industry, thereby bringing both tangible and intangible aspects to the analysis of transformational outsourcing and the internal reorganization. Also, as was argued, medium-sized firms provide a fruitful basis for addressing research objectives, as they are prime proponents for organizational reorganization and restructuring.

The empirical study for this article was conducted qualitatively mainly through face-to-face interviews[10]. As for *EduTech*, two interviews [approximately 90 minutes each] were conducted in September 2006 and December 2006. These interviews were recorded and consequently transcribed for further analysis. For the purposes of the explored phenomenon, the CTO of EduTech and the CEO of Ornicom, which represents the 1st tier supplier to whom EduTech primarily outsourced their production, were interviewed. The CEO of Ornicom was a former employee of EduTech and was involved in the initial outsourcing decision-making. As concerns the *Datamatic* case, preliminary interviews with the company's CEO, Software Manager and Product Development Manager were conducted during the fall of 2006. At the time, the company only had initial strategic plans for process reorganization and outsourcing. However, when steps were taken towards outsourcing in early 2007, the researcher participated as an observer in three management

[9] Embeddedness entails software that may not be visible to the end user but nevertheless operates a particular electronic product. Examples include software for remote controls or various household appliances. For the purposes of this study, embedded software is considered to be software sold as part of a tangible product, whether or not it is visible.

[10] The researcher had conducted several interviews in both case companies prior to this study. The intention of these interviews was to clarify both companies' product strategies, operational logics and management structures. Accordingly, the researcher had a good general knowledge of the companies' operations prior to the interviews for the purposes of this study.

group meetings, during which issues concerning these plans were discussed, analyzed and further steps were developed.

Although qualitative research suffers in terms of broader reliability and validity, based on the explored phenomena and accordingly for the purposes of this study it provides a feasible approach. As also argued by, for instance, Morgan and Smircich (1980), this is because the appropriateness of qualitative research derives from the nature of the social phenomena to be explored. According to Ethiraj and Levinthal (2004), the problem of modularity and complex systems designs is that it is not an exact science that will result in an optimal solution. This in parallel with the complex and highly context dependent nature of outsourcing – which should be taken into account to understand the dynamics involved in the setting (Halinen and Törnroos, 2005) – led to adopting qualitative approach for the purposes of this study (Yin, 1994). In fact, mainly due to the complexity of the issue of modularity, recent research has widely adopted qualitative approaches to explore the complexities of modularity and modularization (e.g., Ethiraj and Levinthal, 2004; Kotabe et al., 2007; Mikkola, 2006; Miozzo and Grimshaw, 2005). Studying areas of complex phenomena in real-life context, only qualitative methods provide the rich knowledge that theory development requires (Shah and Corley, 2006; Yin, 1994). Accordingly, the following qualitative case examples, based on in-depth empirical case work and inductive reasoning (Eisenhardt, 1989; Lukka, 2005), aim at theory development in complex areas of outsourcing transformation and transformational outsourcing.

3.1. Business transformation for outsourcing in Datamatic Ltd.

Datamatic provides solutions for managing personnel and materials flows as well as for labeling and marking of products, including software applications as well as the required

labeling [applicators] and reading [terminals] devices for comprehensive solutions. In addition, on request, Datamatic can also provide their customers with all the consumption materials such as stickers and labels. In 2006 Datamatic obtained a turnover of 11 mEUR and employed 62 persons. Their operations are highly localized, as their turnover accumulates nearly fully from domestic markets. Some sporadic exports are made to neighboring countries.

Since the company was established through incorporation of an MNC business unit in 1989, Datamatic has operated to a large extent by applying a similar operational logic which states that, in terms of hardware, all components are sourced from component suppliers which are then assembled [including software installation and testing] on the company's premises. In terms of software, the core software as well as the possible tailored elements required for single solutions delivery are all developed internally. Software solutions for production, logistics and labeling are based on the company's internally developed DatBar product family. The current operational model is illustrated in Fig. 2.

Take in Fig. 2

As illustrated in Fig. 2, when an order is received from a customer, Datamatic opens a project for it, mainly entailing the assignment of a project manager. Afterwards, the project is defined in its entire breadth, including product descriptions and specification of the components needed to assemble such products. After placing an order for the components, the project manager defines the software required for the solution. If existing solutions are insufficient for customer requirements, the product manager assigns a tailored development project to develop the software. After the components ordered arrive at the

company, the project manager takes responsibility for assembling the products, installing software for them and testing that the entity works. Only after these steps can the products be transported to the customer, which are then installed and integrated in the existing legacy systems of the customer. All of these as well as the training of the customer's personnel are tasks to be managed by the product manager.

In spite of the long history and consequently established working processes, increasing competition coerced the company to rethink their operational logic in late 2005. The main reasons were based on inflexibilities in the production process. As the product development manager of Datamatic stated:

> *"…now the same person [internal employee] does the project management activities, assembles the applicators and terminals from parts, installs the software to the products and finally tests that each one of them works. After that, he goes to the customer and installs and integrates the solution and finally provides required services. In the future, the plan is that the person could focus on project management activities, designing some special applicators [tailored applicators], and on implementation and training work to the customers. We do not see the business in stretching cables or in twirling nuts and screws, and also, such work ties up our valuable resources."*

The company made a decision to focus on certain strategic areas, mainly core software development and delivery project management. As a result, a new pursued operational model was proposed. This model is illustrated in Fig. 3.

Take in Fig. 3

The strategic decision made in Datamatic in 2006 stated that they would focus their resources on core software development rather than on project work of assembling tangible products or making tailored software solutions. However, they possessed some hindrances

for moving towards such operational model. *First*, the company had a large number of variations in their product assortment that used several different components from several different suppliers. The management concluded that relying on several suppliers on parts poses an operational risk. In addition to the large number of possible product variations, in many cases the company fully customized their products as per customers' requirements. Such issues caused difficulties in project management and increased the need for labor-intensive tasks. *Second*, the architecture of the software solutions of the DatBar product family entailed highly interconnected parts, and was poorly documented. The interconnections and the lack of documentation of the existing software architecture made it impossible to outsource any tailored projects, because there was little hope of defining the boundaries of a module or describing the interfaces needed to attach the module to the system. As the software development manager put it:

> *"At minimum we need to document the software to see what is in there and how they connect to each other. Only then can we see what kind of modules can be outsourced. Another story is if we want to outsource […]: in that case we most probably have to do a lot more than just documenting."*

Third, the current production processes were highly uncoordinated. It was not fully clear to the management who was using a specific period of time in each production phase. Furthermore, the management of these processes relied on shared responsibility and, accordingly, loose hierarchies. Though such interactive management structure was working when everybody was under the same 'roof', the managers realized that it could cause severe difficulties when operating with suppliers. *Finally*, the suppliers in their current supplier base of components were incapable or unwilling to expand their activities into product assemblies. Faced with these issues, the company concluded that this

transformation would require the following internal steps to be taken, which were consequently implemented.

1. Reduce the variations in the product assortment. The goal was to decrease the number of applicator product variations from the current 15-20 models into 7 standardized models. In addition, the further goal was that 80 per cent of all solutions sold would be based on those standardized models.
2. Further modularization of products. The firm's strategy and operations logic is that all the scalable software applications for their solutions are developed internally according to a common platform. However, their current solution entailed several interconnections which were poorly documented. Therefore, the process of re-programming and simultaneous documentation of the existing software solution was initiated in early 2006, and was finalized in early 2007.
3. Clarification and division of production processes. As seen in Figs. 3 and 4, shifting to such a production model entails many of the value chain activities such as component definition, product assembly, software installation, product testing and solution delivery to be turned to the vendor. The management drafted an outline of how each phase of the production process was connected to each other to define how outsourcing would affect the entire production and delivery process. Such an outline determined what kind of cooperative processes needed to exist with the supplier when these activities are outsourced.
4. New division of responsibilities. Datamatic assigned the current product development manager to be responsible in all outsourcings of the activities related to tangible products. In terms of software outsourcing development projects, the company increased the responsibilities of their most capable software developer,

and as a result created a position of software sourcing manager, which answers and together implements the software sourcing projects with the software development manager.

5. Finding a supplier. As mentioned, the current component suppliers are unable to provide the company with the service that was stated in the strategy. After the internal reorganizations [phases 1-4], the company intended to start screening for possible suppliers.

After the product, process and management related changes in points 1 through 4 were implemented in 2006 and early 2007, the company started to take actions as stated in the strategy. First, the company undertook a small software development project externally as a pilot. They wanted to test the transferability of activities of the re-architectured software product with a local provider prior to outsourcing larger entities, possibly to low-cost locations such as India. Secondly, the company started to screen possible suppliers that could provide them with the sort of service described in the new operational model. Also, one suitable candidate was piloted through a small subcontracting project to test the service level. Presently, the company occupies a phase in which it is gradually outsourcing the activities to selected vendors, and thereby facing new issues regarding this transformation process.

3.2 Case: Transformational outsourcing in EduTech Ltd.

EduTech Ltd provides technology-based solutions such as language labs, teaching software for ICT classrooms, virtual classroom solutions and classroom management solutions for language teaching and technology-enhanced teaching in educational institutions. The solutions provided by EduTech are basically constellations of software [e.g., a client-based

classroom management system] and hardware components [e.g., recording devices and headsets]. Furthermore, on request the company also provides, e.g., furniture suitable for the equipment for installation in the language labs. In 2006, the company had a turnover of 9.3 mEUR and employed 77 persons. EduTech can be considered highly internationalized, as it has channel partners in over 60 countries, solutions active in over 100 countries and installations in over 19,000 institutions around the world.

The history of the company dates as far as 1961, though since that time the company has undergone several proprietary changes and the current form of the company was established through a management buy-out in 2001. This stage was preceded by a clarification of the corporate strategy which was initiated by technological changes in the industry in the mid-1990s. At the time, the existing products of the company which were based on old tape recording-based audio systems were declining in quantities, while new products based on multimedia recording were increasing in demand. However, at the time a majority of the firm's turnover still accumulated from the products relying on the old tape-recording technology. Regardless, the changes in the demands and technologies impelled the firm to take a strategic initiative to shift towards a clear focus on software development, to lead eventually to a situation in which the entire production of hardware appliances would be outsourced. To implement this plan, the management group came up with six operational policy alternatives:

1. Do not do anything. Wait until there is no demand on the market for the old technology. In the mean time, adjust the resources according to the decreasing needs.
2. Outsource the whole recorder production to a low cost country, like China.

3. Outsource the production to a subcontractor, which is so near to us that our manufacturing people can move to that company.
4. Outsource the production through management buy-out [MBO].
5. Sell the whole production line.
6. Run down the whole product line and speed up the unavoidable development and make it happen in a controlled way.

All of these options had their pros and cons, which were thoroughly analyzed before making final decisions. First, just waiting for the demand to decrease might result in quality risks, as it ties many valuable resources from the new business. Also, the decreasing quantities continuously increased the production unit costs. Secondly, after a preliminary examination of candidates in China and in other low-cost locations, the managers concluded that those partners that were able to 'insource' the production were not interested, and those who could were not. Furthermore, such turnkey outsourcing would require key resources to be sent to the partner to run up the production. Thirdly, they found the alternative of a local subcontractor possible. However, the subcontractor should be able to guarantee the quantities long enough. As the quantities were falling, the issue was also in seeing the possibilities for long-term cooperation with the subcontractor. Fourthly, although the possibility of a MBO was viable, the best MBO candidates were not interested. Fifthly, although many Chinese companies were highly interested in buying the entire production line, the management group concluded that the buyer would require a large amount of assistance in running up the production, which in turn would tie up too much of the firm's resources. Finally, despite the high portion of the turnover, one possibility would be to focus on single product technologies and replace declining sales with multimedia products.

Faced with these challenges, the management group decided to implement a combinative resolution of options 2, 3, and 6. This decision entailed first developing a well-prepared plan to close down the [tape] recorder production. Secondly, outsourcing the manufacturing of the multimedia units and headset adapters [hardware volume products] to China was decided on. Thirdly, outsourcing the rest of the production of tangible products to a local subcontractor located so closely that the manufacturing people could be transferred to that company was resolved. Such decision-making enabled the achievement of a strategic focus towards a software organization as well as product-wise focusing on multimedia products, as they provide better future prospects. Fig. 4 illustrates the created production model from a highly vertically integrated company.

Take in Fig. 4

Fig. 4 illustrates a simplified example of the achieved operational model through transformational outsourcing in EduTech from a tightly integrated production unit of software and tangible components. As illustrated in the Figure, when the order arrives at EduTech, it merely operates as a through-passage by only validating and confirming the order. The order is directed to Ornicom, which automatically identifies the required products and the needed components for the final delivery. For the volume products [product A in the Fig.], Ornicom further subcontracts the production to their Chinese partner. The more knowledge-intensive products [products that for instance require software embedded in them] are produced [assembled] in the company from third- party components sourced from various suppliers [components B and C in the Figure]. After all the required products have been produced and assembled, EduTech delivers the software

that will be embedded in the products as well as all the applications for the final delivery to Ornicom, which then installs the software in the products. When the volume products arrive from the subcontractor, Ornicom merges the entire solution and ships it to the customer. After shipment, EduTech and its authorized partners provide the customers with implementation support as well as training.

Through such a decentralized sourcing agreement whose management is 'outsourced to the 1st tier supplier [Ornicom], EduTech has been able to achieve cost advantages through outsourcing volume work to low cost location and simultaneously achieving flexibility for the production of tighter lead-time requirements. Yet cost cuts were never a primary motive for the organizational restructuring. In fact, it was later calculated that direct production costs increased approximately 15-20 per cent to the calculated internal cost. Regardless, EduTech has been fully satisfied with the results of the outsourcing arrangement. As the current CEO of Ornicom, former manager of EduTech, stated:

> *"It was never about cutting costs! We just did not see our business in the manufacturing and assembly of tangible components. We wanted to outsource all what was not core for us. What we wanted was to achieve business-as-usual but with a better business focus."*

One of the main reasons why EduTech was able to rapidly shift the production of their tangible products across company boundaries was the fact that nearly all the personnel involved in the production was transferred to the subcontractor. In fact, even the former production manager of EduTech became the CEO of the company, which led to the fact that all the tacit knowledge embedded in the production activities was transferred to the vendor, and practically no training or teaching was necessary. In terms of proximity, the subcontractor moved their facilities next door to the company, resulting in only a wall

separating the two companies. Such proximity and fluid transfer of activities was referred to as the key factor behind achieving operational flexibility with on-time turnkey outsourcing of production, with only limited impact on production in the transition phase. Citing the software manager of EduTech:

> *"The transformation was rather easy. Even the very next day [during the outsourcing initiation], I could still go to the same guy with the same problem. The only difference was the color of his jacket…basically."*

Although the created strategy underlined that the company would compete by focusing on software development rather than the production of tangible products, later the company also sought flexibility through outsourcing structured software development tasks. This was enabled by the modular architectural structure of the software. The software developed for the previous product versions [such as the tape recording units] was tightly interconnected 'lump' of functions, and if one wanted to change, add or remove functions from it, it affected many other functions in the system, which made such outsourcing options previously difficult or close to impossible. It was described as a

> *"…house of cards which you did not want to even poke with a long stick, as it would have made it collapse." (CEO, Ornicom)*

As a result of learning about these mistakes, the company applied modular design principles in starting to develop the new product platform during the mid-1990s. This meant that parts of the software could be removed, replaced and attached without impacting the functionality of others. Such modularity enabled independent design and the production of modules. The firm capitalized on this possibility on a few occasions simply by outsourcing the development of highly structured and interdependent modules that would be attached to the system. One of the outsourcing cases, in which the development of a

larger module was outsourced to a Hungarian vendor, led to further outsourcing of the maintenance and further development of the entire product they had developed the module for. Such outsourcings enabled great flexibility in software development. This issue is further elaborated in Chapter 4.

4. DISCUSSION AND IMPLICATIONS

The two exploratory cases illustrated above assist in gaining a deeper understanding of the various aspects of the phenomenon studied. The case of EduTech Ltd illustrates a successful implementation of organizational restructuring towards modular principles. On the other hand, the case of Datamatic Ltd provides useful insights for the challenges that firms face prior to large-scale interorganizational decomposition of activities. In the following chapters, the results of these cases are further elaborated.

In general, the results based on both cases propose that transformational outsourcing is preceded by a clarification of strategic focus towards narrower specialization. Accordingly, the results suggest that the drive towards increasing specialization under competitive pressures is the cause of de-verticalization, and not vice versa. In both of the illustrated cases, firms decided to focus on scalable software development work and outsourced, or then began the process towards outsourcing – activities that possess high labor-intensity such as product assembly work and tailored software development tasks. This result is in line with earlier studies which have found that in seeking operational modularity, design activities are outsourced to lesser extent than manufacturing (Brusoni and Prencipe, 2001). Furthermore, results suggest that the main external drivers for organizational modularity and, accordingly, to transformational outsourcing lie in technological change and increased competitive intensity, which have also been identified

by earlier studies (e.g., Schilling and Steensma, 2001; Sturgeon, 2002). However, the availability of standards, which is stated for instance by Schilling and Steensma (2001) as one of the prime catalyst for modular organizational forms in the industry, operated more as an enabler and not as a primary driving motive.

Though Schilling (2000), for instance, suggests that the heterogeneity of inputs and demands acts as the driver towards the modularization of a system, it can be argued that a certain level of homogeneity in demands also impels modularization of the system in the software industry. This derives from the fact that if customers' demands are fully heterogeneous, the costs of modularization supplant the benefits of modularization, and in such cases solutions may be fully tailored to the customer's needs.

4.1 Outsourcing transformation – creating an outsourcing organization

Although several prior studies (e.g., Amoribieta et al., 2001; Levina and Ross, 2003) suggest that the key to outsourcing lies in finding a competitive supplier, this article argues that, without diminishing the importance of later selection of right supplier, firms should take internal measures to build a suitable setting for interorganizational decomposition of activities in aiming at wider changes in production systems prior to supplier selection. These actions were conceptualized as outsourcing transformation. It was stated by representatives of both case companies that one of the success factors behind transformational outsourcing lay in prior systematic planning of outsourcing as well as the prior internal reorganization of activities and tasks. Therefore, it can be expected that prior internal reorganization exerts a positive impact on success and the realization of outsourcing benefits.

According to the Datamatic case, companies go through several phases prior to finding a supplier for the outsourced activities. This internal reorganization process or outsourcing transformation was defined as a program to modify internal processes and product architectures in order to create the prerequisites for successful outsourcing. Where previous research on modularization suggests a two-fold distinction for internal modularization [product and organization], based on the results in the Datamatic case, this article suggest that modularization activities can be divided into three categories based on their identifiable sequential process in building modular structures for later outsourcing. According to this analysis, the program consists of three sequential though to some extent parallel stages: (1) product design modularization, (2) design process modularization, (3) organizational modularization.

The results of both cases propose that the key to *product design modularization* (1) lies in limiting the interdependencies within the product [this is further illustrated in Fig. 5] and turning as much tacit information into explicit form as possible. According to Baldwin and Clark (1997), the first step towards modular structures in design process is to redefine the cells in the production process. With limiting the interdependencies with the different parts of the product(s) [system], they can be managed and designed independently, and thereby creating possibilities for outsourcing. This result is aligned with the previous studies on modularization of product architectures (e.g., Baldwin and Clark, 1997; Mikkola, 2006; Schilling, 2000). In line with Baldwin and Clark (1997), the re-architecting process illustrated in the Datamatic case entailed mainly undertaking activities for enhancing transferability of activities such as limit interdependencies within and between products and the documentation of product architecture. Although it is generally argued that products can be made increasingly modular by expanding the range of compatible components

[increasing the range of possible product configurations] (e.g., Schilling, 2000), it was argued in the Datamatic case that modularization driven by later outsourcing actually requires the downsizing of possible product variations in some cases. This was due to the fact that the more product variations the firm nurtures, the more component variations are needed, which in turn leads to the need of more suppliers to provide these components. Datamatic did not want to have several suppliers in their portfolio but rather a few focused ones, with whom they could build deeper relationships. According to the CEO of the company, a compromise in product variations would eventually lead to greater operational flexibility.

Take in Fig. 5

Building modularity to existing design structures is one thing, but almost all companies need to adapt to the design rules of others, especially small- and medium-sized companies, though previous research has illustrated that even large MNCs need to apply some design rules and principles contributed by others (see, e.g., Nellore and Söderquist, 2000). However, in outsourcing decisions, size does matter (Nicholson and Sahay, 2004). Obviously, this is the case when adopting to the higher levels of system such as Datamatic, which have to adopt to the standards and built interfaces to communicate with the systems of large enterprise resource planning [ERP] system providers such as SAP or Oracle. In addition, smaller companies also have to adopt the design rules of sub-module providers. For instance, Datamatic decided to license one of the modules from an applications provider. Yet, with the low purchasing power for the client, Datamatic needed to build interfaces to their existing solution in order to integrate the licensed component to their

solution. Such adaptive modularizations can be divided into downstream and upstream adaptive interfaces [Fig. 5].

The case Datamatic illustrated was that after the process of product design modularization, companies should strive towards *design process modularization* (2). As mentioned, e.g., by Sanchez and Mahoney (1996), adopting modular architectures in product design does not automatically lead to design process modularization. Companies need not only create visible design rules for the products but also for the processes by which they are produced. Based on the analysis of Datamatic, a three-fold categorization of Baldwin and Clark (1997) can be applied to creating visible design rules for the processes as well. First [architecture], companies need to break the production process down into modules to define which separate activities of the process are independent from each other and what kind of tasks is related to the production of that specific module. Secondly [interfaces], the task is to define how these activities [modules] interact with each other in the production process [system]. By determining the interconnections, companies are able to define the processes that are embedded [many interconnections with other activities] and those that can be loosely coupled [few interconnections with other activities]. Thirdly [standards], companies need to build standards to evaluate the performance and transferability of each of the segmented activities. Such analysis provides useful information to the company of the bottleneck activities in their process. Specifying the required outputs of component development processes permits those processes to be partitioned into tasks (von Hippel, 1990) that can be performed autonomously and concurrently by a loosely coupled structure of development organizations (Sanchez and Mahoney, 1996). Reflecting the empirical evidence in terms of transformational outsourcing, the evaluation of performance would be based on metrics, such as how much it

ties up internal resources or how volatile the resource demand is, whereas the transferability of the process can be examined through the metrics of process-related knowledge transfer, e.g., codifiability, complexity and teachability (cf. Kogut and Zander, 1993). Such an outline of the visible design rules of production processes was created in Datamatic in order to achieve a better overview of the different activities in their production process and their current performance and interaction with each other which, if outsourced, assist in defining the control and coordination mechanisms required for the successful transfer of activities. At this point, executives must decide how far they intend transformational outsourcing to take them (see Linder, 2004).

The final phase of outsourcing transformation can be referred to as creating *organizational modularity*. In particular, this phase entails building management structures to correlate the pursued operational model to ensure the coordination of outsourced activities. For transformational outsourcing to work, executives must manage it expertly and in a structured manner (Linder, 2004). In addition to the fact that these structures enable knowledge transfer to and from the company, building interorganizational procedures for knowledge transfer can limit occurrence of parallel work. For instance, the software manager of Datamatic stated when piloting software outsourcing that

> *"…when the developed application did not work correctly, the [Datamatic and their vendor] programmers started to communicate directly with each other and eventually solved the bug [problem] in the software. However, they did that without notifying us [program managers], and for several days afterwards we were trying to solve the problem – not knowing that it had already been fixed."*

Although modularity enables parallel design and testing (Loch et al., 2001), parallelism has to be managed in a controlled manner. In practice, as in Datamatic, the

organizational modularization entailed re-assigning management responsibilities of the outsourced production modules by creating the positions of account and outsourcing project managers. In fact, the correct division of responsibilities becomes a key issue in the day-to-day management of outsourcing relations. To take a quote from the software development manager as an example:

> *"We need to reposition our software development team based on the product areas [these areas were identified in the phase of documenting the product] and distribute responsibilities of each outsourcing project according to which area they fall in. These persons responsible for the projects need to claim ownership of the outsourced activity. If there is no divided responsibility and ownership, it is easy to blame the vendor whenever something does not work. […] However, it is not easy to get people to commit and claim ownership for something they have not done. In fact, that is the key management issue in outsourcing."*

4.2 Transformational outsourcing

As stated, transformational outsourcing does not primarily aim at either cost-saving or acquiring know-how unavailable internally, but at changing the whole logic in which the company operates, creating an agile, flexible organization (cf. Mazzawi, 2002; Linder, 2004; Morgan, 2003). During the interviews made for this study, the two main motives referred to for transformational outsourcing were (1) risk leveraging and (2) gaining operational flexibility. Although both account for achieving external operational flexibility (Volberda, 1996), they exert a slightly different emphasis on production. In terms of risk leveraging, the main issue was to grow without having to build a mass based on inflexible human resources. That is why in both cases the target for outsourcing was mainly in labor-intensive activities such as production and assembly while R&D and critical design activities were kept in-house. Secondly, in terms of operational flexibility – since both

companies operated in a highly technology-intensive and volatile industry – demand for internal resources undergoes high fluctuation. Through having a resource pool that can be utilized to the required extent according to demand, companies can optimize their internal resource base and achieve operational flexibility by utilizing external resources for demand peaks. This issue is further elaborated through an example from the EduTech case, which is illustrated in Fig. 6.

Take in Fig. 6

Fig. 6 illustrates, in a simplified manner, the basic rationalization of transformational outsourcing, and the operational flexibility it might provide under conditions of volatile resource demand. The example illustrated in Fig. 5 derives from the software outsourcing agreement of EduTech made in 2002, through which EduTech outsourced the development of structured software modules of one of their software products to a Hungarian service provider. For successful outsourcing, the external programmers needed to learn the design structures of the entire application. After the project was completed successfully and the knowledge over the design structures of the application had accumulated to the vendor, EduTech made the decision to further outsource the entire maintenance and related continuous development of the entire software application to this Hungarian vendor, in which three permanent employees were assigned to their project group. However, it was estimated and budgeted beforehand that this task would require approximately 1.5 man-years annually. However, as quite often in the software industry, the need for resources is not stable but rather is extremely cyclical. For the development work for EduTech, the project group of three programmers used their time

between 100% and 20%. This kind of cyclical resource need causes inflexibilities for firms, but through outsourcing firms as EduTech did, they are able to equalize the internal resource requirement by outsourcing the most volatile activities.

The key to a successful transformational outsourcing agreement that aims at operational flexibility seems to lie in selecting the right supplier, which culminates in finding a partner that can provide the outsourced component or activity in similar manner to how this would occur internally. The key is neither found in cost savings or in enhancing capabilities but rather by achieving "business-as-usual with better business focus", as was stated by the former manager of EduTech and current CEO of Ornicom. He continued:

> *"Looking back, I think the key for success lay in the fact that nothing actually changed, other than the company they were working for. The same people who had years of experience working with each other were doing the job. […] It could have worked with an entirely 'outside' company, but it would have taken a considerably long time to get the operations to work fluently."*

The supplier needs to be able to provide the resources in the quantity needed and whenever they are required – without having to cut quality of production short. Although competence-related criteria are often emphasized in the supplier selection of technology-related products (e.g., Hoetker, 2005), more organizational and strategic criteria were emphasized in outsourcing aimed at organizational flexibility. For instance, according to Amoribieta et al. (2001), potential vendors should be first and foremost ranked on their ability to provide all of the needed expertise. Levina and Ross (2003) state that the vendor's capabilities are comprised by its technical competence, understanding the customer's business, and relationship management. The findings suggest that in transformational outsourcing, though the vendor is expected to provide all the needed expertise, the definitive selection of the supplier is based on its ability in the two latter areas of

capabilities. For instance, EduTech chose Ornicom as their main supplier not because they could provide the best cost base or because they were the most competent but rather because its proximity and willingness to have closer cooperation could provide the company with instant transformation without a transition phase, thereby ensuring continuous suppliers.

However, suppliers with the ability to provide the required expertise and prior understanding of the customer's business seldom exist, and because of this companies often need to transfer the process-related knowledge to the outsourcing supplier. This, as well as results from the cases, leads to the suggestion that transformational outsourcing is an incremental learning process, supporting the arguments for instance of Morgan (2003), which entails transfer of production-related knowledge as well as the establishment of coordination mechanisms between the companies[11]. Furthermore, the initial steps to outsourcing activities taken by Datamatic leads to strengthen the recent propositions of, for instance, Morgan (2003), Graf and Mudambi (2005) as well as Maskell et al. (2005), to the effect that outsourcing as such is a sequential learning process in which structured non-strategic functions precede more complex strategic functions and near-shore locations precede far-shore locations. This finding provides new theoretical aspects for the existing theory base on the complex phenomenon of outsourcing.

As seen from the pursued goals in both case companies, the essence of transformational outsourcing is about transferring value chain activities across organizational boundaries. Transformational outsourcing provided the case companies with benefits such as flexibility for product development, reduced risk, the ability to respond

[11] In the EduTech and Ornicom case, this process was limited, because EduTech transferred the production knowledge in terms of personnel to Ornicom. However, some actions were taken to establish common cooperation procedures.

more rapidly to the needs of the markets and improved innovation activity through scale economics. These motives are similar to the ones identified by literature on modular systems. In either of the cases, short-term cost savings or acquiring know-how unavailable internally were not mentioned as motives, this being argued by transaction cost theory (e.g. Coase, 1937; Williamsson, 1975) and the resource-based view (Barney, 1991; Wernerfelt, 1984), which are commonly used as underlying base theories for outsourcing. They are, however, insufficient as such to capture the entire phenomenon of outsourcing. In turn, as these benefits are similar to those found in the studies on modularity and modular organizational structures, which build strongly on prominent systems theorists such as Herbert Simon (1962) and Christopher Alexander (1964), it can be argued that such a theoretical base can and should be applied for the new developments in the outsourcing strategy. Also, the notion that transformational outsourcing is preceded by stages of incremental learning, which was strongly supported by the findings, suggests the application of theories concerning evolution and learning (e.g., Nelson and Winter, 1982) to capture the various aspects of this concurrent phenomenon.

5. SUMMARY

Although this article supports examining the positive sides of modularity and outsourcing, it does not encourage blind enthusiasm on behalf of increasing the modularization of activities but rather conscious seeking of an appropriate level of modularization, given the limitations of systems. In the ICT industry, where firms need to continuously develop new innovations and reap the value from them as rapidly as possible, modularization also carries defects. For instance, Ethiraj and Levinthal (2004) state:

> *"Excessive modularization may blind the designer to potentially important interactions between decision choices and result in dysfunctional perturbations in module- and system-level performance that constrain evolution to inferior designs. The speed and efficiency gains from modularization will be offset by the increased time spent in the testing and integration phase, where the consequences of ignored dependencies will come to the fore."*

Similarly, Miozzo and Grimshaw (2005) found in their study that outsourcing may limit innovation as the cost and development requirements of outsourcing decisions collide. Such implications lead to the proposal of a thorough analysis to be taken prior to modularization and, in particular, outsourcing. In general, firms that outsource poorly can be severely hampered in their ability to compete (Dwyer and Tanner, 1999).

Under the realization of such trade-offs, this article was aimed at increasing both theoretical and managerial understanding on building the foundation for the successful reorganization of internal activities. From the managerial perspective, the results provided in this article suggest that the basis for successful de-verticalization towards modular organizational structures lies in prior internal transformation. The process of outsourcing transformation entails creating modular product design architectures [product modularity] and adapting modularity to the processes in which they are designed [process modularity] and to the way these processes are controlled and managed [organizational modularity]. After these terms are achieved, the results indicate that the key to successful business transformation lies in finding a supplier that can provide the required activities for the company in business-as-usual manner. However, it has to be noted that value creation does not occur immediately after the transfer of activities: rather, it is a process of incremental learning comprising building mechanisms for the transfer of knowledge and the coordination of common processes.

From the theoretical perspective, this article argues that the commonly applied base theories of the transaction cost approach and the resource-based view are, as such, insufficient to explain the new outsourcing strategies, which aim at wider changes in the production system. For analyzing such a strategy, this article proposes that modular systems/organizational theory provides a suitable base. Even so, the current literature on modularity and modularization provides only scattered results on the organization-wide changes which companies must undertake prior to the successful de-verticalization of activities, with regard to which this article provides useful insights, thereby creating a suitable setting for further research. In terms of transformational outsourcing, this article strengthens the previous findings in terms of drivers and motives towards this strategy. Furthermore, the results point to and are aligned with earlier studies (e.g., Morgan, 2003) suggesting that the benefits of transformational outsourcing are subject to incremental learning, mainly due to the discrepancies in the knowledge base of contracting organizations. However, we illustrated that through supplier selection and building various transfer mechanisms, companies can accelerate this learning process, enabling the faster realization of outsourcing benefits. Despite some existing research, these mechanisms still remain largely neglected by researchers, especially from the view of transformational outsourcing, which in turn creates an important area for further studies.

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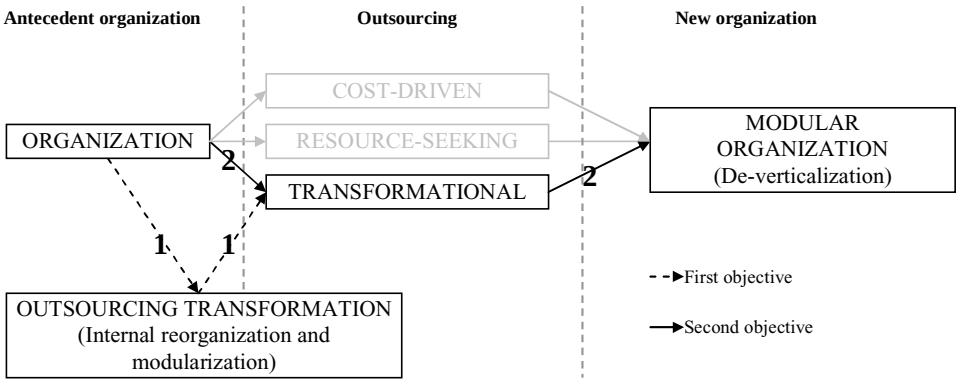

Fig. 1 Key concepts, elements and objectives of the article

Table 1 Comparison of 'traditional' and 'transformational' outsourcing (Mazzawi, 2002)

TRADITIONAL OUTSOURCING	TRANSFORMATIONAL OUTSOURCING
Operational focus	Business focus
All about cutting costs	All about creating value
Helps impose control	Helps manage uncertainty
Aligns with fundamentally unchanged business processes	Aligns with the business processes that change in line with strategic goals
Based on external IT specialists achieving higher performance than a non-specific company	Based on the creation of a network of partnerships in the new connected economy
Removes non-core functions from the business to provide a one-time release of capital	Business change and cost re-engineering enable sustained value creation

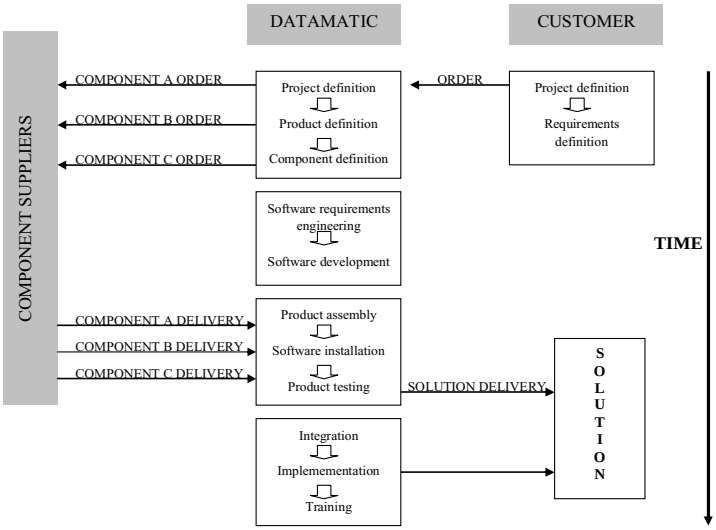

Fig. 2 The current operational model in Datamatic

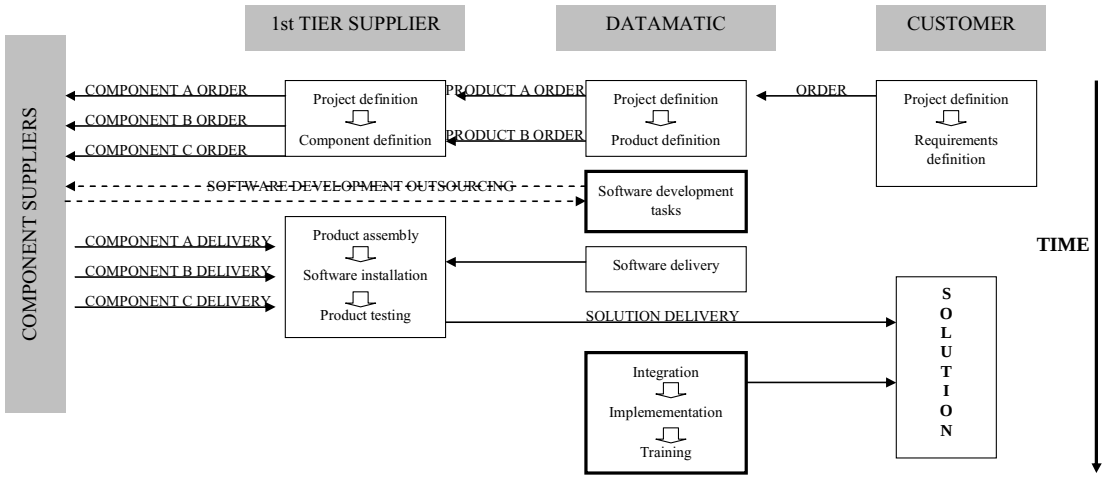

Fig. 3 The pursued operational model in Datamatic

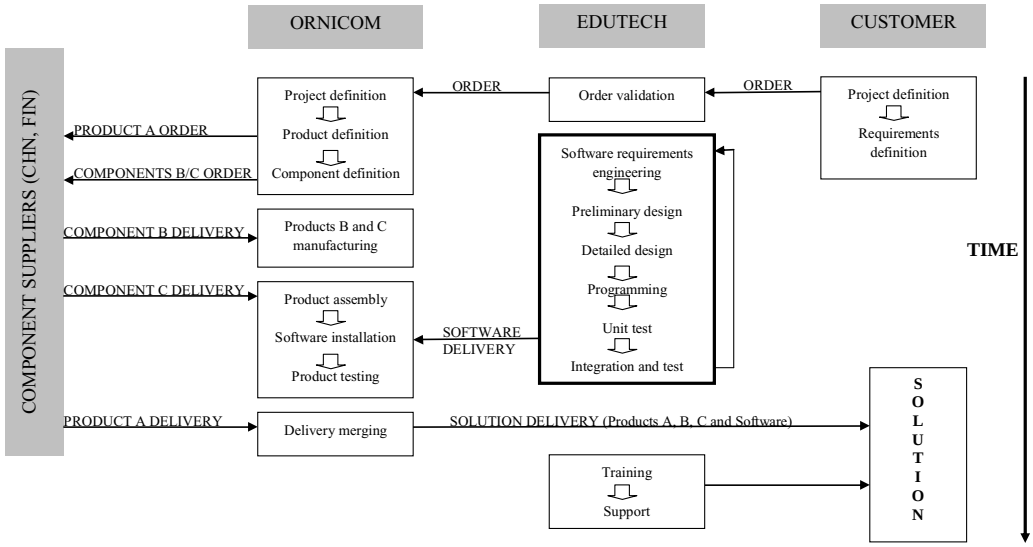

Fig. 4 The created operational model in EduTech

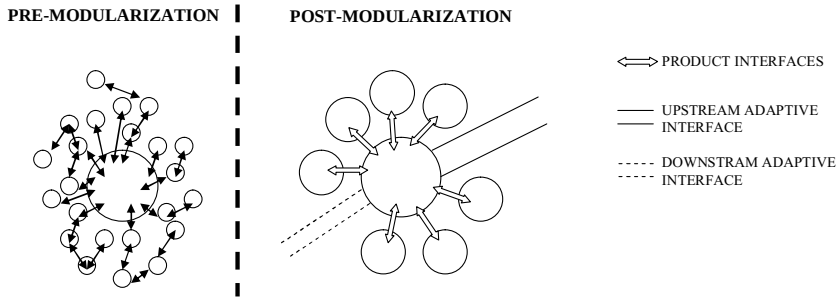

Fig. 5 Example of software product modularization

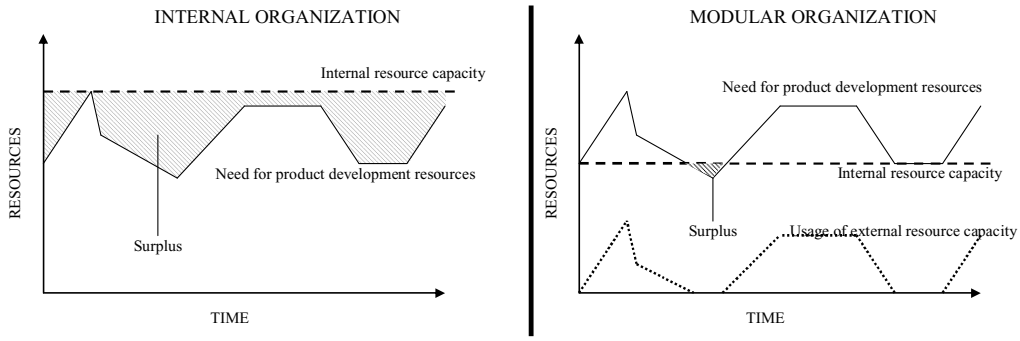

Fig. 6 Production flexibility achieved in EduTech through transformational outsourcing

ARTICLE 5

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Modularity and outsourcing management in software product development – towards a process framework

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MODULARITY AND OUTSOURCING MANAGEMENT IN SOFTWARE PRODUCT DEVELOPMENT – TOWARDS A PROCESS FRAMEWORK

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ABSTRACT

The purpose of this article is to analyze the different levels of architectural and process related modularity in software product development, and to elaborate the management challenges that incorporate the different approaches to undertaking software development. This article utilizes case method to gain thorough understanding of the studied phenomenon, and to test the introduced framework. The article reveals that despite the modular structures embedded in software product architecture and design process, one-off transfer of product development activities is difficult and companies need to collaborate in various design process phases to ensure successful transfer of knowledge to and from the vendor.

Keywords: Modularity, outsourcing, software development, process management

1. INTRODUCTION

The competition between firms for access to a relatively small skills pool has led to rising labor costs. This has, along with the internationalization of the software market, spur software firms to adopt more efficient production techniques and to restructure their organization [1]. In fact, software development teams need to acquire both information and knowledge from a variety of external sources to develop new software [2], and as a result software firms have sought to utilize 'non-internal' means to undertake innovation, specifically through licensing and outsourcing. Firms increasingly outsource product development activities to external parties as part of a process called 'rapid distributed innovation' or 'open innovation' [3]. As a consequence, current trend in outsourcing has dramatically altered new product development in industries such as software [4].

Despite the growing need and interest on capitalizing external resources in software production, recent studies have shown that software firms more often utilize external resources and linkages on the market side and the capitalization of product development related research-oriented external resources is much more limited [1]. However, in an increasingly complex technological environment, a single firm rarely possesses all the

necessary capabilities to succeed. Thus within the software industry there is an increase in the use of external technology resources through technology alliances [5], mainly to achieve improved innovation and more rapid development cycle and thereby time-to-market [6], or to reduce costs and to gain operational flexibility through outsourcing highly structured development work [7]. Regardless of the underlying motives, the key for the ability to outsource activities have been claimed to lie in modularity embedded in product and design structures [8], which is basically due to the fact that modularity have found to significantly ease the management of dispersed production activities [9], [10]. Modularity reflects to the degree to which the products and their production processes are decomposed into smaller subsystems and activities, which can be designed and managed independently, yet function as a whole [10], [11], [13].

Modularity of processes and products as such has been generally adopted by researchers [11] especially in the context of software, in which the ideas date back to the turn of the 1970's [12], [13], and have since been adopted by several researchers [14], [15], [16], [17], [18], [19], [20]. However, it seems that the research on structured connections of the relationship between modularity and outsourcing within this context has yet been limited.

Whereas research exists on examining the modularity of design structures in the software industry, we attempt to complement previous research by unveiling the different scopes of modularity that might exist within the design structures of software development and their relations to outsourcing possibilities, as has been done to some extent in more tangible industries such as automotive [10]. Accordingly, *the purpose of this article is to analyze the different aspects of product and process modularity in software product development and to explore the managerial challenges that are incorporated with the different approaches for undertaking software product development*. Through building a theoretical framework and testing it with three cases of software development projects our goal is to gain a deeper understanding of the conditions under which different breadth of outsourcing options in software development process are transferable to an outside vendor.

This article is structured as follows. First it discusses the current literature on different levels of modularity embedded in the new product development of software, and based on which, proposes a framework for empirical investigation. Secondly, a short rationale and description of the chosen method for the empirical analysis is given, which is followed by short descriptions of the cases of two outsourcing and one licensing situation. Finally, the results of the cases are discussed based on the proposed framework. This article closes with a short summary of discussed topics and key managerial and theoretical implications.

2. MODULARITY IN NEW PRODUCT DEVELOPMENT OF SOFTWARE

The proposed theoretical framework for this article will be founded on two interconnected key issues; modularity and outsourcing. Although modularity as such does not spur companies towards outsourcing, industry fragmentation, product modularity and value chain (process) modularity are often seen as main enablers behind outsourcing [21] and [10]. Industry modularity refers to the availability of resources on the market. For instance, companies start to swing toward 'buy' when, amongst other factors, the supply base offers a location, process technology, or a skill set that would be hard to acquire or reproduce [22]. In process and product level, modularity eases inter-organizational transfer of activities and processes and consequently reduces transaction cost and therefore makes the option to 'buy' more attractive. Yet, due to the intangible nature of the software product development, the analysis of embedded modular structures becomes challenging. Software development has been described as a complex problem solving process simultaneously involving a number of individuals, teams, and organizations with competing goals, interests, and responsibilities [23]. Despite of such challenges, the different aspects of modularity enabling outsourcing can also be identified in software product development; meaning that under some circumstances parts of the software development work can be successfully distributed to an outside vendor [1]. To identify these circumstances, in following chapters we propose a framework which builds on modularity embedded in the software development in the two abovementioned aspects: software architecture (product) and design processes (process).

2.1. Modularity embedded in software architecture

The term of software architecture has been found to capture a complex amalgam of representations and uses, real and figurative, that is rendered and utilized by different stakeholders throughout the software development process. The software architecture can be used, for example, as 1) high-level description of the system guiding the implementation, 2) making decisions concerning resources and strategies, 3) understanding system structures and technologies and 4) documenting the system and understanding over time [24]. Therefore, software architecture can be considered as a communication and coordination tool that creates opportunities for outsourcing. However, in this article we will focus on the modular structure of software and its relation to outsourcing.

As mentioned, the principles of modularity have been introduced to software development already in late 1960s. In 1968 Dijkstra [12] proposed a layered structure for software that resulted as an increased ease of development and maintenance. Parnas advanced these thoughts further with his fundamental work on software architecture in 1970s. From his work we have learned design principles that are still widely applied today. One of such principle is the decomposition criterion known as information hiding [13]. According to this principle, system details that are likely to change independently

should be the secrets of separate modules [17]. Another important principle originating from Parnas is the idea of using modules via their interface only [13]. This principle has laid the conceptual basis for object oriented design. Parnas was also among the first ones to see the connection between the software architecture and the coordination of software development with his finding that decomposition of software into modules should be done according to the division of labor rather than on the basis of flowcharts [13]. This finding suggests that software architecture may be an enabling factor of software development outsourcing.

In recent years, we have witnessed progress in several underlying technologies that enable building components and assembling applications from sets of other components [14]. These advances have built ground for a new discipline of Component-Based Software Engineering (CBSE), raising the interest on software modularity to a new level. The notion of components consisting of other components suggests a hierarchical structure of software architecture. Even though many suggestions have been presented for the hierarchical structure of a software (e.g., [16]), it is through the differing views of the definition of component that has lead us to adopt following hierarchy of software architecture for the purposes of this article [14]: 1) *Run-time component*, that is dynamically bindable package of one or more programs managed as a unit and accessed through documented interfaces that can be discovered at runtime, 2) *Software component*, that is a composition of run-time components and that can be deployed independently and is subject to third-party composition, 3) A *business component* that represents the software implementation of an "autonomous" business concept or business process. It consists of the software artifacts necessary to express, implement and deploy the concept as a reusable element of a larger business system.

Together with the technological advances of the component-based technologies, the business and organizational context within which applications are developed, deployed, and maintained has changed [14]. Instead of developing functionality from the scratch, the organizations have now increased opportunities to 'outsource' some of the software development activities by utilizing readily available functionality of commercial off-the-shelf components (COTS). This approach moves organizations from application development to application assembly [14] requiring significantly different approaches to the management of a software development project [25]. Through the software reuse, the software development organizations have been able to shorten the time to market, as licensing ready-made technology allows firms to focus its resources on core development issues (e.g., [6]). Also, in terms of overall modularity, it has been discovered that modular design structures are favored over integrated ones when flexibility and rapid innovation are more important than overall performance [21] and [26], thereby making such approach to NPD appealing especially to small firms, which often seek to decrease the time-to-market to reap the maximum value from latest technological innovations.

Nevertheless, all the findings above suggest that there may be a relation between software modularity and outsourcing. This relation will be explored further in this article.

2.2. Modularity embedded in software design process

Modularity does not exist only in the architectural structure of software, but also in the manner the software is being developed. In fact, the production processes for software has been characterized by a high degree of technical divisibility (modularity) and it has extremely small transportation (inter-organizational transfer) costs. For this reason the industry is particularly amenable to fragmentation and global dispersion [27], and on a global scale it is organized rather like global production networks in manufacturing with high labor requirements [28].

Perhaps the most modular of the software development process models is the waterfall model [29], which has been widely used in the industry since 1970s. The waterfall model consists of distinct development stages, in which the current stage needs to be fully completed before entering to the next stage. However, the escalating costs associated with software development and the unsatisfactory reliability, performance, and functionality of the resulting software have since then motivated software engineers to develop new alternate models of software development [30]. Some examples of alternative software development approaches include agile methods [31], spiral model [32] and Rational Unified Process [33]. One of the common themes in the evolution of software development approaches is the iterative and incremental nature of software development. When looking the evolution of software development approaches from the viewpoint of outsourcing, it appears that the development activities, such as design or testing, are increasingly overlapping with each other making the outsourcing of distinct development activity more difficult. Yet it appears that there still exist distinct differences regarding the software development activities of outsourcing party and the subcontractor. Perhaps such differences can be better illustrated by examining the software development activities through the hierarchical nature of software architecture.

As a new system is being developed, the design process typically begins by outlining the overall architecture and proceeds then to the detailed designs of the components of smaller granularity. The hierarchical level at which outsourcing occurs then affects the activities that the subcontractor is required to do. The smaller the granularity of components that subcontractor is responsible for, the less the subcontractor will be involved in the overall design. Still, within the scope of the outsourced component, the subcontractor is typically required to perform wide range of software development activities such as detailed design, implementation and testing. Having the subcontractor developing some of the components is only one side of the story. The other side of integration, verification and validation is still often less talked about. One reason for this could be that some of the software process models (such as waterfall-model) are having struggles on describing such activities. We make an attempt to illustrate the activities

typically performed by the outsourcing party and by the subcontractor by adopting ideas from the V-model [34] and the dotted U-model [35] (Fig. 1).

Take in Figure 1

As illustrated in Figure 1, undertaking software development internally would entail the management of a development process from requirements engineering to system validation, while controlling the fluency of the process through high-level verification. However, apart from full turnkey projects, when different activities of this process are outsourced at some point it entails a transfer of the responsibility to the vendor, and subsequently, at some point reclaiming the responsibility back from the vendor. In our attempt to track down the process of transferring product development activities across organizational boundaries, we acknowledge that the software development activities performed by different parties are dependant on the granularity of the component to be outsourced (see previous chapter). For example, if a runtime component is to be outsourced, the subcontractor will most likely be responsible on activities related to that specific component only. However, it still appears that the way design and integration activities are divided between the outsourcing party and the subcontractor varies from case to case. As an example, the outsourcing party may decide to design the low level components completely herself before asking the subcontractor to take over the rest of the development activities of the outsourced component. The inability to define uniform handover points in the outsourcing context has led us to suggest that the responsibilities of the subcontractor can be defined as activities to be performed in the timeline between the *point of outsourcing* and *point of integration* (Fig. 1).

As stated earlier, the point of outsourcing and point of integration are not strongly restricted and can thus differ significantly from one development effort to another. Furthermore, it should be noted that throughout the subcontracting effort, there must be continuous collaboration between the outsourcing party and subcontractor. Such collaboration occurs in many forms ranging from knowledge transfer to high-level validation activities, in which the subcontractor's incremental results are integrated and tested as part of the whole system.

2.3. The relation of modularity and outsourcing in software development process

In the software industry, modularization of a system and modular architectures can yield tremendous benefits such as process flexibility in software projects [11], [36]. But why modularity is required from system and architectural design structures for successful outsourcing? In short, modularity enables the realization of the sought benefits whether they are time, resource or cost related. The key to outsourcing in software development lies in ability to successfully transfer the activities to the vendor, and in the context of software development the issue of transferring activities can be viewed from the

perspective of transferring knowledge. According to Kogut and Zander [37] the ability to use markets [outsource] is dependent on the complexity, teachability and codifiability of the knowledge that is being transferred. In fact, from such perspective, modularity can affect these aspects by at least in three ways and thereby create more suitable setting for inter-organizational dispersion of software development activities.

Firstly, modular design structures in the product architecture level provide a blueprint for dispersed software development. As mentioned, one of the key uses of software architecture design involves understanding system structures and technologies [24]. According to Mikkola [8], the extent a firm decides to decompose its product architectures and related tasks depends on firms' scope of knowledge about the system as a whole. By dividing and clustering functional entities such as business and software components in the preliminary design of the entire solution, the firm can have a better picture of the run-time, software and/or business components that are amenable for dispersion. In addition, modularization of the architecture leads to documenting the system. Software architecture is seen to consist of nothing but knowledge in codified form [38], and how this knowledge is codified and further documented defines the extent which the product architecture is modular. Thus modularity in architectural structures decreases complexity of the system and also increases its teachability through documentation, and thereby increases the possibility for inter-organizational knowledge transfer – in other words – *clarifying and simplifying the point of outsourcing*.

Secondly, according to Schach [39], maintenance caused by correction of faults (corrective), changes in the clients operations and/or environment [adaptive] and adding new capabilities or improve performance [perfective], on average accounts for 67 per cent of the total costs of a software life cycle. Corrective faults also occur due to the many interdependent linkages and therefore 'unmodular' structure of the outsourced component. Companies can increase the software product modularity by reducing the number of design dependencies or by rearranging and re-architecting their pattern distribution [16]. Thus it is plausible to expect, that those modules that have only few dependencies are most applicable decomposition for inter-organizational dispersion. Therefore, modular architectural design structures and modularization can be expected to lower asset specificity and complexity of the system and reduce the need for correction of faults, and therefore lower transaction cost ensuring the realization of sought benefits. Modularity embedded in system design structures thereby *eases integration* of externally designed components (point of integration) to the system architecture as in such case components can at best be integrated to the system via simple/single interface.

Thirdly, according to [11] modularity does not only reflect to the partitioning and decomposition of the task, but also the design of interfaces among the design elements. Interfaces describe in detail how the modules will interact, including how they fit together and communicate [40]. This, in turn, allows parallelism in design and testing [11], [41]. Parallelism in design and testing enables the identification of possible mistakes

and any disharmonies as they occur along the outsourcing process. Accordingly, it may be concluded that modularity in product design structures of the software significantly *eases* the parent company's task of *controlling and coordinating the entire process* (cf. high level verification in figure 1).

To summarize, it is plausible to expect that modularity embedded in product architecture and design process eases inter-organizational knowledge transfer and therefore outsourcing of product development related activities. Furthermore, outsourcing does not only require modularity from the products, it also creates it. Clear indication of this is that open source software is claimed as more modular than proprietary code [42]. Without modularity, there is a little hope that contributors could understand enough of the design to contribute in a meaningful way, or develop new features and fix existing defects without affecting many other parts of the design [16]. Therefore it is plausible to expect that dispersed software development 'coerces' firms to create modular product architectures, which, in turn, assists in further outsourcing and licensing of system components.

Despite the discussion above, it still remains unclear to what extent modularization assists in transferring software production activities across company boundaries. That is, despite modularity embedded in product and in the process in which it is developed assists in outsourcing, it is plausible to expect that the management of such knowledge-intensive and parallel process such as software development does not occur in arms-length manner, but firms need to collaborate in many phases of the process. Therefore, the following empirical analysis aims at increasing our understanding on the process of the outsourced software development, and on the implications of modularity within that process.

3. EMPIRICAL STUDY

The research method utilized in this article can be described as multiple-case method. The case study's strength is in the likelihood of it resulting in theory building, development and refinement [43]. Accordingly, case studies are meaningful in situations where there exists only limited prior knowledge or the extant knowledge seems inadequate [43], [44]. Where quantitative approach provides possibilities for theory validation through testing of hypotheses, it possesses limitations in examining phenomena which are complex and novel. In fact, often qualitative research, such as case approach, provides a sound basis for further quantitative research by identifying the different variables of a specific phenomenon [45]. According to Morgan and Smircich [46] *"Qualitative research is an approach rather than a particular set of techniques, and its appropriateness derives from the nature of the social phenomena to be explored."*. In terms of the focus of this article, it was lamented by Ethiraj and Levinthal [21], that the problem of modularity and complex systems designs is not an exact science that will result in an optimal solution. That in parallel with the complex and highly context

dependent nature of outsourcing, which should be taken into account to understand the dynamics involved in the setting [47], it can be argued that case approach provides given the research topic a sound, and a viable basis for the purposes of this article.

The cases for this article were purposefully sampled from a larger in-depth analysis of 15 small and medium sized software companies, in which total of 30+ semi-structured interviews were conducted. From the analysis of the 15 companies, three were chosen for closer analysis, and complementary interviews were conducted in those companies. The cases were selected on a basis that they best describe the explored phenomenon – that is – they had successfully utilized non-internal means in terms of outsourcing in their new product development process. We found that in unsuccessful cases companies either terminated the project before it ended or they needed to perform certain additional tasks, which impact the comparability of the results. Also, as this article aims also at extending managerial best-practices knowledge, successful outsourcing cases were only targeted. In addition, the theoretical criteria were kept in mind in the case selection, i.e., how well they prospective companies fit with the conceptual categories and what their explanatory power is [43]. Two of the cases were selected on the basis that they illustrate situations where companies have embarked outsourcing in different breadth with slightly different approach, thereby providing a wider perspective to the set research problem. Third case was selected based on their licensing (COTS) experience, which enabled comparative analysis of these two strategies.

As this study is a dialogue between engineering sciences and business economics, we capitalized researcher triangulation in the analysis, which entails using researchers with different background, in this case, software engineering and business. This decreases observer bias and enables more thorough understanding of the explored phenomena [48]. In addition, validity of the findings were increased by 1) decreasing data access limitations by agreeing not to use the actual names of the companies or respondents and by 2) interviewing several different persons within the organizations being studied [at least the CEO and CTO in each company] to limit any possible interviewee biases [48].

3.1. Outsourcing in business component level: case Maxit Banking Systems Ltd.

Maxit Banking Systems Ltd. (hereafter Maxit), established 2001, is a software solutions provider for financial institutions. As a spin-off from the banking industry, Maxit started operations with a realization that the initial product development phase would take at least three years to complete. Therefore their initial plan was to some extent develop the software at low-cost locations. After thorough analysis, Maxit decided to outsource instead of setting up an internal offshore development factory. However, the outsourcing did not occur immediately from the inception of the company, but first two releases of the software were developed internally. As the third release required vast amount more work and therefore provisional resources, at that point they decided to outsource the development functional business level modules for the previously

developed software platform to Manila, Philippines. In fact, later it was calculated by the company that the development of the functional modules required total of development 14000 man days. The extensity of the need for the company illustrates the fact that a company that had in years 2002 and 2003 approximately 60 permanent employees had 80 external developers working for them in the factory in Manila.

The outsourcing did not start by immediate hand-off of specifications and activities, but it embodied a 3-4 months long transition period, in which the outsourcing processes were systematized. This systematization of processes included clarifying the process from requirements to features and to specifications, synchronizing of databases and product development environments, the communications and follow-up of actions and different testing procedures for different phases of the development. In fact, they build processes for nearly everything, including for instance purchasing of equipments. During the transition phase, software developers and consults were flown from Manila to the company's premises to familiarize themselves to the existing software architecture. Around 10 persons came to Maxit's premises for approximately six months to learn the operations methods, the way of making specifications and what kind of software are they expected to develop and to what kind of platform and interfaces. Even after the transition phase the outsourcing did not undertake in a vacuum in Manila. After the project took off, in turn Maxit's personnel went to the Philippines to the premises of the subcontractor to do regression testing for the software system components. The system acceptance testing was done in Maxit's premises, yet at least 1 employee of the company was in the outsourcing company at all times to test the developed software and to ensure the fluency of operations.

Although the company experienced some difficulties especially with the quality of the developed software, the general view of the outsourcing was positive. In fact, afterwards the company estimated that they were able to cut costs approximately 70 per cent of that, that it would have cost if done domestically and in-house. This estimate included the internal costs that resulted from testing and re-work on the developed software.

3.2. Outsourcing in system level: case JPS Insurance Management Solutions Ltd.

JPS Insurance Management Solutions Ltd. (hereafter JPS) provides complete software solutions for life & pension and property & casualty companies. When the company was established in 1992, the two founders moved from management positions of large software companies to be entrepreneurs. They had an idea, but only limited resources, both financial and skill-related, to enforce this idea. The initial business concept of the company was that the actual development of the software would be done in Estonia, as at that time Estonia had the know-how and resources with one tenth of the price in their home country.

The development of the software began as they found a local partner, and together with 15 people they started to construct the software. The operating process was such that the

business knowledge, business architecture and therefore the requirements specifications were done by the managers of JPS and the operational development of the software was done in collaboration with the partner. In fact, the entire product development process was an effort with intensive cooperation throughout the different development phases. The technical architecture (system design) of the software was specified in close cooperation with both parties. The control and inter-personal interaction from the parent was high, although the technical implementation of the project was done either in collaboration or by the vendor. In fact, for the first two years of the development process, the two managers spent approximately 4 days a week in the Estonian software development factory. Despite the extensity of the product, they were able to develop the first version of the product within three years. This was only possible through large scale outsourcing. In fact, a company of two managers had at best 30-40 people working for them.

Today the Estonian unit is the application factory of the company, handling all the operations and subcontracting that are connected to the production process, and only management, marketing and customer relations are handled from the company's HQ. However, they outsource further some customer-specific business components to countries mainly in Estonia and Finland, but also in countries such as Russia, Romania, Ukraine and Poland. This is enabled by modular architectural structure and process management tools that were created as a by-product of the outsourcing project.

3.3. Licensing COTS components in product development: case C-Soft Ltd.

C-Soft Ltd. (hereafter C-Soft) is a computer assisted design (CAD) software producer for industries such as mechanics and industrial home building. The company was established already in 1977. It was even until to the year 1989 that everything was done internally to Hewlett-Packard's UNIX based application environments. At that time the product development resources were distributed mainly to develop the geometrical modeling core which enables the drawing of the objects, and to develop the user interface for the software, but with practically no supplier base they even used their own internally developed databases and word processing tools embedded in their software solution.

However in the turn of the 90's, C-Soft realized that if they want to develop software with good user interface, efficient geometrical modeler and graphics that enable drawing, they did not have the resources to focus on all of those areas. At the time, markets were also changing. They found a company based in England that had just developed a 3D modeler for CAD companies. After a series of performance and suitability tests to the existing environment, they found that it was technologically more advanced than their existing modeler, and thereby they made the decision to license that product and replace the existing, internally developed geometrical modeling core to it. Strategically it was important decision not only because through acquiring this component C-Soft would have to extract the core they had been developing for over 10 years, but also because this

component operates as a core unit in their both lines of CAD products. Similar decision was faced few years later when C-Soft acquired a software component for managing geometrical strictures. However the choice in this case was merely make-or-buy, as they had not been extensively developing this feature beforehand. After analysis of the software component, they found that competitors were starting to license this product, and therefore they made the decision of buy instead of make. Today it was stated that approximately half of all the CAD software producers use this same component for managing geometrical strictures. In the end of the 90s, they also licensed a software module that transforms 3D models into isometric illustration. This occurred through that in sales situation with clients, the received feedback that the software is good, but the isometrics are not of the required quality. Again they made the choice to focus their resources, and after seeking the markets, they found a provider from which they licensed this part of the software.

As illustrated above, C-Soft has licensed several software level COTS components in their long history of CAD software development. In addition, later they licensed few business level components that enabled photorealistic presentations of the developed 3D designs and translation of AutoCAD files into other CAD programs. As all of the components licensed by C-Soft are used widely throughout the industry, building the competitive edge becomes a question. However, by focusing development resources on the chosen core strategy, which was developing the user interface of the solution, the firm was able to built competitive edge around it. Furthermore the representatives of the company stated that through licensing different value-adding modules, instead of providing customers with one product, they can provide full solution by mixing and matching the required components. Despite the large-scale capitalization of external solutions through licensing, it was estimated that only 15-20 per cent of license fees of the company go further to suppliers in royalties and maintenance fees

4. MODULARITY, OUTSOURCING AND LICENSING IN SOFTWARE DEVELOPMENT

Above we provided three short case descriptions, in which companies (Maxit, JPS and C-Soft) had capitalized external resources in their software product development process. In the two of the illustrated cases, companies embarked outsourcing where the point of outsourcing was in business component level; although with the case of JPS the outsourcing project included the entire system including platform and user interface development. The analysis revealed at least three characteristics that support having the point of outsourcing in software development in business component level, although similar characteristics can as well exist in lower levels in hierarchy: 1) adequate volumes, 2) functional entity, and 3) competitive differentiation. *First*, adequate volumes are needed to realize the cost savings, which was the primary motive for outsourcing in both cases. This is because outsourcing involves several hidden costs such as vendor search

and selection, contracting, process building and so on [49], ones often related to the initiation (*ex ante*) of the outsourcing relationship. Therefore cost savings are likely to accrue with larger outsourcing projects where the ratio of ex ante costs decrease in relation to the total costs. *Second*, as business component is a functional entity, it is plausible to expect that there exists better setting to knowledge transfer to and from the vendor. That is because functional entities can be better codified and taught to the vendor [37], than a part of larger entity that has many interlinkages with other parts. *Finally*, even though for specific business component there might exist a ready-made COTS component, companies might turn to outsourcing to create competitive edge. This is because business components are the core functional components of a software solution, and using COTS components in such level might lead to genericness of the solution and accordingly make it difficult to build competitive edge in that area. Figure 2 illustrates the outsourcing processes of both case companies' embedded in the framework that was created earlier in this article (Fig. 1).

Take in Figure 2

As seen in Figure 2, the outsourcings in both cases were not one-time hand off of activities, but they entailed a vast amount of collaborative work, in both cases especially in system design and system verification of the design process. As mentioned in the case of Maxit, in the system design phase the programmers of the vendor were familiarized to the existing software architecture and the system design was more or less a collaborative endeavor, even though preliminary pre-made specifications existed. Furthermore, as the system verification was done in the vendor's premises by Maxit's personnel, it entailed high level of collaboration as well. Similarly with the case of JPS, although the point of outsourcing can be considered to be in the system level, the requirements engineering of the software solution was done by JPS management. Yet, the system design was done in collaboration with the vendor, as well as the phases of system verification and system validation. The vendor took responsibility of the tasks of software design, coding and software verification. Regardless, as seen in Figure 2, although these tasks were transferred to the vendor, JPS controlled the process from system design to system validation in cooperation with the vendor through high-level verification.

Although the licensing decisions entail different approach for development of software components, the underlying process was similar. In terms of the product development of C-Soft, the licensing could be illustrated such as in Figure 3. When a ready-made software component was bough from the markets [licensing] instead of outsourcing, the company has to adapt to the terms of the component, that is, there needs to exist or be built interfaces to the existing system architecture (design rules). There existed only

limited collaboration between the transacting companies. If you buy a module as such, then you also 'buy' the knowledge it embeds [50].

Take in Figure 3

Based on the case analyses, we found that modularity embedded in design process and in product architecture assisted in licensing and outsourcing processes. For instance, with the case of Maxit we illustrated that in knowledge transfer to the vendor, existing modular design architecture increased the teachability of the system to the vendor, as well as decreased complexity which enabled the transfer of modular activities. Modularity embedded in software design process can be seen to clarify the points of outsourcing and integration, as argued earlier in this article, therefore enabling structured process for transferring different levels of product development activities. However, it was seen in the case descriptions that even with high level of modularity in outsourcing of knowledge-intensive activities such as software development especially in the higher hierarchical levels, one-off transfer is not possible but companies need to join efforts in some parts of the development and transfer process. Based on comparison of cases Maxit and JPS it can be expected that the larger the outsourced project [the higher level in the hierarchy] and the less modularity in the existing design structures, the more joint development efforts are needed. In licensing COTS for NPD, modularity similarly assisted in the process. Modularity embedded in existing system design architecture eases testing of the performance and suitability with the system, and further, significantly eases the integration of the licensed component to the system.

5. MAKE, BUY OR SPECIFY – IMPLICATIONS FOR PROCESS MANAGEMENT

Although licensing is often paralleled to and seen as a form of outsourcing, mainly due to their substitute role of 'buy' in the 'make or buy' decision, from the view of software product development these are two very distant issues. Whereas using COTS components in product development moves organizations from application development to application assembly [14], outsourcing in product development moves organizations from applications development to applications management. As illustrated with the cases of Maxit and JPS, the critical issue was not how to assemble the developed components of the vendor, but how to manage the transfer of knowledge and information to and from the vendor and coordinate the entire process. Accordingly, based on the proposed a framework we found that the key nodal points of an outsourcing process lie in 1) knowledge transfer to the vendor, 2) knowledge transfer from the vendor and 3) coordination of the entire process; in all of which we illustrated that modularity has a positive impact. In knowledge transfer to the vendor the key issue is to transfer the

knowledge needed for the completion of the task to the vendor. According to the CTO of Maxit, "a good outsourcing partner does exactly what you want, nothing more and nothing less". However, firms need to make 'want' explicit, meaning that they need to articulate what the partner is expected to do and to what kind of existing structures.

Accordingly as licensing COTS can be seen as a strategy of 'buying', outsourcing is a strategy of 'specifying' as it entails articulating the needs to the vendor. In both cases of outsourcing we illustrated that companies ensured this by establishing collaborative processes throughout the outsourcing period. Collaborative practices had a vital role in transferring the knowledge to the vendor. However, as both of the cases illustrated, the need for collaboration did not stop after the knowledge transfer. The collaborative relationship remained active throughout the outsourcing period. Such collaboration occurred both in verification of subcontractor's deliverables and in the form of high-level verification, where incremental results by the subcontractor were integrated and tested as a larger entity. Furthermore, collaboration was also the key issue in transferring the created knowledge from the vendor. For instance, with the case of Maxit, they established testing procedures of the software to the vendor's premises to ensure transfer of knowledge back to the company. In both cases, although the requirements were articulated to the vendor through specifications, close cooperation and local presence was needed to ensure successful flow of knowledge throughout the process. Figure 4 illustrates the nodal points and the knowledge flow in the process of outsourcing software product development activities.

Take in Figure 4

As illustrated in Figure 4, licensing COTS provides different challenges to the management of product development. As mentioned, whereas outsourcing development activities requires intensive application management, licensing COTS entails applications assembly thereby bringing new aspects to the process management [25]. The management issues that incorporate 'buying' COTS entail adapting to the design rules of the component and integrating the component to the existing system. Figure 5 summarizes the management implications associated with each approach towards undertaking software development – that is – making internally, buying existing components and specifying the development needs to the vendor.

One of the key findings of the case studies is that not only modularity, explicitness of knowledge and standardation of processes lay the prerequisites for outsourcing, but outsourcing as such creates them providing sound basis for further outsourcing, as was argued earlier in this article. For instance, as illustrated with cases of JPS and Maxit, outsourcing coerces companies towards component based software engineering, which in turn creates embedded modularity in the product design architectures. This enabled JPS in their further outsourcing endeavors. The created modular design and product

architectural structures can be used in the software industry to explain continuous and incremental outsourcing within certain companies. Further, although using COTS does not automatically lead to modularization of the system, it assist in such process as the licensed component need to be integrated to the system as such, that is, as a separate entity. Further, adopting COTS to modular systems also assists in risk management, as in case of discontinuance of the licensing agreement the component can be more easily removed from the system

Take in Figure 5

6. SUMMARY AND IMPLICATIONS

The purpose of this article was to gain a deeper understanding of the conditions under which different breadth of outsourcing options in software development process are transferable to an outside vendor. To achieve this aim, we introduced a theoretical framework, which was then examined through three explanatory case descriptions. Theoretically we provided a framework which elaborated further the issue of modularity and using external resources to undertake product development activities. It can be argued that the broader generalizability of this study is limited by its data set and chosen research method. However, our aim was to provide examples that can be used to build and develop theories. Furthermore, due to the highly intangible nature software development, the outsourcing decisions are highly context dependent, which overall limits the possibilities for generalizable results and therefore justifies the chosen case method. Accordingly, we believe to have provided new aspects on the research on modularity of and outsourcing of software development activities, therefore building a sound basis for future research. From managerial perspective, this article provides insights for decision-makers responsible for software product development. This article identifies the key managerial issues that are incorporated with each approach towards product development. Whether software firms decide to make, buy or specify different components in their product development process, different management challenges follow. This article identifies those management challenges and provides tools and insights in managing them.

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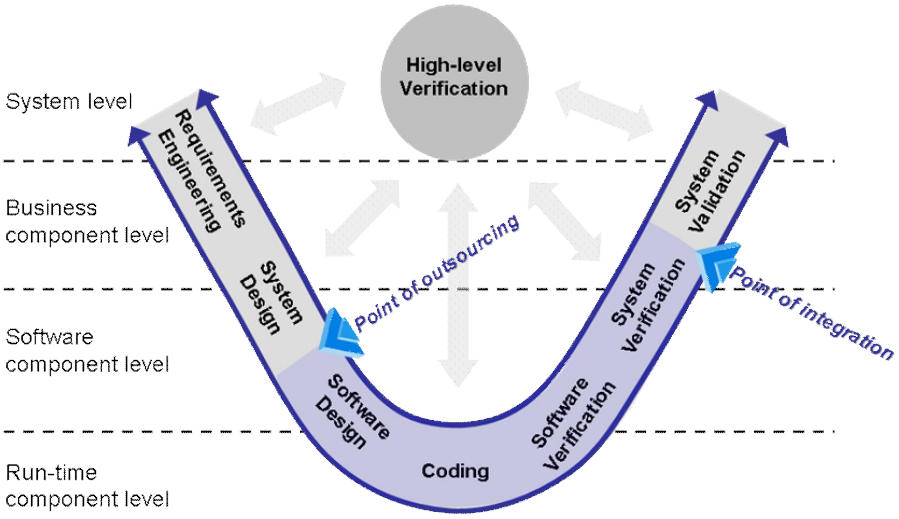


Figure 1. Framework for software development outsourcing

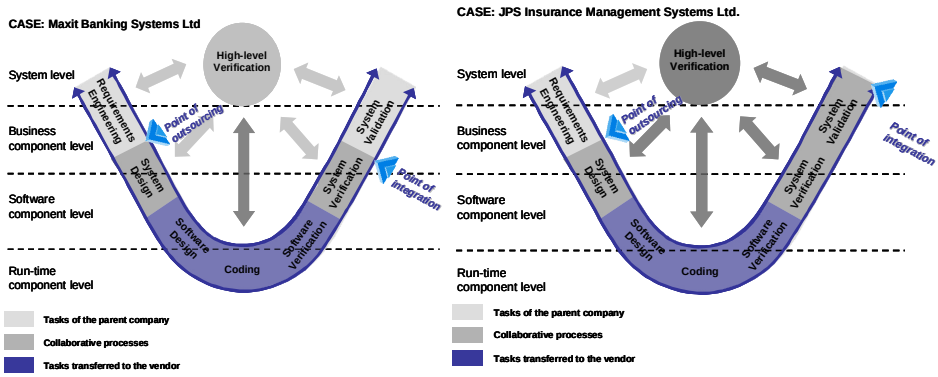


Figure 2. The outsourcing processes of Maxit and JPS

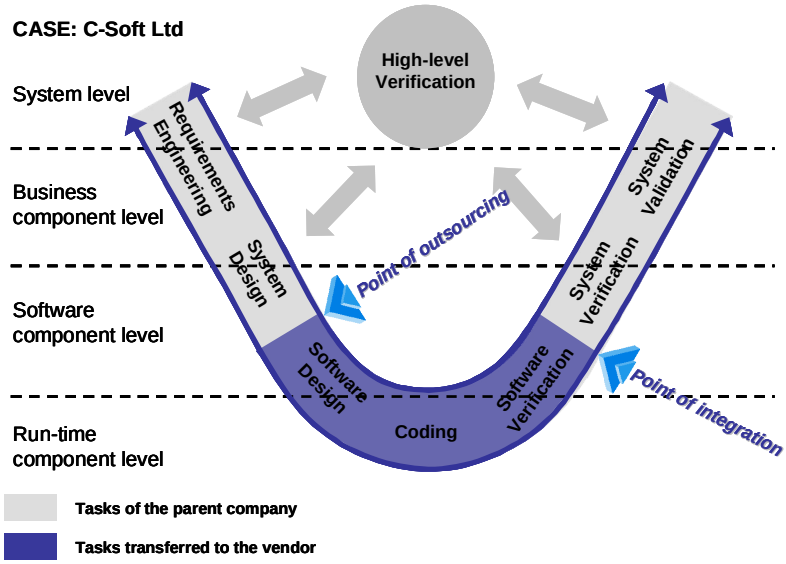


Figure 3. The licensing process of C-Soft

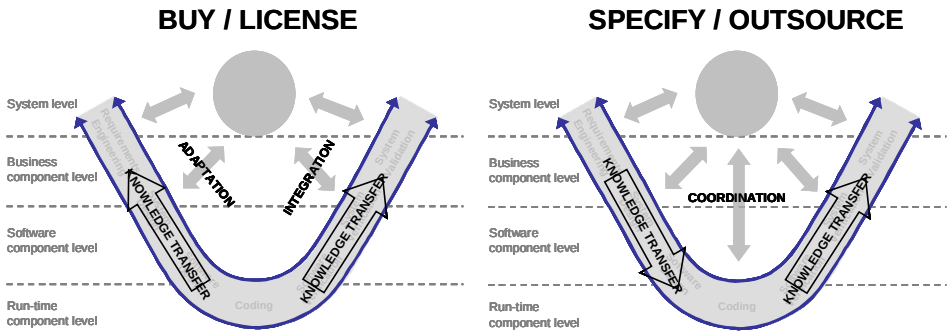
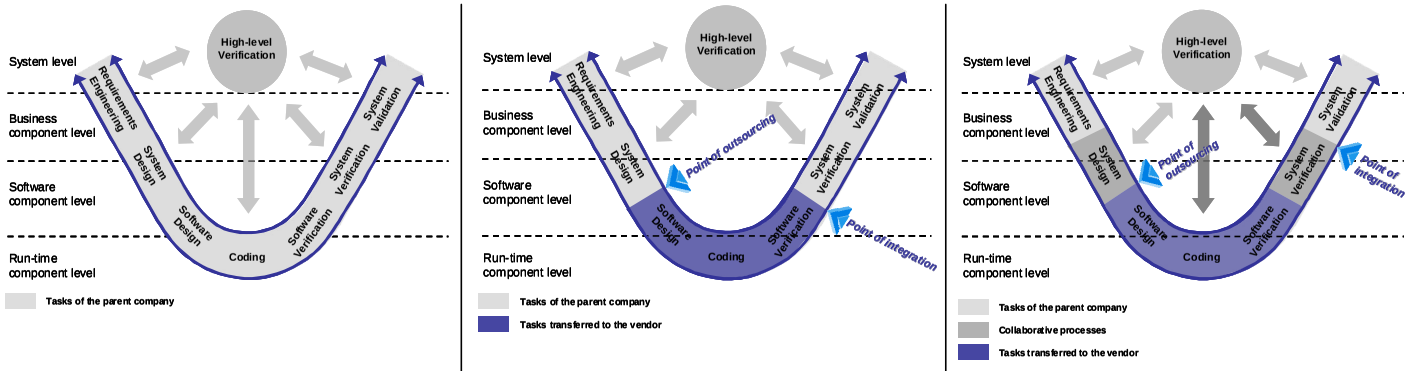


Figure 4. Knowledge flows and key management challenges in licensing and outsourcing

Figure 5. Different approaches to software development management and managerial implications



MAKE	BUY	SPECIFY
- **Management role** in applications development	- **Management role** in applications assembly	- **Management role** in applications management
- **Key management responsibilities** entail the coordination of internal development process	- **Key management responsibilities** entail adapting to the existing design principles of the supplier and integrating them in the existing solution	- **Key management responsibilities** entail the coordination of dispersed application development by ensuring fluent knowledge transfer to the vendor and subsequently from the vendor
- **Key managerial tasks** include building internal processes for flow of information between different development phases	- **Key managerial tasks** include conducting suitability and performance testing for the prospective component and to build interfaces for the component for integration	- **Key managerial tasks** include building processes for overall cooperation (operating procedures), processes for knowledge and task transfer to the vendor (specification creation procedures), and processes for knowledge and task transfer from the vendor (testing and validation procedures).
- In respect to **modularity**, adopting to the principles of CBSE not as vital if the development is not dispersed within the organization	- Prior **adoption to modular design principles** eases especially in the phase of integrating the component to the existing structures. Further, as COTS components are more often functional and well-defined entities, integrating them most likely leads to increase in the modularity of the system	- Prior **adoption to modular design principles** eases significantly the transfer of tasks to the outsourcing vendor, and also in the integration of the externally developed modules. Further, outsourcing well-specified and defined modules and integration of them leads automatically to modular design structures in the system architecture

ARTICLE 6

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Expanding the international business research agenda on international outsourcing

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10

Expanding the International Business Research Agenda on International Outsourcing

Jussi Hätönen and Mika Ruokonen

Introduction

As diminishing national barriers, improved communications links and the evolution of a new, focused supplier base has made it possible to move internal activities and processes across corporate and national borders, the proponents of international business literature have become increasingly interested in the phenomenon of international outsourcing. Ramamurti (2004) has stated that outsourcing across national borders is the new and expanding topic of future international business (IB) research, but as yet the research community has paid only limited attention to this important phenomenon. Accordingly, in this chapter we shall illustrate how several aspects of the phenomenon have been overlooked by IB scholars. We shall not only emphasize the importance and need for further research on the topic, but also to identify some of the important future issues for IB scholars regarding future topics on international outsourcing.

Outsourcing is not yesterday's phenomenon, although interest in this topic has rocketed in recent years. Several different streams of concurrent business literature have contributed greatly on the general practice of outsourcing. For example, previous studies from the strategic management perspective have examined outsourcing from angles such as a tool for restructuring organizations into more flexible forms (for example Lei and Hitt, 1995) – that is, transformational outsourcing (for example, Linder *et al.*, 2002); the motives towards outsourcing (for example, Kakabadse and Kakabadse 2002); the value of outsourcing (for example, Quinn and Hilmer, 1994); the pitfalls of outsourcing (for example, Barthélemy, 2003b); effects of outsourcing on the firm's performance (for example, Gilley and Rasheed, 2000) and market value (for example, Hayes *et al.*, 2000); how to manage outsourcing relationships (for

example, Useem and Harder, 2000) to name but a few. Recently, as requested by Ramamurti (2004), much more focus has been given to outsourcing in the international context (for example, Beulen *et al.*, 2005; Doh, 2005; Farrell, 2005; Levy, 2005) covering issues such as what to outsource and where (Graf and Mudambi, 2005; Palvia, 2004) and recently the topic has been attracting increasing interest among IB scholars.

Despite this growing interest of researchers in the topic, however, the most important question has not yet been fully answered: that is, why do some fail and others succeed in their outsourcing arrangements? Contradictory findings over the applicability of outsourcing of similar organizational processes and functions to similar destinations suggest that the answer to this question lies beyond 'what' and 'where'. Companies seeking to outsource internationally face adversities, often related to the risks of operating in international markets. On the other hand, in a turbulent business environment, outsourcing can diminish company risks, whether they are commercial- or country-related. However, several risks exist in outsourcing itself, such as knowledge spillovers through outsourcing core elements, or for the hollowing of organizations losing control of operations. Nevertheless, it has been stated that, if done correctly and for the right reasons, outsourcing can provide unseen benefits, ones that might assist greatly in operating in today's turbulent markets.

The purpose of this chapter is to raise new issues and aspects concerning the timely topic of international outsourcing, ones that may have been previously overlooked, subconscious, or entirely new. To be able to pinpoint areas for further research from the IB perspective, current research on international outsourcing and its connection to other streams is first analysed – that is, seeking to answer the question 'How has the IB research stream contributed to overall research on outsourcing?' In relation to the identified research gaps we shall illustrate three case studies that together provide a vivid tool to illustrate the practical connection of the suggested possibilities for further research directions in international outsourcing.

As can be seen from Figure 10.1, the study illustrated in this chapter was constructed from three phases whose purpose was to create implications for future research on international outsourcing (Phase 4). First, we conducted a literature review to gain an understanding of current research interest in the topic. Second, we analysed fifteen companies to discover their outsourcing practices and experiences. The purpose of these case studies was to refine and reinforce the current theories, to suggest new research areas on international outsourcing and possibly create hypotheses for further research. Third, based on the literature review and the company analyses, we suggest gaps and thus future directions for international outsourcing research. As already noted, to emphasize the practical proximity of these issues, three examples from the company analyses connected to these issues are provided in the chapter.

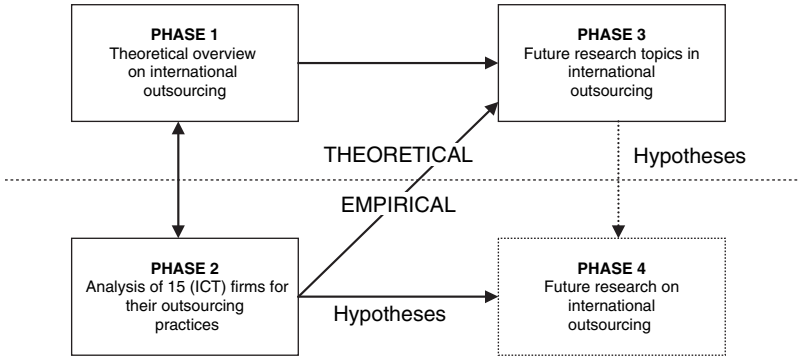


Figure 10.1 Outline of the chapter and its purpose for future studies

Identifying the gaps in international outsourcing research

Although the topic of international outsourcing is often examined in an interdisciplinary manner, Maskell *et al*. (2005) have been able to identify three types of literary stream with an interest in international outsourcing, each with its own characteristics: strategic management literature, supply chain literature and international business (IB) literature. We could introduce an additional fourth stream of literature that has existed since the beginning of the practice, and that is on information systems/technology (IS/IT). However while IS, or IT, literature often draws on strategic management literature, IB literature and sometimes supply chain literature, the issues behind this stream derive from the three main streams of outsourcing literature only in a specific industry context. Thus, in this chapter we shall only introduce the three main streams and their contribution to the understanding of offshore outsourcing[1]. A summary of current research as relevant research equations in and stream is represented in Table 10.1.

First, *strategic management literature* is largely focused on the resource base, core competencies and boundaries of the firm, and is thus focused more on explaining the phenomenon of outsourcing in general rather than offshore outsourcing, although recent developments in that field are leaning towards explaining economic and managerial incentives for offshore outsourcing.[2] However, the main focus of the strategic management literature is to seek the rationales behind actions regarding outsourcing. From the perspective of strategic management, outsourcing was previously seen as a tool to trim the cost base (Coase, 1937; Williamson, 1975) or to acquire resources that were in short supply or that were not available internally (Johanson and Mattsson, 1988; Pfeffer and Salancik, 1978). At the time, outsourcing was seen as a tool to trim

Table 10.1 Current research streams on international outsourcing and their special characteristics

Research stream	Main questions addressed	Some recent contributors	Discipline-based theories
International business literature	• Why outsource abroad?	Farrell, 2004a; 2005; Quélin and Duhamel, 2003	Geographical location theory, transaction cost theory, resource-based view
	• Where to outsource?	Palvia, 2004; Graf and Mudambi, 2005; Vestring *et al.*, 2005	Geographical location theory
	• What is the impact of offshore outsourcing on different stakeholders?	Deavers, 1997; Baily and Farrell, 2004; Farrell, 2004b; Doh, 2005; Levy, 2005	Institutional theory
	• Is offshore outsourcing an incremental learning process?	Hagel and Brown 2005; Graf and Mudambi 2005; Maskell *et al.*, 2005; Beulen *et al.*, 2005	Internationalization process theories
Strategic management and supply chain literature	• What should be outsourced?	Baden-Fuller *et al.*, 2000; Gilley and Rasheed, 2000	Internalization theory (transaction cost theory, resource-based view)
	• Who is the right supplier for outsourced activities?	Hoetker, 2005; Feeny *et al.*, 2005	Network approach
	• How to manage outsourcing relationships?	Barthélemy, 2003a; Lonsdale, 1999; Useem and Harder, 2000; Håkanson and Ford, 2002	Relationship theory, network approach
	• Vertical versus virtual integration?	Fine *et al.*, 2002; Lawton and Michaels, 2001; Bagchi and Skjoett-Larsen, 2002	Theory(-ies) of the firm, organization theory, internalization theory
	• How to manage the new dispersed supply chains?	Lonsdale, 1999; Parker and Russell, 2004	Relationship theory, network approach

Sources: Main contributing sources are Buckley and Lessard, 2005; Maskell *et al.*, 2005.

organizational efficiency through handing out non-critical peripheral functions to specialized providers. However, and as a result of increased competition alongside falling interaction and communications costs and the evolution of specialized suppliers, companies are moving towards outsourcing their more critical functions and processes. Simultaneously, the focus has shifted from strict cost discipline to creating superior customer value. Furthermore, the distinction between core and non-core competencies is fading, and some researchers have even touched upon the issue of outsourcing the core competencies (Baden-Fuller *et al.*, 2000; Gilley and Rasheed, 2000).

This increased outsourcing activity has, according to some management scholars, generated a platform and need for dynamic set of new core competencies. The first of them can be referred to as strategic restructuring competence. The essence of this is that a company's real value in creating competency, perhaps its only sustainable one, might even accumulate from its ability to restructure its value chain continuously (see, for example, Fine *et al.*, 2002). Another 'new' core competence discipline arises from the company's ability to manage the geographically dispersed network of suppliers resulted from the outsourcing of economic activities (Kakabadse and Kakabadse, 2002), also referred to as network competence (Gemünden and Ritter, 1997). Accordingly, the strategic management literature on outsourcing is increasingly focusing around three main questions: (i) what could or should not be outsourced; (ii) for those activities that are outsourced, what the right supplier would be; and (iii) for those activities that are outsourced, what form of relationship is most appropriate? International aspects of outsourcing set challenges for strategic management research related to the latter two questions and provides possibilities for the first one.

The second stream of international outsourcing literature is *supply chain literature*, in which outsourcing is looked at from the value chain and distribution perspective, such as procurement. Vertical integration versus virtual integration has been one of the main comparative analyses in this stream (Bagchi and Skjoett-Larsen, 2002), which often draws on theories such as internalization theory, organization theory and different theories of the firm (Buckley and Lessard, 2005). According to Bagchi and Skjoett-Larsen (2002), it is costly and even sometimes impossible to develop competitive capabilities in all areas, thus firms should identify areas where they can develop or acquire capabilities of their own, and where they can rely on supply chain partners to provide the required competitive capabilities. For example, along with global or multi-vendor sourcing arrangements, supply chains are becoming global and more complex and, as companies are demanding just-in-time deliveries or in-line sequences, issues such as logistics and procurement have become one of the mainstays of the outsourcing literature (Ellram and Billington, 2001). Although configuring downstream operations has been the main focus of both outsourcing and offshore outsourcing in the supply chain literature, innovative business models

have brought a need for new capabilities in upstream supply chain management. Thus the outsourcing literature is increasingly concentrating also on that area (Lawton and Michaels, 2001).

Finally, *international business literature* is emphasizing international localization and factor aspects in explaining to same extent which outsourcing is conducted abroad. Research in international business and management has developed two broad traditions: variance theories and process theories (Langley, 1999). Variance theories aim to explain determinants of variation in corporate performance or behaviour, and typically are tested with cross-sectional data, whereas process theories seek to explain how and why businesses evolve over time (Meyer and Gelbuda, forthcoming).

From the IB perspective, offshore outsourcing literature has focused almost solely on developing variance theories. For example, the effect of offshore outsourcing has been studied in terms such as companies' performance (for example, Gilley and Rasheed, 2000) and market value (for example, Hayes *et al*., 2000), but most importantly the IB literature has focused on certain stakeholder impacts such as on workers and labour (for example, Deavers, 1997), governments (for example, Baily and Farrell, 2004; Farrell, 2004b), NGOs (for example, Venkatraman, 2004) and societies in general (for example, Doh, 2005; Levy, 2005). However, from the variance perspective, much more of the IB scholars' attention should be paid to answering the question, 'Why do some companies fail while others succeed in outsourcing internationally', because successful outsourcing strategies are found to carry positive effects not only for the companies involved, but also for the stakeholders around them (for example, Farrell and Agrawal, 2003).

The variance studies on international outsourcing dominate the IB literature and only limited research has so for emphasized the process aspect of IB research. However, it has been noted that companies are increasingly outsourcing more and more critical aspects of their businesses abroad (Beulen *et al*., 2005). Some researchers have recently started to scrutinize this evolution of offshore outsourcing. In the mid-1990s, for example, Quinn and Hilmer (1994) viewed outsourcing as a development process proceeding from short-term to long-term supplier contracts. Furthermore, Hagel and Brown (2005), for example, state that once a company has developed outsourcing skills, it is more likely to consider moving its outsourcing relationships to companies offshore. This type of incremental learning in outsourcing and offshore outsourcing is a growing topic of research today. For example, Graf and Mudambi (2005), as well as Maskell *et al*. (2005), state that offshore outsourcing is, or normatively should be, a sequential learning process in which cost advantage motives precede differentiation advantages, and near-shore locations precede far-shore outsourcing. Interestingly, this process is very similar to the early models of the outward internationalization process (Johanson and

Vahlne, 1977; Luostarinen, 1979). However, it is as yet unclear whether outsourcing might even have a positive effect on the outward internationalization of companies. Nevertheless, in accordance with this development, we should expect to come across the concepts of 'born global outsourcers' or 'international new outsourcing ventures' in the future.

Combining practice and theory – new aspects for IB research in international outsourcing

The question of 'what determines the international success and failures of firms' has always been the leading question guiding IB research, and will continue to be so in the twenty-first century (Peng, 2004). International business researchers have, however, to large extent neglected to examine outsourcing as a factor behind the success. IB scholars have been preoccupied with justifying the practice of outsourcing to stakeholders on a macro level, while the micro or industry level analyses of outsourcing and its effect on the overall success of companies has been left with inadequate attention. For example, in the field of IB, it has been shown to some extent that companies concentrating on their core competencies and outsourcing other activities are able to internationalize rapidly and with lower costs (Barthélemy, 2003b). Whereas strategic management literature has for a long time emphasized the implementation of a correct outsourcing strategy as one of the key factors behind the successes of modern companies, IB scholars still seem to look elsewhere for factors behind international success. In this chapter we shall introduce a few new perspectives of international outsourcing that have assisted companies in unconventional and unrealized ways in their international business. As a result, we shall identify some issues of international outsourcing that could provide fruitful ground for future IB studies.

Explaining international firms through outsourcing

Along with reducing national barriers, improved communication links and the evolution of a new, focused supplier base, companies are starting to outsource some of their international operations, as the ever-changing markets shift location and internalization advantages. This causes entirely new management issues within multinational corporations, and yet these issues have been overlooked by IB scholars. Furthermore, there exist only limited studies on what causes companies to take on-shore once-outsourced operations. In this age of anxiety and constant change, adding these aspects of international outsourcing to the concurrent IB research agenda could provide a better understanding of the future developments of the outsourcing phenomenon.

New aspects of international outsourcing through changes in the OLI paradigm

The common definition of outsourcing, which states that before something can be outsourced it has to be produced internally, constitutes the fact that

companies cannot internationalize outwards directly through offshore outsourcing, although some authors (for example, Gilley and Rasheed, 2000) suggest that, in addition to the normal way, outsourcing can also occur through abstention, separate from basic procurement, because it only occurs when the internalization of the good or service outsourced was within the acquiring firm's managerial and/or financial capabilities. In short, in this approach, outsourcing is viewed as choosing to buy over make, if make was also possible with internal resources. However, this additional view is often seen as being too broad, as it confuses the practice of outsourcing with procurement and sourcing.

To a large extent, offshore outsourcing can be explained through the OLI paradigm in the way that ownership and location advantages exist, but not the internalization advantages (see Graf and Mudambi, 2005). In other words, it is useful to produce the product or service in the foreign location, but not with internal resources. The only way in which outsourcing is an international operation mode as referred to by the internationalization process models, is changes in the OLI paradigm, and in particular in the advantages in internalization. (See Table 10.2.)

Dunning (1988, p. 63) predicted that:

> MNEs would wish to reduce their presence in a particular country or sector under two circumstances. First, where a change in the distribution of factor endowments (or the efficiency with which these are used) (1) weakens their competitive advantages, relative to those of firms in host countries, or (2) causes them to switch production from the host to home (or indeed, other host countries). Second, where the net transactional benefits (costs) or using the external markets for the exploitation of these competitive advantages increase (fall) relative to those offered administered hierarchies.

Table 10.2 Extension to the routes of serving markets

Route of serving markets	**Ownership**	**Advantages internalization**	**(Foreign) location**
Foreign direct investment	Yes	Yes	Yes
Trade in goods and services	Yes	Yes	No
Contractual resource transfers	Yes	No	No
Offshore outsourcing	**Yes**	**No**	**Yes**
Changes			
Outsourcing foreign direct investment	Yes	Yes → No	Yes
Offshore outsourcing of foreign direct investment	Yes	Yes → No	Yes → No
Relocating outsourced activities	Yes	No	Yes → No

Source: Dunning, 1988.

What Dunning stated to be one of the emerging issues is such divestment and/or relocation of international activities. Several internationalization process models (for example, Johanson and Vahlne, 1977; Luostarinen, 1979), Dunning (1988) state that companies might seek to divest themselves of their international operations in time, yet remain present in the markets through non-equity arrangements such as partnerships, which on the other hand equates with operating abroad through an outsourcing arrangements.

The changes in the internalization and location advantages provide a fruitful and important ground for further studies in the field of IB. In fact, it could be argued that the whole topic of international outsourcing arises from the changes in the advantages of the OLI paradigm. However, many of the possible scenarios are still unrealized and thus provide possibilities for further research. For example, the late proponents of the 'staged models' of internationalization have acknowledged that the internationalization process of a company can in fact move it down the ladder as well as up, but future studies on international outsourcing might illustrate why. The following case illustrates an example of how changes in location and internalization advantages are shaping a company unit from being a foreign production unit towards being a foreign sales unit.

Outsourcing international operations: case company A

Company A is a computer-aided design (CAD) software producer providing the manufacturing industry as well as the building and construction industries with a highly sophisticated but standardized product. The company has its headquarters in Finland and sales subsidiaries in the USA, Singapore, the UK and France. The US subsidiary was established at the start of the 1990s. In the US market the company operates solely with the product for building and construction. This product is sophisticated, and is also therefore somewhat complex, so it takes time for the customer to learn how to use it. This is why the product is often sold with a two-week on-site training course, and a two-year update and customer services package is often added to the final product. When the company entered the US market the entire solution was provided with internal resources. However, after the US business expanded, the company reached a situation where its internal resources, both time and money, were inadequate to serve such a package on such a large continent. First, they found that internalization of the on-site training was not profitable as it tied up the scarce time of software developers, and because there existed a competent supplier in that field to provide that service to them. Furthermore as this relationship developed, company A found that the provision of after-sales service was not profitable and it was better to outsource that as well, partially to the same supplier. The outsourcing decisions which resulted from the changes in OLI advantages over time are represented in Table 10.3.

Table 10.3 Changes in company A's OLI advantages

Services of the CAD product	Ownership	Advantages internalization	(Foreign) location
Establishment of subsidiary A (early 1990s)	Yes	Yes	Yes
Partial outsourcing of implementation services to a US-based provider (mid 1990s)	Yes	**Yes → No**	Yes
Partial outsourcing of after-sales services to a US-based provider (late 1990s)	Yes	**Yes → No**	Yes
Relocating after-sales operations (India, 2006?)	Yes	No	**Yes → No**

Now, however, the company is facing a situation where the location-specific advantages have changed in comparison to those in India, for example. Falling interaction costs and the development of know-how in developing countries has made it more attractive for companies to outsource low-level service jobs to these countries. Thus the company's US subsidiary is now considering relocating some of the outsourced services, such as after-sales call centres, to low-cost locations. Along with further improvements in information and communication links, it might be possible in the future that, for example, India's location advantages precede those of the USA even with regard to implementation services.

The effect of international outsourcing on the outward internationalization process

The internationalization of companies is one of the mainstays of IB research. The proponents of the 'staged models' of internationalization (for example, Johanson and Vahlne, 1977; Luostarinen, 1979) suggest that, as companies acquire more foreign-market knowledge, the more commitment decisions are made. Furthermore, it was argued that outsourcing is an incremental learning process. However, in this chapter we shall argue that, international outsourcing is also an incremental learning processes, and might in fact have an effect on a company's outward internationalization process.

International outsourcing as an incremental learning process and horizontal–outward connections

According to Hagel and Brown (2005) companies do not immediately outsource the most critical activities abroad. In fact, recent studies suggest that off-shore outsourcing is a sequential learning process in which cost advantage motives precede differentiation advantages, and near-shore locations precede far-shore outsourcing (Graf and Mudambi, 2005; Maskell *et al.*, 2005). Sequentality and incrementality suggest that companies gradually engage in

outsourcing first in home markets and only after that do they seek providers from off-shore markets to provide, first, perhaps less critical functions, but later even the most critical ones (see Figure 10.2). Thus location-specific advantages such as productivity, quality, availability of resources, infrastructure and so on are not sufficient to explain the off-shore outsourcing of non-core activities of the firm (Dunning, 1988), but bounded rationality also affects international outsourcing decisions.

Although some studies have been conducted based on the fact that companies move from outsourcing first peripheral activities and then move towards more strategic ones, outsourcing first in near-shore locations, and moving incrementally to far-shore locations, more studies could be done on linking these two separate but similar processes. This is illustrated in Figure 10.2. It is to be expected that companies acquire market knowledge from the outsourcing country. However, it is unclear whether this market knowledge can be transferred. Prior research suggests that the success of outward internationalization is dependent on the effective use of inward internationalization, and vice versa. Furthermore, success behind the internationalization of a company might lie in its previous outsourcing of activities. It is interesting that the inward type of internationalization has received only limited attention, and even more so when some studies have found that inward internationalization strongly affects the outward internationalization process (for example, Welch and Luostarinen, 1993). However, these studies have concentrated almost solely on the procurement and sourcing aspect of inward internationalization, leaving many aspects of the issue of outsourcing untapped.

The basic idea of off-shore outsourcing affecting companies' outward internationalization process is illustrated in Figure 10.3. The underlying

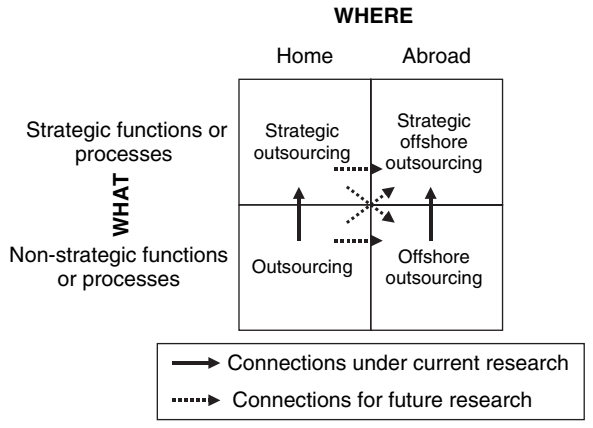
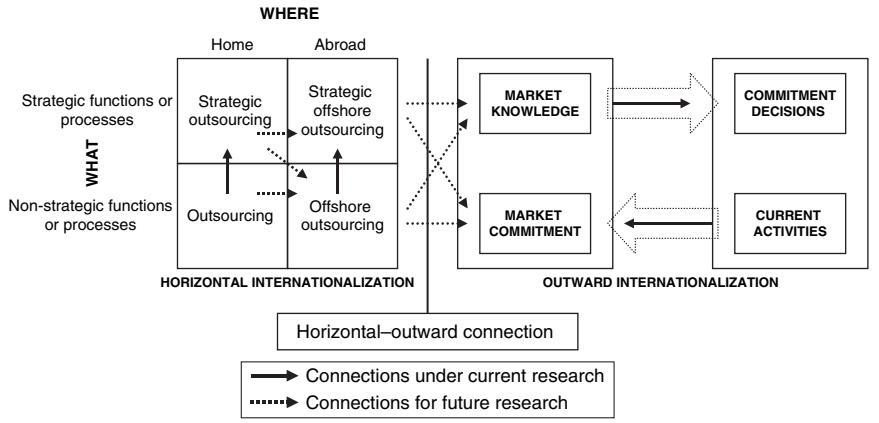


Figure 10.2 The incremental processes towards strategic offshore outsourcing



Source: Adapted from Johanson and Vahlne, 1977.
Figure 10.3 Horizontal–outward connections through outsourcing

assumption of this model, that a gradual increase in off-shore outsourcing will increase the market knowledge in a particular market, has been seen as a prerequisite and one of the decisive factors in an outward internationalization process (Johanson and Vahlne, 1977). Furthermore, the international outsourcing of activities can *per se* increase the market commitment, and this in turn could explain the jumping-over-phases phenomenon in companies' internationalization processes.

The following case illustrates a situation in which a company outsources solely to acquire market knowledge. Although on a very narrow margin as marketing and sales is partially outsourced in this case, it illustrates a situation where an outsourcing agreement is used to boost the outward internationalization process of the company. Based on the following case, it is possible to expect that under some conditions, market knowledge of the target market can be acquired and transferred through outsourcing arrangement.

Outsourcing for market and industry intelligence: company B

Company B is also a Finnish-based design software producer. The company can be considered to be truly global, as today almost 95 per cent of its sales accumulate from abroad, from seventy different countries around the world. Furthermore, the company is represented in fifteen countries, as their product is often sold as a solution that also includes a service aspect, mainly in the form of training and after-sales services such as updating and a support centre.

The company realized that for a sales organization, which company B considers itself to be, there can be no sales without understanding the markets. In particular, they realized this fact as they decided to expand on to the Japanese market. After setting up a subsidiary, the company encountered several problems,

from simple language difficulties to the established methods of conducting business. The Japanese markets turned out to be more complicated than had been expected, and thus the company divested a part of its representation in those markets and simultaneously made a partnership agreement with a local reseller to cover the gap left by the divested part. Thus in a way they outsourced a piece of their local representation or sales to a more competent unit. The main reason and motive behind this decision was to acquire knowledge about the complicated Japanese market. They retained office of their own on the markets so that they would be able to work in close co-operation with the reseller. Even though the company hardly breaks even in Japanese markets today, they still pursue this strategy as they see that the market knowledge that is acquired through the partner could be useful in future efforts to increase commitment on to those markets.

The network effect of outsourcing

In addition of gaining market knowledge, international outsourcing can also assist in other ways the international success of companies. Through international outsourcing a company can also gain valuable access to foreign networks that could eventually be extremely beneficial. In this chapter we shall justify why, in future international outsourcing research, the network effect should not be overlooked.

Internationalization through offshore outsourcing – network embeddedness and social networks

The process-based internationalization view has received a fair amount of criticism. One of the most common of these attacks the issue that in the traditional approach to internationalization, companies have been considered to be clearly-defined decision units with internally controlled resources (Andersen *et al.*, 1997). However, it is stated increasingly that the internationalization of a company is highly related to the context in which it operates (Madsen and Servais, 1997) and, more importantly, to the external resources available in each operational context (see, for example, Bonaccorsi, 1992). The process-based internationalization doctrine overlooks the value and the effect of the network in which the company is embedded (Holmlund and Kock, 1998).

The effect of outsourcing on a company's internationalization process can be further examined from the network perspective. As the company network arguably increases when it decides to outsource activities or processes so does it increase the possibility of its effect on the company. And it has been found that individual contact networks can play a crucial role in the internationalization process of a company (Axelsson and Agndal, 2000). This kind of individual contact network can be created through offshore outsourcing. On the other hand, individual contact networks can also lead to further offshore outsourcing

commitments. Either way, the created network through (offshore) outsourcing often has an effect on the success of a company. In fact, a created downstream network can even result in direct influences on the sales of a company, as illustrated below in the case of company C. Thus, when seeking the factors behind the international success of companies, offshore outsourcing should also be examined from the network perspective.

Off-shore outsourcing as a springboard for outward internationalization: company C

Company C is a European-based software company whose sole business (in a diversified company) is to produce and license computer-aided design (CAD) software, mainly for construction and engineering offices. The firm's strengths lie in its knowledge and experience in providing customers with a highly-developed 3D modelling programme for building and construction, and that is where its core competencies lie.

As the construction industry is evolving beyond CAD to fully computerized projects, this has made new demands on software producers. The builders or designers are no longer satisfied with depicting the construction or the buildings, but are now demanding software programs that, for example, calculate the quantities of the elements that are needed, and work out in which part of the process they will be needed. These kinds of attributes can be developed through a separate calculation tool.

However, for a long time the company's capability to develop such a calculation tool were limited. As they wanted to focus their entire resource pool on the core product, 3D modelling, they decided to outsource the calculation part of the software solution. Accordingly, the outsourcing decision was a typical resource-based rationale. Because using multiple providers to supply them with this part of the solution would have meant building several interfaces to their product, they decided that the most cost-efficient way to proceed would be through a preferred partnership. After a search they settled on a California-based vendor that has specialized in this narrow and specific area.

As the relationship got off the ground the supplier soon realized that the performance of company C was having an effect on its own performance, and to some extent vice versa, so the Californian based supplier became a retailer of the combined solution in the US market (see Figure 10.4). Although the company already had sales in the US market before the retail agreement, this agreement provided company C with a further gateway to the large but troubled market in the USA.

What this case illustrates in short is a situation where outsourcing a part of the production process led to an increase in international sales – that is, outward internationalization. As a result of the decision to outsource the calculation part of the program, company C in fact gained unconscious and

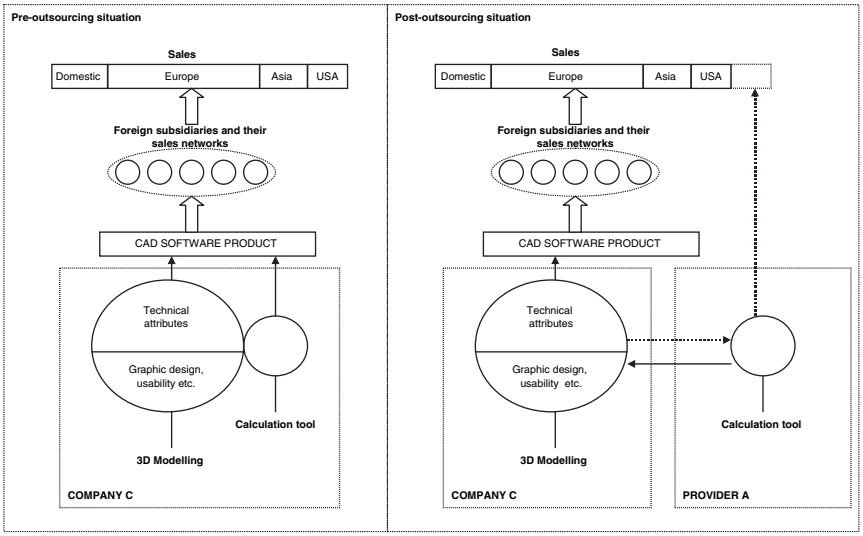


Figure 10.4 The horizontal–outward connection in company C

unplanned benefits. This case illustrates that it is important to take the target country's possible markets into account when making outsourcing decisions. If the company had decided to outsource to India, China or another low-cost location it might have found a cheaper price and perhaps even better quality, but it would have lost possible future sales. Thus, in future international outsourcing research, the network effect cannot be excluded from the analysis.

Conclusions and implications for future research

Since the birth of the practice, the research on outsourcing has gathered momentum, irrespective of a given literary stream. However, several aspects of this important topic have been overlooked or unrealized by the research community. The purpose of this chapter was to identify some of these issues from the IB standpoint. Accordingly, we first identified the scope and contributions of the IB research community in the wider outsourcing research field. Based on the IB literary overview provided in this chapter, we concluded that researchers should continue to seek an answer to the question of why some succeed and others fail in international outsourcing, as this question has not been answered fully in previous studies. In addition, we identified several

issues that have been overlooked in previous research, which might provide a fruitful starting point for future IB research in the area of international outsourcing. According to our analysis, the following research questions and hypotheses could be introduced for further research:

- Under which conditions companies want to divest (a part of) their foreign presence?
  - $H_{1,1}$ Changes in the foreign internalization factors are behind the outsourcing decisions of foreign production.
  - $H_{1,2}$ International outsourcing of international operations (see Figure 10.1) is caused by simultaneous changes in location and internalization advantages.
    - $H_{1,2,1}$ Most often changes in location advantages precede changes in internalization advantages.
- Is outsourcing an incremental learning process, and how does international outsourcing affect the outward internationalization process of a company?
  - $H_{2,2}$ Previous domestic outsourcings have a positive effect on the outcomes of international outsourcing.
  - $H_{2,3}$ Previous outsourcing in a given country has a positive effect on the success of outward expansion to that country.
- How does international network embeddedness affect the international success of companies'?
  - $H_{3,1}$ International network embeddedness acquired through offshore outsourcing has a positive effect on the outward internationalization of companies.

These questions and hypotheses are examples of possible future research questions in international outsourcing. Testing them (Phase 4 in Figure 10.1) as such might create a new set of issues and problems. However, we shall not go any deeper into these hypotheses here, as the purpose of this chapter was not to test them, but only to identify them.

To summarize, generally more research is required on the aspects of international outsourcing other than outsourcing offshore – aspects such as outsourcing international operations or on-shoring operations. Scholars of IB should focus on scrutinizing this phenomenon from new perspectives, because, as demonstrated, international outsourcing can be the underlying factor behind the success of modern international companies. According to Peng (2004), this has always been one of the leading topics guiding international business research.

Notes

1. For a thorough literature review of outsourcing from the IS field, see Dibbern *et al.*, 2004, 35(4), 6–102.
2. For debate over the profitability of outsourcing, see *Journal of Management Studies* 2005, 42(3) (Farrell, 2005; Levy, 2005; Doh, 2005).

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