Managing the Industrial Service Function

Christian Kowalkowski

2008

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Acknowledgements

Time really flies. It is already four years since I started writing (or, at that time, it was rather reading, thinking, and attempting to write) what was to become this doctoral thesis. Throughout the process of writing it, I have had the support of a large number of people to whom I would like to express my gratitude.

First and foremost, I would like to thank my supervisors Per-Olof Brehmer and Staffan Brege for taking me onboard and for being excellent supporters and advisors during these years. Thank you for many interesting discussions, valuable insights and lines of approach as well as the freedom to follow my own ideas in this truly intriguing process!

As a co-author of three of my papers, Daniel Kindström has contributed with lots of ideas, data, and fun. Let’s keep up the momentum!

I am indebted to my industry contacts at the participating companies. Special thanks go to the interviewees at the companies that constitute the core cases which make up this thesis; ITT Water & Wastewater and Toyota Material Handling Group for being exceptionally easy, open, and friendly to work with.

I would also like to thank all my other colleagues in the Marketing Logistics Research Group and EKI/IEI for a friendly atmosphere, many laughs and an inspiring working environment. Special thanks to my Ph.D. student colleagues (current and previous) for all the lunch and coffee-break-on-the-run conversations.

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Much appreciated financial support for this research has been received from Vinnova, the Swedish Governmental Agency for Innovation Systems.

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I thank my family and particularly my parents, for all their encouragement and support during all my years in school. Finally, I would like to thank my beloved wife Helena for all your love, patience, and support; I dedicate this thesis to you. During the last months our son has enriched my life beyond the writing of this thesis; Elmer, I look forward to getting to know you over the years to come!

Liverpool, June 2008
Christian Kowalkowski
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Abstract

During the past decade, growing attention has been given to industrial service offerings in the marketing literature as well as in many manufacturing firms. This phenomenon is often described as a goods-services transition, in which companies increasingly turn to the provision of industrial services in order to achieve competitive advantage, such as closer customer relationships and higher profit margins. Industrial services span a wide range of offerings, from basic after-sales services to process-orientated solutions consisting of both services and capital goods. With industrial service offerings receiving increased attention as their importance is understood, the ability to manage the service business in a manufacturing context becomes ever more vital.

The overall purpose of this doctoral thesis is to describe and analyse how capital equipment manufacturing firms strategically manage their industrial service offerings in order to achieve long-term competitive advantage. This includes analysing how to organise the firm for the development and production of services, and, depending on the type of industrial service offering, what the requirements on the service processes are. Furthermore, the role of information and communication technologies as enablers for new offerings and processes is analysed. The thesis consists of a compilation of five papers, two case descriptions and an extended summary. The research builds on a multiple case study of the service organisations of market-leading manufacturing firms. The main cases are based on in-depth studies at ITT Water & Wastewater and Toyota Material Handling Group.

The results suggest that, as the division between goods and services becomes ever more blurred, there is an increasing need for cooperation between the service and the product organisations. Applying a service logic means that the traditional division between goods sales and after-sales services becomes outdated. Instead, the customer relationship becomes the centre of the offering regardless of its combination of services and goods. Further, the infusion of service in manufacturing firms means that more service processes and interfaces have to be managed simultaneously.

Theoretically, this research contributes mainly to the fields of industrial marketing and service as a business logic. One contribution is the proposed typologies for industrial service offerings which make it possible to better understand the dynamics of service processes. Another important contribution of this research is the service function concept. Industrial services must not be equated with the activities of the industrial service organisation only. Although the service organisation most likely is the key entity, it is only one subset of the service function; sales, product development, manufacturing, senior management, and other organisational entities, as well as external service providers and customers, are to be seen as part-time service functions that influence the offering. Compared to previously, competitive advantage through industrial service offerings is to a greater extent based on factors outside the service organisation, i.e. in other parts of the service function.

Keywords: industrial service offerings, service function, manufacturing firms, ICT, customer relationships, value
Abstract

During the past decade, growing attention has been given to industrial service offerings in the marketing literature as well as in many manufacturing firms. This phenomenon is often described as a goods-services transition, in which companies increasingly turn to the provision of industrial services in order to achieve competitive advantage, such as closer customer relationships and higher profit margins. Industrial services span a wide range of offerings, from basic after-sales services to process-orientated solutions consisting of both services and capital goods. With industrial service offerings receiving increased attention as their importance is understood, the ability to manage the service business in a manufacturing context becomes ever more vital.

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Den industriella tjänstefunktionen: en källa till ökad konkurrenskraft


Den industriella tjänstefunktionen: en källa till ökad konkurrenskraft


Avhandlingen visar på betydelsen av att se industriella tjänsteerbjudanden som något som inte är begränsat till de aktiviteter som utförs inom ramen för företagets serviceorganisation. Även om serviceorganisationen i många fall har den centrala rollen i tjänsteutvecklings- och tjänsteproduktionsprocesserna så bör den ses som en del av en större tjänstefunktion i vilket även försäljning, produktutveckling, tillverkning, ledningsgrupp och andra organisatoriska enheter ingår. Långsiktig konkurrenskraft bygger i allt större grad på aktiviteter som sker utanför den traditionella serviceorganisationen, dvs. i andra delar av tjänstefunktionen.

I många fall är det både externa och interna faktorer som driver utvecklingen mot en ökad tjänsteorientering. Informations- och kommunikationsteknik har en central roll i denna utveckling genom att möjliggöra nya erbjudanden och processer. De största svårigheterna med att strategiskt hantera industriella tjänsteerbjudanden är ofta interna och för att lyckas genomföra en förändringsprocess krävs i regel externa stimuli, exempelvis i form av nya kundkrav. I samband med att konkurrenserna även på servicemarknaden ökar så krävs det att företaget både lokalt och centralt har en förmåga att balansera effektivitet och flexibilitet. Detta innebär att företaget behöver ha en strategisk förnyelseförmåga för att kunna rekonfigurera sin tjänstefunktion och sina tjänsteerbjudanden. En bred tjänsteportfölj kräver att företaget kan hantera flera tjänsteprocesser och kontakttytor mot kund samtidigt. Dessutom krävs en ökad integration mellan de interna service- och produktorganisationerna när gränserna mellan produkterbjudanden och tjänster i allt större utsträckning suddas ut. Den traditionella uppdelningen i produktförsäljning och eftermarknad försvinner allt mer och istället sätts kundrelationen i fokus för erbjudandet oavsett dess sammansättning.
Appended papers

Paper I

An earlier version was published in the proceedings of the 3rd International Conference on Information Technology in Business (ITIB 2006), Warsaw, Poland.

Paper II


Paper III
Kowalkowski, Christian, Per-Olof Brehmer, and Daniel Kindström, “Managing industrial service offerings: requirements on content and processes”, accepted for publication in the International Journal of Services Technology and Management.

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Paper IV


Paper V

Additional publications


Brehmer, Per-Olof, Daniel Kindström, and Christian Kowalkowski (2007), "Organizing for enhanced service offerings – the role of central and local entities in service development and production," presented at the 23rd European Group for Organizational Studies (EGOS) Colloquium, Vienna, Austria.


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PAPER III

MANAGING INDUSTRIAL SERVICE OFFERINGS: REQUIREMENTS ON CONTENT AND PROCESSES. Kowalkowski, Christian, Per-Olof Brehmer, and Daniel Kindström, accepted for publication in International Journal of Services Technology and Management.

PAPER IV

MANAGING INDUSTRIAL SERVICE OFFERINGS IN GLOBAL BUSINESS MARKETS. Kowalkowski, Christian, Daniel Kindström, and Per-Olof Brehmer, under review.

PAPER V


Part III: The industrial service function: empirical evidence

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Part I
Extended summary
Introduction

"Within recent years there has been developing a noticeable tendency to define selling as a process of rendering service. Thus a manufacturer of automobiles does not sell automobiles; he sells transportation. And he uses as his strongest selling point the argument that the buyer of his car will have uninterrupted transportation. Similarly a manufacturer of tires does not sell tires; he sells mileage. And if one casing does not give satisfactory mileage he will furnish another."

The statement quoted above, which was made almost a century ago by Kitson (1922, p. 417), implies a shift in the focus of the manufacturing firm's value proposition. Focus is no longer on the manufacturer's physical products (in this case cars and tyres) but on the customers' value-creation process to which the provider offers value-facilitating goods and services (Grönroos 2008). Thus, it implies a shift from a goods-dominant (g-d) logic to a service-dominant (s-d) logic, in which physical goods are distribution mechanisms for service provision and the value of goods is determined by the customer, based on their value-in-use (Vargo and Lusch 2004a). In Kitson's case, it is the service (i.e. transportation) that the usage of the car renders that creates value, not the purchase and possession of the car as such.

Equally, the quotation from Kitson (1922) bears a resemblance to what many scholars have been arguing for the last decade, i.e. for manufacturing firms to 'go downstream' (Wise and Baumgartner 1999) in order to capture the value which resides in serving the installed base. Such repositioning, it is argued, enables firms to achieve long-term competitive advantage strategically, financially, and in terms of market positions. Although it is challenging to perform, a competitive strategy based on service differentiation is more difficult for competitors to imitate and it enables firms to build closer customer relationships. This means that firms in the manufacturing industry provide more extensive offerings through industrial services required to maintain, upgrade, and in some instances also to operate the equipment manufactured and to increase customers' overall...
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1 Vargo and Lusch (2008a) find this shift in logic of exchange to be consistent with and partially derived from a transition in the business-to-business marketing literature which has moved from understanding exchange in terms of products to concepts of value.
production performance (see, for example, Anderson and Narus 1995; Auramo and Ala-Risku 2005; Davies 2004; Gebauer, Fleisch, and Friedli 2005; Gebauer and Friedli 2005; Goffin 1999; Howells 2004; Lele 1997; Mathieu 2001a; 2001b; MatthysSENS and Vandenbempt 1998a; 2008; Oliva and Kallenberg 2003; Penttinen and Palmer 2007; Phillips, Ochs, and Schrock 1999). Thus, taking into account the increasing importance of services and the substantial challenges for manufacturing firms to develop industrial service offerings (Gebauer 2008b; MatthysSENS and Vandenbempt 1998b; Oliva and Kallenberg 2003), the question of how to strategically manage the service business arises.

1.1 What is the allurement of services?

In the literature on industrial service management, several reasons are given as to why manufacturing firms should give more emphasis to and focus more strategically on their industrial services. For example, Gebauer and Friedli (2005, p. 70) argue that “competing through services enables product manufacturers to earn the potentially highest margins”. A differentiation strategy based on services is also advocated by Anderson and Narus (1995) and competitive service offerings are potential opportunities for firms to become more strategic business partners with their customers, thereby improving customer retention. Creating greater business value for customers through service offerings can reduce competition, and these offerings can also increase share of wallet or deal size and enable firms to access new markets (Krishnamurthy, Johansson, and Schlissberg 2003). Although basic services are often easy for competitors to emulate (Vandermerwe 2000), advanced service offerings are more difficult to imitate than goods and, thus, more extensive industrial services could become a sustainable source of competitive advantage (Oliva and Kallenberg 2003). Since manufacturing firms have deep knowledge of their products and markets, they are often well positioned to undertake a transition into services (Knecht, Leszinski, and Weber 1993; Mathieu 2001b; Wise and Baumgartner 1999).

According to Oliva and Kallenberg (2003), who studied eleven German capital equipment manufacturers, the market for industrial services typically counters a cyclicality of manufacturing operations and operating on it is likely to give higher margins and require fewer assets than manufacturing activities do. In Kalliokoski et al.'s (2004) study of 19 Finnish and four Swedish industrial firms in different lines of business, reducing the cyclical variations in financial performance was found to be a main corporate driver for firms to increase the share of service sales, whereas the impetus on the part of the customer is an increasing demand for more efficient production processes based on new technologies. As many industrial customers focus on their core businesses, the demand on their providers to take a bigger responsibility for and become

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2 It is considered that the sales of services (including spare parts) are less likely to fluctuate than new product sales. During a recession, customers tend to be less inclined to invest in new equipment and/or projects than they do doing economic booms. However, the installed base (i.e. the total number of installed units) in many industries is high compared to annual sales and it needs continuous service, regardless of the business cycle. Thus, the service business is seen as less volatile.
more involved in their processes increases. Nevertheless, the driving forces can vary depending on industry as well as on type of service. Services are shaped by the specific characteristics of the related goods and they, thus, differ across industries (Davies 2003). Furthermore, requirements on services differ depending on whether the service is continuous, repetitious, or unique (Breunig, Kvålshaugen, and Hylde 2007).

In an exploratory study of five ‘leading’ firms within telecommunications, the car industry, vending machines, aircraft, and domestic appliances, Goffin (1999) found that industrial services were perceived by managers at all five firms to be “an essential part of their “offer” to customers. This was equally true for all the range of products; from $300 washing machines to $12 million aircraft” (p. 390). Furthermore, industrial services were an important source of revenue and in some of the firms, the profit margins were significantly higher than the margins on product sales, something also recognised in a study by Knecht, Leczinski, and Weber (1993). They argue that the percent of total contribution margin derived from after-sales business is typically much higher than its percent of total revenue. Similar findings, i.e. that increased service revenue is strongly correlated with increasing operating margins, were found more recently in Gebauer, Fleisch, and Friedli’s (2005) study of German and Swiss equipment manufacturing firms. Furthermore, a major study of international manufacturing firms in the power equipment, rail vehicles, machine tools, paper machines, and metallurgy equipment industries and some of their European service customers, indicated further growth and profit opportunities across all industries and higher average margins than in their product businesses (Henkel et al. 2004).

Often however, firms do not only enter the service market proactively. Instead, fierce competition, growing product commoditisation and changing customer demands on mature markets impels manufacturers to reactively increase the scope of their service operations and to bundle products with services. Commoditisation erodes manufacturing firms’ competitive advantage and can lead to squeezed profit margins (MatthysSENS and Vandenbempt 2008). To give an example, a changing business environment is driving manufacturers in the pump industry to reactively go downstream, according to the industry consulting firm Frost & Sullivan (2007):

“Rising competition and increasing price pressures in the pumps market for the water and wastewater industry are compelling manufacturers to adopt a more service-oriented approach with end users. Given that the market is approaching maturity, there is a very strong need for pump manufacturers to find new ways to increase sales and revenues. Bundling service and maintenance functions along with the products appears to be a move in the right direction and could help them gain much-needed customer loyalty in a fiercely competitive market.”

1.2 Examples from the industry

General Electric (GE) is often used as an example of a firm that early recognised the importance of offering services and successfully exploited these opportunities. Former chief executive officer
(CEO), Jack Welch, has emphasised the importance for manufacturing firms’ businesses to deliver well-managed services from the user’s point of view (Kumar 2004) and to focus on long-term customer relationships instead of focusing solely on business transactions (Isaksson 2005). Rather than concentrating on selling existing products to more customers, GE focused on developing new services, thereby increasing its offerings for its existing customers. In 1980, 85% of the group’s profits derived from manufacturing; twenty years later, three-quarters came from services” (Economist 1999).

According to Siemens’ Vice President for Services, industrial services are regarded as the firm’s main competitive advantage against the threat of having to compete through commoditised products and services with what Porter (1985) calls cost leadership strategy4. A recognised challenge for the conglomerate when expanding its service provision is how to balance the need for standardised/automated service offerings with the need for customised ones (Berner 2005). Another firm that acknowledges the importance of services is the earth-moving equipment manufacturer Caterpillar, which sees its service divisions5, which are fast growing higher-margin businesses, as the key to the firm’s strategic shift and critical for counterbalancing the cyclical product market and a probable stagnating demand (Arndt 2005). In 2006, the firm’s service-related businesses6 contributed to approximately a third of total sales; a number the firm wants to grow to 37 to 40 percent by 2010 (Caterpillar 2006).

One capital equipment manufacturer that has taken over many of its customer’s previous in-house services is Metso Minerals. In its role as a maintenance partner specialising in the customer’s operations and processes, the firm delivered a complete plant to the Sossego copper mine in Brazil in 2003. The goods provided included a 3.5 km long distance-belt conveyor, two cone crushers, a primary gyratory crusher, and five different mills. The service agreement comprises all mechanical preventive maintenance and some corrective maintenance, and includes the supply of spare parts and wear parts. One hundred and forty service people employed by Metso Minerals work at the plant (Metso Minerals 2006) Aiming for long-term service agreements is an espoused strategy and the firm therefore focuses on designing business concepts and products related to new ‘lifecycle services’ (Metso Minerals 2007).

Many manufacturing firms try to communicate externally to their customers today that their physical products are no longer the focal point of their offerings, with statements such as “we

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4 Even if about half of the service profits came from GE Capital and the NBC television network, services are a profitable and strategically critical part of many of the conglomerate’s manufacturing businesses. Nevertheless, because GE has sold and acquired various manufacturing businesses over the years, these types of figures must not be over-interpreted.

5 Despite its importance, the service business is not necessarily well-managed. In a Financial Times (2007) article, for example, Siemens’ industrial services and solutions was referred to as a “hodgepodge division that even insiders call ‘a conglomerate in a conglomerate’.”

6 The three service divisions Financial Services, Logistics, and Remanufacturing accounted for 15% of the firm’s revenues and perhaps 20% of its net income (Arndt 2005).

Besides Financial Services, Logistics, and Remanufacturing, aftermarket parts, Cat Insurance, OEM Solutions, Progress Rail, and Solar Turbine Customer Services are included in these figures.
don’t sell pumps: we sell cost-effective fluid handling” (ITT Flygt) and “we don’t sell trucks, we sell transportation solutions” (Ford Commercial Trucks). In reality, however, if manufacturing firms offer such customised solutions, these often constitute only a minor part of firms’ total revenues and profits (cf. Windahl 2007). The focus of many manufacturing firms is still predominantly product orientated, with an emphasis on unit sales. This can be illustrated by the following quotation from the Senior Vice President Parts & Services at Volvo Buses in September 2005 (translation from Swedish):

“In spite of all the talk of and focus on market demand, our product development is still extremely directed by technical possibilities. Looking at the company’s profitability, product development should focus more on after-market aspects.”

The quotation also illustrates the need for a more integrative approach to industrial offerings in which product and service development, sales, and production are not seen as separate processes. An integrative approach would be in line with Chase and Garvin’s (1989, p. 69) observation that divisions among upstream and downstream activities are dissolving and as a consequence, marketing, sales, service, manufacturing, research and development, etc. all are folding into one another. Furthermore, as Page and Siemplenski (1983, p. 92) noted 25 years ago, to meet the extended needs of customers, which are fostered by increasingly complex, interrelated, interdisciplinary, and interfunctional problems in a synergistic system, firms have to extend their product offerings.

1.3 All that glitters is not gold

Although industrial services create an opportunity for developing stable customer relationships and circumventing price competition, the management of these services is associated with several problems (Homburg and Garbe 1999); “[s]ervices require organizational principles, structures and processes new to the product manufacturer” (Oliva and Kallenberg 2003, p. 161). Since the scope of the service offering can range from traditional after-sales services to extensive customer solutions, it is likely that firms which offer different types of industrial services face different opportunities as well as challenges, and different service strategies may be required, depending on industry and business environment (cf. Gebauer 2008a).

Thus, despite management consultants and marketing scholars singing services’ praises, implementing service strategies and offering more extensive industrial services has proven to be a challenging task for many capital equipment manufacturers. Furthermore, service margins are also being exposed to increasing pressure from low-cost service providers (Henkel et al. 2004) and, thus, offering extensive services and solutions is no guarantee for a sustainable competitive advantage. For example, despite the potential and growth of industrial services in manufacturing firms, only 21% of the firms responding to a Bain & Company survey reported real success with their service strategies. In terms of revenue growth, profit margins, stock performance, and
return on equity, these firms seldom significantly outperformed their ‘traditional’ product counterparts (Baveja, Gilbert, and Ledingham 2004).

Similarly, in their study of mainly German and Swiss equipment manufacturing firms that extended their service business, Gebauer, Fleisch, and Friedli (2005, p. 15) found that:

“most companies find it extremely difficult to exploit successfully the financial potential of an extended service business. Most product manufacturers are confronted with the following phenomenon: companies which invest heavily in extending their service business, increase their service offerings and incur higher costs, but this does not result in the expected correspondingly higher returns. Because of increasing costs and a lack of corresponding returns, the growth in service revenue fails to meet its intended objectives. We term this phenomenon the “service paradox in manufacturing companies.” Instead of achieving a transition from products to services, product manufacturers leave the transition line and move into the “service paradox”.”

This ‘service paradox’ highlights the need for a more thorough understanding of how to manage industrial service offerings in a manufacturing context. Further, Oliva and Kallenberg (2003) identified three successive obstacles for manufacturing firms undergoing the goods-services transition; i) firms are not able to adequately recognise the economic potential of the service component, ii) providing services is beyond the scope of their competencies, and iii) they fail to successfully deploy a service strategy during the transitioning phase. Additionally, while the complementarity between goods and services is high in the marketplace, fewer synergies exist internally to leverage their integration (Brann, Oliva, and Gebauer 2007). According to Jacob and Ulaga (2008), these internal challenges are not so much associated with the actual changes made to the offering, (for example, by the addition of new service elements) as with the understanding and implementation of a new business logic, i.e. a transition from a g-d to an s-d logic. Furthermore, a failure to provide industrial services and offerings with an emphasis on lifecycle costs is hindered not only by the manufacturing firms’ own traditional marketing approaches, but also by dominant industry logics and mindsets among customers and other network actors (Matthyssens and Vandembempt 2008). Thus, despite Kitson’s (1922) call for a service-centred business logic, this ‘ideal state’ still seems far off for most manufacturing firms.

### 1.4 Relevance of the research

There are several reasons why there is a need to study the management of industrial services from a service perspective on value creation. For example, ten years ago, Matthyssens and Vandembempt (1998b) argued that the attention given to the marketing and management of industrial services has been rather sparse in the industrial marketing literature. Furthermore, they considered that the general models and theories on competitive advantage and resource management, such as the ones based on the seminal works of Porter (1980; 1985) and Wernerfelt...
management, such as the ones based on the seminal works of Porter (1980; 1985) and Wernerfelt (1984), did not take into account the unique characteristics of industrial services. Since then, several articles on industrial service management and on manufacturers moving towards increased service provision have been published. Nevertheless, Jacob and Ulaga (2008, p. 3) consider most of this literature to be “to a large extent descriptive or normative in nature [see, for example, Gebauer, Fleisch, and Friedli (2005), Mathieu (2001b), Oliva and Kallenberg (2003), and Wise and Baumgartner (1999)]…and business consultants largely contribute to this debate [see, for example, Auguste, Harmon, and Pandit (2006), Baveja, Gilbert, and Ledingham (2004), Berggren, Bergkvist, and Hedby (2008), Cohen, Agrawal, and Agrawal (2006), Custis and Henderson (2006), Henkel et al. (2004), Knecht, Leszinski, and Weber (1993), and Krishnamurthy, Johansson, and Schlissberg (2003)]”. Hence, more scholarly research is needed (Jacob and Ulaga 2008).

Secondly, the Industrial Marketing and Purchasing (IMP) group has contributed to marketing, by increasing the understanding of how business markets operate and how firms interact within the business network (see, for example, Anderson, Håkansson, and Johanson 1994; Ford 2001; Håkansson and Snehota 1995). However, these theories predominantly consider physical goods, business networks, and activity links between such entities as production processes, product development, logistics, and administrative routines, and, thus, do not investigate industrial services specifically.

Thirdly, industrial services are commonly analysed using a traditional after-sales and production-line approach to services (cf. Levitt 1972; 1976). This view often has its origins in operations management and entails the application of manufacturing strategies on services (for example, viewing the service production as a closed system), not seldom with a focus on operational efficiency (see, for example, Kallio et al. 2000; Slack, Chambers, and Johnston 2004; Tinnilä and Vepsäläinen 1995). Further, it can be regarded as an ‘industrial’ (Kingman-Brundage, George, and Bowen 1995; Ramirez 1999) g-d logic of marketing (Vargo and Lusch 2004a).

Fourthly, although the research tradition of the Nordic School of marketing thought (see, for example, Grönroos and Gummesson 1985; Normann 1983) has emphasised long-term customer relationships as the normative marketing goal, recognised the role of customer inputs in the value creation process, and argued that marketing must not be a business function on its own, it has focused predominantly on the service sector in a consumer marketing context, such as travel, financial services, etc. (Holmlund 2008).

Finally, theories about customer solutions in the capital goods sector often focus on project-based firms that supply complex product systems; “high-cost capital goods are produced as one-off projects or in small tailored batches to meet the particular needs of government, institutional and business customers” (Davies 2004, p. 728). This literature (see, for example, Davies and Hobday 2005; Gann and Salter 2000; Söderlund 2005) therefore does not focus on the management of service offerings in an industrial context where products are less complex and
production volumes higher, even if much of the research is based on rich empirical data and in-depth case studies.

1.5 Purpose

Based on this discussion, the overall purpose of this doctoral thesis is:

*To describe and analyse how capital equipment manufacturing firms strategically manage their industrial service offerings in order to achieve long-term competitive advantage.*

Given the differences between an industrial/manufacturing, goods-dominant business logic and a co-productive, service-dominant business logic (Normann 2001; Ramírez 1999; Vargo and Lusch 2004a; 2008a), it is of particular interest to investigate the management of an organisation which produces goods as well as services. Furthermore, scholars like Bowen and Ford (2002) argue that there are significant differences between managing a manufacturing firm and a service firm. This makes it essential to analyse the management of a service function *within* a manufacturing firm, i.e. an organisation which produces goods as well as services. Having a service perspective implies a co-productive stance on value creation, in which customers are active participants in the service process (e.g. Grönroos 2000; Normann 2001; Prahalad and Ramaswamy 2004). The opposite view would be what Ramírez (1999) refers to as an industrial view with sequential value creation, in which customers are seen as ‘targets’ of marketing and in which value is ‘added’ and equals the amount customers are willing to pay for the offering (cf. Porter 1985).

In line with Barney (1991), the firm has competitive advantage when it is “implementing a value creating strategy not simultaneously being implemented by any current or potential competitor” (p. 102). Whether or not a competitive advantage is sustainable, depends on the possibility to duplicate the benefits of the strategy. Due to the idiosyncratic and difficult-to-trade assets and competencies of firms, this is not to be seen as equivalent to an imitation-driven adoption of firm strategies; benefits can also arise by finding novel ways of creating value, that are superior to existing strategies on the market. Along the lines of Normann’s (2001) view on value creation, which is that through dematerialisation mechanisms, firms can separate activities which have previously been performed together (‘unbundeability’) and separate information from people and matter (‘liquification’), enabling ‘rebundeability’. This can result in the creation of new value configurations in which the patterns of co-production (and, thus, the roles of suppliers, customers, and other actors) differ from previous ones. Thus, in order to achieve successful service management, the firm needs to employ a multidimensional, holistic approach in which service development and service production are not separated and where the customer interface and new technology too are taken into account (den Hertog and Bilderbeek 1999; den Hertog, Broersma, and van Ark 2003).
1.5.1 Research questions

As highlighted by Breunig, Kvålshaugen, and Hylde (2007), Gebauer (2008), Oliva and Kallenberg (2003), Penttinen and Palmer (2007), and other scholars, different industrial service offerings have different characteristics. This depends on the degree of standardisation, dependence on customer interactions, technologies and IT systems available, scope of the service offering, business environment, and other characteristics which are likely to influence the managerial requirements on service performance and service strategy. Thus, there is a need for manufacturing firms to understand what to offer. Equally, there is a need to understand how to offer these service offerings, i.e. to understand how to organise to enhance for the development and production of industrial services, and what the requirements on the service processes are. Internally, it is of interest to explore what organisational capabilities and strategies are required for an increased service offering scope, i.e. if the requirements on the service function change depending on the services that are offered. This involves taking into consideration different ‘functional silos’ as well as the central and local entities of the firm (that is to say the central organisation and the sales companies) as well as the interplay between them (e.g. Ghoshal and Bartlett 1990; Ghoshal and Nohria 1989). It is to be expected that there are different organisational configurations that more or less fit with different offerings.

Furthermore, technological change such as the development of new information and communication technology (ICT) is perhaps the most significant contextual variable that affects intra-firm and inter-firm processes, and thereby, enables new value propositions and value constellations in an industrial context (Kindström 2005). This aspect therefore deserves further attention and it is vital to increase the understanding of how to utilise ICT applications and systems to create value through more competitive (service) offerings.

From this breakdown of the purpose, the following research questions derive:

1. How can different types of industrial service offerings be characterised?
2. What are the requirements on the service organisation for different types of industrial service offerings?
3. How can information and communication technologies enable new industrial service offerings and service processes?

1.5.2 Delimitations

Even if the focus in this thesis is on the provider firm, viewing industrial service offerings as reciprocal, two-way value propositions (Ballantyne and Varey 2006) implies that not only aspects internal to the provider but also external (particularly customer-related) aspects matter; the customer is an important subset of the service function and it is the customer that determines the value of the business proposition. Furthermore, having a service perspective (Normann 2001; Vargo and Lusch 2004a) and a process view of industrial offerings (Tuli, Kohli, and Bharadwaj
implies that the customer relationship as such is an indispensable part of the value proposition. Thus, the importance of understanding the customer’s role for the success of the industrial service offering is recognised, and this has been taken into consideration, albeit implicitly, when the study was conducted. Rather than making this aspect explicit and distinct through a research question, analysing the customer’s role and the customer relationship is seen as an integral and inherent part of the research questions. Furthermore, limiting the study to capital equipment manufacturers is a deliberate choice as there are also many industrial service providers without any in-house manufacturing activities and these service providers and/or systems integrators therefore have a different rationale and market strategy for their service offerings.

1.6 Industrial services

Industrial services are characterized as services offered in a context where the customer is a legal entity, such as a commercial firm, a municipality, or a government organisation, i.e. a business-to-business (and business-to-government) context. They are seen as comprising of one or more of the service categories which involve physical acts to objects, nonphysical acts to customers’ minds, and processing of information. This characterisation would exclude services involving physical acts to customers’ bodies (cf. the service categories in Lovelock and Gummesson 2004). Following the typology made by Henkel et al. (2004, pp. 10-11), but focusing on the production process rather than their explicit focus on the augmented physical product, industrial services as covered by the definition in this thesis are:

(a) **Spare parts**: provision of replacement components for the capital equipment

(b) **Repair**: restoring capital equipment to sound condition after damage

(c) **Reconditioning**: restoring capital equipment to good condition, especially by renovating or rebuilding. Reconditioning is more extensive in scope than repairing

(d) **Retrofit (performance upgrade)**: replacement or addition of one or more hardware and/or software components, which provide better overall performance. Retrofitting is more extensive in scope than reconditioning

(e) **Inspection**: periodical examination of capital equipment for flaws

(f) **Maintenance**: activities required in order to keep the capital equipment in proper condition; major types are preventive, scheduled and unscheduled maintenance

(g) **Technical support**: provision of advice to users of the capital equipment via a call centre, webpage, etc.

(h) **Technical consulting**: offering of technical expertise such as engineering skills and ICT tools to solve a specific problem related to the customer’s industrial production process
Following the typology made by He nkel et al. (2004, pp. 10-11), but focusing on the production physical acts to customers' bodies (cf. the service categories in Lovelock and Gummesson 2004). minds, and processing of information. This characterisation would exclude services involving the service categories which involve physical acts to objects, nonphysical acts to customers' business (and business-to-government) context. They are seen as comprising of one or more of entity, such as a commercial firm, a municipality, or a government organisation, i.e. a business-to-

Industrial services are characterized as services offered in a context where the customer is a legal process rather than their explicit focus on the augmented physical product, industrial services as offerings.

1.6 Industrial services

Covered by the definition in this thesis are:

- (a) Repair:
- (b) Spare parts:
- (c) Inspection:
- (d) Retrofit (performance upgrade):
- (e) Maintenance:
- (f) Technical support:
- (g) Offering of technical expertise such as engineering skills and ICT tools provision of advice to users of the capital equipment via a call centre,
- (h) Conducting an audit of the customer’s processes, analysing the performance, and identifying areas for improvement in terms of e.g. cost efficiency and uptime
- (i) Operation: day-to-day running of production process including all related services
- (j) Customer training: customer training or activities to familiarise customers with the use of hardware and software, regardless of whether it takes place before, during, or after the capital equipment is in place.

Performance audit is not included in Henkel et al.’s definition but is nevertheless regarded as a distinctive process-orientated service, although one could argue that it could be viewed as a subset of technical consulting. Overhaul is a service that is common in many industries and it is evidently an industrial service. However, it can be regarded as composed of individual services such as inspection and repair. One category of services that is however included by Henkel et al. but which is not encompassed by the definition of industrial services used in this thesis, is financing, i.e. supplying funds for the purchase of a good or service. This demarcation has been purposely made, even though financing is a service connected to industrial goods and services, that is often very profitable for the firm, and is a prerequisite for the ‘core offering’.

The different types of industrial services presented can all hypothetically be offered either individually or as service bundles. Bundles can be combinations of some of the individual services solely, or can also include facilitating goods. For example, a rental offering can be a bundle consisting of the rented product and various industrial services and a financing solution. Supporting services not related to the customer’s production and business process and that do not facilitate the use of the core service or good are not explicitly studied.

1.6.1 A preamble on the industrial service function

Grönroos (2000) and Gummesson (1995b) argue that the marketing function must not only be deemed to be the marketing organisation of a firm. There are also several other organisational entities that play a critical role as part-time marketers of the firm (Gummesson 1995b) and of which the service organisation is undoubtedly one of the most significant. Just like the marketing function, the organisational entities that manage industrial services are not limited to the firms’ service organisation as other entities may also have a role in the development, sales, production, and renewal of services. Thus, when analysing the service management of manufacturing firms, it is not sufficient to limit the study to the service organisation only. For example, in order to implement a successful and deliberate service strategy in manufacturing firms, Gebauer, Fleisch, and Friedli (2005) argue that all areas of the firm affected by service strategy need to be involved in the service development process, thereby integrating competences existing in the firm but not in the service organisation, and thereby increasing the commitment to the service strategy. This would highlight the need to look beyond the service organisation. Furthermore, it is argued that
Acha et al. (2004, p. 507) categorise them into three different types: when the service function concept is used in this thesis, the customer, possible service partners, to make a clear distinction between the provider and customer firms and to avoid confusion, when the service function concept is used in this thesis, the customer, possible service partners, and other external actors are generally excluded.

1.6.2 The capital equipment manufacturing context

There are many kinds of capital goods and when exploring capital goods innovation research, Acha et al. (2004, p. 507) categorise them into three different types:

(a) Constructs required for production of goods and services (e.g. offices, factory buildings, dams)

(b) Plant and machinery required for production (including modern equipment such as IT, software and telecommunications networks)

(c) The raw materials and components (finished and part finished) used in production.

The term capital equipment can be seen as a subset of capital goods, as it excludes for example raw materials. In this thesis, capital equipment is synonymous with the plant and machinery required for production (cf. capital goods in Windahl 2007). Thus, a capital equipment manufacturing context implies capital equipment manufacturing firms and, consequently, only firms which offer capital equipment as well as industrial services are studied.

The empirical data used in this thesis comes mainly from in-depth case studies conducted at BT Industries/Toyota Material Handling Group and ITT Flygt (nowadays merged with AWT to form ITT Water & Wastewater) during the period 2004-2008. The two capital equipment manufacturing firms are market leaders in their respective industries and they have a global presence through local sales companies. For Toyota Material Handling Group (TMHG) in particular, industrial service offerings have increasingly become of strategic importance and a source of competitive advantage, and in the pump industry, where ITT Flygt is present, there is also more focus on services. Unbundled and bundled services are seen as a high-growth opportunity for ITT Flygt and as an avenue for building closer customer relationships and avoiding price pressure on capital equipment. Although the empirical data in the appended papers mainly comes from the ITT Flygt and TMHG cases, depending on the papers’ objectives, three of the papers are also based on other cases. For example, due to the interesting insights gained from the Electrolux Laundry Systems (ELS) case when writing the licentiate thesis (Kowalkowski 2006), several examples from this firm were included in two of the appended papers (Papers 1 and 5). Furthermore, in order to identify general patterns across industries, in another of the papers (Paper 3) the main case companies were supplemented with data from additional market-leading manufacturing firms in different industries. Accordingly, in this thesis,
the empirical data is used to indicate both similarities across firms and industries and to analyse contrasting findings.

### 1.7 The appended papers

#### 1.7.1 Links between the papers and the thesis’ research questions

The five appended papers complement each other when it comes to providing a foundation for answering the overall purpose of this doctoral thesis; the findings from each paper are interrelated to the overall purpose as well as to the research questions. Table 1-1 provides an overview of the papers and illustrates their main links to the research questions of this thesis.

**Table 1-1. An overview of the appended papers.**

<table>
<thead>
<tr>
<th>Paper</th>
<th>Focus</th>
<th>Methodology</th>
<th>Empirical basis</th>
<th>Results</th>
<th>Links to research questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper 1</td>
<td>Effects of ICT applications on service productivity.</td>
<td>Multiple case study</td>
<td>ELS, ITT Flygt, TMHG</td>
<td>ICT applications impact service productivity in different ways - cost efficiency, revenue effectiveness, and capacity utilisation - which in turn have managerial implications.</td>
<td>Main links to R3</td>
</tr>
<tr>
<td>Paper 2</td>
<td>The impact of ICT on intra-firm and inter-firm service production process interfaces</td>
<td>Two case studies</td>
<td>ITT Flygt, TMHG</td>
<td>Increasingly, it is possible to replace manual tasks through process integration between organisational entities. Closer customer-provider integration can be a basis for more advanced offerings. Capabilities to manage several process interfaces simultaneously and to balance the interplay between automation and personal interactions become vital.</td>
<td>Main links to R2 and R3</td>
</tr>
<tr>
<td>Paper 3</td>
<td>Expansion and internationalisation of industrial service offerings.</td>
<td>Multiple case study</td>
<td>Seven manufacturing firms (including ELS, ITT Flygt, Saab, and TMHG)</td>
<td>A typology for industrial service offerings is developed, inter-relating degree of bundling, level of customer integration, and process interfaces. In addition, internationalisation aspects are emphasised.</td>
<td>Main links to R1, R2, and R3</td>
</tr>
<tr>
<td>Paper 4</td>
<td>The roles of local and central organisations in the development and management of industrial service offerings in global business markets.</td>
<td>Two case studies</td>
<td>Eight service offerings at ITT Flygt and TMHG</td>
<td>A broad portfolio of industrial service offerings implies having a very wide range of skill sets, including global-scale efficiency and local responsiveness. With specialised and extensive offerings, it becomes more important with a high level of central-local and product-service integration and to internalise service provision.</td>
<td>Main links to R1 and R2</td>
</tr>
<tr>
<td>Paper 5</td>
<td>Differentiation through e-business.</td>
<td>Multiple case study</td>
<td>Four manufacturing firms (including ELS and TMHG)</td>
<td>E-business can be a vehicle for launching new services, to enhance customer relationships, and to reduce customer management costs. It enables services that justify premium prices and that keep low-cost competitors in check.</td>
<td>Main links to R3</td>
</tr>
</tbody>
</table>
1.7.2 Co-author statement

Besides Paper 1, I am the main author of Papers 2, 3, and 4 in which I introduced the basic scientific ideas and was responsible for the discussions, analyses, and writing. Moreover, I was responsible for the research design of Papers 2 and 3 whereas all authors have jointly discussed the research design of Paper 4. Dr Daniel Kindström is the main author of Paper 5 and we have contributed equally with empirical data and jointly conducted the analysis. Besides Paper 5, Daniel Kindström is co-author of Papers 3 and 4. Dr Per-Olof Brehmer is co-author of Papers 2, 3, and 4.

1.8 Outline of thesis

This doctoral thesis consists of five appended papers, which form the basis of the research in the thesis, a synthesising section consisting of six chapters, and an empirical section consisting of two case descriptions.

Part I, the synthesis of the thesis, is organised as follows. Chapter 1 (this chapter) contains an introduction to the area under investigation, provides a rationale for conducting the research, and presents the overall purpose of the thesis and the research questions. In Chapter 2, the theoretical perspective is presented. This relates mainly to the research questions of the thesis even though it also relates to the theoretical frameworks used in the appended papers. Chapter 3 presents the methodological approach and discusses the research design and research process. Chapter 4 summarises the appended papers. Chapter 5 then discusses and analyses the empirical results and the research findings from the individual papers and the overall thesis. This includes analyses of the service function, of the interrelationship between service function and service offering, and of the service strategies of the manufacturing firm. Chapter 6 concludes with a summary of the research contribution, managerial implications, and suggestions for future research.

Part II contains the five appended papers in full. Finally, Part III contains case descriptions of the industrial service function at the two main case companies; ITT Flygt and Toyota Material Handling Group.
2 Theoretical framework

The main idea of this chapter is to review theories associated with the phenomena that has been studied and to provide the reader with an understanding of my theoretical domicile. This chapter is closely related to the theoretical frameworks used in the appended papers, although it also extends the frameworks and more closely relates the theories to the research questions of the thesis.

2.1 Expanding the industrial offering

Evidently, many capital equipment manufacturers expand their industrial offering by integrating service elements into the core offering. Most often, the situation is described in academia and the business press as a goods-services transition (Gebauer, Fleisch, and Friedli 2005; Oliva and Kallenberg 2003), service manoeuvre (Mathieu 2001b) or strategic reorientation (Penttinen and Palmer 2007) from a product-orientated market position to a position of an expanded service offering and customer orientation (see Figure 2-1).

![Figure 2-1. The goods-service continuum (Oliva and Kallenberg, 2003, p. 162).](image)

In its simplicity, Figure 2-1 is illustrative for demonstrating changes in industrial firms’ offerings, with a range from ‘pure’ capital equipment manufacturer to ‘pure’ service provider without any in-house manufacturing activities. However, it should not be confused with the commonly used goods-service continuum, arrayed according to the relative degree of tangibility (cf. Rathmell...
On the path towards becoming a ‘pure service organisation’ the firm has to go through four programmes, which must be distinguished from the physical medium on which they are recorded. Not only is the traditional effort to define services by distinction from tangible goods inappropriate but it also restrains and prevents the understanding of the role of service in economic exchange. Vargo and Lusch (2004b) argue that “[u]nless tangibility has a marketing advantage, it should be reduced or eliminated if possible” (p. 327) and suggest that economic exchange is basically about service provision. Intangible elements such as computer programmes, which must be distinguished from the physical medium on which they are recorded and stored, makes tangibility even more illogical as a measure of categorisation (Hill 1999).

On the path towards becoming a ‘pure service organisation’ the firm has to go through four generic steps (on the goods-service continuum) according to Oliva and Kallenberg (2003, p. 165):

1. Consolidating product-related service
2. Entering the installed base service market
3. Expanding to relationship-based services and process-centred services
4. Taking over the end-user’s operation.

In order to successfully enter the service market, a cultural change and the creation of a global service infrastructure that can respond to local need is required. Expanding the service offering (step 3) is most likely to take place sequentially in two dimensions: a focus on customer interactions and a focus on the value proposition (Oliva and Kallenberg 2003). A similar two-dimensional framework is developed by Penttinen and Palmer (2007). They analysed the strategic repositioning of four manufacturing firms in different industries and they too argue that an expansion in the two dimensions is most likely sequential; firstly a move from a transactional to a relational nature of the customer-provider relationship and secondly from less to more complete offerings, or vice versa. With a more complete offering, the coordination costs typically increase, but if the firm can manage to control or reduce these costs there is an economic incentive to enhance the completeness of the offering. Both Oliva and Kallenberg (2003) and Penttinen and Palmer (2007) identify the continuum from transactions to relational exchange as a main attribute of the two-dimensional service space. However, whereas Oliva and Kallenberg (2003) put the focus on the value proposition without considering the actual service structure/portfolio (i.e.

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7 A strategic question is whether it is desirable or not for a manufacturing firm to always strive to go through all four steps. However, this matter, which one can argue is of decisive importance for the firm, is not something examined by Oliva and Kallenberg (2003).
bundling), Penttinen and Palmer (2007) consider degree of product/service bundling and extension in meeting customer needs as the second attribute (see Figure 2-2).

![Figure 2-2. Two service offering frameworks (Oliva and Kallenberg 2003, p. 168 and Penttinen and Palmer 2007, p. 554).](image)

Thus, customer-provider relationship, focus of offering (e.g. product or process), and bundling strategy are three critical attributes to take into consideration when strategising and organising for industrial service offerings. Service offerings can be plotted on a continuum from repetitive service production where existing knowledge is applied to unique, ad hoc services, where new knowledge and solutions are required (Breunig, Kvålshaugen, and Hylde 2007; Hansen, Nohria, and Tierney 1999). Since the rationale for bundling is to offer relatively customised services through a modularised service platform with standardised components, bundling can be discussed in the context of this standardisation-customisation continuum. Stremersch and Tellis (2002, p. 56) view product bundling as the sale of two or more separate goods or services in one package and they argue that bundling strategies yield higher revenues than unbundling strategies, because customers are willing to pay for what they perceive as higher value. Further, they argue that pure bundling strategies are preferable to mixed bundling strategies unless the market is highly competitive, in which case mixed bundling increases variety and consequently, increases customer demand for the firm’s offerings. That the multiservice cost function, which summarises both service production and other organisational costs, exhibits economies of scope is important when determining the firm’s range of bundled and/or unbundled offerings. That is to say that the cost of providing sharable input to two or more different services is subadditive. Panzar and Willig (1981) discussed the notion of such economies of scope from a manufacturing perspective, but its logic can likewise be applied to services, although systems of service

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8 Pure bundling is a strategy in which the firm sells only the bundle and not (all) the services or goods separately whereas mixed bundling is a strategy in which the firm sells both the bundle and (all) the services and goods separately (Stremersch and Tellis 2002).
production differ from manufacturing in that various external factors (e.g. customers) are likely to play a more significant role in the production process (e.g. Larsson and Bowen 1989; Ojasalo 1999).

The firm is likely to have offerings in more than one position in a service offering framework (such as the frameworks in Figure 2-2); for example, some of the firm’s services can require a relationship-based approach whereas others are better performed using mainly transactional routines. Furthermore, the firm can offer both product- and process-orientated services and bundled and unbundled ones. Therefore, the range of offerings is a relevant issue to explore in connection with bundling. If new services with a different focus and scope than previous ones are offered, one issue to consider is how to manage the service offering portfolio (for example, whether or not to continue to offer all the services previously offered). The cost of having the range of competences and technologies required to develop and fulfil the offerings efficiently and effectively increases rapidly as the range of offerings widens. Thus, the investments needed and the running costs of having the desired range of offerings might constrain the ability of the firm to adapt different elements of the offerings to meet and fulfil customers’ needs, particularly if the customers’ problems are complex. Having a wide range of offerings implies having solutions for various customers’ needs based on the firm’s unique capabilities and technologies, and consequently, the firm needs to have knowledge of a wide range of different expressed and/or latent customer needs, as well as the ability to deal with the many different types of offerings and customer relationships. On the other hand, a narrower focus, is likely to entail lower operational costs, but is unlikely to be a complete solution to the customers’ needs. Besides, it provides less opportunity to have a reciprocal relationship with customers, something which would enable the firm to better understand the customers’ problems and react to changing needs (Ford 2001). This issue is of particular interest, given the many capital equipment manufacturers that increasingly provide various forms of industrial services and bundled offerings.

2.1.1 The role of information and communication technologies

The quotation by Kitson (1922) on page 1 in the introductory chapter illustrates that, despite recent attention from academia and the business press, offering business solutions to customer needs rather than selling goods is not a new phenomenon. However, the structural changes caused by the ‘information revolution’ in the past 100 years and particularly the rapid development of ICT in recent decades, has enabled firms to offer many new services which were previously not possible to create (Normann 2001; Rust 2004; Rust and Thompson 2006)⁹. Thus, ICT has facilitated the rise of the service economy and has been a critical enabler for concepts such as ‘servicification’ (Normann 2001) and ‘the servitisation of business’ (Vandermerwe and

⁹ However, despite the new possibilities for information-based services Vargo and Lusch (2004a) argue that the fundamental unit of exchange has always been services being exchanged for services.
Rada 1988). Today, world-leading manufacturing firms utilise ICT to launch new information-based services and thereby increase the opportunities for differentiation and competitive advantage through value creation and enhanced customer relationships (Kindström 2005). In their study of how manufacturing firms improved their positioning through enhanced service offerings, Penttininen and Palmer (2007) identified ICT enablement as a key requirement for the competitive positioning of all the firms studied. ICT can enable value creation through new complementarities, which can be bundled both vertically (e.g. after-sales services) and horizontally (e.g. one-stop shopping) (Amit and Zott 2001).

New ICT can be seen to enhance asset liquidity and in so doing, create new value by enabling a temporal and spatial reconfiguration of activities (Normann and Ramirez 1995). In addition, many repetitive services can be standardised through ICT and processes can be automated or eliminated, thereby increasing economies of scale. Thus, sources of value through ICT applications and systems have both a revenue-enhancing and a cost-reducing perspective, as both efficiency and effectiveness can increase. Besides (cost) efficiency and (revenue) effectiveness, Grönroos and Ojasalo (2004) consider the management of demand (i.e. capacity utilisation) a critical third element of service productivity. This is particularly evident in the case of services that are dependent on personnel, such as repair and maintenance, since it is more difficult to cope with excess capacity or excess demand. The utilisation of various ICT applications enables the firm to store performance in electronic form, thereby setting capacity free (Gadrey, 2000; Hill, 1999; Lovelock and Gummesson, 2004) and in so doing improving service productivity.

Matthyssens and Vandenbempt (1998b) argue that innovation in industrial services should not only be sought in the core of the industrial services as such, but that a deliberate introduction/expansion of ICT in core processes is a key contributor to differentiation when creating competitive advantage in industrial services. Furthermore, ICT affects the day-to-day running of the customer relationship by facilitating communication and reducing costs for both actors among other things. In their study of two international engineering service firms, Breunig, Kvålshaugen, and Hynde (2007) found that ICT systems could be important tools for ensuring high service quality, regardless of location and people, although it is important to have the abilities to balance standardised and automated processes with local responsiveness. Moreover, ICT facilitates integration and interdependence among geographically dispersed organisational entities (i.e. subsidiaries) of international firms. They conclude that “ICT tools and systems can be applied very differently with respect to the type of activity set it is supposed to support” (p. 34). ICT has both a standardisation logic in its algorithmic nature and an inherent flexibility due to among other things, its possibilities for personalisation which it brings. Therefore, Sundbo (2002) considers ICT particularly suitable for flexibility and modularisation of services, especially knowledge-based ones. Thus, in line with Penttininen and Palmer’s (2007) findings, ICT is likely to have a central role in enabling the expansion of the industrial service offering. Furthermore, ICT
can enable closer integration between dispersed organisational entities of the manufacturing firm’s industrial service function.

2.2 The service function

If taking a services marketing perspective on industrial services management and recognising the unique characteristics of services, it implies taking a holistic approach (cf. Grönroos 2000). Thus, it is not sufficient only to investigate the service organisation of the industrial firm. The service function is generally regarded as the (local and/or central) organisational entity responsible for the firm’s main service activities. However, in analogy with the marketing function (Gummesson 1995b), the service function of a firm is not limited to the service organisation (the firm may not even have an in-house service organisation)\(^ {10} \). Likewise, the service function must not be seen in isolation from other organisational functions. For example, how a capital good is manufactured and integrated in the customer’s production processes affects such things as its accessibility and reparable. Thus, when designing the equipment in the new product development (NPD) process, the construction team responsible can choose to what extent they take into account the requests from the service organisation; depending on the design, \textit{ceteris paribus}, the length of time requires to repair the equipment can vary. In addition, requirements on material and manufacturing costs can affect the product quality and, consequently, affect the lifetime of the equipment and how often maintenance and repair activities are needed.

Gummesson (1987; 1991) coined the term ‘part-time marketers’ for all employees who are not full-time marketers, i.e. not marketing specialists from marketing and sales departments, but who carry out marketing activities and thereby influence customer satisfaction, customer perceived quality, and revenue. Part-time marketers comprise (for example) the personnel working with the production of all the different industrial services and the part-time marketers do not only more than outnumber the full-time marketers in most industrial markets several times over, but are often the only personnel and thus the only marketers. Similarly, part-time service personnel comprise all those employees that work in other organisational entities but who in spite of this, have a direct or indirect effect on the firm’s service offering. In order for part-time service employees and the management of customer relationships to be successful, established internal relationships are a prerequisite.

The vital role of the customer in service innovation (Gallouj and Weinstein 1997; Mannervik and Ramírez 2006) and service production (Bitner et al. 1997) makes it necessary to recognise the customer as also being a part of the service function. Having the customer involved in the service processes can be beneficial but it also increases the input uncertainty, since customers, being external to the firm, are more difficult to control (Larsson and Bowen 1989). Service partners and other external resources are also included in the service function; when firms lack the capacity to

\(^ {10} \) In this thesis, the service function concerns only industrial services in a business-to-business context. It does not refer to an internal services and support organisation.
perform the service or when they do not have the capabilities to perform it efficiently and/or effectively, they tend to use service providers (Axelsson and Wynstra 2002).

The decision to compete on industrial services rather than merely on products is a strategic decision (Homburg and Garbe 1999, p. 62) and when a manufacturing firm makes the decision to enhance its service offering, the character of the service function is likely to change. For example, a capital equipment manufacturer that moves into the provision of integrated solutions needs to develop or acquire new competences such as key account management and risk analysis skills (Brady, Davies, and Gann 2005). This may imply that new specialist teams are connected to the service function as part-time service entities or that the service organisation (i.e. the full-time service function) expands. In other words, depending on the offering, a firm has different market positions and requires different competences. Thus, the service function configurations are likely to differ. The activities a firm undertakes to alter its core capabilities11 and/or its market domain (i.e. strategic position), thereby refreshing, reinvigorating, or transforming the source of competitive advantage, is referred to as strategic renewal (Floyd and Lane 2000). In the capital equipment manufacturing context, this could mean that by acquiring new service capabilities and undertaking a repositioning downstream, the firm undertakes a strategic change to alter the current trajectory of mainly competing through product leadership (cf. Volberda, Baden-Fuller, and van den Bosch 2001). Also, knowledge renewal processes operating at the firm and employee level are essential to competitive advantage (Ballantyne and Varey 2006). These processes can be activated by communication and dialogue (Ballantyne 2004), which underscores the importance of developing trust and well-functioning relationships between participants in different parts of the service function.

2.3 The notion of industrial service offering

Because the terms industrial services and industrial service offerings are used throughout the thesis, a further elaboration on the rationale of using these specific terms is needed.

2.3.1 Industrial services as superordinate to after-sales services

Just as the service function is all-encompassing and includes the service organisation, the term ‘industrial service’ is regarded as being more inclusive than the commonly used term ‘after-sales service’. Although the physical product very often is the centre of the manufacturing firm’s main value proposition (i.e. product sales), using terms like ‘after-sales service’ (see, for example, the value chain metaphor in Porter 1980) and ‘post-purchase marketing’ (Burger and Cann 1995) is ambiguous. Such terms maintain the perception that serving the installed base after the sale is completed per se is the service function’s raison d’être, and that it is not to help customers to create

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11 In line with Leonard-Barton (1992, p. 111), capabilities are considered core if they differentiate the firm strategically. Furthermore, because of similar conceptualisations, capabilities are seen as synonymous with competencies (cf. Madhavaram and Hunt 2008) and are thus used interchangeably.
value (and thereby capture part of that value for itself). Therefore, instead of the commonly used term ‘after-sales service’, which is often associated with a manufacturing-strategy approach to service operations (e.g. Johansson and Olhager 2006) and is, thus, inevitably linked to the sales of goods and provider-orientated rather than customer-orientated (Paloheimo, Miettinen, and Brax 2004), the term ‘industrial service’ is used in this thesis. From a lifecycle point of view, the potential value of sales for after-sales services is often higher than the actual product sale (Knecht, Leszinski, and Weber 1993) and the interpretation of the term based on its linguistic meaning understates this importance. Another related problem is to establish when the product sale is actually completed. Is it when the contract is signed – possibly before the product is delivered and before the customer’s operating personnel trained – or when the product is in operation? If the sale is completed when the equipment is operating, it excludes the initial services, which are required in order to sell the equipment and make it a part of the installed base. Furthermore, such demarcations can be blurred; consultation and performance audit are examples of services that can come before, in connection with, and after the actual sale.

Thus, the definition of industrial services includes pre-purchase, at-purchase, and after-sales services (Homburg and Garbe 1999). Vandermerwe (1994) points out that the capability to provide services before, during, and after the sale/purchase is a key differentiator for many successful firms. However, whereas many authors have a product-centric view of industrial services, a customer-centric view (e.g. Shah et al. 2006) implies that the focus of the services is not only on product efficacy – whether the product works – but also on the product’s efficiency and efficacy within the customer’s industrial production and business processes (cf. Oliva and Kallenberg 2003):

“value as seen by customers is meaningful only in terms of what customers get out of core products and services [value-in-use], not just what goes in (as was the case previously) [value-in-exchange]” (Vandermerwe 1994, p. 45).

In addition, even if a capital equipment deal is made between the manufacturing firm and its customer, the agreement does not necessitate a transfer of ownership (cf. the rental discussion by Lovelock and Gummesson 2004) and therefore no purchase of physical goods. Hence, the same ‘after-sales services’ can be performed on rented and leased equipment as on purchased.

In many cases, customers do not buy specific goods or services but instead buy “expectations of benefits” (Levitt 1969, p. 8) manifested as bundled offerings combining different elements of goods or services, or both. With a broader offering, consisting of both goods and services, a more extended customer need is fulfilled than in ordinary product selling. This has much in common with definitions of systems selling (Hannaford 1976; Mattsson 1973; Page and Siemplenski 1983), integrated solutions (Davies 2004; Windahl 2007; Wise and Baumgartner 1999), and systems integration (Prencipe, Davies, and Hobday 2003). Systems integrators (as
defined by Davies, Brady, and Hobday (2007)) however, do not have manufacturing in-house and instead incorporate multi-vendor technologies and products.

In their study of customer and supplier firms in the information technology, health care, and financial services industries Tuli, Kohli, and Bharadwaj (2007) found that the participating suppliers in the study (as well as extant marketing literature) viewed solutions as customised, integrated bundles of goods and services that address individual customers’ specific needs. However, they argue that this established definition of solutions does not apply from the customers’ point-of-view. Instead, customers tend to view a solution as “a set of customer-supplier relational processes” (p. 1) in which the customisation and integration of goods and/or services is one part only. Relational processes before as well as after the customisation and integration of the goods-services bundle are also perceived as a critical part of the solution. This is consistent with the process-centric, relational thinking of service as a perspective on value creation (Edvardsson, Gustafsson, and Roos 2005) and the s-d logic of marketing (Ballantyne and Varey 2006; Vargo and Lusch 2004a). As Grönroos (2000) argues, it is not only the output of a service process that is critical but also the activities in the service process and this process can be more important for the value-creation premises than the actual output. For Grönroos (2004, p. 2), the essence of service is “to support customer’s processes, so that value for them is created in those processes”. This is done by applying specialized competences (i.e. knowledge and skills) (Vargo and Lusch 2004a, p. 5) and it applies to single, transactional services as well as services constituting a complex bundle of goods and services over a long period of time.

Based on the above discussion and its definitions, industrial services are broadly viewed as a series of activities connected to the customer’s value-creation processes in a business-to-business context; i.e. processes supporting customers’ industrial production and business processes, so that value for them is created in those processes. Despite the emphasis on customer perceived value, a part of the value created obviously has to be captured by the provider (cf. Blois and Ramírez 2006). In addition, the service can be provided either directly (e.g. customer training) or indirectly (e.g. spare parts) "through the provision of tangible goods; goods…[being] distribution mechanisms for service provision” (Vargo and Lusch 2004b, p. 326). Consequently, industrial services can have an effect on the customers’ processes by affecting both goods and persons.

2.3.2 Why service offerings?

One reason for using the concept of offering in this thesis, is to move away from the discussion about goods versus services, as the term offering is all-encompassing. It is also a better term to use than the term ‘product’ (seen as either good or service) because product is inherently linked

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12 Tuli, Kohli, and Bharadwaj (2007) propose that a solution comprises (i) customer requirements definition, (ii) customisation and integration, (iii) deployment, and (iv) post-deployment support.

13 Furthermore, the service can be performed not only for the benefit of another entity (i.e. the customer or another stakeholder) but also for the entity itself (i.e. self-service) (Vargo and Lusch 2004a).

14 Thereby, the term offering bears resemblance to Vargo and Lusch’s (2004a) view of service as something that is provided either directly (i.e. services) or indirectly (i.e. goods).
to a good\textsuperscript{15}. In addition, the concept of offering is perceived to be more inclusive than ‘service’, which is more likely to be seen as a single, unbundled service only (although authors that argue for service as a perspective (Edvardsson, Gustafsson, and Roos 2005) and a service-dominant logic of marketing (Vargo and Lusch 2004a) have an all-encompassing view of service). To Grönroos (2008), a market offering based on service logic is a value-supporting process that includes goods, services, information, and customer-firm interactions. This is also in line with the view of Normann and Ramírez (1993, p. 68) who claim that:

“any product or service is really the result of a complicated set of activities: myriad economic transactions and institutional arrangements among suppliers and customers, employees and managers, teams of technical and organizational specialists. In fact, what we usually think of as products or services are really frozen activities, concrete manifestations of the relationships among actors in a value-creating system. To emphasize the way all products and services are grounded in activity, we prefer to call them offerings.”

Since service elements constitute the core of the offerings which are the focus of the thesis, such offerings are referred to as (industrial) service offerings. Managing service offerings includes the management of industrial services and of the service organisation as well as the management of offerings consisting of both the installed base-to-be and the related services and the cross-functional coordination between the service organisation and other organisational entities. Furthermore, the concept of offering is about offering the customer something, but the customer makes the decision whether to accept this offering or not. This is in analogy with the concept of value proposition; value is not pre-produced by the provider and sequentially added as it is in the value chain metaphor (cf. Porter 1985) but determined by the customer (Ballantyne and Varey 2006; Vargo and Lusch 2004a) and the value proposition is a bridge between the firm’s internal and external environment (Normann 2001).

\subsection*{2.4 Perspectives on services and service as a perspective}

The traditional view of service has been that services are not only something different from goods, but that the good is the norm and service production is aberrant (Vargo and Lusch 2004a; 2004b). Thus, service activities have often been considered of secondary importance for manufacturing firms and have been pushed into the background by the manufacturing-orientated focus. The IHIP characteristics (intangibility, heterogeneity, inseparability, and perishability), which in much marketing literature are deemed to distinguish services from goods, addressed by e.g. Regan (1963) and summed up by Zeithaml, Parasuraman, and Berry (1985), are considered to be of little value if one wants to understand what creates customer value, and thereby what de

\textsuperscript{15} In this thesis, the term product is sometimes used instead of offering when the core part of the offering is a good (i.e. physical products). In these cases, the terms product and good are sometimes used interchangeably (cf. Normann and Ramírez 1993).
facto creates profitability and competitiveness. Edvardsson, Gustafsson, and Roos (2005) find
the characteristics as generic service characteristics outdated and Vargo and Lusch argue that
these characteristics “(a) do not distinguish services from goods, (b) only have meaning from a
manufacturing perspective, and (c) imply inappropriate normative strategies” (2004b, p. 324). The
normative marketing goals should be customisation, rather than standardisation and to maximise
customer involvement in the value-creation process. Moreover, the normative goal of the firm
should be to reduce inventory and to maximise service flows. This view is supported by Lovelock
and Gummesson (2004) who claim that many services in fact possess one or more of the
opposite IHIP characteristics, that is to say, tangibility, homogeneity, separability, and durability.
Many software services for instance are homogeneous and durable (Hill 1999).

A service goods dichotomy based on ownership is another aspect that can be accentuated (e.g.
Grönroos 2000; Judd 1964). Lovelock and Gummesson (2004) have proposed a set of
assumptions, tentatively labelled the rental/access paradigm, which are based on the premise that
marketing transactions that involve a transfer of ownership from provider to customer are
idiosyncratically different from those that do not (i.e. services). Hill (1999, p. 443) states that

“From an economic point of view, it makes a considerable difference who owns the
goods involved, who controls the timing and location of production, who bears the
capital costs and who assumes the risks. The distinction between the production of
goods and services often depends more on these economic factors than on the
nature of the production process.”

Although this aspect is recognised as interesting, services are not discussed and analysed from a
strictly economic view in this study. Furthermore, in extensive service offerings like integrated
solutions, some of the equipment can be owned by the customer and some by the provider,
which complicates the use of the dichotomy (Windahl 2007). The management of service
operations does not necessarily differ depending on whether the equipment is rented to the
customer or if the customer owns it and has a service level agreement (SLA) with the same
service level as is included in the rental deal (in either case the equipment can also be owned by a
leasing company).

2.4.1  A service perspective on industrial offerings

A radically different (and inverse) view of services than the traditional one, is to view service as a
marketing logic. In line with Ramírez’s (1999) and Normann’s (2001) view of value creation and
the time logic of market exchange (Ballantyne and Varey 2006), Vargo and Lusch (2004a) argue
in their seminal paper that service provision rather than goods is fundamental to economic
exchange. They embrace an integrative, comprehensive view of marketing:

“The goods versus services debate was about the supposed differences between
goods and services; S-D [service-dominant] logic considers the relationship between
service and a good – that is, a good is an appliance used in service provision. In S-D logic service is the common denominator of exchange and thus is hypernymic to goods. There is no good-versus-service winner or loser in S-D logic” (Lusch and Vargo 2006b).

Consequently, as the function of goods is to deliver service, every business is seen as a service business. Vargo and Lusch (Lusch and Vargo 2006b; Vargo and Lusch 2004a; 2008b) put forward the patchwork of the proposed service-centred dominant logic of marketing thought in the form of ten foundational premises, of which the following have particular relevance for this thesis:

(a) Goods are a distribution mechanism for service provision.

(b) The customer is always a co-creator of value.

(c) The enterprise cannot deliver value, but only offer value propositions.

(d) A service-centred view is inherently customer orientated and relational.

Furthermore, knowledge is considered to be the fundamental source of competitive advantage, the comparative ability to cause desired change drives competition, and all social and economic actors are regarded as resource integrators. The s-d logic implies, for instance, that value is idiosyncratic, experiential, and contextual and that no value is created through manufacturing. Instead, the customer determines the value of the goods based on their serviceability, that is, their value-in-use.

Rather than a category of offerings, Edvardsson, Gustafsson, and Roos (2005) suggest that service is to be seen as a perspective on value creation and that value creation is best understood from the customer’s perspective, based on value-in-use as defined and experienced by the customer. The importance of not focusing on the exchange value only, but to call attention to the value-in-use of industrial offerings, has also been emphasised in studies of business relationships (e.g. Lapierre 2000; Ulaga and Eggert 2006). However, s-d logic emanates from a consumer marketing context in which value-in-use is compared with a ‘priceless’ experience for the individual buyer (Lusch, Vargo, and Malter 2006) whereas, when discussed in an industrial context, the ability to point at superior monetary value-in-use for the customer firm is of crucial importance (Anderson, Kumar, and Narus 2007). Nevertheless, one must recognise that with a co-productive view of value creation, some managed values cannot be measured or monetised (Ramírez 1999). This suggests that the complexity is clearly much higher if values are contingent and established interactively in a value-creation process than it is if value creation is seen as unidirectionally transitive in value chains.

Even if s-d logic implies a perception of how value is created that applies to both services and goods, authors like Stauss (2005) argue that there can be situations where goods-based concepts and models might be useful. Grönroos (2006), however, argues that such situations are to be
deemed as residuals where the only customer contact is the manufactured good. Evidently, this is not the case with capital equipment manufacturers that offer various types of services:

“In addition to what are normally treated as services, … industrial products in business-to-business contexts can be treated as services. In these situations the customer interfaces fulfil the characteristics of services more than they fulfil characteristics for goods. A service logic describes better than a goods logic these types of situations” (Grönroos 2006, p. 330).

Thus, services can be seen as being intertwined with manufacturing, and as a catalyst for increased market orientation and competitive advantage. Although not all customers are very advanced and customers with a transactional intent might focus on exchange value and unit price rather than value-in-use, the normative marketing goal should be to maximise value-in-use, regardless of the scope of the offering (Vargo and Lusch 2004a). This service logic is commensurable with a process view of industrial offerings in which the customer relationship, and not the particular bundle of goods and services, constitute the core (e.g. Tuli, Kohli, and Bharadwaj 2007).

Nevertheless, changing from an industrial, goods-dominant to a service-dominant logic can involve several internal challenges. Söderström (2003) studied an unsuccessful attempt to adopt a service logic in a manufacturing firm that offered ‘functional sales’ (i.e. solutions), and he identified i) the need for a paradigm shift in the business logic and ii) structures needed to support this shift as being the main obstacles. In their study, Oliva and Kallenberg (2003) point out several managerial challenges; services require new capabilities, metrics, and incentives as well as new organisational principles, structures, and processes. Inevitably, this new set of capabilities will reallocate financial and managerial resources from the traditional sources of competitive advantage, i.e. from the product organisation (NPD, manufacturing and product sales). Hence, although corporate culture is a complex issue, a cultural change is required.

2.5 Value propositions

The premise that the firm can only offer value propositions (Vargo and Lusch 2004a) implies that the customer determines the value of the offering. Value propositions can be seen as a reciprocal, two-way promise of value, operating to and from the provider and customer (Ballantyne and Varey 2006). However, according to a service logic firms are not restricted to making value propositions only, but that they can take part in the value-fulfilment process as well (Grönroos 2006; 2008). Hence, as Ramírez (1999, p. 50) argue, “[v]alue is not simply ‘added’, but is mutually ‘created’ and ‘re-created’ among actors with different values” and values in professional business-to-business services have “a highly individual and situational character” (Lapierre 1997, p. 391).

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16 In this thesis, no distinction is made between ‘service logic’ and ‘service-dominant logic’.
Having a service perspective means that equipment sales and service sales are not only seen as being separate activities in time, but as activities, which together, constitute the reciprocal relationship between provider and customer (and other actors involved) in which the multiple values are co-invented, combined, and reconciled (cf. Normann 2001; Ramírez 1999). In their value propositions, firms can emphasise different values. An internal focus means that focus is on cost efficient, standardised operations, whereas an external focus gives emphasis to revenue effectiveness and customisation. In their survey of managers in US firms, Rust, Moorman, and Dickson (2002) found that these two foci are distinct and affect firm performance differently. They bear similarities to the exploitation and exploration abilities discussed by March (1991, p. 71):

“Exploration includes things captured by terms such as search, variation, risk taking, experimentation, play, flexibility, discovery, innovation. Exploitation includes such things as refinement, choice, production, efficiency, selection, implementation, execution. Adaptive systems that engage in exploration to the exclusion of exploitation are likely to find that they suffer the costs of experimentation without gaining many of its benefits. They exhibit too many undeveloped new ideas and too little distinctive competence. Conversely, systems that engage in exploitation to the exclusion of exploration are likely to find themselves trapped in suboptimal stable equilibria. As a result, maintaining an appropriate balance between exploration and exploitation is a primary factor in system survival and prosperity.”

Because demand is heterogeneous and dynamic within industries too (cf. Hunt and Morgan 1995), the firm has to balance in order to respond to multiple, and sometimes inconsistent, demands from the marketplace. Exploitation would most likely be critical for repetitive services, whereas unique services would require the organisation to possess distinctive exploration capabilities. In fact, Matthysens and Vanderbempt (2008) argue that opportunity-seeking behaviour and other forms of exploration are required in order to fight commoditisation.

In addition, an externally focussed value proposition can either reduce costs for the customer, by reducing unit cost for example, or enable the customer to increase business performance such as by enabling more units to be produced (Anderson, Kumar, and Narus 2007; Blois and Ramírez 2006; Ravald and Grönnroos 1996). Thus, every value proposition can have a different focus and the emphasis does not necessarily have to be on enhancing value-in-use for the customer. Further, knowledge-based industrial services can cause causal ambiguity and make it difficult to identify the links between provider means/actions and customer results/outcomes (Lapierre 1997). A customer orientation becomes particularly important for firms offering extensive service offerings, something which became evident in Penttinen and Palmer’s (2007, p. 561) study of capital equipment manufacturing firms:
“While it is—to some extent—a strategic choice by the seller to move toward a market of more complete offerings, it is the customer that either accepts or rejects such a repositioning. It was clear that, across all the four case studies, one of the main challenges for the suppliers was how to convince the customers of the value of the new business proposition.”

Thus, having a long-term perspective of the customer relationship and an understanding of customer needs, seems to become increasingly important with more extensive service offerings consisting of several unbundled services and, eventually, also includes the ‘core product’ as part of the offering. In addition, a competitive service offering is by itself not enough for carrying out a business exchange as trust also is a necessary condition (Gummesson 2004a; Johnson and Selnes 2004; Ring and van de Ven 1992). Das and Teng (2004) noticed that more trust is being demanded than before both within and between firms, and trust between firms “creates a reservoir of goodwill that helps preserve the relationship when, as will inevitably happen, one party engages in the act that its partner considers destructive” (Kumar 1996, p. 97).

### 2.6 The customer-provider relational processes

The service system is an open production system in which the customer, unambiguously, is a participant. This is illustrated, for example, in Eiglier and Langeard’s (1976) seminal servuction system model (see e.g. Bateson and Hoffman 1999) where the firm is broken into two parts; that which is visible to the customer and that which is not. The invisible organisation and system (back office) affect the visible part of the organisation (front office), which, in turn, is divided into two parts; the inanimate environment in which the customer-provider interactions and service production takes place, and the front-office personnel who provide the service. Finally, the bundle of service benefits received by the customer is derived from an interactive process. Thus, the service function and its processes comprise both the provider and the customer, and all other stakeholders directly or indirectly involved in the service development and production processes. Therefore, customers influence both service production (Larsson and Bowen 1989) and service innovation (Gallouj and Weinstein 1997), and customer interactions are critical for successful (and cost efficient) service management (Normann 2000). This is the very opposite to Chase’s (1978, p. 137) view that “the less direct contact the customer has with the service system, the greater the potential of the system to operate at peak efficiency”. Despite being thirty years old, this statement illustrates an ‘industrial’ (Kingman-Brundage, George, and Bowen 1995; Ramírez 1999) or goods-dominant logic (Vargo and Lusch 2004a) still prevailing within many firms. Such g-d logic is internally orientated rather than market and customer orientated, and it neglects the fact that external actors are also part of the service function.

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17 Deriving from consumer marketing, the model includes not only customer A, who purchases the service, but also other customers (B, C, …, n) who are in contact with the service organisation at the same time as customer A (e.g. in restaurants or on airlines). In a B2B context, this aspect is likely to be less prominent.
A market orientation, including customer centricity, is likely to have a substantial positive effect on long-term financial performance (e.g. Hunt and Morgan 1995; Narver and Slater 1990) and Slater and Narver (1996) found the associations between market orientation and strategy to be stronger for firms with a differentiation strategy than the ones with a cost-leadership strategy. Customers’ needs and solutions can be viewed either as expressed, and something of which the customer is aware and therefore able to articulate, or latent, that is to say needs and solutions the customer is unaware of. According to Narver, Slater, and MacLahan (2004), market orientation is composed of indispensable sets of behaviour. The first one is a reactive market orientation, which is the firm’s attempt to understand and satisfy customers’ expressed needs, while the second one is a proactive market orientation, and is the way the firm attempts to understand and satisfy customers’ latent needs. Since it is often insufficient to attract and keep customers in the long term by exclusively satisfying customers’ expressed needs, a reactive market orientation is not enough and a proactive market orientation therefore plays a major role in the success of new offerings. However, unless the provider has developed customer relationships and an understanding of what its customers want, the proactive behaviour may lead to unsuccessful service offerings “ahead of market readiness” (Baveja, Gilbert, and Ledingham 2004).

Even if the service itself is transaction based, customer-provider relationships can have a long-term perspective. In order to enable a proactive market orientation, relationships with customers that are more extensive than arm’s length are important for understanding latent needs and solutions (Hax and Wilde 1999); for example, some customers can play the role as lead users before releasing the offering to a larger customer base (von Hippel 1986). Proactivity is seen as “taking initiative in improving current circumstances or creating new ones; it involves challenging the status quo rather than passively adapting to present conditions” (Crant 2000, p. 436) whereas reactive behaviour is to adapt to conditions set by customers, competitors, and other actors in the business environment. To Normann (2001), proactivity corresponds to the ability to conceive and reconfigure the value-creating system, by organising value creation beyond the firm’s boundaries and thereby not only creating new offerings, but designing a new business environment. Hence, firms not only adapt to the external environment, but they also shape it through innovation (Normann 2001; Teece 2007) and “firms can innovate not only by recombining the resources they control, but also by harnessing those of the partners, suppliers, and customers” (Zott and Amit 2007, p. 195).

Moreover, value is not only created when the offering is made cleverer, but also when customers are made more intelligent, through the firms’ continuous reconsideration and redesign of competencies and relationships (Normann and Ramírez 1993). In line with Normann (2001), proactively endeavouring to find new constellations and offerings in which customer value is created, is considered to also provide value for the provider in the long term. Furthermore, only acting reactively does not generate sufficient insight into new value-creating opportunities for the customer and thus, generates little customer dependence and basis for future customer loyalty.
(Narver, Slater, and MacLahlan 2004). A firm’s preferred strategy should be to foresee customer value changes rather than to try to adapt to changes when they occur. Such proactive capability may well become a source of competitive advantage for industrial firms (Eggert, Ulaga, and Schultz 2005).

Relationships between customer and provider are a dynamic phenomenon (Eggert, Ulaga, and Schultz 2005). These relationships always exist; if not expressed, then they are latent and one of the actors, or both, can choose to activate it or not (Grönroos 1997). “Even in the cases when the firm does not want extended interaction or repeat patronage, it is not freed from the normative goal of viewing the customer relationally. Even rather discrete transactions come with social, if not legal, contracts (often relatively extended) and implied, if not expressed, warranties” (Vargo and Lusch 2004a, p. 12) and the firm should strive for long-term customer relationships. However, it is not the long-term relationship per se that should be emphasised but rather the attitudes and perspective towards the long term (Lusch and Brown 1996). Even if the provider has a relational intent, there is a limit to the number of close, mutual relationships in which a firm can be involved (Zolkiewski 2004), as customers are not necessarily willing to invest in relationships with all the firms they interact with (Rust and Thompson 2006). Some customers are not interested in anything more than a parity good or service at a competitive price (Day 1994). When classifying customers according to how relationship value is created both for the customer and for the firm, Johnson and Selnes (2004) call these type of customers ‘acquaintances’ as opposed to ‘friends’ and ‘partners’. Friends have generally a longer time horizon than acquaintances and the offerings are more differentiated and adapted to specific market segments. Partners generate the highest sustainability of competitive advantage (although it depends on how unique and effective the coupled customer-provider activities are organised), the time horizon is the longest, as both trust and commitment is required, and the offerings are customised to individual customers. For many types of services (including industrial services), economies of scale are low and therefore closer relationships tend to generate more value than distant relationships. Nevertheless, even if “the accumulated value created in a customer portfolio may be dominated by friends and partners, acquaintances are more likely to be the cornerstone of a firm’s portfolio and the primary source of economies of scale” (Johnson and Selnes 2004, p. 15). Another profitability-related issue is that even if the customer too has a relational intent, the relationship might be unprofitable for the provider. Seeking to retain such a customer in an industry with continuous customer interactions cannot be defensible from a business rationale point of view. Hence, if there is no possibility of improving the profitability of the customer relationship, relationship longevity should not be aimed for (Storbacka, Strandvik, and Grönroos 1994).

The role of the customer in the service processes differs depending on the type of service (Bittner et al. 1997; Larsson and Bowen 1989). Some processes can be performed mainly by automated
back-office operations (e.g. information processing) whereas the inputs to such processes, for example, might require various degrees of active customer participation and dialogue between customer and front-office employees. Therefore, the effectiveness and profitability of a service or solution is dependent not only on a number of supplier variables, but also on the customer (Tuli, Kohli, and Bharadwaj 2007). The ability to adapt to the provider’s offering through an exploratory dialogue is one such customer variable. Other customer variables are giving the provider information and guidance regarding political issues within the customer organization, and information and guidance about its operations, thereby accelerating the provider’s learning. The design of the service system and process interfaces between customer and provider entities are influenced by customer disposition to participate in the service production process as well as the diversity of customer demand (Larsson and Bowen 1989). In such a two-dimensional continuum, the interdependencies can be aligned in order of complexity; pooled, sequential, and reciprocal being the most complex coordination mechanism (cf. Thompson 1967). A service can be seen as a set of process interfaces, and the firm has to have the ability to manage the different interdependence patterns. This simultaneous coexistence of several service types in the same organization poses substantial managerial challenges for the firm, as the service types interact and reinforce each other (Breunig, Kvålshaugen, and Hylde 2007).

2.7 Summary

Together, the issues discussed in this chapter and in the five appended papers, and their connection to the overall purpose and research questions, are represented in Figure 2-3 and indicated by the broken line. The focus of the thesis is on the manufacturing firm’s management of their industrial service offering. Further, technological development, particularly in the form of new ICT applications and systems, is an exogenous factor that has been seen to play a major role in the enablement of new service offerings, and is therefore explicitly investigated. The technological development enables new ICT systems and applications and, thus, new service processes (including changing customer-provider interfaces) and offerings are being made possible through dematerialisation mechanisms (cf. Normann 2001). In addition, the co-creation of value and the reciprocal two-way value proposition means that the role of the customer implicitly is taken into account.
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When the offering is viewed as an input to the value-creating process, the value created depends not only on the characteristics of the service offering, but also on the configuration of the value constellation, i.e. the linkage pattern between organisational entities and their roles in the service co-creation process. Thus, it is pertinent to the subject to gain increased understanding of the interrelationship between different types of industrial service offerings and service function configurations and its implications on the firm’s service management.
The research process

This chapter deals with the fundamental methodological considerations of the thesis, the research process, and the collection and analysis of data. Validity and reliability are also considered and discussed. The intention is to give the reader an understanding of how the research was conducted and the rationale behind the decisions taken in the crafting of the thesis and its five appended papers.

3.1 The author's background

Although I began with a tabula rasa, the soft tablet has continuously been written on. I gained some initial experience and knowledge of the theoretical and empirical field while studying towards my Master's degree in Industrial Engineering and Management at the Linköping Institute of Technology. During the following four years as a Ph.D. student, I have been influenced by the prevailing research paradigm and traditions of the Marketing Logistics Research Group and therefore adhere to a systems theory and analytical view, as discussed by Arbnor and Bjerke (1994). Thus, I try to apply what is predominantly a systems theory view, even though I recognise that ideas from both systems theory and an analytical perspective may be relevant when conducting my research. Assuming that the whole does not equal the sum of its parts, that the parts depend on the system, and that knowledge is system dependent (Arbnor and Bjerke 1994) are three systems theory postulates germane to the thesis. Further, the research tradition of the research group means that most doctoral theses are based on case study research. Furthermore, at an early stage of my research process I attended a doctoral seminar in service management and marketing at Hanken, the Swedish School of Economics and Business Administration in Helsinki, Finland, something which has influenced my theoretical perspective. Participating in a doctoral course on the service-dominant logic of marketing in autumn 2006 also played an important role for my theoretical thinking. I believe that achieving complete objectivity is never possible in social sciences although one, in line with critical realism, should strive towards this as the locally connected curve strives for the linear asymptote.
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3.1.1 The research projects

In June 2004, I joined Industrializing After Sales Services (IASS), a research project about industrial services financed by Vinnova, the Swedish Governmental Agency for Innovation Systems. Several leading manufacturing firms in different industries participated in the project\(^\text{18}\). The project’s starting point was that product leadership is no longer seen as a sufficient condition for sustaining the manufacturing firms’ competitive advantage. The main reason for this is product commoditisation (Matthyssens and Vandenbempt 2008; Ulaga and Eggert 2006) due to developments such as rapid technological diffusion (Lele 1986) and low-cost competition from new entrants (Lovelock 1995). In addition, the traditional customer lock-in of spare parts sales which is very profitable for the firms (cf. Knecht, Leszinski, and Weber 1993) is also subject to increased low-cost competition. Furthermore, the buying and selling of industrial services and spare parts are often conducted in a fragmented way (Abrahamsson and Brege 1995), meaning that each local company designs and operates its service activities without interference or coordination from central units. There is often no central concept to identify how the services support the product by delivering superior customer benefits. Thus, there is a significant improvement potential for the management of services in many manufacturing firms (cf. Kalliokoski et al. 2004) and offering industrial services is seen as an avenue for differentiation and future competitive advantage. Consequently, a need to work more systematically with industrial services was identified.

The IASS project was comprised of three subprojects (Cost Efficiency, Customer Touch Points, and Value Creation) and I was mainly involved in the Cost Efficiency subproject, in which BT Industries\(^\text{19}\), Electrolux Laundry Systems (ELS), ITT Flygt, and Saab Aerosystems participated. The IASS project was finalised in spring 2006, with a number of practitioner orientated reports as the main output, and shortly afterwards, the continuation project, Developing Industrial Offerings (DInO) started and is due to end in spring 2009. The point of departure was similar to the IASS project and it followed on where that project ended. Hence, most of the participating firms were the same\(^\text{20}\) and the most significant change for my research process was that BT Industries, one of my two main case companies, no longer chose to participate. A second company that did not choose to participate in the DInO project was ELS. Both the objectives of the projects and the access to service managers during project meetings and workshops influenced my research interests (particularly during Stage 1) and, thus, indirectly my research design.

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\(^{18}\) The participating firms were AGA/Linde Gas, BT Industries, Electrolux Laundry Systems, ITT Flygt, Metso Minerals, Saab, TeliaSonera, and Volvo Buses.

\(^{19}\) This was before TMHG was created. Thus, BT Industries and Toyota had separate management structures and local operations.

\(^{20}\) The participating firms were AGA/Linde Gas, ESAB, Husqvarna, ITT Flygt, Metso Minerals, Saab Aerotech, TeliaSonera, and Volvo Buses.
3.2 A multiple case study approach

The scientific method used in this research is case study research. A case study may be defined as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and context are not clearly evident” (Yin 2003, p. 13). Furthermore, a case study research strategy is considered advantageous when the investigator has little or no control over the events and as such, fits my research agenda. Woodside and Wilson (2003) have a broader view than Yin (2003) on case study research, which they regard as “inquiry focusing on describing, understanding, predicting, and/or controlling the individual (i.e. process, animal, person, household, organization, group, industry, culture, or nationality)” (p. 493). Thus, they consider case study research appropriate both for theory building and theory testing and as an approach which is useful in industrial marketing research particularly.

Case study design enables the researcher to attain a deep understanding in research on thinking-doing processes in industrial marketing, something which Woodside and Wilson (2003) believe is not possible through quantitative studies.

In order to provide a complete and accurate picture of how industrial service offerings are managed, relying on one or a few key informants, as is the case in surveys, is most likely not sufficient as to get this picture requires multiple key informants representing different business functions and organisational levels (cf. Parasuraman’s (1998) view on how to measure customer service in business-to-business markets). A multiple-case study can lead to conclusions that are more substantial than a single-case study and different cases may emphasise complementary aspects of a certain phenomenon (Eisenhardt 1989; Yin 2003). Given the objective of the study and the character of the research questions, a multiple-case study approach was chosen as the research strategy. Consequently, the choice of case firms was critical (Eisenhardt 1989) as it must be possible to justify every case in accordance with the thesis’ purpose (Yin 2003).

The research inquiry can be characterised as mainly being explorative and comparative. The empirical evidence has come predominantly from the two main case studies (BT Industries/TMHG and ITT Flygt). In addition, the primary case studies are compared also with secondary case studies (ELS, and Saab Aerotech) and with other researchers’ case studies of Husqvarna, Metso Minerals, Sandvik Coromant, and Volvo Buses in order to broaden the perspective (also across industries) and enable a more holistic view. Multiple cases strengthen the precision, the stability, and the validity of the findings, thereby adding confidence to the single-case findings (Miles and Huberman 1994). This deliberate choice of case study research inquiry is particularly interesting for the study of industrial services in a manufacturing context, because previous research has generally been descriptive or normative, and not seldom contributed to by business consultants (Jacob and Ulaga 2008). Furthermore, few in-depth case studies have been conducted (see Penttininen and Palmer 2007 for an exception) as many studies are based on larger qualitative (see, for example, Gebauer, Fleisch, and Friedli 2005; Oliva and Kallenberg 2003) or quantitative samples (see, for example, Brann, Oliva, and Gebauer 2007; Gebauer 2008a). Thus,
there is a lack of case stories, as most of the previously published research tends to be somewhat anecdotal and/or based on success stories.

Due to the lack of research into services in manufacturing settings (compared to the mainstream B2C services marketing research) the intention was also to extend existing theory by applying established models from conventional service management and organisational literature (e.g. Grönroos and Ojasalo 2004; Larsson and Bowen 1989) in a new context. Therefore, the theoretical point of departure in some of the appended papers is the analysis of a specific phenomenon (such as the effect of ICT on service process interfaces) using previously derived frameworks (theoretically and/or empirically). By confirming, extending or revising existing models throughout the iterative research process, it was possible to gain new insights and increase my understanding of the empirical phenomena studied. Hence, the concept development was a consequence of this approach rather than its primary rationale.

### 3.2.1 A note on the information gathering and analysis

The information gathering and analysis process has not been linear but rather, highly iterative in nature, matching theory and reality. This enabled me to take advantage of the systemic character of both the empirical world and of the theoretical models. This iterative process between theory and empirical data collection is often referred to as abduction or systematic combining (Dubois and Gadde 2002), or iterative grounded theory or extended case method (Matthyssens and Vandenbempt 2003):

“In studies relying on abduction, the original framework is successively modified, partly as a result of unanticipated empirical findings, but also of theoretical insights gained during the process. This approach creates fruitful cross-fertilization where new combinations are developed through a mixture of established theoretical models and new concepts derived from the confrontation with reality” (Dubois and Gadde 2002, p. 559).

Theory building is the result of infusing extant literature/theories with empirical data. In this way, theory building does not start from scratch (as in grounded theory) but from combining data with grounding in existing theories... The main purpose [of iterative grounded theory or extended case method] is not to create new theory but to integrate and extend existing theories” (Matthyssens and Vandenbempt 2003, p. 600).

These statements are in line with my research process, which I regard as an interplay between deduction and induction. Even if this may be seen as a pragmatic approach to research in management, there is no contradiction between a pragmatic approach and a rigorous methodology (Suddaby 2006).
### 3.2.2 A two-stage research process

The research process can be divided into two parts, of approximately two years each. Although the purpose of the two stages was similar and the data gathering techniques were the same, the number of cases and the unit and level of analysis differed due to the different purposes of the two stages; a licentiate thesis is the main output from Stage 1 and this doctoral thesis is the main output from Stage 2. Table 3-1 gives a summary of the research design and the data gathering process.

<table>
<thead>
<tr>
<th>Description</th>
<th>Main data gathering technique</th>
<th>Main triangulation technique</th>
<th>Desired purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STAGE I</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>– Studying how capital equipment manufacturers enhance their industrial service offerings</td>
<td>– In-depth interviews with central service managers at BT Industries/Toyota Material Handling Group, Electrolux Laundry Systems, ITT Flygt, and Saab Aerosystems (fully taped, transcribed and summarised)</td>
<td>– Research project meetings/focus group discussions and workshops with case company representatives and managers from other companies dealing with the same issues as the case companies</td>
<td>– Understanding industry logic and service strategies</td>
</tr>
<tr>
<td></td>
<td>– 2004-2006</td>
<td>– Secondary material (internal and external presentations, documents, and reports)</td>
<td>– Mapping market offerings (particularly industrial services)</td>
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<tr>
<td><strong>STAGE II</strong></td>
<td></td>
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<tr>
<td>– Studying how the service function of capital equipment manufacturers manages industrial service offerings</td>
<td>– In-depth interviews with central and local managers and specialists at BT Industries/Toyota Material Handling Group and ITT Flygt (fully taped, transcribed and summarised)</td>
<td>– In-depth interviews with 10 customer representatives – Research project meetings/focus group discussions and workshops with managers from ITT Flygt and from other companies dealing with the same issues as the case companies</td>
<td>– Understanding the characteristics of industrial service offerings; obtaining in-depth insight of the interrelationships between service interfaces, service scope and service focus</td>
</tr>
<tr>
<td></td>
<td>– 2006-2008</td>
<td>– Secondary material (internal and external presentations, documents, and reports)</td>
<td>– Understanding the link service function and service offering</td>
</tr>
<tr>
<td></td>
<td></td>
<td>– Interview with UK water and wastewater industry expert – In-depth interviews with service managers and business developers from different industries – Feedback from interviewees on transcripts and case studies</td>
<td>– Understanding service function and service offering dynamics</td>
</tr>
</tbody>
</table>

Table 3-1. Research design and data gathering process.
3.3 Stage one

The first stage of the research process concerns the time from when I began my doctoral studies in June 2004 until the presentation of my licentiate thesis in June 2006.

3.3.1 Unit of analysis

The unit of analysis relates to how the case is defined (Yin 2003). During the first stage, in parallel to my research, I also participated in the IASS project, in which central service managers from manufacturing firms participated. By having the central service organisation as the unit of analysis I was able to gain synergies from the IASS project at this initial stage of the research as the IASS project members all had central positions. Although it was not sufficient and all-encompassing enough for the objective of the doctoral thesis, the central service organisation was seen as an adequate unit and level of analysis to provide a first understanding of manufacturing firms’ service organisations and service offerings.

3.3.2 Selection of cases

For the first stage of the research process, BT Industries, ELS, ITT Flygt, and Saab Aerotech were selected as case companies. The selection of cases was mainly based on three main criteria:

1. That the firms were market-leading manufacturing firms\(^{21}\)
2. That the firms had espoused the strategy of increasing their focus on the service market and grow through industrial services
3. That access to key respondents was possible.

Thus, the case companies were selected not as representative cases or random samples of manufacturing firms, but to contribute to theory building. Even though one may argue that the selection of cases was limited to the firms participating in the IASS research project, the choice of cases can be argued to have been made by theoretical sampling, which means that “cases are selected because they are particularly suitable for illuminating and extending relationships and logic among constructs” (Eisenhardt and Graebner 2007, p. 27). Also, selecting firms participating in the IASS project was considered advantageous due to the frequent contact with the firms and the access to information from the service managers that participated. Furthermore, there are subsequent choices one can make about people and events which are to be examined (Stake 2000) and, accordingly, I was in no way limited to the project participants only. However, I chose to limit the study to encompass the central service management’s view at this initial stage of my research process; many of the interviewees participated regularly in the project and I met them during project meetings and workshops.

\(^{21}\) Although there are different paths to market leadership (Treacy and Wiersema (1993), for example, put forward operational excellence, product leadership, and customer intimacy as three distinct ones), these firms have generally pursued a product leadership strategy.
The selected firms strive for an increased service offering although they are in different stages of this development due to internal and external factors. BT Industries has been working for a rather long period with service offerings internationally and has been successful with selling rental plans. ITT Flygt is servicing both public and private customers and has a number of solutions agreements, even though most of its services are not very complex. Electrolux Laundry Systems services customer segments with very different needs and requirements and the firm is to a rather high extent dependent on service partners for the service production. Saab Aerotech is also increasingly focusing on service operations and integrated solutions competences, but compared to the other firms, it is a low-volume manufacturer with more extensive system scope and technical complexity. The competitive strategy of the firms is differentiation rather than cost leadership. Although they cannot ignore their costs, long-term competitive advantage is achieved by being unique along some key dimensions that are widely valued by customers rather than by being the low-cost provider (cf. Porter 1985).

**BT Industries**

The Swedish company BT Industries was acquired by Toyota in 2000. BT Industries was the world’s largest manufacturer of warehouse trucks and Toyota Material Handling Company (TMHC) held the number one position for counterbalanced trucks. BT Industries’ net sales totalled €1.6bn (SKr14.7bn) in 2005. Out of the 8,910 employees in BT Industries, 42% were employed in the service market, whereof a majority were field service technicians. As far as service strategies are concerned, their main goal is to increase the share of long- and short-term rental fleet trucks. Secondly, the firm aims to sell more Full Service SLAs if a rental sale is not possible and thirdly, to increase the number of Preventive Maintenance SLAs. For the company, it is of interest to get away from a focus on unit price and their objectives are to have a well-utilised service organisation and long-term relationships with customers. In a five-year contract, about 50% of the customer’s costs are directly related to the truck investment and 50% are service-related costs. During a truck lifecycle, services including spare parts, constitute a majority of these costs. Approximately 40% of all new trucks in Europe are sold through rental plans and the number is steadily increasing. In a rental plan, the customer has a stipulated cost for all material handling activities including the rental trucks, maintenance, and spare parts. Most trucks operate in long-term rental plans but also short-term rental is offered to provide peak time backup to supplement customers’ core fleet capacity.

Because it was not until 2006 that a joint organisation (TMHG) of BT Industries and TMHC was established, BT Industries, not TMHG, was selected as a case company. However, since the respondents from the central organisation from 2006 and forward worked for TMHG’s

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22 In Europe, the integration on the local level did not start until 2007. Therefore all the local respondents worked at BT sales companies when the interviews were conducted (2006-2007).
European regional organisation Toyota Material Handling Europe (TMHE) and since BT Industries no longer exists, the firm is generally referred to as TMHE or TMHG in this study.

Electrolux Laundry Systems

Electrolux Laundry Systems (ELS) is one of the world’s leading manufacturers of professional laundry equipment, offering a wide range of equipment, including washer extractors, dryers, hydro extractors, ironers, and finishing equipment, as well as services to the needs of individual businesses – from the laundries of apartment houses, hotels and health care institutions to commercial laundry operations and coin-operated laundromats. The company has approximately 1,500 employees in the sales companies and in manufacturing, located at three manufacturing plants in Sweden, France and Denmark. The headquarters are located in Copenhagen, Denmark, and the company has 23 national sales companies around the world. Approximately 12% of the employees are working with services in the field. A network of 120 importers also serves the global customer base. ELS is part of the Swedish-based Electrolux Group, which has 57,000 employees, sales of SEK105bn (2007), and is the world’s largest producer of powered appliances for kitchen, cleaning and outdoor use.

The professional laundry equipment has a long life span. Although equipment in use can be adjusted to new detergents, new equipment is more water and energy efficient, less worn out, and allows more combinations of detergents and washing programmes. The industrial service market is important both for maintaining the installed base in a professional environment but also as an entrance to new product sales. Spare parts and maintenance services are key factors for ELS and are a potential area of improvement. Earlier, industrial services have been seen as a necessary evil and not regarded as a strategic element to manage customer expectations properly. However, the increased price pressure on equipment requires growth in all parts of the product lifecycle and especially in industrial services. Due to the relatively long life span of the installed base and to the laundry equipment becoming increasingly similar, the industrial services are what more and more distinguish the actors on the market. Therefore, ELS views service quality as a chance to demonstrate and market ELS in comparison to the competitors.

The financial goal is to increase the customer base as well as to gain shares in the net sales of industrial services including spare parts. In 2004, ELS’ net sales were SEK2.2bn, of which 80% involved existing customers and the remaining 20% were new clients. Only 20% of the service contacts and net sales go directly through ELS; 70% go through partners and 10% are estimated to be lost to competitors. The industrial service organisation is part of the sales organisation, which consists of local organisations in the countries where ELS operates and that are not represented by third-party service partners. An internal report indicated that much of the potential of industrial services is lost due to a suboptimal organisational model and inconsistent execution standards. The majority of service technicians are employed at independent service partners that are connected to ELS through service agreements. Third-party service providers can
also be retailers on some markets. As a majority of the potential net sales of industrial services are generated by third parties and there is an estimated potential profit of about SKr105m, ELS is carrying through an acquisition of service partners worldwide.

The service organisations differ from country to country, depending on if each subsidiary’s own service technicians are used or if the service is handled by third-party service providers, which leads to a variety of systems for call handling. The services are executed and invoiced directly by third-party service providers, giving no profit to ELS (except for spare parts sales). If spare parts are ordered via a dealer, it too decreases ELS’ margin. The local organisations recognise the importance of centrally managed activities and are positive if these lead to increased profitability, while central control of local sales processes can be interpreted negatively. However, there is no overall and consistent way to manage industrial services across the different countries and the understanding of the impact of services varies among the local organisations. In countries where ELS has its own technicians, there are most often three levels of SLAs: (1) service one or a few times per year, (2) service plus included spare parts, and (3) ELS has a complete undertaking in a full-service agreement.

A more detailed case description of ELS can be found in Kowalkowski (2006), i.e. in the licentiate thesis.

**ITT Flygt**

ITT Flygt is part of the ITT Corporation and is a leading supplier of submersible drainage, sewage, and propeller pumps, sewage mixers, and accessories, and services for use in environments ranging from water and wastewater treatment, raw water supply, abrasive or contaminated industrial processes, mining, and crop irrigation. Sales amounted to $1.14bn (SKr7.84bn) in 2006. Service operations are performed either by the local service organizations or by authorized and independent service partners. A majority of the SLAs are preventive maintenance contracts, but many customers do not have any agreements and many of these customers buy service from competing service firms. Although marketing activities and service delivery are adapted to specific customer segments, today’s offering is fairly standardised with the same contract forms being offered to all customers. One major market-related change in recent years is that private, as well as public customers are outsourcing service operations, something which has created new opportunities for ITT Flygt’s service operations. Further, increased awareness of energy costs and total cost of ownership imply an opportunity for ITT Flygt to extend its role both towards customers and towards actors such as contractors and consultants.

In 2007, ITT Water & Wastewater (W&W) was created through the merger of ITT Flygt and business unit AWT (Advanced Water Treatment) and total sales amounted to $1.6bn (SKr10.8bn) in 2007. However, when most of this study was conducted, Flygt was still a separate business unit and the company referred to is therefore ITT Flygt.
Saab Aerotech

Saab is a leading high-technology company with its main operations in defence, aviation, space and civil security. Saab covers a broad spectrum of competencies and capabilities in systems integration and the firm develops, manufactures, and delivers advanced products and services for the defence market, as well as for commercial markets where many new business opportunities are created. The principal customer has traditionally been the Swedish Air Force through FMV (Försvarsmaterielverket) – the Swedish Defence Material Administration – but thanks for example to strategic partnerships, Saab has continuously increased its export sales. Of the order bookings in 2007, 65% came from customers outside Sweden. Nevertheless, research, development and production are carried out principally in Sweden. Total annual sales are SKr23.0bn and order bookings totalled SKr20.8bn during 2007. Research and development corresponds to about 20% of turnover. The business unit Saab Aerotech provides what they call ‘aftermarket products’ and services for life-cycle support of customer systems and platforms, for example:

- Complete Integrated Logistic Support (ILS) to operators of Saab developed aircraft in the commercial and military markets
- ILS Services including technical support, training, modifications, etc. for a range of Army and Navy systems and equipment
- Consolidated in-sourcing of support programs from within the Swedish Defence structure to strengthen ILS services across all branches
- Maintenance, repair, and overhaul (MRO) services for Saab and other OEM aviation related platforms and products. Special flight services in niche markets.

Because the empirical data from the Saab Aerotech case is only used in one of the appended papers (Paper 3), this case description is rather short. A more detailed case description of Saab Aerotech can be found in Kowalkowski (2006).23

3.3.3 Information gathering

Before gathering primary data from case respondents, I acquired theoretical knowledge through literature reviews and discussions with supervisors and colleagues to better grasp and problemise the phenomenon, as some pre-understanding is needed in the initial phase of inquiry (Yin 2003). Interviews were conducted in a semi-structured manner with one or two managers from each case company’s central service organisation. Discussions were also held with representatives from two or more of the firms at the same time in different discussion forums, project meetings, and

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23 Due to organisational restructurings, the business unit referred to in the licentiate thesis is Saab Aerosystems. In the organisational division in 2006, Saab Aerosystems had the business responsibility whereas Saab Aerotech had the operational responsibility for support operations. In reality, the lines between the two business units have been somewhat blurred and key respondents have changed positions from Saab Aerosystems to Saab Aerotech. Also, part of the data collected for the licentiate thesis, where Saab Aerosystems was a case company, refer to Saab Aerotech.
workshops related to the IASS research project (see Table 3-2). Discussion forums were similar to interviews, as they too were semi-structured, but here the agendas were set by the two or three researchers, including myself, participating and/or a company representative. The discussion forums took place early in the research process and the sources of evidence have similarities with the exploratory approach to qualitative research discussed by Calder (1977), where an attempt is made to generate and identify concepts and terms as a first stage of the research process, orienting towards a new theoretical field and generating initial hypotheses.

Table 3-2. Information gathering in Stage 1.

<table>
<thead>
<tr>
<th></th>
<th>BT Industries</th>
<th>Electrolux Laundry Systems</th>
<th>ITT Flygt</th>
<th>Saab Aerotech</th>
</tr>
</thead>
<tbody>
<tr>
<td># Interviews</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td># Phone interviews</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td># Participations in discussion forums</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td># Participations in workshops</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td># Participations in project meetings</td>
<td>1</td>
<td>3</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td># Total</td>
<td>13</td>
<td>9</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td># Meetings with respondent</td>
<td>(9) Product Manager Service Market (4) European Sales Manager</td>
<td>(7) Vice President Genuine Parts &amp; Services (1) Senior Manager Customer Care (1) Manager Future Care Support Processes</td>
<td>(16) European Product Manager (4) Product Manager Spare Parts</td>
<td>(3) Head of Support Solutions (14) Program Manager Business Development (2) Service Manager (1) R&amp;D Customer and Product Support</td>
</tr>
</tbody>
</table>

One purpose, and a major advantage, of the workshops and project meetings, was the opportunity to present empirical data previously collected, introduce preliminary results, discuss the findings, and receive feedback. Even if the workshops and project meetings were not opportunities for structured or semi-structured interviews, it was possible to discuss and ask specific questions and validate information, for example through written reports sent to the firm representatives before the meetings and through presentations at the meetings. Because representatives from all the firms were present, I also came to a clearer understanding when firm managers exchanged opinions and experiences among themselves. In many ways, the approach in this phase of my research was similar to Lindberg and Nordin’s focus group phase (2008), for example, although it was somewhat less systematic. Discussions with and between the different managers were generally very sincere and constructive, since most of them were in similar positions within their organisations and none of the businesses they represented were competitors. Hence, it is possible that participants opened up and shared insights that would not have been available from the interviews conducted (cf. MatthysSENS and Vandenbempt 1998a). In addition, internal and external written material and firm presentations supplemented the empirical data. Some of the internal material has been of particular interest and facilitated the case analysis.
considerably. Furthermore, attending external presentations and the discussions following, complemented the BT Industries case.

The interviews and discussion forums took between one and a half and three hours, whereas project meetings, discussion forums, and workshops took about five to six hours. I have also held phone interviews, taking between 20 and 80 minutes, with representatives from each firm in order to ask complementary questions and validate the cases. Several other phone calls have also been made to the respondents, but they are either not considered to be specifically related to the cases or only a few minutes long. Through the project meetings and particularly through follow-up phone calls, I was able to complement my data collection and thus, ask questions not taken up during the interviews. The majority of the interviews and of the researcher-led discussion forums in the IASS project were conducted from October 2004 to February 2005. However, a few interviews were conducted in mid-2005 and complementary phone interviews took place in early 2006.

### 3.3.4 Analysis of information

All interviews were taped and transcribed and passages were categorised according to research subthemes before comparing the information from different respondents. I received feedback from the interviewees on the transcribed interviews and on preliminary versions of the case studies. Information from the transcriptions was grouped into similar themes, based on the purposes and the theoretical frameworks of the papers and theses, and regrouped following a systematic combining process. Thus, even if I made careful comparisons after the majority of interviews were carried out, constant comparison and theoretical sampling took place. Constant comparison means that collection and analysis of information was simultaneous and theoretical sampling meant that decisions about which interviews to conduct and which other data to collect next, are determined by the theory in progress. As Suddaby (2006, p. 634) points out:

> “Constant comparison contradicts the myth of a clean separation between data collection and analysis. Theoretical sampling violates the ideal of hypothesis testing in that the direction of new data collection is determined, not by a priori hypotheses, but by ongoing interpretation of data and emerging conceptual categories.”

Whereas firm participants in the discussion forums were from the case firms only, workshops and project meetings involved participants from all three IASS subprojects. The workshops dealt with specific topics related to the project and the agenda was set by the firm holding the specific the workshop. However, I did have the opportunity to present, discuss, and receive feedback on theories as well as empirical findings related to the thesis on a continuous basis. Initial project meetings served to identify a list of characteristics that were relevant to service managers, whereas later meetings mainly concerned working methods for service management. Furthermore, internal and external secondary data was used to obtain supplementary information about the case companies and their business environments.
Information from the firms studied was elaborated to produce case studies. During Stage 1, this was conducted in connection to the licentiate thesis. The case studies allowed the identification, evaluation, and matching of patterns as they emerged from within the individual cases to take place and this initial analysis of data corresponds to Eisenhardt’s (1989) and Yin’s (2003) idea, which is firstly to become familiar with each case as a separate entity in order to identify case specific patterns before making a cross-case comparison to identify common patterns. Replication logic is central to building theory from case studies (Eisenhardt 1989), which means that the different cases served as replications, contrasts, and extensions to the emerging theory (Yin 2003) and that the real-world context in which the phenomena occur is emphasised (Eisenhardt and Graebner 2007). The four cases were reported in the licentiate thesis (Kowalkowski 2006) and the analyses are presented in the licentiate thesis and in Paper 1.

### 3.4 Stage two

The second stage of the research process concerns the time from July 2006 until June 2008.

#### 3.4.1 Unit of analysis

Although most focus was on the service organisation, not all service development and production is managed by that division/unit. Therefore, a strict delimitation for the data collection and research focus based on organisational function was not considered to be adequate. Besides, in order to better understand the role and status of the service organisation, conducting interviews with managers responsible for related areas of the service function (i.e. part-time service managers) and with general managers was seen as essential. Thus, in connection to the overall objective of the thesis, the industrial service function of each case firm was chosen as the unit of analysis. Since the service organisation is to be seen as the focal point of the service function, the perspectives given in the cases mainly reflect the views and opinions of those central and local service managers responsible for strategy, business development, and operations. The service function has been analysed on two levels; the central service function (i.e., the parent company) and the local service function (i.e., the subsidiaries). Initially, the study focused on the central level of analysis (i.e. Stage 1) but as the iterative research process evolved, it became evident that a thorough understanding of the local level of the theoretical construct was also necessary.

#### 3.4.2 Selection of cases

A prerequisite for selecting the case firms was that the firms’ characteristics (e.g. capital equipment manufacturers), service offerings, and service strategies (such as an increased focus on the service operations and an increasing alignment between corporate strategies and service strategies) corresponded to the phenomenon which I was about to study. Because I found ITT

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24 This is because, as argued, even if the service organisation is likely to constitute the most important and extensive part of the service function, it is nevertheless only one subset of it.
Flygt and TMHG to be the most interesting cases for my research questions and because access to key informants was considered possible, I chose to focus the remaining part of my research on those two firms. In order to better understand the industrial service function and, hopefully, to reach more valuable findings, I found it better to focus my research process on fewer but more in-depth cases.

For example, ITT Flygt and TMHG are both global market leaders in terms of product sales. Both firms have an international presence and information access to both central and local level respondents was found to be better than at ELS and Saab Aerotech. Besides, compared to ELS and Saab Aerotech, ITT Flygt and TMHG in particular, had been working with service development and service sales the longest and had a multifaceted service offering portfolio. As previously discussed, Saab Aerotech is a different type of manufacturing firm than the three high-volume capital equipment manufacturers (e.g. more related to a systems seller/integrator) and the firm operates in a very different business environment. In the case of ELS, the service organisation did not enjoy very strong support internally and the amount of resources given to services and the number of service offerings it had was also limited. However, the ELS case did provide several interesting insights, particularly related to how ICT applications enable new services, and I therefore deliberately chose empirical evidence also from the ELS case in Papers 1 and 5.

### 3.4.3 Information gathering

In order to avoid bias and allow the collection of rich data, my research process was initially quite broad and open (Eisenhardt 1989). For example, I presented relatively thorough case studies in my licentiate thesis, and not all data included was necessarily further analysed. Gradually, however, I became more focused and specific in my data gathering (cf. Nordin 2005). Interviews were conducted in a semi-structured manner with one (or sometimes two) respondents from the case firms also in this stage of the research process. People interviewed during the first round of interviews were also interviewed during the second round. Even though I started interviewing central service managers because I had access to these key respondents (i.e. convenience sampling), the sampling of respondents was partly contingent. That is, although I had a clear idea of the respondents which I wanted to interview, it was partly a ‘snowball sampling’ (cf. Coleman (1958) as quoted in Salganik and Heckathorn 2004). For example, some interviewees would recommend me to contact particular individuals due to their experience and expertise. Suitable respondents were generally identified during discussions with interviewees. For example, an interviewee could suggest a suitable respondent for further talks or I could ask with whom I could further discuss a particular issue. Also, my purpose and research design implied that I identified a number of key respondents that I wanted to interview. This meant that I chose to investigate some parts of the service function more in detail than others, since the main locus of...
my study was the service organisation. In general, I found it easier to get access to key respondents at TMHG than at ITT Flygt.

Because of my aim, it was not sufficient to only study the central service function, and for that reason, I also carried out interviews in the local subsidiaries. Due to practical reasons, I initially conducted interviews in the Swedish subsidiaries. BT Industries’/THMG’s Swedish subsidiary is one of the leading subsidiaries in Europe (for example, it has one of the highest shares of rental plans) whereas ITT Flygt’s Swedish subsidiary is less advanced in terms of service offerings and ICT systems, compared to leading subsidiaries like the one in the UK. In order to not only gain a better understanding of local conditions but also to better understand how subsidiaries which have been successful in terms of services manage their operations, I therefore decided to conduct interviews also at the UK subsidiaries. The UK is a competitive marketplace for both firms’ subsidiaries which have a leading position in each firms’ European organisation. This included interviewing a researcher with in-depth knowledge of the UK market before collecting primary data at ITT Flygt’s UK sales company.

The majority of the interviews at ITT Flygt and TMHG were conducted from December 2006 to June 2007 and it was also during this period that most of the customer interviews took place. Since customer co-creation of value is a fundamental postulation and since the research questions implicitly deal with the role of the customer, it was of major interest to gather primary data from some of the firms’ customers as well. In order to increase my understanding of the role of the customer for the industrial service offering, I met with several customer representatives. These were selected mainly on two premises; customer segment and size, and the type of offering they purchase from the case firms. Table 3-3 provides an overview of the number of respondents interviewed (see Appendix to find a complete list of the respondents).

Table 3-3. Overview of the number of interviews and discussion forums conducted in Stage 1 and Stage 2.

<table>
<thead>
<tr>
<th></th>
<th># Interviews</th>
<th># Interviewees</th>
<th># Discussion forums</th>
<th># Participations in discussion forums</th>
</tr>
</thead>
<tbody>
<tr>
<td>BT Europe/TMHE</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>BT Svenska</td>
<td>6</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BT Danmark</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BT Rolatruc</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customers</td>
<td>5</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total TMHG case</td>
<td>21</td>
<td>22</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>ITT Flygt/ITT W&amp;WW</td>
<td>8</td>
<td>5</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>ITT Flygt Sverige</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITT Flygt UK</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>External specialists</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customers</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total ITT Flygt case</td>
<td>16</td>
<td>15</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Electrolux Laundry Systems</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Saab Aerotech</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td># Total</td>
<td>40</td>
<td>40</td>
<td>5</td>
<td>8</td>
</tr>
</tbody>
</table>
The interviews and discussion forums took between 20 minutes and five hours (most interviews were between one and two hours long), whereas project meetings, discussion forums, and workshops took about five to six hours. In general, information gathering stopped when theoretical saturation was reached (Strauss 1987), that is, when I considered that additional data would result in minimal incremental understanding (Eisenhardt 1989). However, in some cases, I had problems gaining access to key respondents. Following Miles and Huberman (1994), I thoroughly read interview transcripts, project meeting and workshop notes, and internal documents, in order to find themes and patterns. In total, the interview transcriptions were more than 200,000 words long, which corresponds to approximately 400 pages25. Critical passages were highlighted and initial interpretations were documented in the margins (cf. Danneels 2002).

3.4.4 Analysis of information

The primary and secondary information was analysed following the same systematic combining process that was used in Stage 1. In the same way, within-case analysis was made before the cross-case synthesis. Transcribed information from different types of respondents (e.g. central service managers, local service managers, general managers, and customers) has been compared and interviews from Stage 1 have been compared with new information from the second interview stage.

During the process leading towards this doctoral thesis, two of the original cases have been complemented, re-written, and presented in Part III. Findings from the analysis are presented in this thesis and in Papers 2, 3, 4, and 5. In the cases where the information gathered was combined with empirical data from other researchers’ case studies (i.e. Papers 3 and 5), considerable time was spent discussing similarities and differences across the initial findings and what the implications would be for my research. Additionally, the analyses in Papers 2 and 4 were conducted with my co-authors; individual interpretations of the findings were presented and discussed in order to reach a consensus on the final analysis of the findings. Obtaining separate perspectives and interpretations of the papers’ tentative findings decreased the risk for misinterpretations and enhanced the trustworthiness (cf. Kollberg 2007).

3.5 A note on the methodology in the appended papers

Early in my research process, the important part that new technology played in industrial service development became evident and I found it germane to my research to increase my understanding of this. Paper 1 is based on initial studies of BT Industries, ELS, and ITT Flygt in Stage 1. I found empirical evidence in the three cases (however not from the Saab Aerotech case) to be of interest when examining the effects of ICT applications on service productivity. Because of the limitations of only having primary data from respondents from the central service organisation, the other four papers are based on data collected and analysed during both stages of

25 If all interviews would have been transcribed literally, the total length would be even longer.
the research. For example, when further exploring how ICT is affecting and driving changing service processes and customer interfaces (Paper 2), I chose to focus my continuous study to BT Industries/TMHG and ITT Flygt, and I carried out interviews also at the subsidiary level and at customer level. In parallel to Paper 2, I wanted to get closer to the theoretical construct of the industrial service function and, thus, more explicitly analyse the role of organisational structure associated with different service offerings, something which resulted in Paper 4.

Participation in various meetings and discussions in the IASS and DInO research projects not only allowed me to try ideas and find patterns that were consistent in different contexts and industries, but was also an opportunity to distance myself from a somewhat narrow focus on BT Industries/TMHG and ITT Flygt (cf. the participant observation discussion in Windahl 2007). In order to gain a more general understanding of possible similarities and differences in premises between firms and industries related to the expansion and internationalisation of industrial services, a broader study was made, which included the four initial case firms as well as three additional project firms with similar characteristics. The total number of interviews used in Paper 3 were 49, including interviews carried out by co-authors. Similarly, comparing and combining the empirical data from two of my cases with that of another researcher allowed the relatively normative focus of Paper 5.

### 3.6 Quality of research

In order to ensure quality of research, Yin (2003) suggests four tests that should be applied on qualitative case study research. The four tests are construct validity, internal validity, external validity, and reliability.

#### 3.6.1 Construct validity

Construct validity is critical for case study research (Yin 2003) and to achieve better validity, a multiple-case study has been conducted using interviews as well as internal and external secondary material. Interviews were conducted with respondents from several different units and levels within the organisations and to avoid bias, several respondents have been asked the same question in order to approach issues from different perspectives (Eisenhardt and Graebner 2007). A potential problem that can be manifested when conducting case studies is phenomena not considered acceptable to study or report for one reason or another but which nevertheless is of decisive importance for the research process. Such phenomena, which Gummesson (1985) terms taboos, have however not been witnessed, and I have therefore not been constrained by such aspects in my writing. The only information that I have been asked to remove from my cases is financial and market figures and competitive strategies, although my overall interpretation has been approved. A first draft of the case descriptions and a preliminary analysis from Stage 1 was sent for validation to the firm representatives in May 2005 in order to avoid errors and

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26 For the purpose of Paper 5, however, primary data from central service managers was regarded as sufficient in the ELS case.
misunderstandings. The complete cases (which were presented in my licentiate thesis) were sent to the firms in spring 2006 and I was then able to discuss the cases further and make corrections, thereby increasing the construct validity of the study (Yin 2003). Similarly, earlier versions of the case descriptions appended in this thesis were sent for validation to firm representatives during the spring of 2008.

3.6.2 Internal validity

I have been looking for patterns or deviations between the empirical evidence collected and theory, and I have also contrasted the tentative findings with additional empirical data. Such research design concurs with the tactics of pattern matching and finding rival explanations, which strengthen the internal validity of the research (Yin 2003). In order to achieve higher internal validity, multiple respondents have answered the same questions. Moreover, using the iterative process of a systematic combining meant that additional questions and topics could be added to the interview protocol, thus, the interview guides were not the same for every interview because they were partly altered and extended as new lines of thinking emerged during the research process. This must not be regarded as unsystematic behaviour but rather as what Eisenhardt (1989) terms 'controlled opportunism', whereby one takes advantage of new ideas in the data collection, thereby improving internal validity and construct validity (Matthyssens and Vandenbempt 2003).

3.6.3 External validity

The choice of case firms was a deliberate research design parameter to increase external validity and ensure some form of generalisation (cf. McDermott 1999), i.e. that the findings are applicable on industrial service functions in other firms as well, provided that the settings are similar. The cases were chosen for theoretical, not statistical reasons (cf. Gummesson 2000) and this view recognises the researcher’s profound understanding of the cases and the possible variety in depth between cases, for example the extent of the case studies and the levels of analysis. My view on case study research, theory development, and generalisation is similar to that of Normann (1976, pp. 73-74):

“If you have a good descriptive or analytic language by means of which you can really grasp the interaction between various parts of the system and the important characteristics of the system, the possibilities to generalise also from very few cases, or even one single case, may be reasonably good. Such a generalisation may be of a particular character; it might be possible to generalise a statement of the type “a system of type A and a system of type B together comprise a mechanism which tends to function in a particular way.” On the other hand one cannot make any generalisations about how common these types of systems and interaction patterns are. But the possibilities to generalise from one single case are founded in the comprehensiveness of the measurements which makes it possible to reach a
fundamental understanding of the structure, process and driving forces rather than a superficial establishment of correlation or cause-effect relationships. – One advantage with studies that make use of several cases – beside the possibility to make typologies – is that it is possible to identify different contextual or situational variables. In such studies it is also possible to test basic hypotheses about covariation between variables” (translation from Swedish).

Thus, case study research can be seen as useful for theory development (Eisenhardt and Graebner 2007) and I am of the opinion that it is possible to analytically generalise on the basis of a few, or even a single case, to similar cases and to theory.

3.6.4 Improving overall validity

In order to improve the validity of this thesis, I had the opportunity to ‘test’ my results by presenting these to people external to the firms with insight into the context/research area and receiving feedback on my work-in-progress (cf. Nordigården 2007).

- Writing a licentiate thesis and having the opportunity to discuss my material with readers such as the pre-seminar opponent (Dr Nicolette Lakemond) and the seminar opponent at my licentiate thesis presentation (Dr Lars Witell) and receive thoughtful comments.

- Writing papers related to the thesis’ research area (and based on the same case studies) for peer reviewed conferences was an opportunity to receive comments and discuss issues such as methodological choices, findings, and possible further research. Also the writing of and feedback on papers not directly related to this thesis were valuable for increasing my theoretical and methodological knowledge.

- It is important to ensure that the findings can be related to practical implications and to receive feedback from practitioners in the business context studied. As discussed earlier, the IASS and DInO projects offered several opportunities to discuss results with managers. I have also presented parts of my results for representatives from other manufacturing firms in other contexts and received some interesting comments.

3.6.5 Reliability

A case study protocol was used to increase reliability. All interviews were taped and transcribed, notes were taken during all meetings, and all of this data is filed. Due to the respondents being very well versed in the service function and the service market, it is believed that high reliability has been achieved. The transcribed interviews were sent to the respondents in order to receive comments and ensure that I had not misinterpreted anything critical. However, most respondent did not provide any feedback. Instead, I received most feedback from the respondents that participated in either of the two research projects (and I was also able to discuss preliminary findings with them, although the final interpretation was always mine).
4 Summaries of the papers

This chapter summarises the contents and main contributions of the five papers included in the thesis. The summary gives a starting point for the synthesis of the research findings in the next chapter.

4.1 Paper I: Service productivity gains through ICT applications

The purpose of the paper is to examine and discuss how information and communication technology (ICT) applications can increase industrial service productivity through existing and new services. In addition, some implications of new ICT applications for the service organisation are examined. The focus is therefore not on the technology as such, but rather on what ICT applications can enable in terms of enhanced industrial service offerings and better profitability.

The research is based on case studies conducted at the three capital equipment manufacturing firms, BT Industries, ELS, and ITT Flygt. Most of the primary data was gathered through interviews with central service managers and in various inter-firm discussion forums and workshops.

To a large extent, the service production process is an open system in which variations in quality occur not only because of endogenous factors but also due to the influence of customer participation and other exogenous factors (Larsson and Bowen 1989; Ojasalo 1999). In the production system for professional services, the customer is unequivocally part of the social system (Parsons 1956) and Mills and Morris (1986) view customers as 'partial' employees of the service provider. External service partners can even more so be considered as intertwined in the service system. Service production takes place through three different production modes; either partly or fully in interaction between provider (and/or service partner) and customer (i.e. service encounter) and/or partly or in isolation from one another.

According to Grönroos and Ojasalo (2004), service productivity can be defined in a simple way as the revenues from a given service divided by the costs of providing it, and it is a function of
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According to Grönroos and Ojasalo (2004), service productivity can be defined in a simple way as the revenues from a given service divided by the costs of providing it, and it is a function of
three elements; internal efficiency, external efficiency, and capacity efficiency. Whereas internal efficiency refers to the service provider’s and the customer’s inputs to the service production process, external efficiency is the service output, both in terms of output quantity and of how the quality of the service process and outcome is perceived by the customer. The third element, capacity efficiency, refers to management of demand and has to be included because it is (generally) not possible to inventory the finished service (Donnelly 1976; Rathmell 1966; Regan 1963). Demand and supply imbalances can vary notably between different types of services (cf. Lovelock 1983) and both low demand and excess demand reduce service productivity (Grönroos and Ojasalo 2004; Normann 2000). For example, if demand exceeds what currently can be managed, customer perceived quality will decrease, resulting in a negative effect on external efficiency and thereby reducing service productivity.

Firms can use ICT to capitalise the flexibility of service provision (Vargo and Lusch 2004b) and ICT applications can enable reduced costs and enhanced service quality simultaneously (Anderson, Fornell, and Rust 1997; Normann 2000). Building on Grönroos and Ojasalo’s (2004) service production framework in which service productivity is a function of internal, external, and capacity efficiency, the impact on service productivity by ICT applications and solutions is illustrated by five examples from the case firms.

The first example concerns a service technician certification programme launched at ELS in order to find out the knowledge profile of each individual service technician at service partners. The idea of the online certification programme is to assure that the quality of the service performed by external personnel is homogeneous. Further, the function of the programme is also to ensure that the customers’ operating personnel have the knowledge needed to handle the equipment correctly. This is an example of how ICT can be used to achieve a guaranteed minimum level of expertise among service technicians and it is primarily a means to improve external efficiency through increased customer perceived quality of the service outcome.

The second example is an installed base database, which provides information about machinery type, application, installation date, customer site, maintenance statistics, etc. It enables improved mapping of the installed base, thereby giving the provider better understanding of its customers’ operations and a better estimation of market potential. Information extracted from the database can be used to improve customer perceived quality by providing more accurate services; it can for example reduce the number of unnecessary journeys by service technicians that can occur due to wrong parts being sent or personnel travelling unnecessarily because of erroneous or obsolete customer data. This leads to increased external efficiency as well as better cost efficiency and capacity utilisation of service technicians.

The third example is a mobile workshop concept with service vehicles complementing (or replacing) stationary workshops, something that was developed at ITT Flygt because on some markets, the current service workshop infrastructure did not match actual demand fluctuations
and had limited coverage. Since 80% of the firm’s equipment can be served with a mobile
workshop, more customers can be served and due to this increase in output, revenues increase.
Furthermore, better utilisation of personnel and service infrastructure lead to increased capacity
efficiency.

The fourth example is BT Industries’ mobile business solution, where each service technician is
equipped with a personal digital assistant (PDA) that enables him to receive work reports and
access spare parts information (among other things). The main objectives for implementing the
solution was to reduce invoicing lead-time and administrative costs, and the effects surpassed
expectations; lead-time was cut from 1-4 weeks to 1-3 days and the number of customer centres
was reduced (for example in Sweden from six to two). This led to increased cash flow and
improved process quality and planning of service activities for the firm while customers benefited
firm faster response to service calls and reduced administration. The customer signs the
completed work orders instantly on the PDA’s display and can choose to receive the work
reports electronically. Hence, both service quality and availability have increased.

The final example is ELS’ management information system for laundries, that enables the remote
monitoring and optimisation of laundry flows. The system, which can be managed both by ELS
and by customers themselves, reduces the provider’s inputs of front-office personnel and has a
positive impact on the quality and quantity of the service process output.

The interrelationship between the three productivity dimensions means that although a new ICT-
based solution can make changes to one of the dimensions in particular, the other two are also
affected by the change. Increased costs can be assigned to investments in and maintenance of
ICT, while reduced costs can be assigned to personnel and faster service production time. An
important factor of success when new technology is introduced is technology maturity at the
company as well as among customers and partners (cf. Parasuraman 2000). In the cases studied,
ICT has not only led to an increased standardisation and automation of service production, but
also facilitated the externalisation and combination of knowledge. In line with Gadrey (2000), it is
shown that capacity, which is traditionally regarded as a constraint in service production, has
become less of a limitation due to new ICT.

The revised service productivity model (see Figure 4-1) also includes service partners and
considers the effects that ICT has on the three productivity elements. In addition to the original
framework by Grönroos and Ojasalo (2004), it is argued that all three production modes
contribute directly to output quantity albeit the process quality of services produced in isolation
from customer is not directly perceived by the customer, and therefore has less impact on total
customer perceived quality (hence the broken line from service production in isolation from
customer to output quality).
This paper is published in the International Journal of Knowledge Management Studies (2008), Vol. 2, No. 1, and an earlier version has been presented at the 3rd IT in Business Conference 2006 in Warsaw, Poland.

4.2 Paper II: Technology as a driver for changing customer-provider interfaces

The purpose of this paper is to explore how ICT is affecting and driving changes in service processes and customer interfaces among capital equipment manufacturers. Case studies have been conducted at the central and local service organisations of the two market-leading, international firms BT Industries and ITT Flygt. The theoretical basis of this study is Larsson and Bowen’s (1989) service process framework, which recognises that different services require different service processes. Thus, the intra-firm and inter-firm interdependence patterns including the role of the customer differ between organisational entities. The focus of the study is the relationships between the provider’s front-office and back-office entities and between provider and customer.

The first contingency in the framework concerns customer disposition to participate, which is defined by the extent to which the customer plays an active role in supplying inputs to the service production process (Larsson and Bowen 1989); service systems can differ significantly depending on the level of customer participation (Bitner et al. 1997). The second contingency concerns the diversity of customer demand, which includes both the uniqueness of the products/processes to
be serviced and the uniqueness of the desired outcome. Together, the two contingencies constitute a service process framework with four different interdependence patterns and where the level of input uncertainty, which constitutes the diagonal, relates to degree of customer involvement (see Figure 4-2). Another important issue is the dissonance between front office and back office, and their various degrees of coupling, and the main locus of interdependence in each cell is the most complex area of coordination.

![Figure 4-2. Changing interfaces in service production (Kowalkowski and Brehmer 2008 based on Larsson and Bowen 1989, p. 221).](image)

A close interaction and dialogue between the customer and the provider is required for reciprocal services such as customer training, fleet management, LCC analysis, and other problem-solving and process-orientated services. The co-creation of value plays a central role when developing these services with the cumulative knowledge and experience of both actors. Further, new reciprocal services generate specialized skills and competencies that can be codified and formalized so that they can be combined with other resources and offered to other customers. One example of this is BT Industries’ flexibility parameters in its rental plans (such as the length of the agreement, how to manage the residual value, etc.). Traditional after-sales services, such as repair and maintenance, tend to be associated with a service design where the customer’s request and specification precedes the provider’s service performance, i.e. sequential customized services. If, on the other hand, the provider offers the customers the technical infrastructure and other resources required for them to perform the service themselves, the services have a sequential standardised service design (e.g. online spare parts ordering, surveillance, and rather basic repair and maintenance work). Finally, remote monitoring and control services are examples of services which can be efficiently managed mainly through pooled service design.
When formalised, many new reciprocal services no longer require the same degree of interaction and dialogue. As routines are established and service processes become more standardised and repetitive in nature, service production is seen as co-production rather than co-creation. That is, no ‘new’ value is created (Ballantyne and Varey 2006). This distinction is represented by a diagonal intersecting the level of input uncertainty in Figure 5-2; value creation focuses on effectiveness/exploration, whereas value production implies a focus on efficiency/exploitation and involves lower input (and output) uncertainty.

Because of the effects ICT has on the provider-customer interfaces and, thus, the repercussions for the premises behind the service offering, it is relevant to discuss the implications of new ICT on the service production processes through Larsson and Bowen’s (1989) framework. New technology has enabled more activities to be performed without direct customer contact as well as enabled front-office personnel to substitute some of the activities previously conducted by back office. This has led to an increased role for service technicians in administrative tasks. Accordingly, Larsson and Bowen’s (1989) framework is extended to include also a sequential customised service design where the main locus of interdependence is reduced to front-office entity. The back-office entity still matters but i) back-office personnel play a less significant role in the production process, ii) some service support coordination processes are automated and/or eliminated, and iii) a decoupling takes place between the front and back offices. It is thus increasingly possible to replace both goods and tasks with a dematerialised integration of processes (cf. Normann 2001), something which has a direct effect on the customer interfaces and service design. Hence, as indicated by the arrows in Figure 4-2, ICT applications and systems enable new processes and a development from reciprocal to sequential and pooled service designs. Instead of being dependent on individual employees and personal interactions, information systems enable BT Industries and ITT Flygt to provide many services simply by reusing codified knowledge (cf. Hansen, Nohria, and Tierney 1999). Table 4-1 presents ICT-related changes in service production process interfaces.

<table>
<thead>
<tr>
<th>Arrow 1: Reciprocal to more sequential</th>
<th>Arrow 2: Sequential to reciprocal</th>
<th>Arrow 3: Sequential to pooled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changing from system–people design</td>
<td>Changing from people–system design (system–system design)</td>
<td>Changing from people–people design</td>
</tr>
<tr>
<td>Sequential standardized</td>
<td>Sequential customized</td>
<td>Sequential to a more international integration (back office)</td>
</tr>
<tr>
<td>High local responsiveness is critical (front office work can be supported by ICT support)</td>
<td>High local service is consistent (front office) is supported by ICT services based on codified knowledge</td>
<td>High local responsiveness is critical (front office work can be supported by ICT support)</td>
</tr>
<tr>
<td>Consistent local service is possible to develop into international integration that is based on standardized and global production regardless of where the order is placed</td>
<td>Technological systems enabling tools and systems engineering performance, new calculation models based on product and systems engineering packages, SLAs, automated and integrated services</td>
<td>Plant analysis, new pricing and calculations, new service features available in EASY and supervision services, new services based on ICT</td>
</tr>
<tr>
<td>ICT enables standardized and global service based on ICT</td>
<td>ICT enables pump monitoring through software updates</td>
<td>ICT enables not only new, information-based services, but also enables already existing services to be enabled in new ways</td>
</tr>
</tbody>
</table>

Table 4-1. ICT-related changes in service production process interfaces (Kowalkowski and Brehmer 2004).
Table 4-1. ICT-related changes in service production process interfaces (Kowalkowski and Brehmer 2008).

<table>
<thead>
<tr>
<th>Service process design</th>
<th>Delivery characteristics</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New reciprocal</strong> (people–people design)</td>
<td>High local responsiveness is critical (front office work can be supported by ICT support)</td>
<td>Plant analysis, new pricing models based on product performance, new calculation and systems engineering services based on ICT</td>
</tr>
<tr>
<td>Arrow 1: Changing from Reciprocal to more Sequential customized design (people–system design)</td>
<td>A combination of local responsiveness (front office) and standardization and international integration (back office)</td>
<td>ICT enables standardized report packages, SLAs, automated knowledge management (codified knowledge)</td>
</tr>
<tr>
<td>Arrow 2: Changing from Reciprocal to more Sequential standardized design (system–people design)</td>
<td>Consistent local service production regardless of people or subsidiary is reached through international services based on standardized processes</td>
<td>Technological systems enabling subscription to ICT applications and linkages to other processes and products (e.g. surveillance), web interface</td>
</tr>
<tr>
<td>Arrow 3: Changing from Sequential customized to a Pooled service design (system–system design)</td>
<td>International integration that is possible to develop into standardized and global integrated services</td>
<td>ICT enables pump monitoring and supervision services, new features available in EASY through software updates</td>
</tr>
</tbody>
</table>

To sum up, the study provides new insights into how technology enables new service processes and thereby, shows that services do not necessarily fit into pre-defined service process interfaces. Instead, this paper illustrates that a dynamic view of service production is required, as ICT enables not only new, information-based services, but also enables already existing services to be performed in new ways. Increasingly, several service processes and interfaces have to be managed simultaneously, something which may necessitate the development or acquisition of new capabilities. Since the division between services and goods is becoming more blurred in offerings (e.g. rental plans), front-office employees in the service organisation must become more proactive and integrate more fully with product sales employees and vice versa; in other words, the firm needs to develop its product-service capabilities. Another critical capability is to identify/sense how value for both the provider and the customer can be created through new ICT. Furthermore, the firm must be able to balance the interplay between automation and personal interactions and between efficiency and effectiveness, when producing/creating value. That implies having a reciprocal service design when needed and more standardised and decoupled interdependence patterns in other situations.

This paper will be published in Management Research News (2008), Vol. 31, No. 11, and an earlier version has been presented at the 10th QMOD Conference 2007 in Helsingborg, Sweden.
4.3 Paper III: Managing industrial service offerings: requirements on content and processes

The purpose is to describe different forms of service offerings required for industrial production systems and requirements related to the expansion and internationalisation of industrial services. It is of particular interest to discuss the impact of ICT on industrial services. The concept of industrial service offerings is viewed as a composite of three conceptually distinct factors: service scope (degree of bundling) (Stremersch, Wuysts, and Frambach 2001), service focus (level of customer integration) (cf. Oliva and Kallenberg 2003), and service process interfaces (front-office, back-office, and customer) (Larsson and Bowen 1989). A case study approach was chosen as the research strategy and in total, 49 interviews were conducted at the capital equipment manufacturing firms Electrolux Laundry Services, Husqvarna, ITT Water & Wastewater (ITT Flygt), Metso Minerals, Saab Aerotech, Toyota Material Handling Group, and Volvo Buses.

As services are becoming a more central part of many manufacturing firms’ value proposition, their service scope is extended through bundling. Bundled services consist of several subsets of unbundled service elements, which generally implies a modular internal service structure with standardised processes and interfaces. One problem related to bundling is that in many firms, several services are regarded as add-ons which can be given away in order to close a product deal, even at the expense of overall profitability (cf. Anderson and Narus 1995; Oliva and Kallenberg 2003). Other challenges relate to the manufacturing and R&D-orientated corporate culture, lack of top management commitment to service strategies, the sales organisation’s focus on equipment sales, and incentive systems and KPIs which disfavour of service operations.

When firms expand their service offering not only are product-orientated services such as repair and maintenance offered but also services with a focus on the product’s efficiency and effectiveness within the customer’s processes. Evidently, the more extensive the scope of the service offering and the more the focus is on the customer’s production process instead of solely on the installed base (i.e. product orientation), the more important it becomes to have relationship longevity. The majority of unbundled product-orientated services are of such character that the customer does not take an active role in these services and there is generally little incentive to invest in the relationship. In addition, the revenue model depends on the type of service, which means that pricing differs between offerings. With extensive undertakings like integrated solutions, revenue models are often fundamentally different from the models of product-orientated services. Bundled, process-orientated services have fixed or dynamic prices and are generally a result of a successful relationship involving less advanced agreements that have cumulatively become more extensive. Bundled offerings most likely contain both product- and process-orientated services, and can vary considerably in scope.

Depending on service scope and service focus (together referred to as service space), the service process interfaces (as discussed in Paper 2) will differ, and likewise the process interfaces can
industrial service offerings is viewed as a composite of three conceptually distinct factors. It is of particular interest to discuss the impact of ICT on industrial services. The concept of systems and requirements related to the expansion and internationalisation of industrial services. The purpose is to describe different forms of service offerings required for industrial production.

4.3

process interfaces (as discussed in Paper 2) will differ, and likewise the process interfaces can have cumulatively become more extensive. Bundled offerings most likely contain both product- and process-orientated services, and can vary considerably in scope. When firms expand their service offering not only are product-orientated services such as repair and maintenance offered but also services with a focus on the product's efficiency and effectiveness within the customer's processes. Evidently, the more extensive the scope of the service offering and the more the focus is on the customer's production process instead of solely on the installed base (i.e. product orientation), the more important it becomes to have integrated solutions, revenue models are often fundamentally different from the models of strategy and in total, 49 interviews were conducted at the capital equipment manufacturing firms.

As services are becoming a more central part of many manufacturing firms' value proposition, the content of the service offering and the customer relationship. Figure 5-3 illustrates the most common interfaces for different types of service offerings. Services in cells one and two generally require the ability to manage one particular process interface, as the services are unbundled. The market trend is towards more bundled service offerings (cells three and four), which involves the ability to manage several different service processes and interfaces. It is worth noticing that, due to reduced customer disposition to participate in the service production process, sequential standardised service design (i.e. the customer being the sole locus of interdependencies) is less common and thus not denoted in Figure 4-3.

By relating the service focus to the service scope, a typology that enabled the categorisation of service offering via a variety of mechanisms such as offering, pricing and relationship is presented. It implies that different operational processes and interfaces become critical depending on where in the service offering framework the service offering is positioned, i.e. depending on the content of the service offering and the customer relationship. Figure 5-3 illustrates the most common interfaces for different types of service offerings. Services in cells one and two generally require the ability to manage one particular process interface, as the services are unbundled. The market trend is towards more bundled service offerings (cells three and four), which involves the ability to manage several different service processes and interfaces. It is worth noticing that, due to reduced customer disposition to participate in the service production process, sequential standardised service design (i.e. the customer being the sole locus of interdependencies) is less common and thus not denoted in Figure 4-3.
Due to the internationalisation of industrial services, the geographical scope of the services offered is becoming another important aspect to consider as the service scope covers several geographical markets. When the enhancement of service offerings is regarded as a fundamental component of the strategy of the firm, manufacturers are more likely to operate locally through wholly-owned service organisations (cf. Morschett 2006). Generally, it becomes more difficult to deploy successful service strategies when operating through independent dealers that have the operational relationships with the customers. For example, offerings have to create value for the dealers too, and often, dealers do not have access to the manufacturer’s business systems, are less knowledgeable about the offerings, and are less loyal to the manufacturer. These problems also face firms that operate through authorised and/or unauthorised service partners.

Traditionally, the case firms’ subsidiaries have had a high degree of independence, which among other things, has resulted in local service development in isolation and incompatible local business systems. The endeavour to increase the degree of central control is clearly noticeable in the cases and more resources are being allocated to ICT development centrally in order to achieve a standardisation of service processes and practices as well as compatibility between local systems. Few subsidiaries have the financial resources, time, and expertise required to initiate large-scale ICT projects themselves and consequently, not only central managers but also local managers at many firms, are positive to increased central-local integration as long as it facilitates the local organisation in allocating resources more efficiently and effectively to its core operations. Of the firms studied, the most successful ones with regard to the internationalisation of services, are those having a transnational organisation (cf. Leong and Tan 1993). That is to say, an organisational structure in which local market differences and the importance of flexibility
among its subsidiaries are recognised, while simultaneously the subsidiaries are able to find synergies from increased internal efficiency and better central resource allocation.

It is not only differences in national regulations, fiscal legislation, and country-specific factors for pricing that distinguish international services from local or national ones. In international agreements, the interfaces become even more complex as coordination is required between back office and several front-office entities (cf. Rehme 2001), i.e. that the local service organisations operating in each country coordinates their activities not only with the central service organisation but also partly with the other local organisational entities on the markets covered by the centrally signed service agreement. With central agreements, both national and international, there is a risk on the local level that the customer chooses not to follow the agreement. Thus, in order to manage the agreement successfully, the customer must also have a rationale for signing an agreement for a major international undertaking instead of having several customised, country or site specific agreements and must therefore too have a certain level of central-local integration and central control of the agreement. Among the international agreements signed, most services are unbundled and product-orientated, such as general framework agreements. TMHG is the only case company to have signed major international, bundled contracts. An increasing number of TMHG’s customers sign preferred supplier agreements that include long-term rental plans. Generally, international bundled, process-orientated services seem to be extremely complicated to manage and coordinate, compared to local ones. When determining what services to offer, the firm also has to decide how these should be delivered to achieve the expected value. This requires both reactive and proactive service development and deployment, and a need for increased integration between headquarters and subsidiaries, as well as more consistent local service processes. However, business development can not take place on a central level only.

To conclude, the lack of resources traditionally allocated to the service organisation compared to the product organisation, suggests that there is major improvement potential and that financial gains are possible if more attention is given to industrial services. By introducing a framework for different forms of industrial service offerings, consisting of service focus and service scope and linked to service process interfaces (see Figure 4-3), this paper develops a typology that fills a gap in existing literature (cf. Kumar and Kumar, 2004). The internationalisation aspect of industrial services has not been emphasised in previous service typologies (e.g. Mathieu, 2001; Oliva and Kallenberg, 2003; Penttinen and Palmer, 2007), which is something that further adds to the contribution of the research presented in Paper 3.

This paper will be published in the special issue on “Developments in Industrial B2B Services” in the International Journal of Services Technology and Management.
4.4 Paper IV: Managing industrial service offerings in global business markets

The purpose of this paper is to analyse how industrial service offerings are developed and managed in multinational manufacturing firms. In particular, the roles of central and local service organizations are investigated. Case studies have been conducted at the central and local service organisations of the two market-leading, multinational firms ITT W&WW and TMHG. The starting point is that few studies of the management of industrial service offerings investigate the relationships and interdependencies between local and central organisational entities. Existing research into the internationalisation of services concerns either the market entry and expansion of service businesses (most often B2C firms) or professional service firms (e.g. Blomstermo, Sharma, and Sallis 2006; Doherty 2007; Ekeledo and Sivakumar 1998; Freeman, Cray, and Sandwell 2007; Lovelock and Yip 1996; Segal-Horn and Dean 2007; Watters 1995).

Because industrial services span a wide range of offerings, the supposition was that, depending on the type of service offering, the premises and requirements on local and central systems and processes would differ notably and therefore the industrial service offering was chosen as the research object. Two services from each quadrant in Figure 4-3 were chosen, totalling eight. The services were repair, operations training, retrofit, process optimisation, safety inspection SLA, full service SLA, short-term rental, and long-term rental.

The local and central service processes and service system need to facilitate the service offering and, thus, differ from each other depending on service (cf. Edvardsson 1997; Edvardsson and Olsson 1996). Consequently, the requirements on the local and central service organisations and on the interdependence between the entities differ (see Table 4-2).
The purpose of this paper is to analyse how industrial service offerings are developed and managed in multinational manufacturing firms. In particular, the roles of central and local service organizations are investigated. Case studies have been conducted at the central and local service organizations of the two market-leading, multinational firms ITT W&WW and TMHG. The starting point is that few studies of the management of industrial service offerings investigate the relationships and interdependencies between local and central organizational entities. Existing research into the internationalisation of services concerns either the market entry and expansion of service businesses (most often B2C firms) or professional service firms (e.g., Blomstermo, Sharma, and Sallis 2006; Doherty 2007; Ekel edo and Sivakumar 1998; Freeman, Cray, and Sandwell 2007; Lovelock and Yip 1996; Segal-Horn and Dean 2007; Watters 1995).

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<table>
<thead>
<tr>
<th>Service offering</th>
<th>Role of local organisations</th>
<th>Role of central organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repair</td>
<td>Customer interaction and service performer (unless externalised)</td>
<td>Developer of concepts, ICT applications, and product information</td>
</tr>
<tr>
<td>Operations training</td>
<td>Customer interaction and service performer (unless externalised)</td>
<td>Developer of concepts and product information</td>
</tr>
<tr>
<td>Retrofit</td>
<td>Lead generator and service performer</td>
<td>Specialist developer, resource pool (and service performer)</td>
</tr>
<tr>
<td>Process optimisation</td>
<td>Lead generator* and service performer (local application specialists)</td>
<td>Specialist developer, resource pool (and service performer), suggesting guide-line price models</td>
</tr>
<tr>
<td>Safety inspection SLA</td>
<td>Customer interaction and service performer</td>
<td>Developer of concepts, driving standardisation (routines and processes, guidelines and terms of condition, ICT)</td>
</tr>
<tr>
<td>High-end SLA</td>
<td>Customer interaction, lead generator* and service performer, locally developed</td>
<td>Developer of concepts, driving standardisation (routines and processes, guidelines and terms of condition, ICT), general frameworks, supporting weaker subsidiaries</td>
</tr>
<tr>
<td>Short-term rental</td>
<td>Customer interaction, lead generator* and service performer</td>
<td>Developer of concepts, driving standardisation (routines and processes, guidelines and terms of condition, ICT), general frameworks, supporting weaker subsidiaries</td>
</tr>
<tr>
<td>Long-term rental</td>
<td>Customer interaction, lead generator* and service performer</td>
<td>Developer of concepts, driving standardisation (routines and processes, guidelines and terms of condition, ICT), general frameworks, financial risk/ownership, supporting weaker subsidiaries</td>
</tr>
</tbody>
</table>

*Depending on subsidiary; the role of lead generator does not apply to ‘receiver country’ subsidiaries. However, even in these local organisations, exploration takes place (although to a notably less extent).

Based on the patterns that emerged during the analysis, four lessons which relate to the global management of an industrial service offering portfolio were extracted:

1. An in-house local service organization is preferable when competing through industrial service offerings;
2. A transnational structure is superior when competing through industrial service offerings;
3. The balance between exploitation and exploration is dependent on the service offering portfolio; and
4. Reciprocity between product and service organisations is needed for extensive service offerings.

For basic services in particular, simultaneously having an in-house service organisation and working through local service partners can prove advantageous. If operating through service
partners, the firm needs to create incentives for its service partners to work more closely and in a more interconnected manner. Further, it involves contractual agreements where profit-sharing and risk-sharing are specified. Thus, the service offering becomes a reciprocal, three-way value proposition between supplier, customer, and service partner. However, having an in-house service organisation and an infrastructure to respond to local service demands is needed if the firm is to compete through more extensive and/or advanced offerings. This is in line with Morschett’s (2006) findings, that the seeking of global integration advantages means that firms choose to internalise their service operations.

Furthermore, the study suggests that globally linked and locally leveraged processes27 are critical for the global service operations. Whereas Bartlett and Ghoshal (2000) highlight the importance of linking local management to central decision-making by having managers from the central organisation working for the local ones, these findings suggest that the opposite can be even more effective; both ITT W&WW and TMHG have assigned skilled local managers and specialists to centrally initiated projects and positions in the central organisation. This is one example of how central-local linkages can be established without being perceived as a central top-down initiative. The ability to achieve a high level of both exploitation and exploration is a source of competitive advantage (cf. Liu 2006). When the service offering portfolio is broad, both aspects particularly are vital. However, depending on the firm’s service offering portfolio, different emphasis needs to be given to exploitation and exploration. Having a broad portfolio of industrial service offerings implies having a very wide range of skill sets. In general, with process-oriented and/or bundled offerings, the more important an in-house local service organization, a transnational structure to synergize from spatially dispersed knowledge, and reciprocity between product and service organizations becomes. Furthermore, the weighting between exploitation and exploration changes as exploration becomes more central for the success of the service.

Both formal (standardized service elements and processes, uniform ICT systems, etc.) and informal integrative mechanisms (socialisation) are critical for successful management of global service offerings. For extensive offerings in particular, the central organization sets some boundaries in what constitutes acceptable service content such as mandatory SLA elements, followed by local choice to explore within these boundaries (cf. Verbeke and Kenworthy 2008). For SLAs this can be standardised SLA levels and core service elements that must be included and offered. For rental plans it can be centrally decided-upon parameters in the contracts and financial guidelines. Uniform business systems also set boundaries for service processes and practices.

Due to the interactive nature of most service production compared to manufacturing and distribution, socialisation becomes perhaps even more important in the context of industrial services, enhanced relationships, and reduced costs.

27 Globally linked processes means pooling knowledge of different central and local entities to jointly create and manage an activity whereas locally leveraged processes are ensuring that local knowledge is available also to other entities worldwide (Bartlett and Ghoshal 2000).
service offerings than it is in product business. It is seen that consistent with research on multinational firms, informal relationships can overcome the negative effect of spatially dispersed entities (e.g. Hansen and Løvås 2004; Kim, Park, and Prescott 2003; Tsai 2002), and integration mechanisms like the establishment of service forums and joint projects have facilitated central-local integration and reciprocity.

This paper is under review.

4.5 Paper V: How world-leading manufacturers can achieve differentiation through e-business: new services, enhanced relationships, and reduced costs

The purpose of this paper is to address how market-leading industry incumbents can use e-business services to create value through differentiation and thereby increase their competitive advantage. The starting point is that today, it is industry incumbents, as opposed to start-up firms, that are driving e-business development and are using these technologies, now often incorporated into the concept of ICT, to increase competitiveness. One aspect of particular interest is how e-business can increase competitive advantage by the expansion of industrial offering through services. Because e-business has become commoditised, it is not a differentiator by itself (Carr 2003), but differentiation lies rather in the new practices it enables (Brown and Hagel 2003). This research is based on qualitative case studies conducted at four Swedish-based capital goods manufacturing firms; BT Industries/TMHG, Electrolux Laundry Systems, Sandvik Coromant (a world-leading manufacturer of cutting tools and inserts for the metalworking industry), and Volvo Buses (the world’s second largest bus manufacturer).

Treacy and Wiersema (1993) argue that there are three competitive advantages that firms can have in order to achieve market leadership; operational excellence, product leadership, and customer intimacy. Of these, both product leadership and customer intimacy hold substantial potential for e-business technologies as vehicles for new information-based services, rooted in knowledge residing within the firm or its value network. Close to the competitive advantages suggested by Treacy and Wiersema, Porter (1985) discusses three distinct, generic strategies that firms can pursue and of which differentiation is one, and the others cost leadership and focus. However, Hax and Wilde (1999) consider Porter’s strategic framework to be insufficient when it comes to describing all the possible ways in which firms can compete. Instead, they propose three strategic options; best product (representing a continuum from low cost to differentiation), customer solutions, and system lock-in (e.g. by proprietary standards). Thus, the best product option comprises Treacy and Wiersema’s operational excellence and product leadership options, whereas customer solutions bear a close resemblance to customer intimacy, with its emphasis on LCC and value-in-use. Hence, it can be seen that differentiation possibilities consist not only in enhanced product attributes. To synopsise, four main competitive advantages can be derived, of which one, system lock-in, has little bearing on the service offerings of the type of manufacturing
firms studied, if this is related to e-business. For example, few dominant design proprietary standards for these types of industrial service offerings exist. Although offering leadership is often implicitly perceived as goods-centred, it is argued that it can refer to parts of or the firm’s total offering regardless of its share of goods and services elements. Even if cost-efficient operations are vital, for the firms studied, as they are market leading, competing through low cost is not a strategic option. Thus, the main potential for differentiation is found in offering leadership and customer intimacy.

In the case firms, a growing part of business development can be attributed to the development and inclusion of e-business and information-based services into their core offerings. Figure 4-4 illustrates the effects of e-business on differentiation within the studied firms; the upper part of the figure shows the more general aspects and the lower part some specific examples.
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<table>
<thead>
<tr>
<th>Volvo</th>
<th>Process automation and elimination</th>
<th>New services (unbundled), Better quality and availability, Lower customer costs</th>
<th>Customization of offerings, Personlization of information, Information gathering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandvik</td>
<td>Process automation and elimination</td>
<td>New services (bundled and unbundled), Better quality and availability, Lower customer costs</td>
<td>Customization of offerings, Personlization of information, Information gathering</td>
</tr>
<tr>
<td>BT</td>
<td>Process automation and elimination</td>
<td>Extension/refining of services, Better quality and availability, Lower customer costs</td>
<td>Information gathering, Creation of new offerings (indirect)</td>
</tr>
<tr>
<td>ELS</td>
<td>Process automation and elimination</td>
<td>New services (bundled), Better quality and availability, Lower customer costs</td>
<td>Customization of offerings, Personlization of information, Information gathering</td>
</tr>
</tbody>
</table>

1) Reduced costs  2) New services  3) Enhanced relationships

<table>
<thead>
<tr>
<th>Volvo</th>
<th>Direct billing. Information management efficiencies.</th>
<th>Matching buyers and sellers of used vehicles. Fleet management systems. Online ordering of parts.</th>
<th>Online access to specific vehicle specifications. Integration with customer system.s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandvik</td>
<td>Transaction efficient handling of small transactions</td>
<td>Inventory control at customer site. Sales management tools.</td>
<td>Customized catalogues for customer needs. Online personalisation (of eg ordering info and history) according to customer users (individuals)</td>
</tr>
</tbody>
</table>

Figure 4-4. The effects of e-business on differentiation (Kindström and Kowalkowski 2007, p. 504).

E-business, for instance, has a major effect on the offering leadership dimension, which most likely can be ascribed to the firms’ traditional modus operandi of highlighting technical features of tangible offerings; i.e., services are created in a way that resembles their traditional NPD processes. That is, e-business is used to develop new services and processes from a rather technical, inside-out focus of what it is possible to create rather than based primarily on market sensing and needs in the marketplace. In the case of BT Industries, this can be attributed to a
refinement of their offerings through sales management tools, report packages, and more accurate information through wireless information access, thereby resulting in better quality and availability and lower customer costs. Examples of new services from ELS are the laundry information management system, remote monitoring services, and the service technician certification programme for improved service quality, better availability and lower customer costs. Many of these services can be offered either bundled with existing services and/or goods, or provided as stand-alone unbundled services both to the installed bases of existing customers and to new customers.

Other services, which include activities linked to establishing closer customer relationships, principally relate to the customer intimacy dimension. Not only does this mean that new services are created, but also that specific customer needs and processes are addressed when offerings that both relieve the customer (i.e. reduce costs) and enable the customer (i.e. increase business performance/capacity) are customised (cf. Anderson, Kumar, and Narus 2007; Ravald and Grönroos 1996). BT Industries, for example, offers customised fleet management solutions and uses information extracted from trucks, CRM tools, and other systems to enhance the customer intimacy dimension. For ELS, integration with customer systems, process optimisation, and online personalisation are means to build closer customer relationships. Thus, the customer intimacy dimension includes closer operational linkages, enhanced information sharing, and, as is particularly evident in the BT Industries case, more extensive legal and contractual obligations (cf. Penttinen and Palmer 2007). This enables decreased costs for managing existing relationships and by bundling new information-based services to the offering, also expands the customer interface.

In addition to creating new value for customers and achieving increased switching costs and lock-in effects, e-business is also used internally to achieve cost efficiency. Uniform mobile business systems and transaction-efficient service ordering enables process automation and elimination and it also enables firms to profitably approach previously unprofitable customer segments, such as small customers with low transaction value versus cost ratio. More efficient administrative processes also affect customers, since automated order processing can reduce costs for customers as well and also increase the availability and simplicity of the interaction with the provider.

The cases shed light upon how e-business and services are used by market-leading firms to stay ahead of competitors by moving the competitive frontier further, into areas not open to offerings that solely compete on product features. Hence, this competitive frontier is out of reach for low-cost competitors, who lack the necessary capabilities and resources, such as knowledge management competencies and well-functioning distribution and service networks. Therefore, moving away from the traditional, product-centric competitive space, in which value is largely created by technological advances related to product development, is a way to avoid offering commoditisation and to increase both internal and external efficiency. In the new competitive space new services, information, and relationships (e.g. knowledge of customers and their
processes) become essential (cf. Vargo and Lusch 2004a). Thus, e-business can be used to facilitate differentiation strategies and extend the business model of the firm.

This paper has been presented at and published in the proceedings of the 18th Information Resources Management Association (IRMA) International Conference 2007, Vancouver, Canada.
Discussion of research findings

The following chapter summarises and discusses the research findings from the empirical studies, the appended papers and the licentiate thesis, and presents a synthesising analysis of the results with respect to the thesis' research questions and overall purpose.

5.1 The industrial service function

As discussed in the literature on the transition from goods to services (e.g. Gebauer, Fleisch, and Friedli 2005; Oliva and Kallenberg 2003; Penttinen and Palmer 2007), new forms of industrial offerings are associated with new organisational requirements. Achieving competitive advantage through industrial services derives to a high degree from the firm's ability to create internal alignment among critical organisational elements in order to fit market needs (Neu and Brown 2008). Thus, depending on the firm's service offering portfolio as well as on the type of customers and their disposition to participate in the service production process and inclination to invest in the customer-provider relationship, the organisational structure will differ. In order to strategically manage industrial offerings, the firm needs to employ a holistic approach and look beyond the service organisation. As suggested in Chapter 2.2, one way to approach this issue is to use the service function metaphor.

Based on the empirical findings from the cases, a generic representation of the industrial service function is given. This function does not only include the service organisation and other internal entities, but takes also into account the role of the customer and the possible roles of various third-party actors in the business network that the firm has relationships with and that in various ways, influence the service offering (see Figure 5-1). Despite them being influences, law and legislative bodies and other external (macro) actors are not included in the scope of the service function. Also, because this is not part of the thesis' unit of analysis, investors and other external stakeholders are not taken into account.
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In analogy with Gummesson’s (1995b) marketing function, the shaded areas in Figure 5-1 represent the service function, i.e. parts of the firm other than the service organisation as well as external actors that are regarded as part-time service functions. The part-time service functions of the firm are the following:

- **Senior management** formulates market strategies and targets, including service strategies and whether or not to reposition the firm on the marketplace through service offerings. This also includes market communication like the CEO’s statement towards employees or stakeholders. For example, ITT Flygt’s president has articulated the transition into services in the corporate news magazine by stating that customers need total solutions and that both customers and suppliers stand to benefit from ‘servitisation’ (Birgersson 2006). In addition, senior management is involved in the negotiations of major (service) contracts.

28 The shadings are not to be seen as quantified proportions but rather as rough estimations whose purpose is illustrative and, consequently, the shaded proportions between entities differ between firms and over time.
• **Sales** refer to the organisational units which are assigned to sell the firm’s traditional offerings, i.e. capital equipment (for example, larger service organisations tend to have their own dedicated service sales force). This is to be seen as an integral part of the service function and apart from the service organisation, it is generally the most critical customer-provider interface for the service function. If the sales force have a traditional product-centric approach they are likely to promote equipment sales at the expense of services, i.e. giving away services in order to land a product deal. On the other hand, if the sales force has been trained and empowered to also sell services actively, they may also offer SLAs and other services, which have positive effects on the service organisation and the overall service function. On many markets where firms successfully sell services, the sales and service organisation work closely together, ideally in a symbiotic relationship, both on an operational and a managerial level.

• **Key Account Management** (KAM) can have a role similar to Sales, although on a more extensive level; a more systematic planning, offering development, and customer relationship management will lead to new business agreements (e.g. Homburg, Workman, and Jensen 2002; Rehme 2001). Furthermore, it includes managing relationships with major national or international customers and, thus, requires increased coordination. These large agreements, as in the TMHG case, may include not only equipment but also services. For Key Accounts which include services, the interface between KAM and the service organisation becomes critical for the customer relationship.

• **Rental** directly influences the customer relationship, and because rental is a service, rental sales are regarded as a subset of service sales. If rental sales figures are very modest, as are ITT Flygt’s sales on many markets, the rental business of these sales companies may consist of salesmen who only work part time with rental. However, due to its specific characteristics and requirements, on an organisational level rental is generally separated from the service and sales organisations. Nonetheless, many rental sales activities may be performed by the sales organisation (particularly if rental is a nascent business) and the service is usually done by service technicians belonging to the service organisation (although there can be specific technicians conducting only rental-related service, a strategy TMHG carries out on some markets).

• **Finance** can have a decisive influence on a business deal, including the case of services. Particularly in the case of rental plans and other extensive services which are often associated with high financial risk compared to traditional equipment and services sales, financial guidelines and directives, terms of payment, etc. are dictating key elements of the offering. However, as stated in Chapter 1.6, financing is not regarded as an industrial

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29 As for rental sales, for example, the sales organisation may have the most important role of the service function. This is because the salesman can provide the customer with the option of either buying new equipment (i.e. ownership of goods) or a rental plan (i.e. a service).
service. It has a supportive role for rental, KAM and other primary activities, and examining the role of the finance department is not regarded as central for the analysis. Thus, this part-time function has not been explicitly studied.

- **Engineering/consulting** can be one organisational unit or several depending on the firm. Often, these units have a focal role in service provision since they offer industrial services to the firm’s customers. However, these services differ from (and complement) the traditional after-sales services provided by the service organisation as they require other specialist competences (e.g. process technical expertise) and focus on the customer’s processes rather than on the installed base per se. Process optimisation, lifecycle cost calculations and similar services can be a necessity if the firm is to enhance its service offering and compete on knowledge of customer processes. For example, ITT Flygt can offer specialist engineering services that very few other firms can compete with. This is seen as a competitive advantage for repositioning the firm’s offerings and developing the customer relationships. For bundled process-orientated offerings where these competences are needed, it becomes vital to manage the coordination and cooperation with the service organisation and how to share knowledge across organisational boundaries.

- **Research & Development/product development** mainly influences manufacturing and other parts of the traditional product organisation. However, feedback loops from service personnel are important in order to design equipment that is not only easy to assemble in the manufacturing plant but also easy to replace in the field. Particularly for more extensive services such as rental and performance contracts, issues like predictability of maintenance and lifecycle costs are essential, and this is something which calls for intra-firm collaboration between the service organisation and the R&D and/or product development organisations. Furthermore, as services are increasingly information-based (see Papers 1 and 5), the technology being bundled into the equipment has to support ICT systems and applications used for service provision and vice versa. Since the organisational dividing line between the service organisation and the technical department(s) is often relatively distinct (cf. ITT Flygt), it can be difficult for product development to understand the needs of the service organisation and thus, to take the requirements into account in the NPD processes.

- **Manufacturing** has an influence on the customer relationship through capital equipment and has an indirect influence on the service function. For example, the use of cheaper components can lower the product price but if the result is lower quality equipment, it will lead to more frequent repair and maintenance. In a short-term perspective, provided that the firm’s revenue models are based on traditional after-sales services (i.e. that the customer pays for service hours and spare parts), this can have a positive effect on service
sales and utilisation of service personnel. In the longer term, however, it can lead to deteriorated customer relationships and also obstruct the firm from having high margins on more extensive offerings (with other forms of revenue models). Furthermore, on a strategic level firms have to decide whether new goods and service processes should be linked through bundling or not (cf. Johansson and Olhager 2006).

Among the external actors, the customers obviously have the central role; as main participants in the service co-production process they are included in the service function. Since the focus of this thesis is on the service function of the provider, the customer is generally reduced to one entity, as in Figure 5-1. Although the situation differs between firms and markets, third-party service providers have an evident role in a generic representation of the service function. For example, ITT Flygt relies on external service partners on minor (e.g. Sweden) or major (e.g. Germany) parts of local markets. External service providers can also be firms other than authorised and unauthorised service partners, i.e. direct competitors. Particularly evident in the ITT Flygt case, is the role that other actors in the business network have on the service offering. For ITT Flygt, consultants and contractors often have a significant influence on specifications and inquiries, and, thus, these network relationships must be managed in accordance with the firm’s market and service strategies.

### 5.1.1 The different roles of service function entities

Despite the role of part-time service functions for service management, for many services only one or a few organisational entities of the service function are the main locus of interdependencies. In line with the discussion in Papers 2 and 4, depending on type of service, different interdependencies and, thus, different organisational arrangements are required. As seen both in the case descriptions and in the appended papers, industrial services (as covered by the definition in Chapter 1.6 in this thesis) can be offered either unbundled or bundled in packages with other services and/or capital goods. Although the situation differs between firms, an attempt is made to classify the interrelationships between industrial services and organisational arrangements for some distinct types of services (many of the unbundled services are likely to require similar, if not identical, organisational arrangements).

Figure 5-2 shows actors involved in MRO services (i.e. maintenance, repair, and overhaul) or basic service level agreements (SLAs) and, obviously, the situation differs depending on whether MRO is conducted by a) the firm’s service organisation or by b) an authorised service partner or other third-party provider. The broken line between the service and customer entities in example b) means that there is no direct interaction between the two actors during the service production process. There are several critical operational and strategic aspects to consider when offering MRO services and basic SLAs. These include how to predict future demand and manage demand fluctuations, how to develop/implement ICT applications and systems, the design of possible incentive systems, and how to gain better understanding of customer needs. It can also be stated
that having dedicated service salesmen within the service organisation facilitates service sales, particularly more extensive ones. The many smaller customers tend to buy rather basic services (and spare parts) and they are often more profitable in terms of margins than are major agreements and customers with professional buying centres. Therefore, it is vital to manage these relationships efficiently and at the same time strengthen the relationships and act more proactively.

Figure 5-2. Examples of organisational arrangements for MRO services.

Whether or not to operate through third-party providers depends partly on the firm’s ability to provide incentives for the third-party provider to sell its services and spare parts. It also depends on the service volumes; in the ITT Flygt case, for example, low and/or fluctuating volumes favour externalised service provision but this also involves the risk of cementing low and unpredictable service volumes if the partner relationships are not successfully managed. An advantage with in-house operations, as expressed by one central manager, is “whole-hand pointing”; i.e. increased control (despite the fact that many subsidiaries have (had) a high degree of independence).

With more extensive SLAs, the customer interfaces increase (see also Papers 2 and 3) and it becomes central to emphasise other values, such as ‘peace of mind’ rather than only specifying frequency of visits, hourly costs, and spare parts prices. As SLAs become more extensive and process-orientated, the pricing tends to move from variable to a fixed price per time period. In order to offer these services, the structures suggested in Figure 5-2 are most likely not sufficient, because additional competences, which do not reside in the service organisation, are required. Thus, sales, KAM, engineering/consulting, and other part-time service functions will have a more prominent role in the organisational arrangement for bundled process-orientated offerings such as ITT Flygt’s customised Platinum SLAs and TMHG’s long-term rental plans.

Rental services can be organised very differently depending on factors such as type of equipment rented, size of agreement, and whether any additional services are bundled to it. In Figure 5-3, the first example illustrates a situation like the one in ITT Flygt’s Spanish subsidiary where the service operations are performed by local service partners. However, ITT Flygt manages the overall
rental relationship and the customer buys the service from ITT Flygt. As in Figure 5-2 (b), there is no direct interaction between the two actors during the service production process, hence the broken line in Figure 5-3 (a). The other example is a common arrangement for a rental plan at TMHG once this has been handed over to the key account manager. In both cases, finance is a critical back-office function, if not during the execution then at least during the negotiation and commitment phases (cf. the phases in Ring and van de Ven's (1994) IOR framework). Further, the more extensive the agreement, the more important becomes the establishment of legal bonds. Other part-time service functions which are critical (particularly in the long term) are R&D/product development and manufacturing, because decisions made during product development and manufacturing, such as the serviceability of the equipment and the quality of components, may constrain or permit certain service activities. Engineering/consulting services can also play a critical role in rental services, particularly when designing/customising the offering. Thus, the interconnectedness between the traditional product and service organisations ought to be managed from a strategic point of view.

Figure 5-3. Examples of organisational arrangements for rental services.

In the case of TMHG, an increasing number of international agreements now also include service. Without making any distinction between local and central entities, such a KAM agreements can be depicted in a somewhat simplified manner by Figure 5-4. For international agreements, not only the local, but also the central/regional KAM organisation will be involved and will assign a central key account manager responsible for the specific deal (cf. Rehme 2001). Correspondingly, a central purchasing manager is likely to be the top customer representative. Although decisions taken by senior management, directly or indirectly, affect other forms of service operations, senior management are more inclined to take an active participation in international KAM agreements due to their extent and importance. As in the rental plans in
meetings with other full-time and part-time service functions also (mainly service and sales).

KAM that will manage the customer relationship, although the customer will have regular
are generally involved. After the implementation phase this responsibility is handed over to the
instance, when (re-)selling a rental plan, representatives from the service and sales organisations
specialists). In the customer relationship with major rental customers in the UK for TMHG,
later serviced by the local service organisation (together with local monitoring and control
vertical, which in the case of ITT Flygt and TMHG, implies increased central-local integration.
function is extended with new organisational entities and roles, both horizontally and
in the central agreement. According to many respondents, lack of commitment from local management to the customer is
and the customer locally have to work according to the stipulations in the central agreement. According to many respondents, lack of commitment from local management to the customer is a root cause of unsatisfactory performance in the local management of central agreements (cf. Brax 2005).

Nevertheless, depending on phase, the service development and production processes involve
different local and/or central organisational entities (both full time and part-time service functions). For example, during the development of an ICT-based service, central service mangers and central/local engineering entities (such as monitoring and control), may be the ones primarily involved. During the take-to-market and sales processes, it is mostly the local sales and/or service organisations that are involved (after initial support, training, and marketing material from the central marketing organisation), and after the offering is sold, it is executed and later serviced by the local service organisation (together with local monitoring and control specialists). In the customer relationship with major rental customers in the UK for TMHG,
different parts of the service function are involved in different phases of the process. For instance, when (re-)selling a rental plan, representatives from the service and sales organisations are generally involved. After the implementation phase this responsibility is handed over to the KAM that will manage the customer relationship, although the customer will have regular meetings with other full-time and part-time service functions also (mainly service and sales).

5.2 Interrelationships between service offering and service function

The interdependencies between the entities of the service function not only differ between firms, but they also differ in importance depending on the firm’s service offering portfolio. Thus, the interdependencies between the service function and the service offering need to be understood.
As a value proposition, the service offering is a link between the internal and external environment of the firm (Normann 2001), which implies that value is co-produced (Ramírez 1999) and determined by the customer (Vargo and Lusch 2004a). This also has implications for how to organise for the service offering:

“Status, power and authority are allocated based on potential value for customers. In traditional organizations, authority is hierarchical and often based on functional specialization. Service logic suggests that status is best granted to those who know what customers value, and how to orchestrate organizational resources to create it” in order to promote customer perception of seamless service (Kingman-Brundage, George, and Bowen 1995, p. 26).

In particular in the case of major service development projects for bundled process-orientated offerings, the adaptation of a multiple and flexible structure is seen as advantageous. This form of ‘contingent hierarchy’ encourages reciprocity among service function entities and is likely to lead to better overall responsiveness to customer demand (Tuli, Kohli, and Bharadwaj 2007). In some situations, a high degree of local responsiveness is decisive, whereas in other cases efficient central processes may play a more prominent role.

If a firm that offers traditional after-sales services (e.g. MRO) decides to offer technical consulting, it means that specialist competences, if not held in-house already, have to be obtained either through recruitments, acquisition, or collaboration with a third party. Moreover, if a firm takes a step towards offering rental plans as a complement to product-orientated SLAs, as in the TMHG case, it has to manage dual revenue models, i.e. both the traditional one and one where the customer pays a fixed cost per time period, regardless of any fluctuations in the provider’s service activity costs. This is something which can create ambivalence internally if it is not managed through separate rental personnel (cf. with the ambivalence of having a traditional sales force also designated to sell service agreements). Furthermore, the competences required for managing rental agreements and the risks associated with new types of financial agreements imply that dedicated rental personnel is needed. Hence, the decision to offer rental plans means that the service function is extended with new organisational entities and roles, both horizontally and vertically, which in the case of ITT Flygt and TMHG, implies increased central-local integration. This can be expressed for example through central guidelines for local agreements.

5.2.1 The central-local dimension of the service function

When discussing the industrial service function in connection with Figure 5-1, the central-local dimension has not been taken into account. This is a deliberate choice made in order to simplify the elements that make up the service function. However, since the case firms, as well as most other major manufacturing firms, have an international presence, there are also aspects related to
the central-local interface of the service function that need to be taken into account (see also Paper 4). For example, all organisational entities in Figure 5-1 can be found on the central level (manufacturing is seen as a central activity because it is not part of local sales companies). With the exception of manufacturing and R&D/product development, all entities can be found locally in the sales companies as well. However, not all functions necessarily exist in all subsidiaries. Besides, as in the ITT Flygt case, on some markets where rental is not yet very strong, the rental function may be performed by a service manager with part-time responsibility for rental. In addition, if a firm has not previously been focusing on rental, it could be possible that, due to local demand on a leading market, a sales company decides to offer rental plans despite the lack of central rental organisation and strategies. If this is successful, it is possible that in a second phase rental would be brought to central management’s agenda as well.

The internationalisation of industrial services means that it becomes more important to manage the geographical scope of the service function (cf. Morschett 2006). Although it is a somewhat simplified description, ITT Flygt and TMHG are making a transition from having a multinational structure with relatively autonomous subsidiaries, to a more transnational structure with tighter integration and coordination. This can facilitate a situation such as when a local organisation may not have the capabilities to offer all expertise services that leading customers require and as a result, may therefore have to rely on application specialists from the central organisation or from other, more prominent subsidiaries. Thus, how to manage the interdependencies within international firms, e.g. the degree of centralisation/decentralisation and integration (Siggelkow and Levinthal 2003) become a critical aspect for firms expanding their service offerings. For instance, what degrees of freedom should the local organisations have with regard to the SLAs, and whether or how to manage the relationships with service partners depends both on the firm’s service strategies and the central organisation’s control. However, due to the entrepreneurial spirit of many sales companies and the traditionally low degree of central control and integration at ITT Flygt and TMHG, changing to a transnational structure is in many ways challenging.

Due to centrally initiated projects and to the central resources required for projects such as common business and CRM systems, coordination between the central service organisation and the local subsidiaries is becoming more important. For example, at the time when it was developed and implemented, it would not have been possible for the subsidiaries of TMHG to develop the mobile business system EASY, because most of the subsidiaries would not have been able to fund that kind of activity, and if they had been able to, it would still be difficult to find the necessary resources. In this case, the project was centrally initiated and driven and three ‘lead user’ subsidiaries were initially involved.

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30 One must recognise that the classification of organisational entities into central and local ones may be too simplistic. For example, both BT Industries and ITT Flygt have a regional structure between the corporate and the subsidiary level. In addition, project teams and other temporary organisational entities may include members from both local and central level.
The creation of a service forum in which both local and central service managers participate and meet regularly (e.g., quarterly) has been important for the service culture of that entity in a product-centric firm like ITT Flygt and enables informal information flows and the cross-fertilisation of ideas across borders. This can facilitate a non-coercive integration, not only between local and central entities, but also between local ones. A related idea at senior management level is the example from some BT/TMHG subsidiaries where, for example, the managing director of one subsidiary can be a board member of another subsidiary, thereby facilitating on exchange of knowledge across borders.

Very often, both central and local representatives are involved in service development projects, an involvement which is critical according to managers at both ITT Flygt and TMHG. Participants can for example be the internal entrepreneur that came up with the idea and local and central managers. The concept is initially rolled out on markets where either customers have expressed a particular need for the solution or where a latent market opportunity has been identified. A competence linked to this is the capability for central management to identify local projects and services assumed to have a potential for other markets also and to exploit this local, explorative initiative and centrally disseminate it to other subsidiaries. Being able to manage these globally linked and locally leveraged processes is a core capability of transnational organisations (Bartlett and Ghoshal 2000) and, accordingly so, of the service functions of the manufacturing firms studied.

A prerequisite for successful exploration initiatives is market sensing. It is a “scanning, creation, learning, and interpretive activity” (Teece 2007, p. 1322) that that can be defined as “the organization-wide generation of market intelligence, dissemination of its intelligence across departments, and organization-wide responsiveness to it” (Kohli and Jaworski 1990, p. 6). Although market sensing is generally regarded as a capability to sense exogenous events and trends, sensing geographically and functionally dispersed organisational entities should likewise be regarded as a distinctive capability. Central managers at ITT Flygt do not only find market sensing a core outside-in process, (cf. Day 1994) but also, internal (local-central) market sensing is becoming more important for a more integrated and global firm. For example, one of ITT Flygt’s current central service projects is based on a supervision service concept initiated by a local enthusiast in the Australian subsidiary, and on the local level, the concept has been dependent on individuals working with it after regular working hours. Thus, without centrally allocated resources, it can be difficult to rise above a localised and unstructured offering. Local-central market sensing (as well as knowledge exchange between subsidiaries) is also critical for TMHG, since leading subsidiaries have developed service offerings and applications that are valuable to other subsidiaries as well. With regard to market sensing, there is a need to also sense actors other than customers (Matthyssens, Vandenbempt, and Berghman 2006), something particularly evident in the case of ITT Flygt, where consultants and contractors are very often major influencees for the specification of larger contracts. Because cost efficient operations are a major
Concern for the service organisations, this implies finding a balance between exploratory market-sensing activities with their open-minded inquiry and a rigid structure, to which the local organisations are aligned.

Furthermore, development projects which are initiated centrally (such as many ICT-related service development projects at TMHG) also require local commitment and involvement; if no subsidiary shows interest in the project it will most likely be difficult to implement locally. On the other hand, if subsidiaries show an interest in the project, they will be involved and try to influence what service elements to include. If there is acceptance among some of TMHG’s subsidiaries for the project, investments are made and the subsidiaries will have an annual running cost that they pay to the central organisation for maintenance and development.

The local organisation is obviously the one best suited for receiving local market intelligence and customer information. However, particularly for smaller subsidiaries such as Flygt Sweden, there are few resources for a proactive service development as most, if not all the time is spent on regular (reactive) service operations. In larger subsidiaries the situation might be different, but the resources and economies of scale are nevertheless not the same as for the central organisation. Although increased integration between the central organisation and the traditionally relatively autonomous subsidiaries has many positive effects on the service operations, there is obviously a risk that too much central control will suppress local entrepreneurship (Burgelman 1983) and reduce market responsiveness (Jaworski and Kohli 1993). Therefore, the firm needs to find what degree of integration and local autonomy in should have while working towards a transnational service infrastructure; that is to say including both local and central development, as well as interplay between the two, thereby enabling subsidiaries to synergise from increased internal efficiency and better central resource allocation (Leong and Tan 1993), something which TMHG has been relatively successful with. Compatibility between information systems becomes particularly important if central management wants to compare the performance of different subsidiaries and there can therefore be an unwillingness and resistance locally towards the implementation of new systems. International contracts like the one between TMHG and IKEA, require coordination between the central organisation and several subsidiaries, and therefore demand a certain degree of compatibility between the information systems.

### 5.2.2 A typology for industrial service offerings

When analysing the industrial service function from the provider firm’s point of view, the characteristics of the industrial service offering affect how to arrange the organisation. Industrial service offerings can be characterised through two distinct factors: service scope and service focus (see Figure 5-5). These factors have different effects on how the offerings need to be managed by the service function, i.e. which elements of the service function and what service process interfaces are needed in order to perform the service activities (see also Paper 3).
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further decision is made, the project will not be carried out. If the project is accepted, the
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Furthermore, development projects which are initiated centrally (such as many ICT-related
services only should be offered together with others, in specific bundles (cf. Stremersch and
Tellis 2002). Bundled offerings can include both product-orientated and process-orientated
services and are sold separately) via mixed bundles (services are available in bundled as well as in
unbundled offerings) to bundled (all service elements are included in one offering) (Stremersch,
Wuyst, and Frambahc 2001). SLAs and rental plans are examples of bundled offerings and one
strategic choice to be made is whether to offer all services as bundled and unbundled, or if some
services only should be offered together with others, in specific bundles (cf. Stremersch and
Tellis 2002). Bundled offerings can include both product-orientated and process-orientated
elements. In general, the case firms are pursuing a mixed-bundling strategy. Further, services such
as product-orientated SLAs can be preceded by some form of analysis of current processes and
costs, and measures to improve process performance can be initiated before the actual agreement
is executed.

31 Due to the recent merger, in reality, this term is used by ITT Water & Wastewater.
However, the capability to recombine existing offerings (Gallouj and Weinstein 1997) to new combinations/bundles is vital, and this is very much linked to the standardisation/customisation discussion of how to combine standardised service elements throughout offerings. Customers that sign extensive agreements in particular, expect the offering to be customised, whereas internally, it is important to achieve efficiencies by standardising processes and service elements. This service offering design logic is vital, not only for product-orientated SLAs but also for more extensive agreements and integrated solutions (cf. Davies, Brady, and Hobday 2007). In reality, providers need to understand what differentiates their offering from that of competitors’ for a specific customer and to communicate these values to the customer through the value proposition (Anderson and Narus 1998). At the same time, these offerings must be efficiently managed and therefore standardised to a high extent in order to maintain operating margins. Although to a high degree standardised, the critical selling point for many of TMHG’s rental agreements with customers is the ability to make customer-specific adjustments for some parameters in the contract. This means that generally, most (or all) of the offering is based on standardised service elements which are combined in a rental bundle. Similarly, ITT Flygt’s Bronze, Silver, and Gold contracts have a standardised structure with common attributes.

One issue related to the two dimensions in Figure 5-5, is whether or not the organisational arrangement involves coordination across geographical borders, something which is becoming increasingly important to match customer demand (cf. Rehme 2001). For example, the rapid growth of BT Industries’ European KAM (EKAM) organisation (and later TMHG’s European Key Account (EKA) organisation) illustrates the increasing number of international customers and central agreements that need to be managed. These international agreements mean that customers expect commonality between service activities regardless of the local market, which makes it problematic to have a multinational structure with autonomous subsidiaries. However, as discussed in Paper 3, there are significant differences between industries and in this sense ITT Flygt, for example, has a very different market situation, with fewer large and international customers compared to TMHG.

To summarise the service offering characteristics, there are specific requirements associated with each dimension of the service offering. For example, as discussed in Paper 2, the process interfaces depend on the type of service (cf. Larsson and Bowen 1989). Further, if the firm offers a broad spectrum of services with different foci (i.e. both product- and process-orientated services), the firm needs a variety of skills, such as proficient service technicians, salesmen, systems engineering specialists, and other technical expertise. Compared to offerings with less extensive scope, bundled offerings are likely to be associated with a higher need for efficient coordination between front-office and back-office operations, which often involves multiple organisational entities. Further, as discussed in Chapter 4.4 (and in Paper 4), there are distinct challenges associated with service delivery to multinational customers and/or management of internal central-local coordination. Thus, different sets of skills and competencies are required for
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Table 5-1. Examples of industrial service offerings and their characteristics.

<table>
<thead>
<tr>
<th>Industrial service offering</th>
<th>Service scope</th>
<th>Service focus</th>
<th>Organisational arrangement</th>
<th>Main service design (service process interfaces)</th>
<th>Main service function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance and repair</td>
<td>Unbundled</td>
<td>Product</td>
<td>Local</td>
<td>Sequential customised (front office-back office coupling or front office decoupled)</td>
<td>Service organisation (and/or Third-party service providers)</td>
</tr>
<tr>
<td>Customer training</td>
<td>Unbundled</td>
<td>Product</td>
<td>Local</td>
<td>Reciprocal (front office-customer coupling)</td>
<td>Service organisation (and/or Third-party service providers)</td>
</tr>
<tr>
<td>Common spare parts pricing for international customers</td>
<td>Unbundled</td>
<td>Product</td>
<td>Central</td>
<td>Sequential standardised (customer decoupled), Pooled (back office decoupled)</td>
<td>Service organisation, Senior management</td>
</tr>
<tr>
<td>Retrofit</td>
<td>Unbundled</td>
<td>Process</td>
<td>Local</td>
<td>Sequential customised (front office-back office coupling), Reciprocal (front office-customer coupling)</td>
<td>Service organisation, Engineering/consulting</td>
</tr>
<tr>
<td>Technical consulting</td>
<td>Unbundled</td>
<td>Process</td>
<td>Local</td>
<td>Reciprocal (front office-customer coupling)</td>
<td>Engineering/consulting (and Service organisation)</td>
</tr>
<tr>
<td>Process-technology consulting to international customers</td>
<td>Unbundled</td>
<td>Process</td>
<td>Central</td>
<td>Reciprocal (front office-customer coupling), Sequential customised (front office-back office coupling)</td>
<td>Engineering/consulting, Senior management (and Service organisation)</td>
</tr>
<tr>
<td>Safety inspection SLA, preventive maintenance SLA</td>
<td>Bundled</td>
<td>Product</td>
<td>Local</td>
<td>Sequential customised (front office-back office coupling), Pooled (back office decoupled)</td>
<td>Service organisation (Third-party service provider)</td>
</tr>
<tr>
<td>International service agreement</td>
<td>Bundled</td>
<td>Product</td>
<td>Central</td>
<td>Local-central and transnational sequential customised (front office-back office coupling), Pooled (back office decoupled)</td>
<td>Service organisation, KAM, Senior management</td>
</tr>
<tr>
<td>Full service SLA</td>
<td>Bundled</td>
<td>Process</td>
<td>Local</td>
<td>Reciprocal (front office-customer coupling), Sequential customised (front office-back office coupling)</td>
<td>Service organisation, (Senior management), (KAM)</td>
</tr>
<tr>
<td>Rental</td>
<td>Bundled</td>
<td>Process</td>
<td>Local</td>
<td>Reciprocal (front office-customer coupling), Sequential customised (front office-back office coupling)</td>
<td>Rental, Service organisation, KAM, (Sales organisation), (possibly Third-party service providers)</td>
</tr>
<tr>
<td>International key account agreements including rental trucks</td>
<td>Bundled</td>
<td>Process</td>
<td>Central</td>
<td>Local-central and transnational sequential customised (front office-back office coupling), Reciprocal (front office-customer coupling)</td>
<td>KAM, Service organisation, Senior management, (Sales organisation)</td>
</tr>
</tbody>
</table>
If not otherwise stated, the service process interfaces in Table 5-1 are either exclusively/predominantly local only or they can include a high degree of central-local coupling. However, since this service design is conditioned by market situation, existing practices and processes, and other facets, it is not explained more in detail. Furthermore, as is evident from Paper 2, service process interfaces are dynamic and can thus, change, something which is not taken into account in Table 5-1. The entities included in the main service function in Table 5-1 connotate principally to the operational (execution) phase of the service. That is, the negotiation phase (including bargaining) and the commitment phase (including the formal legal contractual agreements) (cf. Ring and van de Ven 1994) are not included. For example, for extensive undertakings like international KAM agreements, it becomes vital to manage legal and financial issues. Further, R&D/product development and manufacturing are not included (due to their indirect role for the service operations), even though they too to various degrees influence the service offering, particularly in the long term.

In sum, there needs to be a good alignment between the characteristics of the service offering, the service system, and the design of the service processes (Edvardsson 1997; Normann 1983), as a fit leads to improved service quality and improved utilisation, and thus to improved competitive advantage and profitability (cf. Johansson and Olhager 2004). For example, as some services (particularly basic after-sales services) become more standardised and as a result of increased volumes, become increasingly commoditised, the service production processes have to become more efficient. This is likely to lead to increasingly standardised and pooled service designs accompanied by decoupled divisions. TMHG, in particular, works purposefully with a focus on increasing cost efficiency and the utilisation of the service organisation by exploiting new ICT applications such as EASY.

### 5.3 Strategic management of service offering and service function

When managing industrial service offerings, there are a number of strategic issues which are related to the research questions of this thesis, to take into account. These issues have derived from the empirical case data and from theory as well as from the systematic combining of the two. The first issue concerns the interrelationship between service offering, service function, and service strategy, and it relates to the goods-services transition. Second, ICT needs to be managed strategically due to the interrelatedness between ICT and services in an industrial context. Third, the customer relationships have, obviously, a significant influence on the firm’s service offering and service strategy.

Besides taken into account the scope and focus dimensions presented in Figure 5-5 and the degree of central-local interdependence when managing industrial services, attention has to be paid to the breadth of the service offering (Brann, Oliva, and Gebauer 2007; Gebauer and Pütz 2007). For instance, if the firm makes a strategic repositioning from being an equipment
manufacturer to an industrial solutions provider, the question is whether to continue to offer all the previous services as well, or whether to make a more radical repositioning and no longer offer some of the firm’s previous offerings. Thus, both deciding what to offer and having the capabilities to manage those offerings is vital. As Baveja, Gilbert and Ledingham (2004) point out, the pattern of investments, capabilities, and market strategy differs notably between an equipment repair service and a process consulting service. In the ITT Flygt and TMHG cases, generally the premises for repair services are associated with higher fixed costs, in terms of a service and spare parts distribution network. Furthermore, the market strategy would be to augment the core offering, i.e. the capital equipment, through after-sales services and to manage a highly efficient and well-utilised network of service technicians would be a core capability. Process consulting services, on the other hand, require performance improvement expertise and the ability to cultivate trust and commitment among customers, and these process-orientated services imply a strategic repositioning ‘downstream’.

When managing a portfolio of industrial services, another aspect to consider is which parts of the service function are needed, i.e. how to best structure the service function to enable efficient and effective service operations. Furthermore, it is important to decide whether offering a particular service is mainly an operational or tactical issue, or if it can have more far-reaching, strategic implications. For example, for a firm offering repair services, extending the service offering to include reconditioning can be seen as an incremental, evolutionary development. It also has implications for product development and other part-time service functions and may strengthen the customer relationships, but most likely it has no major, strategic consequences for the firm. Similarly, if ITT Flygt were to extend its local rental portfolio to include new types of equipment, it too would be an incremental, evolutionary development. If instead, ITT Flygt were to decide to offer operations services, i.e. take over customers’ operations, it would be a radical change of service offering. Such repositioning is not an ad hoc change that is made and due to the implications for the firm and its customer relationship, it would most likely be based on strategic considerations. Thus, it would not be a decision made in the service organisation in isolation from other parts of the service function and without alignment with the firm’s market strategy. Similarly, if a decision is made by TMHG to take on more extensive undertakings that imply increased operational and/or financial risk, it involves senior management, KAM, finance, and other part-time service functions and it possibly requires new skills such as risk management, financial acumen, and legal skills, which is in line with Brady, Davies, and Gann’s (2005) view of additional skills required for providing integrated solutions.

Gebauer, Fleisch, and Friedli (2005) argue that the criteria for developing new service offerings has to derive from the service strategy and that there needs to be alignment between service

32 However, for manufacturing firms in earlier stages of the service infusion, an initial incremental development such as the one from repair to reconditioning can be a first step in a strategic shift towards increased customer centrality and service provision.
strategy and marketing or corporate strategy. For example, offering operational services is not in line with ITT Flygt’s current service strategies (even if there may be exceptions). A lot of service innovation is customer driven (cf. Mannervik and Ramírez 2006) and the provider may be willing to take financial risks by exploration through new concepts and thereby enhance the customer relationship. For example, BT Industries’/TMHG’s Swedish subsidiary signed an agreement with a sawmill customer, where truck drivers would be included and payments would be linked to produced output (i.e. timber). Another exogenous driver which may influence the provider to reconsider existing service strategies and the criteria for selecting and innovating new service offerings, is the risk of emerging intermediaries such as logistics providers and facilities management firms in the case of TMHG taking over the customer interface.

None of the manufacturing firms studied have taken any quantum leap regarding changes in market strategy or service offering. Instead, the change processes have taken place rather cumulatively. This can be attributed not only to a deliberate evolution of market strategies and offerings but also to path dependence (Teece, Pisano, and Shuen 1997) and core rigidities (Leonard-Barton 1992). The latter is particularly evident in case firms such as ITT Flygt and Saab Aerotech. Leading capital equipment manufacturers generally pursue a product leadership strategy (cf. Treacy and Wiersema 1993) and, being product-centric rather than customer-centric, the main sources of revenues can be attributed to new product and spare parts sales. As Leonard-Barton (1992) argues, the very same values, norms, and attitudes that support a particular core capability that makes the firm successful in one discipline can also constrain it, and become core rigidities. In the context of this study, high status and excellence in dominant product-related disciplines makes it less attractive (i.e. lower status) and more difficult (i.e. fewer resources allocated) to implement service strategies and conduct service operations; services has been, and in most of the cases studied, still is, a non-dominant discipline.

Although some managers at ITT Flygt and other case firms claim that it is the case, TMHG is the only firm studied that has evidence for stating that in essence, they are today a service organisation, because the total service offering is the key issue for many customers. Hence, the firm (at that time BT Industries) has attended transport and logistics exhibitions for example without displaying any physical product, asking customers not to buy any of their trucks, and instead have promoted rental plans (cf. Windahl et al. 2004). However, the strategic change is a cumulative process rather than a disruptive one. In fact, at most exhibitions, TMHG (still) display their latest trucks and the firm’s transition into services exhibits evolutionary rather than revolutionary characteristics.

The fact that there has been an economic boom during the time when the case firms have been studied means that a major challenge for TMHG and other firms has been to keep up their manufacturing capacity. For firms with few service offerings in particular, this means that from a short-term profit-maximisation perspective the business rationale may be to focus on the core
(product) business rather than on enhancing the service offering. Thus, there can be “poisonous side effects of success” (Sinkula 2002, p. 266) for the firm. This unwillingness to change can increase due to ‘incumbent inertia’ whose root causes Lieberman and Montgomery (1998) consider to be i) lock-in to a specific set of fixed assets, ii) reluctance to cannibalise existing (product) offerings, and iii) organisational inflexibility. In the case firms, the first two causes would not be main causes of service development being inhibited. Instead, independent of firm, a majority of managers found that organisational inflexibility was the root cause of restrained service development, which is in line with Shah et al.’s (2006) findings that, often, the main challenges of changing from a product-centric to a service- and customer-centric firm are related to internal issues. For instance, one senior manager expressed the situation in the following way: “business development has always been synonymous with product development”, which makes it difficult to change the prevailing practices and views. Due to this ‘incumbent inertia’ and a relatively profitable core business, external stimuli, such as changing customer requirements and increased spare parts sales competition, often play the role of the primary change agent for services.

Since new offerings require capabilities the firms might not have, making correct performance, cost, and risk assessments becomes more difficult. For instance, process-orientated services require competences other than traditional after-sales support, because an understanding of the customers’ production processes is required. In the case of TMHG, it can be the lack of expertise and equipment for container and heavy-duty materials handling, which has to be acquired externally when required. The increasing importance of ICT for ITT Flygt’s offerings and the lack of such competencies in the firm’s resource base led to the acquisition of a Swedish provider of pump controllers and software. Similarly, in 2004 ITT Flygt decided to sign an exclusive distribution agreement with the UK firm Dynamic Logic, whereby ITT Flygt distribute the firm’s telemetry and monitoring and control systems. Furthermore, for enhanced service offerings, it is critical to have the ability not only to create value but also to clarify the value-in-use in monetary terms for both customer and provider (see also the discussion by Anderson, Kumar, and Narus 2007). As the cases illustrate, the abilities to extract performance data, enable new value-creating services, and communicate their benefits, are increasingly associated with new ICT applications and systems.

5.3.1 Information and communication technologies as enablers

In line with the view of Rust (2004), ICT development and service development is highly interrelated in the firms studied. At TMHG for example much of the business development in the service organisation is synonymous with ICT development. The continuous improvements of

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33 Due to the recent boom in many industries, the firms have (temporarily) avoided some of the deteriorating effects of product commoditisation.
The mobile business system are one reason for this, but also other e-linkage systems and applications are being developed, for example fleet management systems and machine-to-machine communication. In addition, new technologies, and thereby potential services opportunities, are increasingly bundled with the equipment. This enables the extraction of detailed performance data and enables remote services and machine-to-machine communication for example. As ICT becomes a more integral part of the offering, reliability and security becomes even more critical (cf. Nightingale et al. 2003) and Nilsson (2002) argues that service organisations should focus relatively more attention on reducing variation in the production process and thus, pay greater attention to improving basic reliability. If focus is on improving internal processes, the reliability of the services provided should be higher. In the cases studied, (as illustrated in Papers 1 and 5 in particular), ICT enabled new applications, such as TMHG’s mobile business system EASY, that have a positive effect on process and outcome quality, and thus, on the firm’s image and customer perceived quality (cf. Figure 4-1, p. 58).

The internal and external effects on the three service productivity elements cost efficiency, revenue effectiveness, and capacity utilisation (Grönroos and Ojasalo 2004) differ for new ICT applications (see also Paper 1). Services have traditionally been conducted locally in an ad hoc manner, whereas ICT enables a more consistent global service strategy and resource platform. Particularly at ITT Flygt, there is major potential for improving service productivity through central support and investments in new information systems that enable more efficient business tools. Many of today’s administrative tasks performed by service personnel could be conducted more efficiently or automated, and in that way, set local operative resources free. EASY is a successful example of how a number of non-value creating activities in the service production process have been eliminated or automated.

Cost efficiency, revenue effectiveness, and capacity utilisation are all critical for the case firms’ industrial service operations; the priority depends on both endogenous factors (such as financial targets of corporate management) and exogenous factors (intensity of rivalry, market dynamics, etc.). Only because a firm is focusing on innovating new, complex services (exploration) it does not mean that it must disregard cost efficiency and capacity utilisation issues (exploitation); price in most cases is an order qualifier, and high costs will thus lead to reduced operating margins. Furthermore, efficient capacity utilisation also becomes critical for more complex, specialist services because many firms find it difficult to recruit people with the required skills, something which can result in lost business opportunities.

The differences in knowledge and skills among individual service technicians have consequences for the service quality which becomes less homogeneous due to these variations in competence. In particular, ensuring that external service personnel have the required skills is challenging, something that is illustrated in the ITT Flygt case and the example with ELS given in Paper 1. For instance, certification programmes can be seen as a means by which the quality of the service
output can become more homogeneous as personnel need a minimum level of expertise in order to perform the service. It can also be a way of better integrating service partners in the firm’s business network.

The potential to gain better customer knowledge and thereby provide more accurate services can be obtained by keeping track of the customers’ installed base (equipment type, application, installation date, customer site, actions taken, etc.) in an internal database and by utilising this information in a systematic way. However, not only does this require compatible business systems between markets, but the prerequisites for obtaining correct information vary between industries. For example, because pumps are rather fixed installations compared to trucks which are not fixed, it should be easier for ITT Flygt to manage this information than for TMHG (although inadequate, incompatible information systems and internal unwillingness have been problems for ITT Flygt).

In her study of an international equipment manufacturer’s maintenance management solution, consisting of services, data and an information system, Brax (2005) concluded that service provision requires effective information management. She found that “both a good integrative information system and information management practices are fundamental to providing complex industrial services for installed bases” (pp. 151-152). This is in line with the findings in this thesis (e.g. Papers 1 and 2). Furthermore, coherent information management practices become even more important if for example ITT Flygt and TMHG want to achieve transferability of the offering between subsidiaries/geographical markets. However, it does not necessarily imply that the all local service offerings must be cast in the same mould with identical, standardised processes. Rather, ICT applications and systems should enable new and/or more efficient service processes without inhibiting the local organisations’ degrees of freedom, for instance, with regard to local market adaptation.

A lot of new data can be extracted from the systems and an important issue therefore becomes what strategies to have and what methods to use in order to obtain relevant and adequate information that will lead to better services (cf. Paper 2). Thus, service productivity and value creation can be attributed both to improvements in the service process of existing service offerings and to new service processes with a different service output, that can be clustered as new offerings. As in the case of ITT Flygt’s monitoring and control services, this may require the acquisition of a new business line. An important business implication of increased data access is the possibility to offer services with new revenue models, such as short-term rental where customers pay TMHG for truck usage. However, the integration of information systems (extranets, web portals, etc.) can be obstructed not only by an aversion towards increased dependence/interdependence, but also by IT security issues. This can be related both to the provider and the customer. Swedish municipalities for example have restrictions on data access...
and the possibility for external parties to obtain and modify data in the systems, which is something that affects ITT Flygt.

5.3.2 The role of the customer

Although many business development activities take place centrally (and need to do so) the customer is an important source of service development and innovation (cf. Galloj and Weinstein 1997) and the critical capabilities to sense and seize customer co-innovation (Mannervik and Ramírez 2006) are mainly linked to local interactions between service and sales representatives and customers. One major reason why the service market has attracted more attention in recent years is because it enables the firm to have a continuous contact with the customers and thereby the possibility to strengthen the relationships, improve existing service processes, and generate ideas for new concepts. Many new concepts are initially customer incentives and developed reactively as a response; i.e. ad hoc innovations (Galloj and Weinstein 1997). BT Industries’/TMHG’s operations agreement with a major sawmill, where revenues were linked to the customer’s outputs of timber produced, is one clear example of such a customised offering. ITT Flygt also customises offerings according to demands from some of its major customers.

Despite a trend towards increased service sales and more extensive service offerings, there is not one unambiguous trend when it comes to customer-provider relationships. As seen in the TMHG case particularly, many customers are becoming more professional in the sense that there is a purchaser or purchasing manager responsible for the negotiations and supplier evaluations instead of a buyer from the operations or maintenance department. This often means that there are fewer links between the buying centre and the users, and that instead, focus is on value-in-exchange, and lowest price (on trucks and/or services) can be the order winner. Thus, the personal relationships which exist on an operational level become less important for the service sales process, although there can be more customer interfaces (i.e. multiple relationships) than previously. These findings correspond with Windahl’s (2006) argument that framework agreements lead to changed customer interfaces for ITT Flygt in the UK; the separate wastewater plant is no longer the decision making unit, but instead, a water company or main contractor is. This means that the customer interface becomes more intricate as the customer organisation gets more complex, with a hierarchical structure, and the undertaking may involve several customer sites. Furthermore, focus shifts from being on individual product sales or services transactions to contractual agreements and longer relationships. Nevertheless, despite more extensive undertakings, the mentality among many of the case firms’ customers is still on price and value-in-exchange, rather than on lifecycle cost and value-in-use. It also means that there is a considerable amount of power play and little room for ‘real’ partnerships (cf. Matthyssens and Vandenbempt 2008). The other main trend which is deduced from the empirical observations is

34 Despite long-term personal relationships between individuals, often, the offering can be based on transactional routines.
that the competence of the buyer is higher than before and the customer views the relationship as strategic. Often, the numbers of interested parties in the buying centre increase (e.g. both vertically and horizontally, often including users) and a collaborative approach with a long-term orientation (which can be beyond the contractual time) is emphasised. Hence, low price is seen as a qualifier and focus is on lifecycle costs and/or process performance (i.e. emphasis is on value-in-use). If instead focus was to be mainly on low costs, it would probably inhibit local initiatives and knowledge exploration.

As discussed, it is important to both have an understanding of the users’ needs and the decision criteria by which the customer decides what offering to buy and from whom. The perceived value of a service offering differs among customers, not only depending on their industry characteristics but also on the influencees in the buying centre (Webster and Wind 1972) and the interface towards the provider. Therefore, new service offerings may require the provider to ‘teach’ the customer not to emphasise short-term purchasing gains, but to consider lifecycle costs (Matthyssens and Vandenbempt 2008). Often, this is a challenge for TMHG when dealing with professional buyers at major customers. For ITT Flygt too, this is difficult due to industry’s traditional focus on products and technicality. Thus, customer learning (Payne, Storbacka, and Frow 2008) and dialogue (Ballantyne 2004) becomes more important, something which can be facilitated through services such as customer training and consulting.

Additionally, for extensive offerings such as rental plans, a condition for selling in the first place is that the offering aligns with the strategies and financial directives of the customer firm, something which the buying centre has to follow. A global player like IKEA has a policy of owning most assets, whereas firms with other policies prefer to rent trucks and other capital equipment. As in the case of Husqvarna, the firm previously rented parts of their truck fleet, for example from BT Industries/TMHG, but central directives changed and instead, the firm now buys trucks and SLAs. For ITT Flygt particularly, there can be several actors involved in the industrial equipment sales process, such as consultants, contractors, and end customer. These actors can be interested in and focus on very different (and contradicting) issues. Knowledge-intensive services might cause conflict with engineering consultancy firms and there is a risk of channel conflict with major contractors if ITT Flygt makes offerings which are too extensive (e.g. subsystems). In the case of ITT Flygt, it is difficult to emphasise better product and service performance, and lifecycle cost minimisation when the focus of the contractors is on the capital cost (cf. Windahl 2006).

The differences in the customer’s procurement and supplier relationship strategies have consequences for the provider firm’s customer relationship management strategies and, thus, on its service offerings. A customer focus on unit cost and exchange value makes it difficult to develop new innovative offerings with a focus on value-in-use, which means that cost efficient operations and maximisation of service employee utilisation become primary business drivers.
However, it does not imply that the firms should not invest in customer relationships and act proactively. On the contrary, managers in the case firms unanimously consider that long-term relationship-based governance creates a positive ‘legacy’ (cf. Penttinen and Palmer 2007) which makes it easier for the firms convincing customers of the new service offerings and of the potential for mutual benefits. For example, enhanced information sharing (which can be enabled by things such as TMHG's fleet management reports) and frequent customer interactions, like regular customer meetings during the contract’s execution phase have a positive effect on customer relationships. One aspect embedded in a relational orientation and highlighted as a success factor for the ability to sell new offerings is trust. Nooteboom (1996) distinguishes between two types of trust which, in this context, are both needed when the service offering is enhanced. “Trust may concern a partner’s ability to perform according to agreements (competence trust), or his intentions to do so (goodwill trust)” (p. 990) and they therefore represent two independent sources of subjective trust (Das and Teng 2004). Thus, a long-term relational orientation is not a sufficient condition for enhanced service offerings, as the customer must perceive that the provider has the competences needed for the particular service. Since the case firms have a product leadership position, they are in a favourable position for building competence trust for their service operations as well.

The importance of the customer-provider relationship for enhanced service offering is in line with Grönroos’ (e.g. 2008) process view; rather than a particular bundle of goods and service elements, services are to be seen as a series of activities linked to the customer’s value-creating processes. It is important to cultivate strong personal and informal relationships (Matthyssens and Vandenbempt 1998b) if the firm is to shift from a rather short-term product view with transactional routines to a holistic solutions view, with a focus on long-term customer bonds and proactive behaviour. However, while many customers are content with the traditional set-up of relationships and service offerings, one of the case firms’ customers expressed frustration that the provider does not behave proactively and offer new process-oriented services (e.g. uptime). Since buyers can find it difficult to have the competence needed to change current work processes, they may expect providers to take a more proactive stance. Although this illustrates a problem on an individual level between managers from both sides (a mismatch in expectations and value proposition) it can also be a matter of insufficient customer orientation in the firm/subsidiary. That is, the provider prefers the exploitation of the existing resource base and competences, which in this case, is a reactive response to customer needs through traditional after-sales support. There is little short-term incentive for the provider to invest in the customer relationship and take the risk of proposing process-orientated offerings because equipment and spare parts sales (and possibly also the service contracts) are profitable and competitors are not proactive enough.
5.3.3 The role of service partners

Whether or not to operate through third-party service providers is a strategic choice that has consequences for how the firm manages its service offerings and interdependencies with customers (see also Paper 4). Generally, it is more difficult to offer more extensive and advanced services on markets where the firms operate through authorised and/or unauthorised service partners, something that is evident in the ITT Flygt case. Due to aspects such as high service volumes and the strategic importance of services, BT Industries/TMHG operate through service partners only on a few markets. What is increasingly problematic as providers enhance their service offerings, is that operating through external service providers makes it more difficult to establish and develop long-term relationships with customers. Since the partner firm has the operational relationship with the customers, the provider's relationship with the customers tends to be less developed and it becomes more difficult for the provider to know of customer needs; something which is critical if a service logic is adopted (cf. Tuli, Kohli, and Bharadwaj 2007). Furthermore, technical integration with customers (and with the service partner) becomes more complex. In line with the findings in this thesis, Nordin (2005) in his study of the externalisation of basic product services at a global industrial firm which also adopted service logic, found that a major problem with the externalisation of services is that it reduces the possibilities of creating and maintaining good relationships with customers.

It is most likely that service partners also serve other brands, and for the provider, it is difficult to obtain the same loyalty from service partners as from a subsidiary. Having service partners also involves a relational risk, as they might act opportunistically from the provider’s point of view. For example, spare parts sales can be approximately 50% lower if the service is conducted by a partner firm instead of through ITT Flygt’s in-house service organisation. The reason is that service firms are inclined to use cheaper counterfeit or unauthorised parts instead of genuine parts. It can also be difficult to know and ensure that the service partners have the knowledge required to perform the service adequately; they may have the fundamental skills to perform traditional after-sales services but, as in the case of ITT Flygt, may lack a deeper product and process knowledge. Overcoming this can be complicated, particularly as the service partner may be unwilling to make the investments needed to obtain and have access to better information and if the provider is unwilling to share confidential conformation and integrate information systems. The firm takes a risk of unsatisfactory business performance by becoming dependent on service partners, and this is particularly the case for more knowledge-demanding services.

The competitive advantage created and the revenues generated by an in-house local service organisation can therefore more than offset the lower costs of using an external industrial services network (cf. Goffin 1999). For ITT Flygt, reasons for using both in-house repair shops and service partners are flexibility and financial risk aversion. By using partners in regions where the customer base is lower, the firm avoids unnecessary fixed costs. Furthermore, it can be more cost efficient for ITT Flygt to not have the operational customer interface. However, this lack is
likely to be an obstacle when enhancing the service offering. Because the strategy is to increase service sales and to market new offerings, the situation is problematic on markets where the service partners both have a strong market position and a dual role of both customer and competitor.

5.4 A transition from service organisation to service function

Even if there exists an implicit product-centric business philosophy which impedes service focus and strategies (cf. Brax 2005) at firms such as ITT Flygt (and even more so Saab Aerotech), there is a clear market trend towards more services. The increase in bundled service offerings means that the firms need to manage several types of service production interfaces (internally and towards customers) in parallel; this includes both interfaces between organisational functions and between front-office and back-office operations within the functions. This is particularly evident at TMHG, where extensive bundled offerings constitute the lion’s share of the firm’s service business; this also includes the capital goods in rental plans. For example, using Larsson and Bowen’s (1989) typology (see also Paper 2), rental plans have all portfolios of interface patterns to some extent, even if most significant interface in a rental plan is sequential customised service design. Reciprocal interfaces are necessary too, particularly during the negotiation and commitment phases of the relationship. In addition, the service interfaces are dynamic, in that it is possible to alter the interface of a particular service from a less to a more efficient mode.

The set of service process interfaces within the service function, including the customer interface, required for a particular service offering, depends on the technology available and the novelty of the service. As illustrated in Paper 2, ICT enables the dematerialisation of several (non-critical) service processes, which implies that, for a given service, processes are becoming increasingly sequential and pooled, rather than reciprocal. Also, as the service offering becomes standardised and routines become established, there can be less need for customer interactions and reciprocity for many activities. On the other hand, new customer demand and possibilities for value creation in customer relationships imply that new interactions and reciprocity is required. Because the case firms are market leaders that compete through differentiation, it is not possible for them to only focus on such efficiency aspects, as at the same time they also need to proactively explore new service opportunities and enable new value-creation possibilities, thereby creating new competitive service offerings.

As discussed, enhanced service offerings may require new service function structures (and thus, new skills and interdependencies between organisational entities) and this, in turn, may have consequences for the product-related side of the organisation. In the longer term, becoming customer centric and service orientated will inevitably initiate changes in corporate strategies, culture, and organisational structure also. On many European markets, more than half of all TMHG’s trucks delivered are embedded in rental plans. Thus, in many ways, the firm has
repositioned itself from being an industrial truck manufacturer to a material handling solutions provider; something which can be regarded as a business innovation (Kowalkowski, Kindström, and Brehmer 2008). That is, the underlying mental models which frame what the firm does have changed (cf. paradigm innovation in Tidd, Bessant, and Pavitt (2005)). This implies reconfiguration (Normann 2001) and the willingness and ability to unlearn (Sinkula 2002) and ‘destruct’ obsolete routines, which leads to the adaptation of more effective behaviours (Matthyssens, Vandenbempt, and Berghman 2006)\(^\text{35}\). It also means that when changing offerings and revenue models, from product sales to rental for example, competences are enhanced or destroyed and organisational functions other than the former dominant ones become focal. This type of architectural change, where the firm learns about new interactions across functional boundaries (Henderson and Clark 1990), is regarded by Matthyssens, Vandenbempt, and Berghman (2006) as indispensable in business markets, particularly for upstream and midstream businesses, like the type of capital equipment industries studied here, in order to avoid competition from downstream actors. Besides, even if there are fewer competitors on many markets due to consolidation, the remaining competitors are likely to be more professional and ‘competitive’. Across the firms studied (and particularly the ones without extensive service offerings), service managers expressed frustration about the often slow progress and the need to either adapt to changing market conditions or to proactively reconfigure if expanding the service offering. Even if a transformation from being (perceived as) a manufacturing firm to being (perceived as) a service provider is a slow process, this form of business innovation should be deemed a process of strategic change and renewal to alter the path dependence of the firm (cf. Volberda, Baden-Fuller, and van den Bosch 2001).

Having a separate service organisation has been a way for the case firms to overcome internal resistance, acquire necessary resources, and create a dedicated service unit in a product-centric firm\(^\text{36}\). Oliva and Kallenberg (2003) consider a separate organisational entity to manage the service offering, a critical success factor for manufacturing firms selling industrial services. Similarly in their study, Gebauer, Fleisch, and Friedli (2005) found that manufacturing firms that have successfully increased service revenues, have decentralised service organisations with their own sales force and service technicians, as well as profit-and-loss responsibility. If one considers the case firms, Saab Aerotech has independent organisational units, although these are few, that work with the service market, and when a separate service market organisations was built up centrally at BT Industries/TMHG, ELS, and ITT Flygt it resulted in an increased service focus in the subsidiaries. Accordingly, the case firms have already established a separate service organisation and would, if classified according to Oliva and Kallenberg's (2003) process model

\(^{35}\)Matthyssens, Vandenbempt, and Berghman (2006) refer to business innovation as value innovation.

\(^{36}\)Likewise, a separate rental management/organisation is seen as a success factor for the sales and development of rental offerings at ITT Flygt and as a prerequisite for BT Industries’ rental expansion.
for developing service capabilities, all be beyond the second phase of the four generic phases (i.e., the firms have entered the installed base service market)\textsuperscript{37}.

However, isolating the service operations and personnel from product-related operations can obstruct the ability to access the full complement of intra-firm capabilities and resources needed to offer complex services, as it is vital to be able to integrate competences from different organisational units and cultivate intra-firm collaboration and esprit de corps (Neu and Brown 2005; 2008). By keeping the product and service businesses completely separate, the firm risks losing out on the linkages and strategic relationships between the two areas (Baveja, Gilbert, and Ledingham 2004). The service-sales interface in particular is critical for successful service sales and operations, something which became evident when analysing the cases; a well-functioning service-sales interface is regarded as vital even if the local service organisation has dedicated service salesmen.

Hence, building up a separate service organisation can be a necessary first step, even if a separate service unit needs to become integrated with other intra-firm activities and processes within the service function as the service offering is enhanced (cf. Windahl and Lakemond 2006). This view is supported by Brann, Oliva, and Gebauer (2007), who suggest that the degree of intra-firm collaboration and integration of goals is contingent on the type of service; it may be beneficial to manage traditional after-sales services through a clearer and more distinct service organisation, whereas more extensive, process-orientated services require more integration with other parts of the service function. Consequently, a traditional organisational structure with product lines and a separate service organisation in parallel, can be adequate for rather basic service offerings, such as unbundled, product-orientated ones. However, in order to gain internal awareness and support, to expand the service sales, and to have an integrative market strategy that is one that does not separate product and service offerings, it becomes more important to couple between front office and back office, between central and local entities, and with various part-time service functions. For example, a rental contract for warehouse trucks, a fixed-price SLA for a complete pump station, or an availability contract make LCC and emphasis on value-in-use essential characteristics of the offering and imply a more extensive service function. Thus, in line with the product becoming part of the offering rather than the centre of it (cf. Oliva and Kallenberg 2003), when moving along the goods-services continuum the traditional service organisation shifts from being the main locus of the service function to being one part of it only. That is, rather than correlating only the service organisation with the firm’s service strategies, the other parts of the service function ought also to be taken into account when enhancing the industrial service offering.

\textsuperscript{37} The four phases are: 1) Consolidating product-related services, 2) Entering the Installed Base service market, 3) Expanding to relationship-based and process-centred services, and 4) Taking over end user’s operation (Oliva and Kallenberg 2003, p. 165).
Contributions and implications

In this final chapter, the theoretical contributions made by the research are discussed, the implications of the study for managers are presented, and avenues for future research are put forward.

The overall purpose of this doctoral thesis has been to analyse how capital equipment manufacturing firms strategically manage their industrial service offerings in order to achieve long-term competitive advantage. In other words, the purpose can be seen as aiming to capture and understand service management in a manufacturing context. By 'capturing' and illustrating the phenomenon through the cases (Part III of the thesis) and the case descriptions in the appended papers (Part II), it is depicted within its real-life context. 'Understanding' means that the empirical evidence is analysed and interpreted through the infusion of theories/frameworks with reality, throughout the iterative, systematic combining process. Hence, the findings are also compared with other empirical studies and related to literature, thereby leading to a more comprehensive understanding. Finally, in this chapter, I outline the main theoretical contributions of the research reported in this thesis, and point to normative implications for practitioners. To the best of my knowledge, no prior research on the downstream movement along the goods-services continuum has looked beyond the service organisation and explicitly studied the service function; instead, focus has been on the repositioning along the continuum (see, for example, Mathieu 2001b; Penttinen and Palmer 2007) and/or on the service organisation solely (see, for example, Gebauer, Fleisch, and Friedli 2005; Oliva and Kallenberg 2003). Furthermore, previous studies of this transition have not unequivocally dealt with issues related to the central-local coordination of international services.

6.1 The service function concept

An important contribution of this research is the service function concept. The findings presented in the appended papers and in the analysis bring to light that it is erroneous to equate industrial services with the deeds, processes, and performances of the industrial service organisation. Instead, the argument made in this thesis is that a more holistic approach to the
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management of industrial service offerings is needed and that the service organisation, although most likely the key entity, is only one subset of the service function. The phenomenon studied is a repositioning in moderately dynamic markets (cf. Eisenhardt and Martin 2000) of capital equipment manufacturing firms’ value propositions along the goods-services continuum towards increased service provision; with firms offering more industrial services than after-sales services, the capabilities of specific part-time service functions become decisive for the market success of many new service offerings. Hence, the traditional service organisation shifts from being the main locus of the service function to one part of it only. For example, if an industrial service provider should change its business model and become a systems integrator, most of the core capabilities would not reside in the traditional service organisation (cf. Brady, Davies, and Gann 2005; Davies, Brady, and Hobday 2007). However, in the cases studied the service organisation has remained the main locus of the service function because of the type of services offered (i.e. most emphasis on MRO and related after-sales activities in SLAs and rental plans). Nevertheless, compared to earlier, success in the marketplace is to a greater extent based on factors outside the service organisation, and which are to be formed in other parts of the service function.

In order to have a competitive service offering, the firm needs to think in terms of wholes and in terms of integration of structure (i.e. service function) and processes (cf. Normann 1983). Thus, it is not enough to limit the discussion to the service organisation. The need for increased integration between service function entities is supported by Neu and Brown (2005; 2008) who found that an autonomous structural form did not support the intent to satisfy highly complex needs. Unless the service function adapts to new offerings with new requirements on competence, there is a risk of a structure-strategy misalignment between the organisational arrangement of the service function and market strategy. In line with Normann’s (2001) thoughts on value creation and sources of competitive advantage, the firm must have a strategic renewal capability to reconfigure its service function and service offering, possibly by extricating this from the firm’s current routines and practices and thereby enabling it to break off its existing developmental trajectory.

The effective development and sharing of knowledge in vertical relations between employees and management, and in collaborative horizontal relations between groups, depends on trust and collaboration (Adler 2001). Since an increasing number of offerings, in general the strategically most important ones, depend on efficient horizontal and vertical coordination within the service function, a corporate culture that creates and cultivates trust between local and central organisational entities becomes vital (cf. Grönroos 2000). For this purpose, not only formal structures, but also various forms of informal forums, such as the service manager forum at TMHG are essential. Customer relationship management and market sensing are predominantly local activities that become even more important when a firm provides services. Thus, there is a need to balance local and central forces and to avoid either rigid, centralised structures or autonomous local units (cf. Bartlett and Ghoshal 2000).
How to manage the service offering portfolio, that is to say what service offerings (including the choice of bundling strategies) and organisational arrangements to have, also becomes a strategic matter for the firm. The service organisation can sufficiently manage many traditional after-sales services on its own, but for more complex services either the service organisation is likely to require support from specialist (part-time service) functions or the specialist function can be the main locus of service interactions. The latter would be the case with systems engineering services, where few interactions with the service organisation take place. Thus, as ITT Flygt, TMHG and other firms that to an increasing extent are competing through (complex) service offerings, the importance of cross-functional collaboration for competitive offerings increases (cf. Prahalad and Hamel’s (1990) accentuation of expertise distributed across units).

This thesis has proposed and presented typologies for industrial service offerings. For example, it becomes vital to consider customer-provider reciprocity if the firm is pursuing a certain service strategy but less so if choosing another avenue. In the case firms studied, certain drivers for this strategic service development were identified, but other drivers may be root causes for change in other firms, industries and/or markets. Whether the firm chooses to focus on after-sales services, rental, or consulting, whether it emphasises customer relationships or product features, and whether it acts reactively or proactively to exogenous changes are some of the possible choices which all have consequences for the firm’s competitive advantage and how its service function is organised.

6.2 Contribution to the literature on industrial marketing

Despite the importance of industrial services for the competitive advantage of many manufacturing firms, the literature on industrial marketing still views the industrial firm as a manufacturer in most cases. However, as highlighted in this thesis, traditional industrial business models are being challenged, as firms increasingly turn to service provision. The increased role of service for manufacturing firms places new demands on how to organise and strategise. In line with Stabell and Fjeldstad’s (1998) view on value configurations and with Gebauer, Fleisch, and Friedli’s (2005) empirical findings, firms may need to manage the symbiotic relationships of having two different business logics; service and manufacturing.

However, in line with Grönroos’ (2006; 2008) view on industrial offerings, this thesis argues that capital equipment manufacturing firms with a mixed offering (i.e. goods, services, and product-service bundles) should pursue an overall business strategy based on a service logic (although the marketing tools as such may differ depending on activity). Further, manufacturing activities too should be seen as a part of the process of integrating and transforming micro-specialised competences into complex services (Lusch and Vargo 2006b). If the firm is making a dedicated effort to enhance its service offering, it is not sufficient to merely add services to the existing product offerings (Brax 2005). Nevertheless, without active commitment from corporate management it seems unlikely that it will radically break free from the constraints of goods-
dominant business philosophy and practices. In reality, however, due to internal ‘incumbent inertia’ as well as to exogenous constraints (Matthyssens and Vandenbempt 2008), an incremental approach may be the only viable one. Brann, Oliva, and Gebauer (2007) hypothesize that the tension between a service and a product/manufacturing culture will be a constant challenge for manufacturing firms choosing to bundle goods and services, something which has also been seen in this research and which is particularly evident in firms that have only recently begun to focus on the service business.

In addition, if the customer relationship is viewed as the core of the firm’s offering, a more integrative view needs to be taken of the marketing strategy of the firm, possibly viewing the service function as the firm’s primary customer interface and, in line with s-d logic, as a function hypernymic to manufacturing (cf. Lusch and Vargo 2006b). This would also be in line with Edvardsson, Gustafsson, and Roos’ (2005) suggestion that service is used as a perspective on value creation in customer relationships, which would have implications for how the firm perceives itself and its role on the marketplace (cf. Vargo and Lusch 2004a).

Even if the changing offering is often referred to as a goods-services transition, it does not imply abandonment of prior offerings to the benefit of new offerings with higher service content. Rather, the cases suggest that firms tend to increase the breadth of the service offering (cf. Brann, Oliva, and Gebauer 2007) which they need to manage and coordinate within their service functions. Hence, more service processes and interfaces have to be managed simultaneously. Furthermore, as seen in the ITT Flygt case, the depicting of service development as a sequential transition downstream along the goods-services continuum can be erroneous; in reality, the situation is more complex and multifaceted. As the division between goods and services becomes ever more blurred (for example in TMHG’s rental plans) there is an increasing need for successful cooperation between the service and product organisations. Obviously, cooperation and coordination on business management level is needed, but it is also important that it works on an operational level, for example between service technicians and product salesmen.

6.3 Contribution to the literature on adopting service logic

Empirically-based literature on adopting service logic at industrial firms is sparse (Nordin 2005)\(^{38}\) and although mini-cases and ‘anecdotal evidence’ in journal articles can provide insights into specific issues, they do not provide comprehensiveness. The case studies in this thesis contribute to theory by providing understanding of a manufacturing context and knowledge of issues arising

\(^{38}\) For example, despite recent attention given to s-d logic in book chapters and special journal issues (Aitken et al. 2006; Lusch and Vargo 2006a; Vargo and Lusch 2008b), most of the scholarship has been consumer oriented. Also of note is that in Vargo and Lusch’s (2004a) seminal paper, the term ‘consumer’ was used 38 times. Exceptions to the consumer dominance of studies so far are Ballantine and Aitken (2007), Flint and Mentzer (2006), and the Industrial Marketing Management special issue on the transition from product to service in business markets (Jacob and Ulaga 2008). Notwithstanding, Palmer, Winklhofer, and Brodie (2006) have called for more research on the application of s-d logic in industrial marketing settings.
during the service infusion, such as the organisation and structuring of industrial service offerings.

Applying service logic as a market orientation means that the traditional basis of division in goods sales and after-sales services disappears and that the customer relationship becomes the centre of the service solution, regardless of its combination of direct and indirect service components (i.e. services and goods). This has implications for the way firms organise in order to offer service and it implies a process view, which means that sales, service, manufacturing, engineering, R&D, finance and other local and central organisational entities need to work integratively, and together with customer units. Developing a service culture with shared values and beliefs means that information should be made symmetric between all the parts of the service function. When the customer-supplier relational process is in focus, maximising the unit sales of various product lines and services is subordinate to the long-term relationship value-in-use (i.e. value for both customer and supplier).

Although service literature highlights the importance of personal interactions, as illustrated in this thesis, the relative emphasis of interactions for service provision is not only contingent on the type of service but also on technology. Technological change is affecting and altering existing service processes and customer interfaces, which means that services do not necessarily fit into pre-defined service design categories (Paper 2). Furthermore, new ICT applications and information-based services can have significant effect on service productivity (Paper 1), differentiation (Paper 5), and value creation, in other words; i.e. ICT as a platform to enable new offerings. Moreover, uniform processes enable closer central-local integration (and in the case firms also an increased centralisation) and better KPIs and performance-tracking systems. This means that the predilection for personal interactions that is apparent in much of the services marketing literature should perhaps be more balanced; automated processes and human-computer interaction can improve customer perceived quality and reduce costs simultaneously, even if social bonds and market sensing may weaken as a consequence.

In accordance with a service logic, knowledge (renewal) is regarded as the fundamental source of competitive advantage (Ballantyne and Varey 2006; Vargo and Lusch 2004a), and the acquisition of specialised skills and knowledge is often a prerequisite for the ability to offer new types of services. This means that effective organisational learning as well as the ability to unlearn is needed, which can be difficult (Sinkula 2002). For example, it can be difficult to unlearn things such as a salesman’s focus on product sales and a service technician’s working method for maintenance and repair activities. Since more extensive and process-orientated service offerings generally require a higher level of reciprocity and collaboration with customers, customer
relationship management skills\textsuperscript{39} become even more important (cf. Christopher, Payne, and Ballantyne 2002; Gummesson 1995b). Based on the empirical evidence and analysis, a final comment on the s-d logic of marketing is that the conceptual polarisation (and simplification) of the g-d and s-d logic is not fully reflected in and supported by the findings in this thesis. For example, the firms’ traditional business logies, which overall are congruent with g-d logic rather than s-d logic, also share some central components with s-d logic, such as viewing customers as resources with whom to interact, not as isolated entities which are passive targets of marketing\textsuperscript{40}. Not only service organisations but also many product organisations have emphasised and highlighted the importance of long-term customer relationships, where social aspects such as trust, commitment and even friendship links are important ingredients\textsuperscript{41}. Thus, even if developed customer relationships are often a prerequisite for service sales, the shift from an industrial business logic to a service business logic cannot be equated with a shift from transactions to relationships. Although many basic product and service offerings are based on transactional routines rather than on interdependence and reciprocity, it does not imply that trust and long-term commitment do not exist. In fact, despite increased service orientation, there are many long-term relationships both personal and at a firm level that actually become less important as more extensive offerings tend to involve more professional buyers and an idea of ‘objective’, monetised value.

\textbf{6.4 Managerial implications}

“Because of the specificity of service management, it is not that easy, nor natural, for a manufacturing firm to carry out a service strategy” (Mathieu, 2001a, p. 451).

This quotation capsulises one issue illustrated in this thesis; the fact that the management of industrial service offerings in a manufacturing context is in many ways a challenging undertaking. A goods-services transition has significant implications for strategy, organisational structure, and costs, and it also requires a deeper understanding of customers. As in the TMHG case, service innovation is either triggered by external or internal factors (including technology), and this makes the spanning capability to integrate the inside-out and outside-in capabilities critical (cf. Day 1994). Moreover, because the transferring of knowledge and services across geographical boundaries (i.e. across subsidiaries) is often difficult, central-local integration can enable, or be

\textsuperscript{39} In spite of the commonly used term ‘customer relationship management’, “it is the quality of the relationship that can be ‘managed’, not the relationship as such” (Ballantyne and Varey 2006, p.337).

\textsuperscript{40} A possible reason for this is that the foundations of s-d logic are based predominantly on North American lines of thought (cf. Grönroos 2008) and, it is argued, implicitly consumer orientated. Whereas customers have been viewed as passive targets à la the 4P model in traditional American consumer marketing, (Nordic and other European) industrial marketing scholars have been arguing for decades for the importance of viewing customers relationally regardless of whether the core offering is goods or services. The importance of trust and long-term commitment for traditional product sales too has been stressed in various empirical studies of business relationships on industrial markets (see, for example, Hammarkvist, Häkansson, and Mattsson 1982; Holmlund and Törnroos 1997; Häkansson and Snehota 1995).

\textsuperscript{41} However, it has been more difficult to cultivate the customer relationships without continuous interactions in the form of service provision.
enabled by, the central organisation taking on the supervisory role of a ‘liaison centre’. In this way, the central organisation tries to facilitate and impact the transfer of knowledge between geographically dispersed organisational entities.

The service function as a metaphor can be useful when communicating the importance of services and the interrelatedness with the rest of the organisation in order to create better awareness and willingness for cultural change. One related issue is how to define what the service business of the firm is and how to measure revenues from and value of industrial services. Industrial services are not only traditional after-sales services but include technical consulting, rental sales, and other services for which parts of the service function other than the service organisation play a critical role. Therefore, the firm needs to have a clear service strategy and purpose for enhancing its service offering. In other words, the firm must decide if it is a strategic repositioning to support increased product and spare parts sales only or if it is part of a change of the firm’s business model from manufacturer to service provider, something which would imply that the firm’s manufactured goods would no longer be the centre of the firm’s value proposition. In either case, the choice has consequences for how to manage the service function, although these consequences are very different.

Another managerial challenge concerning industrial services is how to determine their strategic importance and financial contribution. This is problematic, particularly if the service organisation is separated from the ‘core’ parts of the firm. For example, if measured as a specific activity (on the basis of cost per service technician hour for example) it is possible that a service contributes little to the firm’s profit. However, if sales of services and product lines are not viewed specifically but, instead, the focus is on the customer relationship, the picture may become a different one. When not only focusing on return on investment (ROI) and other established financial KPIs, but rather taking the relationship value into account (e.g. by measuring return on relationships (ROR) as suggested by Gummesson (2004b)), it is possible that the same service is seen as having a long-term, revenue-generating role such as constituting as a building block for stronger social bonds, input to customer co-innovation, and as prerequisite for future product and service sales. Hence, it requires a long-term view of customer relationships, something which does not fit well with the short-term financial goals that tend to drive many enterprises (Payne, Storbacka, and Frow 2008). An alignment between service strategy and corporate strategy is needed and this should be reflected, for example, in financial and revenue growth targets (cf. ITT Flygt). Internal measurement systems and financial bonus systems therefore also need to be aligned with the business logic of the service operations.

**6.5 Suggestions for future research**

One of the interesting issues to expand within the industrial services research area is a study of the phenomenon from the customer’s perspective. This would contribute to further insights into
the goods-service transition. In addition, external actors other than the customer have an effect on the provider’s industrial service offering, which is particularly evident in some industries.

It would also be of further interest to study the internal organisation and how to manage the co-existence of two business logics within the firm and how this interrelationship evolves as the firm enhances its service offering. Another interesting organisational aspect would be to study how to manage the increased complexity and risk related to enhanced service offerings and global customers (Nordin et al. 2008).

Another important area of research concerns service profitability. Although industrial services are often pointed out as a high-margin business, high investment in enhancing the service business does not necessarily generate the expected financial returns (cf. Gebauer, Fleisch, and Friedli 2005). Therefore, analysing profitability figures would possibly give a more balanced view of service profitability and a better understanding of the differences between industries and between different types of industrial services.

Yet another interesting area is service innovation. Because service innovation is not limited to the service offering and the service production processes, manufacturers need to have an understanding of how one type of service innovation affects other parts of the service system and business model (Kowalkowski, Kindström, and Brehmer 2008). Furthermore, the increasing importance of services for many manufacturing firms, means that service development and innovation strategies become a necessary and integral part of their strategic work. However, traditional NPD models are often applied on the firms’ service development processes. Thus, it would be highly interesting to further analyse the requirements on service development in a manufacturing context, taking into account services-specific characteristics, various forms of customer co-development/innovation, and the interdependence with the firm’s capital equipment (Kindström and Kowalkowski 2008a).

Finally, the largest market potential for industrial services in many industries is actually not integrated solutions and other extensive, project-based services. In addition to a sequential repositioning from basic offerings towards more complete ones, in many manufacturing firms there is a move from complex, customised offerings (i.e., integrated development projects) towards less complete ones. It is important to recognise this phenomenon as firms can utilise distinct competences from both basic and complex offerings when formulating strategies and designing offerings. That is, firms selling solutions to key account customers can use standardisation and downscaling to address the middle segment of the customer range. Future studies should further analyse the organisational requirements for a successful integration and utilisation of competences from basic and complex offerings (Kindström and Kowalkowski 2008b).
the goods-service transition. In addition, external actors other than the customer have an effect on the provider's industrial service offering, which is particularly evident in some industries. It would also be of further interest to study the internal organisation and how to manage the co-existence of two business logics within the firm and how this interrelationship evolves as the firm enhances its service offering. Another interesting organisational aspect would be to study how to manage the increased complexity and risk related to enhanced service offerings and global customers (Nordin et al. 2008).

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Lindberg, Nina and Fredrik Nordin (2008), "From products to services and back again: Towards a new service procurement logic," Industrial Marketing Management.


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### Appendix: list of respondents

<table>
<thead>
<tr>
<th>Date Respondent</th>
<th>Respondent</th>
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<tbody>
<tr>
<td>2005-01-17 (project meeting), 2005-09-08, 2005-09-29 (workshop)</td>
<td>Aftermarket Manager, ITT W&amp;WW</td>
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<tr>
<td>2007-01-10 (interview)</td>
<td>Product Manager Spare Parts, ITT Flygt</td>
</tr>
<tr>
<td>2007-01-18 (interview)</td>
<td>General Service Coordinator, ITT Flygt Sweden</td>
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<tr>
<td>2007-04-12, 2006-09-19 (project meeting)</td>
<td>Business Development Analyst, ITT Flygt</td>
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<tr>
<td>2007-04-16, 2006-09-19 (project meeting)</td>
<td>Technical Manager, ITT Flygt</td>
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<tr>
<td>2007-04-30 (interview &amp; strategy meeting)</td>
<td>Marketing Manager - Industrial, ITT Flygt UK</td>
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<td>2007-04-30 (strategy meeting)</td>
<td>Business Development Manager, ITT Flygt UK</td>
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<tr>
<td>2007-04-30 (strategy meeting)</td>
<td>General Manager Service &amp; Repair, ITT Flygt UK</td>
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<tr>
<td>2008-01-30 (interview)</td>
<td>General Manager Marketing, ITT Flygt UK</td>
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<td>2008-06-12 (interview)</td>
<td>Central Rental Manager, ITT W&amp;WW</td>
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<td>2007-01-10 (interview)</td>
<td>Customers to ITT W&amp;WW</td>
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<td>2007-04-11 (interview)</td>
<td>Maintenance Engineer, Norrköping Vatten</td>
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<td>2007-04-12 (interview)</td>
<td>Application Specialist, Norrköping Vatten</td>
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<td>2007-03-02 (interview)</td>
<td>Industry specialists</td>
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<td>2007-03-02 (interview)</td>
<td>Research Fellow, CENTRIM, University of Sussex</td>
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<td>2006-12-05 (interview)</td>
<td>Sales Development Manager, BT Europe/TMHE</td>
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<td>2006-12-20 (interview)</td>
<td>Service Manager South, BT Svenska</td>
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<td>2007-01-03 (interview)</td>
<td>Application Specialist Sales Support Europe, TMHE</td>
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<td>2007-01-05 (interview)</td>
<td>Sales Manager South, BT Svenska</td>
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<td>2007-01-22 (interview)</td>
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<td>2007-04-13 (interview)</td>
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<td>2007-05-04 (interview)</td>
<td>Managing Director, BT Rolatruc (later MD in THMUK)</td>
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<td>General Manager Rental, BT Rolatruc</td>
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<td>Customers to Toyota Material Handling Group</td>
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<td>2007-09-07 (interview)</td>
<td>Repair/maintenance Foreman, Beslag &amp; Metall</td>
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<td>Senior Purchasing Manager, IKEA</td>
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<td>2007-09-20 (interview)</td>
<td>Logistics Manager, Proton Engineering</td>
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<td>2007-09-20 (interview)</td>
<td>Purchasing Manager, Husqvarna</td>
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<td>2004-11-23 (discussion forum)</td>
<td>Vice President Genuine Parts &amp; Service</td>
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<td>2004-11-23 (discussion forum)</td>
<td>Senior Manager Customer Care</td>
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<td>2004-11-23 (discussion forum)</td>
<td>Manager Future Care Support Processes</td>
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<td>2004-10-13 (discussion forum), 2005-02-03 (interview)</td>
<td>Head of Support Solutions</td>
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<tr>
<td>2006-01-17 (project meeting), 2005-09-29 (workshop)</td>
<td>Service Manager</td>
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Part III
The industrial services function: empirical evidence

In order to give a better understanding of the industrial service function, the case studies of ITT Flygt and Toyota Material Handling Group, the two main case companies, are provided. Both case companies have a local (i.e. most often synonymous with national), regional, and central (i.e. headquarters) organisation and in the case of ITT Flygt, it is on the EMEA (Europe, the Middle East and Africa) region while in the case of TMHG, the focus is on the European region.
ITT Flygt is a leading supplier of submersible pumps, mixers, and accessories, as well as services for use in environments ranging from water and wastewater treatment, raw water supply, abrasive or contaminated industrial processes, mining, and crop irrigation. Sales amounted to SKr7.84 billion in 2006. The company was founded in 1901 and its corporate headquarters are located in Stockholm, Sweden. In the 1940s, the world's first submersible close-coupled motor driven pump was developed and today, the most common products are:

- Submersible drainage pumps for building sites and the dewatering of mines
- Submersible sewage pumps and mixers for treatment plants and pumping stations
- Submersible propeller pumps for prevention of flooding and irrigation.

A wide variety of products are offered, ranging from SKr2,000 to SKr2m each and from 10 kg to 10 tons. The enterprise has over 4,500 employees and it has over 40 sales companies worldwide, which it fully or partly owns. Two manufacturing entities are located in Sweden, one in Germany, one in China, and one in Argentina. Europe is the most important market as a majority of all sales takes place there. The company is organised into three regions; EMEA, Asia Pacific, and Americas.

Since 1968, ITT Flygt AB has been part of the US engineering company ITT (International Telephone & Telegraph) Corporation with a 2006 turnover of $7.9bn (SKr58.3bn) and approximately 41,000 employees around the world. In 2006, the Fluid Technology segment of ITT had revenues of $3.1bn (SKr22.9bn), making ITT the world's largest pump manufacturer. North America and Europe are the two major regions and the largest product segment is wastewater handling. Since 2007, the Fluid Technology segment has been divided into three value centres: Water & Wastewater (W&WW), Residential & Commercial Water, and Industrial Process. ITT Water & Wastewater was created through the merger of ITT Flygt and AWT and includes the brands Sanitaire, Wedeco and Leopold, and total sales amounted to $1.6bn (SKr10.8bn) in 2007.
ITT Flygt

ITT Flygt is a leading supplier of submersible pumps, mixers, and accessories, as well as services for use in environments ranging from water and wastewater treatment, raw water supply, abrasive or contaminated industrial processes, mining, and crop irrigation. Sales amounted to SKr7.84 billion in 2006. The company was founded in 1901 and its corporate headquarters are located in Stockholm, Sweden. In the 1940s, the world’s first submersible close-coupled motor driven pump was developed and today, the most common products are:

- Submersible drainage pumps for building sites and the dewatering of mines
- Submersible sewage pumps and mixers for treatment plants and pumping stations
- Submersible propeller pumps for prevention of flooding and irrigation.

A wide variety of products are offered, ranging from SKr2,000 to SKr2m each and from 10 kg to 10 tons. The enterprise has over 4,500 employees and it has over 40 sales companies worldwide, which it fully or partly owns. Two manufacturing entities are located in Sweden, one in Germany, one in China, and one in Argentina. Europe is the most important market as a majority of all sales takes place there. The company is organised into three regions; EMEA, Asia Pacific, and Americas.

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The creation of ITT W&WW implied an integration of Flygt and most of the operations of the business unit AWT (Advanced Water Treatment). By combining Flygt’s wastewater and dewatering pumps with AWT’s biologic, filtration, and disinfection products, ITT believes that the W&WW organisation offers a complete line of transport and treatment systems to municipal and industrial wastewater customers (Pump Industry Analyst, August 2007). However, when most of this study was conducted, Flygt was a separate business unit of the Fluid Technology segment.

**Service strategies**

ITT Flygt is working strategically to become more market and customer orientated, which is a change from previous marketing strategies. Due to the product- and production-orientated corporate culture, the strategic change is thorough and time-consuming, and two major issues are the displacement of power and speed change. The displacement of power is assigned to top management level; from the product/manufacturing and R&D organisations, who are not used to viewing the marketing organisation as an orderer, to the marketing organisation. Speed change refers to the increased pace in which the marketing strategies are changing. The lack of concrete intra-firm dialogue about service strategies can also be assigned to the lack of a central after-sales organisation between 2000 and 2003. During these years, instead of having separate product lines of which after-sales was one, the firm was organised into business areas. Each business area was responsible for services for its own product lines, but the service business did not receive sufficient attention and management power within this organisational design.

The increased market orientation can be derived from both internal and external factors. For example, competitors like the Danish firm Grundfö, are targeting the firm’s market-leading position in certain segments while internally, the parent company ITT is making higher demands on growth than previously. Since it is difficult for ITT Flygt to expand within its core product business, this means increased focus on new offerings and on the service market. For a long time, ITT Flygt had espoused the strategy of being the market leader for submersible equipment. Recently however, the firm removed ‘submersible’ from its strategy, something which implies that the firm may come up with more products and solutions for dry installations too and that it aims to be perceived as more than a supplier for wet installations; i.e. as capable of offering solutions to customers’ needs regardless of whether these include submersible equipment or not.

**Business development**

ITT Flygt has traditionally limited its market offering to products, but increasingly, the firm will extend its offering to include subsystems. For example, it has started to deliver prefabricated pump stations with ‘intelligent’ control systems. Unlike sewage-treatment plants and other large systems, these subsystems are a market segment where the firm is not competing with contractors who build the larger systems. ITT Flygt has a major installed base and is generally acting more as an order receiver than as a proactive sales organisation; the lack of knowledge
about the customers’ installed bases makes it more difficult to act proactively. Some managers perceive a lack of proactivity in the sales organisation and from the central organisation towards the sales companies, something which makes it more difficult to work with business development and enter new market segments. Furthermore, on top management level, it is considered that Flygt is too slow at implementing new ideas, including new service and rental concepts. Although this is now changing, business development has been synonymous with products development over the years. With regard to future business development-related challenges and possibilities, one central manager believes that:

“the main challenge that we have is ourselves. The customers need us to develop our business; the demand is out there. But the challenge is actually our internal organisation; out way of thinking and our way of working; another way of thinking has to permeate the organisation…”

Taking care of local competencies centrally, formalising these, and disseminating them to other sales companies as well as creating interfaces between local sales companies, are things that the firm needs to improve. Therefore, it is vital that local managers, specialists and/or other key individuals are always involved in centrally initiated projects since it is a prerequisite for local success. After ‘training the trainer’, these local managers can teach their local organisations and implement the changes. In the case of customer involvement in business development projects, customers are generally engaged in activities such as phone interviews and in-depth interviews.

**The service offering**

Of ITT Flygt’s total sales in 2004, services and service-related activities constituted an obvious, although growing, minority. Spare parts sales made up approximately 14% of total sales whereas activities categorised as Service (i.e. workshop repair and maintenance) constituted 5%. The activities categorised as industrial services are Service (i.e. workshop repair and maintenance), Spare parts, Installation, Rental, and Replacement pumps, making service sales approximately 35% of total sales.

Although the service offering mainly consists of single, unbundled services or basic forms of SLAs, the firm’s ambition is to increase both the number of contracts and their scope. In their marketing towards customers, ITT Flygt highlights not only its products but also tries to communicate the image of being frontrunner in knowledge-demanding service offerings, e.g. with slogans such as “We are famous for our products. But our job is to create solutions”. The ability to offer customers of all sizes trouble-free operations at the lowest possible maintenance and energy cost, by means of advanced monitoring and control systems for example, is emphasised.

An aftermarket value ladder has been used internally for communicating and marketing the development of service offerings (see Figure 1). The extent of the offering depends on the
customers’ willingness to outsource service activities to providers like ITT Flygt. Spare parts and MRO (maintenance, repair, and overhaul) have traditionally been offered, whereas long-term service contracts are examples of more recent offerings. Condition monitoring, asset management, and operations are all more extensive offerings very much connected to the individual customer’s outsourcing intentions and to the conditions in the local service organisations. There are some condition monitoring contracts and a few asset management contracts in place, but to date, there are no operations agreements where the customers pay a fixed price per volume of liquid. A first step towards new offerings is to improve the profitability, particularly with regard to service hours, before fine-tuning offerings towards customer segments.

Fixed-price repairs

Fixed-price repair offerings were introduced on a wide front 2004-06. Initially, there was massive resistance from many subsidiaries but now more and more of them are promoting these services. ITT Flygt has four types of fixed-price repairs to offer customers: from a basic form that only includes inspection without repair, to the most advanced one, where all the components in the pump are replaced. Similarly, spare parts for these repairs are likewise ordered in four levels only: from no parts to very many. Hence, structuring the offerings has enabled ITT Flygt to better structure its deliveries, service production, and service development.
The fixed-price repairs are offered to customers at a predefined fixed price, regardless of the exact time and number of parts needed to solve the particular repair. The different repair levels are intended to suit common repair types, and the advantages for the customers are simplicity when ordering and faster processes, i.e. less downtime. For ITT Flygt, the fixed-price repairs save time for inspecting of the pump and calculating costs, facilitate the internal streamlining of administration, and enable personnel to more easily specify and communicate customer benefits. The different fixed-price repairs from lowest to highest-level repair are:

- **Level 1:** inspection and diagnostics, including oil change
- **Level 2:** replacement of wear parts, i.e. o-ring, outer seal, cable, impeller, diffuser
- **Level 3:** major overhaul including bearings
- **Level 4:** major overhaul including stator.

ITT Flygt has a fixed-price repair list, in the form of a matrix constituting pump type and repairs with 10-20 elements. This modular thinking is relatively new and these services are seen as a way to compete with local service competitors. By specifying the repair cost, the intent is to achieve a competitive advantage over smaller competitors who state their hourly rates but not how long time the repair will take. In order to make correct estimations of repair costs and decide whether to repair or replace the pump equipment, it becomes vital for the service organisation to approximate both the repair cost and the cost of replacing the broken piece of equipment with new one. Nevertheless, fixed-price repairs only account for a small share of total service sales and local variants of the four levels are common.

**Service level agreements**

ITT Flygt’s service contracts are packages of services and goods offered to customers on an annual basis, and these include preventive maintenance visit(s) to installations along with various packages of included parts. The selling point is that SLAs create value for customers in terms of reliability (i.e. maximised pump uptime), extended product life, cost control, and expert advice, including statistics and visit reports. SLAs also serve as a possibility to outsource activities. ITT Flygt in turn, obtains a fixed, predictable income, better management of service technician utilisation, and is in a better position for replacement business. There is no difference in service personnel regarding the different agreement levels. However, for some contract forms, ITT Flygt can let a service partner do some of the services. In many countries, maintenance is divided into preventive and corrective; corrective maintenance is generally carried out in the workshops, whereas preventive maintenance takes place in the field.

On many markets, ITT Flygt offers its customers different SLA levels with reports, analyses, and advice available to a varying degree in all agreements. The four SLA levels (three standardised and one customised) originally come from the UK subsidiary and these SLAs have been introduced at
other markets as well, although, so far, mostly with less success than in the UK. In the UK, SLAs are called Flexicover and the contract levels are marketed as Bronze, Silver, and Gold:

- **Bronze** is a basic SLA, allowing an annual preventive maintenance visit whereas spare parts, repairs, corrective maintenance, and other site visits are charged at the going rate.

- **Silver** includes preventive maintenance twice a year, with corrective maintenance and other visits at the going rate. Consumables, i.e. impeller, wear rings, o-rings, and oil, are also free, whereas other parts are at the going rate too.

- **Gold** includes preventive maintenance twice a year and corrective maintenance and free pump parts as well. Any breakdowns between regular services are covered, although remaining services are at the going rate. If the customer’s pump station is not the size or type to warrant a complete Gold contract, ITT Flygt personnel can recommend a Silver contract instead.

In addition, Flygt offers customised (i.e. Platinum) SLAs. A selling point used for service contracts is that ITT Flygt’s “planned maintenance is a safeguard against expensive failure and keep the units working at optimum efficiency. With Flexicover your annual maintenance cost can be budgeted in more detail” (from the Flygt UK webpage). The service contract logic is that the SLAs are bundled offerings composed of various unbundled service components. As the SLA’s service scope increases, the pricing moves from mainly variable to fixed (see Figure 2).

![Figure 2. ITT Flygt’s service contract design.](image-url)

With regard to service agreement levels, the ambition is to sell more extensive forms of agreements, even if today the focus is on the first two service levels, partly due to a lack of customer interest in more extensive ones. Risk increases concurrently with the extent of the offering and ITT Flygt has become increasingly cautious about what equipment is taken over in terms of standards and upgrading possibilities for example. Even though the aim is to increase the number of higher-level agreements, there is a reservation connected to the number of service
hours; nonvalue-added service hours must be avoided in order not to erode the profitability of the SLAs.

Having a contractual undertaking often involves complex situations where the customers possess a maintenance and operations competence that ITT Flygt to some degree has to take over. Risks associated with SLAs are not clear for all areas of application, which means that it becomes more difficult to make money on some of these agreements. The introduction of new monitoring and control systems and new products can however, change the situation in the long run.

Besides being profitable, SLAs enable local service organisations to have a large percentage of the turnover from the beginning of the year and make it possible to schedule. Nevertheless, it can be difficult to have a satisfactory process and generally, ITT Flygt has not assigned enough resources to selling SLAs; it has instead been more or less a sideline for the service manager or the salesman responsible for the customer.

The SLA design and content are formulated by ITT Flygt and are therefore relatively standardised. Different types of undertakings might have different requirements regarding service processes, but this is not something ITT Flygt has focused on. Since the majority of contracts on most markets are either Bronze or Silver, the service processes have been streamlined primarily for these two contract forms. It is thus believed that there is potential for SLA processes to correspond more efficiently to the agreement level and the customer segment. Since all three contract levels are in principle standardised, service personnel are familiar with the work routines, administration is minimised, and the customer knows what to expect. Service contract levels are also relatively standardised between countries, even if the company has cut out some details from the SLAs on some markets because these made them more difficult to sell.

**Rental**

Rental is a high-growth business for ITT Flygt, although the turnover varies significantly between markets. In general, ITT Flygt offers a range of electric, diesel and gas pumps, mixers, generators, and accessories for emergency, temporary, and semi-permanent pumping of non-clean water and effluent. However, because customer demand is very different from market to markets, the rental offering and its management differs among subsidiaries.

**Systems engineering**

Systems engineering and design are value-creating services that ITT Flygt offers. For example, ITT Flygt offers lifecycle cost calculations and the company has in its possession software for things such as the calculation of fluid transients. Even if different cost parameters dominate the lifecycle cost, depending on the type of system and the type of application, in the great majority of cases the purchase price of a pump or mixer constitutes only a minor part of the lifecycle cost. The combined costs of energy and of maintenance have a far greater impact on the lifecycle cost than the purchase price, and ITT Flygt therefore tries to make these the prime considerations
when reducing lifecycle costs. When ITT Flygt makes a lifecycle cost analysis, all costs over the lifetime are added together and recalculated at the net present value. The selection of pump components starts by personnel estimating the losses in the complete system, which in turn, allows a more accurate planning of overall system efficiency.

When a salesman or service technician visits a public utility customer and finds out that the pump station is on the municipality’s list for reconstruction or exchange, ITT Flygt usually becomes involved in putting up measuring and control equipment at the site to monitor existing liquid flows and checking how many hours per day the pump station is working. If the effect is unnecessarily high, considerable savings can be made for the customer by reducing the effect but despite the savings, it is difficult for ITT Flygt to charge for these types of services.

ITT Flygt produces monitoring and control systems for many different pump and mixer applications and supplies hardware such as pump controllers, sensors, electrical start equipment, and cables. The company also has software for running the system. The PC-based supervision software applications range from those operating in wastewater treatment plants and pump stations to products which pump groundwater from building sites. Sometimes, the customer has its own monitoring equipment but if this is not the case, a salesman can discuss the matter with the customer and lend him equipment for some months. If the customer has a service contract, ITT Flygt can monitor how much the maintenance cost is and when it is time to upgrade or replace the equipment. Often, the customer has a long-term policy that states that ITT Flygt has to rebuild or exchange 3-5 pump stations per year and ITT Flygt can itself plan and prioritise the work. Although these process analysis services add much value for the customer, it is difficult to obtain payment for them as the customer expects help with these things. The only situations in which ITT Flygt receives payment for these services is when a study is made of pump stations, when there is a competitor pump, and when it is not a potential business opportunity. However, these situations only occur in 2-3% of all cases.

**Warranty**

The service organisation or possibly an authorised service partner are involved in warranty undertakings. The warranty period on products and labour is between one and two years, but in practice, the service organisation seldom makes sure whether customers have had the service prescribed for the guarantee to be valid or not. Often there is no need for maintenance during the guarantee period but even in cases such as when service personnel instruct the customer that the pump requires an annual oil change during the guarantee period, this is not always carried out. Upgrading of existing products can be problematic as this requires a continuous product development process, and time-to-market for a new product generation is often 10-15 years. The product life is usually 10-15 years too and the customers are thus usually recommended to replace the old product with a new, more efficient one. Because customers rarely purchase any
maintenance during the guarantee period, the result is higher wear; the focus is on separate items of expenditure rather than on the total cost.

**The service organisation**

Even if ITT Flygt highlights not only its products but also its various industrial services in its marketing toward customers, in reality, the number of service undertakings differs greatly between countries and the local service organisations are very heterogeneous. As pointed out by one local manager, “service started just as an add-on to the product sales side of the business”. Nevertheless, the importance of the service organisation has increased incrementally in many sales companies in recent years.

ITT Flygt’s first major service business project was Lean Europe, which ran until 2006, and the purpose was to make an extensive analysis of the organisation and find improvement potential. Members from both the central organisation and several European subsidiaries were involved in the project. Although a number of its subprojects achieved some success, other projects were withdrawn at an early stage and there were also difficulties coping with the large number of different business systems.

**Integration aspects**

The subsidiaries have a high degree of autonomy and few central resources and tools are allocated to support the local service organisations. As a uniform business and CRM system is being implemented, integration is also taking place in information systems and information management practices. Traditionally, the parent company has not provided the sales companies with all the systems required such as quotation systems, sales support systems, and logistics systems, in order to sell. Therefore, each sales company has had (or still has) their own systems (provided that they have all these systems). By having uniform systems, sales between markets would be more transparent and the consolidated cost of managing local IT systems, for example, would be reduced. Since the focus has been on product sales, services are still managed by ‘pen and paper’ on some markets. This means that there is no rational way to keep track of all the customers and service history, and that invoicing and other administrative tasks become more extensive.

The entrepreneurial spirit of the subsidiaries has been important for their success and many local managers feel loyal to the subsidiary rather than to ITT Flygt. Hence, attempts to increase the central-local integration are not always without friction. Knowledge exchange between subsidiaries regarding services is not formalised and has generally taken place on a spontaneous basis. Further, ITT Flygt’s marketing campaigns have previously differed between markets, and 2005 was the first time the same campaign for a product line was launched worldwide.
The central organisation

Although services are of strategic importance to ITT Flygt, top management has dedicated little time and effort to this issue and the internal status of the service organisation is not as high as local and central service managers would like. Therefore, a central service market organisation was built up at the firm. Previously, although there was an organisation for technical support, no one was working actively with the service offering. The new central organisation works with service business development and all European service managers from the subsidiaries meet four times per year, something that has significantly increased the focus on services. In 2003, the central Aftermarket & Service organisation was established. However, it was part of the Industry business segment until 2006, when it became a separate business segment in the new central marketing organisation. Although managers perceive that the service organisation still is treated somewhat unfavourably compared to other business segments, the last years have involved more focus on and awareness of service both centrally and in many subsidiaries. Beside the central organisation, there is a regional organisation in place. For example, the Nordic organisation, which was established about five years ago, has one after-sales manager who has the overall responsibility to after-sales services in the Nordic countries located in Norway.

According to central service managers, although this is slowly changing, there is still a lack of commitment to industrial services in the company. There is also an organisational problem connected to roles and responsibilities; it can be unclear who deals with sales, who is in charge of business development, who is responsible for pricing, etc. Since the central service organisation provides little help on pricing issues, subsidiaries work independently on price models for different service contracts. While the operative service selling is being carried out in the subsidiaries, the ambition is to increasing prepare common service strategies centrally. This is however encountering strong political resistance from local management either as well-established subsidiaries at major markets especially do not wish to lose some of their autonomy or because they consider the central strategies not to be aligned with local market conditions. Therefore, top management commitment plays an important role in changing the current processes into ones that are both more service-orientated and centralised.

The local organisation

ITT Flygt’s internationalisation started by operating through distributors, of which many were later bought by the firm and turned into subsidiaries. The subsidiaries are generally organised into a sales organisation and a service organisation, and the service organisation includes a number of service centres (see Figure 3).
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![Figure 3. The organisation within the ITT Water & Wastewater value centre.](image)

The subsidiaries are relatively independent from the head office. For example, unless local service contracts are extensive, the central service organisation seldom knows about specific contracts and the division between different contract forms. This is because reporting must be made on an aggregated level only, showing the total number of contracts per country. This can be regarded as a shortage of information but on the other hand, the central service organisation can not necessarily assimilate all the information it receives.

The many different information systems in the subsidiaries make it more difficult to obtain transparency and to synchronise information. It also involves higher costs since IT departments are needed locally. In addition, local service managers feel that few ICT resources are allocated to the service market organisation and that there is significant cost efficiency improvement potential. So far, service technicians do not use PDAs or laptops and generally, a great deal of time is spent on manual administrative work.

**Flygt Sweden**
Flygt Sweden, the Swedish subsidiary, is a special case organisation-wise since it is part of the parent company and it has two parallel organisations; one sales organisation and one service organisation. It is a matrix organisation in which the local service managers report to one of the four regional branch office managers who, in turn, report to the managing director. The service organisation is basically the only part of Flygt Sweden that has significantly expanded in recent years and of the 75 people working in the sales company in 2006, 38 were service personnel. However, the number of workshops has not increased over the last 20 years. On the contrary, for a period, there were several workshops for example in Norrland (i.e. Northern Sweden) connected to hydroelectric power plants. Many of these workshops have been externalised and nowadays operate as service partners, although with the same personnel (e.g. in Kiruna, Luleå, and Umeå). The only in-house workshop in Norrland today is in Sundsvall where most of the
customers (e.g. Boliden) are in the mining segment. Today, Flygt Sweden operates through eight in-house workshops and 20 external workshops operated by service partners.

In the past, rather than being an independent organisation, the service organisation was more closely linked to the sales organisation and perceived as something necessary in order to sell equipment. Parallel to the service organisation becoming seen to be more important, Flygt Sweden is going downstream; e.g. by repairing pump stations and not only single pumps and by signing SLAs with municipalities. It has also a closer collaboration with its authorised service partners, something considered important since the future strategy will, most likely, be not to increase the number of in-house workshops. In-house workshops require manpower and the turnover generated by a service technician is approximately one tenth that of a salesman. Moreover, in order to make money, service vans, environmental approval, and such things are needed and it is difficult to employ additional service personnel due to current employment policies. Thus, providing service is strategically important but the future approach is likely to involve in-house service as well as independent and authorised service partners. As stated by one manager, local presence is critical for many customers:

“The most important criterion for a customer when choosing a service provider is proximity. This is defined as one hour travel time. If this is exceeded, he will choose another provider in the area.”

However, it is seen as a risk to operate solely through in-house workshops since this involves increased fixed costs and assets and reduced flexibility. Nevertheless, in-house workshops are more successful than external ones with regard to sales of SLAs. Offering pump station repair and SLAs involves increased risk and requires certain competence and experience, something which differs also among in-house workshops. The workshops that offer more extensive services are generally more successful than the others and there is an ambition to increase the number of more extensive service offerings. However, there is no pronounced national strategy for increasing the share of SLAs.

The main drivers for more extensive service offerings are increased turnover and profit. With SLAs, there are advantages for the service organisation in terms of economies of scale and the ability to plan service utilisation in advance. Further, SLAs often secure future spare parts sales. As on other European markets, there is an increase in counterfeit or unauthorised spare parts sold by professional, international parts providers, something which did not exist to this extent in the past. Since spare parts sales is generally the most profitable part of the pump business, increasing internal awareness about the service market, something which is not sufficient according to some managers, is vital. Hence, the response to the increased competition can be seen as rather reactive.

Since Flygt Sweden sells complete pump stations, there is a golden opportunity to sell SLAs in connection to the commissioning of the pump station. The incentive for the salesman is that he
can profit by the service sales, provided that the customer belongs to his account. Thus, both the service and the sales organisation benefit from these sales, something which may facilitate increased understanding between the two organisations. In 2005, a leaflet describing the different SLA levels was brought out for the Swedish market. However, the organisation has not been very successful with sales of SLAs, something which one manager attributes to three reasons; i) major customers do not request these type of offerings, ii) since SLAs are relatively expensive, they cost too much for jointly-owned land associations to be interested, and iii) there is no dedicated service salesman for SLAs. Instead, SLAs are sold by the ordinary service organisation and partly by the sales organisation. For example, whereas 10-15% of the Swedish service sales can be assigned to SLAs (mostly Bronze level SLAs), the Norwegian sales of SLAs account for more than 50% of service sales.

Rather than SLAs, many major customers, such as mid-size municipalities and paper mills, are increasingly requesting framework agreements. These agreements are signed locally and imply a definite hourly rate and specified spare parts rebate (i.e. a net price list). Central (i.e. national) agreements are common for product sales but not for services. However, requirements from large pump customers or customers’ customers also have an influence on the service operations. For instance, SJ (the Swedish State Railways) and Vägverket (the Swedish Road Administration) require a five-year warranty from their contractors and this therefore affects Flygt Sweden as well, as the company has to offer a five-year warranty for Flygt equipment. Therefore, the subsidiary has developed a form of ‘service concepts’ to deal with these requirements.

The service organisation’s turnover has increased in recent years and although most of the increase can be attributed to services, a significant part can be connected to replacement sales. This means that service technicians sell pumps that it is not considered profitable to repair, and some managers see a potential in teaching service technicians to become better salesmen. Increased service sales are related to the increased outsourcing of services at customers, both private ones and municipal/public ones. Another change in recent years is that response times are most often specified in the agreements. Further, requests for 24-hour duty are something that is expected to become more common in the future; today, Flygt Sweden has no regular 24-hour duty.

**Flygt UK**

The service/aftermarket business accounts for approximately one third of the turnover of Flygt UK, ITT Flygt’s UK subsidiary. Flygt UK has 50-60 service technicians on the road and about 15 in its eight in-house workshops located around the country. Due to a consolidation in the pump market, today there are fewer pump firms providing services compared to a number of years ago. Figure 4 illustrates parts of Flygt UK’s organisation.
The SLA levels originate from the UK and compared to many other markets, the subsidiary has a high share of SLA sales. The sales of Bronze, Silver, and Gold contracts are split fairly evenly whereas it is considered that there is no demand for more extensive agreements such as availability contracts. In the future, it is believed that the competition in the service market will increase, thus driving prices down, and already today there is more competition and competitors working hard to take over Flygt UK’s customers. Flygt UK is looking for more extensive agreements with the larger customers and opportunities for bringing new customers into the service business. For example, increasing the number of preventive maintenance contracts among customers – from single householders to large firms – is seen as being important because these SLAs bind customers to use Flygt UK for repair and maintenance services. Flygt UK is trying to work proactively with its service offering and strategies, something expressed by two local managers:

“With any service business you can have a reactive side of the business (something is broken and you need to fix it). And from what I have seen from our service division here, is that it’s much more a phase of trying to develop a service offering to the customers so that it becomes maybe less reactive and it becomes a better relationship with the customer. So we’re trying to lock the customer in for longer with Flygt and we’re also developing packages that are attractive to customers”.

“We’re really trying to innovate with products that we can offer within a service environment. So we’ve got certain products, for instance Fixed Price Servicing which means that the customer in advance can know how much it’s going to cost to repair that unit and they can call us and tell us what pump they have and say they want a fixed price repair for that pump. That saves an awful lot of administrative work of making a quotation for that customer and we can go straight in and dismantle the pump and see what’s needed, order those spare parts, repair the pump and get it back to the customer. And that’s something that our workshop manager developed. And
we really try to always bring on new types of products that we can offer to the customers to make it easier for them and easier for us. It's something that competition is catching on to but we can have the edge for a certain time and it gives us a competitive advantage”.

Customers are segmented into four different industries: Municipal, Wastewater, Construction and mining, and Industry. In the UK, about ten large private water companies operate the wastewater market and apart from these water companies, which belong to the municipal segment, there are not many other large customers for the service business. Flygt UK is rather reliant on the municipal business and generally sets up commercial agreements with those water companies on the product and service side, which ties Flygt UK to the customers for usually three years. The privatisation of the UK market has made the water companies more reliant on external suppliers and, thus, opened up possibilities for vertical forward integration for ITT Flygt and other pump manufacturers (see also Windahl 2006).

For example, after having provided a maintenance agreement for submersible pump repair services for seven years, the service organisation was awarded a framework agreement by the £367m (2007 figures) turnover water company Wessex Water. The framework agreement built further on the existing relationship and included all of Wessex Water pumping stations (Pump Industry Analyst, February 2006). In 2007, the £919m (2007 figures) turnover water company Anglian Water extended its framework agreement with Flygt UK and besides supplying Anglian Water with pumps up to 7.5kW, the agreement implies that Flygt UK repairs all its own pumps irrespective of size. Furthermore, Flygt UK was assigned to help the water company to implement a total cost of ownership (TCO) approach to pump selection and to reduce costs incurred via pump energy consumption, thus, taking account of lifecycle costs, rather than just initial capital cost. The increased customer focus on LCC and more extensive agreements in the UK bring together the product sales and the service departments, as an increased cooperation between the two departments is needed when writing the specifications for the tendering documents (cf. Windahl 2006). The sales and service departments have traditionally been completely separate entities of Flygt UK, something which has made the development of more extensive offerings more difficult. However, the message from top management is that service and sales have common goals to achieve and need to work more closely together. If there is a conflict of interest, it often comes down to relationships between individuals in the sales and service organisations.

**Service technicians**

ITT Flygt’s internal service organisation is used for most activities, but service partners are also used and are more common on some European markets, such as the German and Italian, than on others. More than 400 service technicians are employed in the European subsidiaries. Focus on customers’ needs is a company core value that, according to ITT Flygt should guide service
technicians and other personnel in their daily work. So far, service technicians in none of the subsidiaries are using PDAs, but service managers believe that such ICT applications would be beneficial for the organisation by improved utilisation, reducing overall costs, reducing variance, better internal communication, etc.

**Part-time service functions**

ITT Flygt’s marketing organisation is a matrix organisation consisting of six business segments (Water & Wastewater Transport, Treatment, Building Trade, Industry, Dewatering, and Aftermarket & Service) and a number of supporting functions, such as Monitoring & Control (see Figure 5). Thus, the business function for Aftermarket & Service crosses the business units segments. The business segments are not to be equated with customer segments since one business segment may serve customers from many customer segments. For example, the Treatment segment has both municipal and industrial customers, Dewatering has construction and municipal customers, and Aftermarket and Service has customers from all customer segments.

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**Figure 5. ITT Flygt’s marketing organisation.**

The business segments are strategic areas for business development activities such as common applications, offerings, and/or business logics, and they are not suitable for activities such as operational sales and follow up. The standardisation of internal processes, both on central and local level, is seen as vital:

“[It is] extremely important. And it is very important for the sales companies; they must understand what we are doing. If all of us working with business development, regardless of the business area, are working in the same way, they can feel at home,
so to speak: “now we will have a Tollgate 1 meeting, now we have made an analysis”. Then they understand what we are talking about. It is not only the sales companies but also internally in the building [i.e. ITT Flygt headquarters] with R&D, IT departments, and the other departments. I think that to have a standardised process to work from is one of the most important things actually, regardless of what one is working with. Because it also becomes a quality assurance in itself and it becomes easier to bring people along, to get commitment, etc.” (senior manager).

Whereas the Aftermarket & Sales business segment is responsible for after-sales services and other product-related services, other services are developed within each of the five other business segments. The development of these types of services is related to the ‘maturity’ of the organisation, i.e. whether or not the focus is solely on products. For instance, the core offering (i.e. products and product-related sales) can be augmented and strengthened by being bundled with services, such as monitoring and control. Although many services are included in the offering and not specifically charged for, eventually, it should be possible to charge for some services that few, if any, others in the industry are able to offer. This could be engineering services that not even consulting firms have the knowledge to offer. Although not necessarily having a major potential in direct monetary terms, such services are perceived as having a market potential to position ITT Flygt as the leading provider of knowledge intensive offerings.

**The sales organisation**

Locally, salesmen generally focus on selling equipment and they do not perceive service aspects as being important. This behaviour is something service managers would like to change and there are also managers that would like the service technicians to become better salesmen, as they are considered to be in a good position to sell products and as already today they sell equipment to a certain extent. In general, there is a correlation between having an in-house service organisation on the local market and the number of service agreements sold by the product salesmen.

**Product development and manufacturing**

There are internal difficulties when it comes to business development across different functions and business segments. Most employees involved in consultation, calculation, taking measurements, as well as analysts, belong to the technical department, or possibly to the installation department, whereas employees working with industrial services belong to the aftermarket and service organisation. These two groups of personnel hardly communicate with each other, although it is possible to make them cooperate by putting them in the same business case. As a line organisation however, there are rather sharp dividing lines between them. Until recently, ITT Flygt has not been working systematically with business development centrally and, for instance, has not involved customers in workshops on a regular basis. Focus is still very much on product development and on the hardware. In successful projects the physical product has often been the catalyst for intangible additions to the offering, such as control systems. In the
long run, it is likely that pumps will demand less maintenance. This would imply that the traditional after-sales service business will play a less important role than it does today.

As soon as pumps and other equipment are phased out of production, so is the documentation connected to it. This is done in spite of the fact that the documentation will be needed during the equipment’s lifetime. The service organisation is aware of this problem, but according to service managers, there is a lack of understanding within the manufacturing organisation about the importance of correct documentation for the service operations.

For new product development (NPD) projects to be initiated, the marketing or sales organisation has to be the orderer of the project; without the commercial base, it is unlikely that the development project can start. The marketing/sales organisation makes a specification of requirements to ensure that the product will fulfil what they regard as market needs (although this does not necessarily equate with the actual needs of the users). Thus, for NPD projects, it is important not only to receive requests from the sales companies but also, to conduct interviews with customers and visit users in order to gain better understanding of customer needs. Otherwise, there is a higher risk that the marketing or sales organisations base their requirements on already existing ITT Flygt or competitor solutions, rather than on what it is technically possible to achieve, e.g. pumps that can bear more gravel and wear before breaking, manage challenging applications without losing high efficiency, and other products which are not currently available.

Further, an investment analysis based on sales price and volume is required in order to estimate whether costs are viable or not. Other specifications include environmental aspects, technical performance measurements such as pump curves and non-clogging ability, and market-related ones, such as adaptation to different voltages and frequencies. The manufacturing and construction organisations are involved from the start and later on, inputs from the service organisation are also obtained. With the exception of service intervals, many of these requests are about practical issues, such as how to perform service and installation in the field, how to lift the pump, how to place the pump in a half-dismantled condition, etc.

**Rental**

Rental is a high growth business for ITT Flygt and in recent years, it has been very successful on some markets, particularly in Australia, Brazil, Canada, Spain, and the UK. On many other markets, rental sales figures are very modest and often these sales companies only have the personnel responsible for rental working with it part time; thus, dedicated rental salesmen and technicians are a favourable condition for rental sales. Furthermore, it is critical to manage the local interfaces with the service and sales organisations. Since the service organisation performs service on the rental equipment, there can be problems regarding internal invoicing and transparent profitability aspects. Further, since salesmen traditionally just sell pumps and not
rental pumps and related services, it can be difficult to proactively sell rental. Therefore, it is preferable to have a separate rental organisation if possible.

The markets for rental vary significantly among countries, not only in terms of shares and turnover, but also in terms of customer segments. In the UK, there is generally a demand from the major water companies, in Spain the construction segment is buying rental services, and in Australia it is predominantly the mining sector. Consequently, since the application areas differ, the rental equipment also differs in different countries. On some markets, like the Spanish one, rental is managed not only by the in-house service organisation but also, through service partners. However, ITT Flygt is still responsible for the contract and does the invoicing to the customer.

In connection to customer projects, general industrial outsourcing has led to the development of short-term rental offerings, which in the EMEA region are particularly successful on the UK market and Flygt UK is continually expanding its rental fleet product range and service offering to exploit niche markets. In the UK, Flygt Rental offers emergency, temporary, and semi-permanent pumping of non-clean water and effluent, and it has a 60-page rental guide online with detailed information and technical data about the range of the rental equipment. The principal customers are municipalities, construction firms, quarries, and mining firms, and the rental services range from basic packages to turnkey rental packages, including pumps, mixers, aerators, and diesel pumps. Flygt Rental has experienced a rapid growth and in the UK, the turnover increased by 90% between 2004 and 2006. The rental business has its own transportation fleet, is operated by dedicated rental personnel, and it has improved its fleet mix, reduced the age profile of the fleet, and added new products to its portfolio in order to grow. Moreover, in order to meet the high demand, Flygt Rental is expanding the number of rental centres (it had seven rental centres in mid-2006) (Water Briefing, 2006).

Rental was separated from the service division of Flygt UK a number of years ago. In the UK, there are a handful of rental firms that are key customers of the product sales organisation, that is to say that they have there own rental fleet around Flygt products. By creating a separate rental division, a conflict of interest between the service division, which is perceived as relatively neutral, and the rental division, which is seen as a competitor to these rental firms, was avoided. In Sweden, some pumps are rented to construction firms and municipalities for a few weeks. The trend in the construction industry is that there is an increased interest to rent equipment, but so far, Flygt Sweden has not started offering formal rental agreements like the ones in the UK. What does exist, however, is dewatering, which is a concept similar to rental. Dewatering is packaged as a service and the customer buys pumping instead of pumps for short-term, temporary site dewatering and sewage bypass projects.

Unlike SLAs and other service contracts, a three month rental contract is seen as rather long-term as most contracts are shorter. Another difference from the traditional service organisation is
that 24-hour service readiness is critical. One central manager works with the rental business with the help of a local manager in the UK and helps local sales companies with the implementation of a rental business. For instance, a ‘rental handbook’ is developed, is made available online and is continuously upgraded. The rental handbook states and explains the most critical phases of the implementation, such as strategy and business plan, dedicated organisation and resources, a user-friendly system and efficient processes, a high quality product portfolio and optimised fleet, strong marketing and efficient sales, and the mind set of the personnel.

In many situations, rental can be a differentiator between ITT Flygt and ‘pure’ rental firms because ITT Flygt has an engineering expertise that those firms most often lack. Thus, it is not only a matter of delivering the rental equipment and having a 24-hour readiness, but also having the knowledge to help the customer with his needs and suggest solutions to his problem. For example, when a water company needs to make a bypass, ITT Flygt not only has the rental equipment necessary but also the technical expertise required to perform the operation.

Rental is seen as a major opportunity for organic growth but ITT Flygt is also acquiring external rental firms, e.g. because it can be easier to buy organisations that already have the right mind set than to try and transform the existing organisation through change management. Further, the firm is also growing through acquisitions of manufacturers, such as the 2003 acquisition of Italian-based, €3.9m revenue (2002 figures) Uniservice Wellpoint, in order to have a competitive rental portfolio. Uniservice Wellpoint produces a range of diesel and electric powered, vacuum primed centrifugal pumps and well point dewatering systems for both the rental and ordinary sales markets. ITT Fluid Technology president Bob Ayers viewed the acquisition of Uniservice Wellpoint as “a continuation of our strategy to enhance service solutions throughout the company, and will help our Flygt group migrating from a product provider to a solutions provider”. The strategy was to build on the combined strengths of the two firms to expand ITT’s rental presence (Pump Industry Analyst, April 2003, p. 16).

**Monitoring and control**

ITT Flygt offers telemetry, water monitoring, and data logging products to enable customers to remotely monitor not only water treatment works but also rivers, canals, estuaries, reservoirs, ports, and harbours. Many sales companies have a monitoring division that is responsible for the development of these offerings. Today, large customers such as large municipalities can buy control systems designed for their type of sewage system. This provides the customer with an overview of the operational status of his system and enables remote control of connected stations and plants, thereby reducing operational costs. Instead of having technicians travelling backwards and forwards visiting stations according to a rota, a control system with remote outstations enables better planned service and maintenance. However, the investments and fixed costs associated with the monitoring and control system means that the system is most cost efficient for customers with many pump stations. Therefore, a possible service could be to offer 24-hour
remote control services to smaller customers by letting the customers connect their pumps to ITT Flygt’s system. This is an example of a central initiative and there are several examples of similar local ones as well. In Sweden, for example, this is seen as a way of developing the customer relationships and integration further and also as a means to increase pump sales.

Supervisory control and data acquisition (SCADA) systems are becoming ubiquitous and in 1989, ITT Flygt acquired the Swedish monitoring and control firm MacTec Control, and thereby expanded its offering. Although there are possibilities for improvements, such as seamless integration with the pump equipment to reduce engineering hours, competition in this area is fierce and the firm competes both with local actors such as Swedish-based Cactus and global players like Mitsubishi and Siemens. Therefore, many customers only buy the pumps and the interface to the SCADA system from ITT Flygt while the SCADA system is purchased from a systems supplier. The importance of monitoring and control competencies and the potential for further development of these types of offerings was also a reason for ITT Flygt to sign an exclusive distribution agreement with UK-based Dynamic Logic, whereby ITT Flygt distributes Dynamic Logic’s telemetry and monitoring and control systems.

**Key account management**

At ITT Flygt, there is no central KAM organisation and the situation differs among local markets, with some sales companies like Flygt UK working with a KAM structure. However, in its drive to become more market orientated, the firm is reviewing whether or not to have key accounts in the regional organisations (EMEA, Asia Pacific, and Americas). The idea would be to manage interdependencies through a KAM organisation with the major, international consulting firms and contractors that have a large influence on the industry. Managing these relationships is of strategic importance for ITT Flygt if they are to become involved early in the processes in order to influence design choices so that there will be a fit between these actors’ requirements and ITT Flygt’s product range.

In the UK, the firm works with key accounts for services as well. In 2007, Flygt UK managed 2-4 water companies through a KAM structure since it is important to have good relationships with these customers and as major customers need certain amount of attention. Because many suppliers want to reduce the supplier base, it is believed that the opportunities for large agreements with major customers will increase in the UK.

**Externalised services**

Service operations are performed either by the local service organisations or by authorised and independent service partners. Extensive service offerings require competences most authorised service partners do not have, which makes having their own service organisation critical as more focus is given to the firm’s service operations. The situation differs considerably among European markets; e.g. in the UK, Flygt has a strong service organisation and no authorised
service partners, in Sweden Flygt operates both through the in-house service organisation and through service partners, and in Germany there is only one Flygt-owned workshop and more than 100 service partners. Clearly, if the firm has a strong service market presence or if some service partners are more powerful than the in-house service organisation and/or play a central role in the service delivery system has different implications on service strategies and operations.

The local service partners which ITT Flygt collaborate with, use on average only about 50% genuine spare parts compared to the company’s own service organisation; the remaining share is considered to be cheaper counterfeit or unauthorised parts. The figure differs noticeably however among different European markets; partners in Norway and Denmark have more than 50% genuine parts whereas Italy, Germany, and France have less than 30%. Particularly in Italy, there is fierce competition from local competitors which can be explained to a high extent by the fact that ITT Flygt lost a major spare parts market share when, several years ago, a decision was taken to outsource all service activities to service partners. Since then, the company has returned to having an in-house service organisation in Italy, although it does not have a dominant market position. In general, expansion in the service market is based more on organic growth than on acquisitions. An exception was made when ITT acquired Ellis K Phelps & Co, the largest US distributor of Flygt products. The $32m (2004 figures) company’s sales, service, and local monitoring and control business mainly revolved around Flygt’s equipment (Pump Industry Analyst, August 2005).

In Sweden, the firm has a three-channel strategy for its service operations; an in-house service organisation, authorised service partners, and un-authorised service partners, and one major challenge is to reduce the number of counterfeit or unauthorised parts sold by unauthorised partners. Besides, there are customers that serve their own equipment. Today’s strategy means that the service partners (both authorised and un-authorised) are classified into three categories. The highest level implies that the provider is a ‘genuine’ Flygt representative who markets the firm’s products, has a certain workshop standard, has the highest level of discounts, and has more support from Flygt Sweden; i.e., the highest requirements but also most benefits. This strategy also involves a geographical division of the market as authorised service partners have geographical exclusiveness.

Being able to deliver SLAs requires a rather high degree of competence, something many of the authorised partners do not have today. Although in the minority, some managers in Sweden try to actively work more rationally and in a more structured manner with these service partners and the linchpin in this strategy is to make them adopt Flygt Sweden’s way of working and move up the value chain and, as a consequence, both sell and buy more Flygt equipment. Despite being authorised service partners, some firms also sell non-Flygt pumps. For many of those, this is a matter of survival and something Flygt Sweden has to accept; in a place with two pump service firms, the best one generally becomes the authorised service partner. If Flygt Sweden should
choose to close the relationship, the service partner would still have the relationships with the local customers but would choose another pump supplier.

**The service sales process**

After the product sale and installation, the customer contacts either the local service workshop or a third-party service provider for service sales and resale. A standard product might need annual inspection and extensive maintenance every third to fifth year, and contacts between the company and customer representatives are made in connection to these supervisions. Major customers have daily contacts with their service provider, discussing when to make a repair or replace existing parts. These relationships and processes are what ITT Flygt calls its aftermarket processes. Apart from this, there are some direct spare parts sales where the customer effectuates the service himself and only orders the parts (see Figure 6).

![Figure 6. Actors involved in the service sales processes.](image)

Usually ITT Flygt offers customers SLAs during the end of the guarantee time as at this point of time the customer has become aware of the operating costs, although most customers already are aware of this as they have more than one plant. How the contract forms are designed if the customer signs an SLA, whether the local sales manager or the service representative is responsible, or if more internal people are to be involved in the contract negotiations is not yet standardised. There can be a sales representative who has a KAM responsibility for the customer but in practice, his/her focus is on product sales, so the service manager has to step in and visit the customer and promote SLAs. This approach is not unproblematic however as service managers are often former mechanics that have been more structured in their work and performed better, and therefore been promoted, but they are seldom appropriate salespeople. The result is that latent business opportunities are lost since fewer contracts are signed.

The cost dominating the customers’ total lifecycle cost is energy consumption; in the Nordic countries, it can be more than 90% of the lifecycle cost. On these markets, where the climate is colder than on most other markets, the heater element in the pump house sometimes consumes more energy than the actual pumping. The explanation is that the pumps are dimensioned for
maximum flow and are often not in use more than five hours per day, whereas a heater element can have almost the same effect as the pump but is switched on around the clock. Due to working environment reasons, ventilation is also installed in the pump house to prevent gas from rising and this too consumes energy. Nowadays, there is a lifecycle cost and environmental awareness among many customers, and as a result ITT Flygt has spent a lot of time and money on increasing the coefficient of utilisation from e.g. 70 to 75% on pumps. Consultants are quick to adapt the new efficiency requirements when compiling a specification and if the provider cannot deliver equipment that is efficient enough, he is fined. As seen here, however, pumps may account for a minority of the energy cost, which is something of which most customers are not aware.

On most markets, ITT Flygt sells prefabricated pumps with lids, and in the Nordic countries, a standard version superstructure is offered as well. The pump house can either be delivered prefabricated or in components and the excavation is either made by a local contractor or by ITT Flygt. Quite often, it is a combination; the local contractor makes the calculations because the municipality has to bury the pipes and then ITT Flygt lowers the pump house and makes the necessary connections. Not all subsidiaries are successful and profitable as local competition can be fierce, especially when local authorities favour local contractors to international companies.

**Service sales**

With regard to service sales, ITT Flygt usually approaches the customer when the equipment is delivered and installed or, if the customer has no interest of discussing it earlier, when the guarantee time has expired. Typically, the service manager who has the customer within his district brings up the issue of services and service contracts. Contractors generally only focus on price and they are uninterested in service contracts and aspects such as lifecycle costs, and energy consumption. As they usually only operate the plant during a few initial months, they have a short-term mentality that ITT Flygt has to comply with. As the customer often turns a blind eye to lifecycle costs initially due to internal reasons (e.g. separate procurement and maintenance budgets), when ITT Flygt has brought up lifecycle aspects and service offerings in early discussions with customers it has every now and then backfired. The company believes that the customer is unwilling to be reminded of all the operational costs in the procurement phase, and therefore instead turns to a competitor that does not mention running costs.

Some public customers in Sweden have an Agenda 21 programme and they have been advised by local politicians to increase their environmental awareness, which means that energy consumption is a parameter that must be included in the information given to the consultant for the specification. Lifecycle costs are then included and sometimes, there are calculation models of how to balance between product price, service cost, energy cost etc. Sometimes consultants have included a clause in the specification stating that the supplier will be fined if the energy efficiency stated is not achieved. Suppliers like ITT Flygt, which do not compete with lowest unit price, are
keen to help consultants with such specifications because they do not want to be involved in a price war on products.

The division of the wastewater industry into a capex (i.e. equipment sales and agreements) and an opex (i.e. service sales and agreements) side, makes it more difficult for providers to both coordinate equipment and service sales activities, and to market more extensive, integrated service offerings (cf. Windahl 2006). There is no typical decision maker for buying SLAs but instead, this depends on the customer; for smaller industrial customers it is often their maintenance manager and for municipalities it is usually someone responsible for their maintenance department. The service sales process differs considerably depending on the value proposition:

“[the SLAs] are very much standard products. When it comes to other bigger customers where we have maintenance contracts, it is always an individual exercise that we go through to offer a tailored product for them. Normally they put out a tender, giving their requirements and then we would make an offer based on those requirements” (local manager).

The order winners and qualifiers for the services depend on the customer but generally, critical factors are price and availability. Service quality, the perception of peace of mind, and proactive behaviour are also important to many customers, and so is the customer-provider relationship. In many places, ITT Flygt has had a service workshop for decades and many local employees have worked for the firm for a long time, something which creates personal relationships and trust between the actors. Further, the firm is able to solve a wide range of problems, not only basic services but also provide consultative services like pipework configuration modelling and loss calculations. These issues are critical to some customers.

**Information and communication technologies**

Traditionally, ITT Flygt has developed most pump software and information systems in-house, which has led to numerous variants and a lot of people both local and from the central office have been needed to maintain these systems. Thus, one challenge is to standardise and reduce the number of systems used internally, in other words to implement uniform business systems in the sales companies. Another ICT-related challenge is to improve the interface between central and local entities as well as towards customers. For example, insufficient resources being spent on ICT means that in many sales companies, such as at Flygt Sweden’s service organisation, a lot of time is spent on administration, such as order handling, due to the insufficient information systems.

**Key performance indicators**

A parameter commonly used to measure performance is cost per sold service hour and level of utilisation of personnel and in addition, different financial key performance indicators (KPIs)
such as cost and revenue ratios are frequently used. Gross profit margin per hour and type of contract are also measured and compared between different countries as well as between workshops. Another interesting KPI is the ratio spare parts sold through the firm’s own service organisation compared with total spare parts sales, which can give a picture of how widespread the use of non-Flygt parts is. Attempts have been made to obtain this information cumulatively – comparing the number of sold units with the percentage of products for which customers buy spare parts – but this turned out to be difficult and imprecise because many parts can be used in very different products. Only a few spare parts are unique to specific products.

KPIs that can be regarded by the organisation as objective and that measure the degree of maturity are desirable, but the problem is to know how to best measure this service development. One KPI used is the relation service market (in terms of spare parts and services) compared to product sales, although this is considered to be an improvised solution as it does not cover all the important dimensions. From the turn of the year 2005/06, a new service report system, whereby it is possible to compare KPIs between different subsidiaries, was implemented. A common business application system is not needed when calculating the KPIs and as the instructions are the same to all subsidiaries, the hope is to generate comparable KPIs, such as direct/indirect cost quotient, degree of invoicing, and time lost.

Customers are not directly interested in the KPIs used to measure internal performance, but instead, are interested in information about equipment performance, product benefits, water and energy consumption, and utilisation, as well as broad outlines of what work has been performed by ITT Flygt personnel. This could be in the form of a spreadsheet containing work history, when visits have been made, when future visits will take place, and what parts have been replaced. Some customers request online lists containing this information.

**Incentive systems**

On many markets, today’s incentive system for the sales force is product-based only, something that solely rewards sales of new products. Furthermore, the sales personnel do not take into consideration whether the customer is creditworthy or not, as this aspect does not make any difference to the incentive system. If services were incorporated into the incentive systems, it would most likely be advantageous to service sales.

**Profitability**

Although service market activities (including spare parts sales) constitute about one third of the total revenues, few resources in terms of financial resources, KPIs, etc. have traditionally been allocated to the service organisation. However, the situation has improved compared to some years ago. Norway, Austria, Denmark, and the Netherlands are the markets that deliver the best results from their service organisations, something that is considered to partly be due to the focus on services on local management level. Salary level and competition are other factors affecting
profitability. There is a major difference in service hour break-even for example between Norway and Italy; Italy reaches break-even through spare parts sales since the price per hour that it is possible to charge is low due to competition from small service companies. Norway, on the other hand, reaches break-even on service hours only. Well-functioning CRM systems are an important tool in becoming more profitable.

Historically, the line of argument has been to obtain profitability on spare parts, whereas losses often have been made on service hours. Service production has been viewed as something different and difficult, and this approach can partly explain the losses made and why many activities have been given away to small third-party providers. The national subsidiaries have major overhead costs and they are working with the service market relatively independent of one another. A majority of the European subsidiaries have struggled to make profits, or even zero-sum results, on service hours. In order to e.g. improve efficiency, local subsidiaries were divided into a number of regions in early 2004.

Even today, contracts can be inadequately designed, with rebates on product units and sometimes on services, which has led to the company trying to standardise its contract forms. For instance, the sales organisation on one major European market signed a contract with a large water company which included a rebate on products and to a certain degree on services too, without informing and receiving approval from the service organisation. The contract resulted in losses on service hours and the local sales and service organisations disagree on who is to account for the loss. From central management there is however no indication that rebates on services, in connection to new product sales, are being frequently given. So far ITT Flygt has not been able to follow-up the profitability of contracts in general, only of some customers.

In contrast to products, which have a certain production cost regardless of what market they are sold on, service personnel salaries for example can vary considerably between different markets. As a result, services have different costs depending on the market. ITT Flygt has therefore chosen not to include services when international contracts are signed, and instead negotiate their price locally. Moreover, because wage levels differ between countries it is a complex task always to be updated on all local service costs when centrally negotiating with customers. Furthermore, it is believed to be more difficult to reach a consensual agreement locally if the complete contract is signed centrally.

**Annual growth**

The service and spare parts sales (including replacement pumps) account for approximately 35% of the product sales, but the potential is considered to be 80-300% higher in three different scenarios that have been presented internally. If the installed base lifecycle length is taken into consideration, the figures can be even higher. Today the annual growth of service sales (i.e. services not including rental, consultation, etc.) is the same as for products but a major potential has been identified through internal benchmarking between different geographical markets. New
services which offer higher value are recognised as having an even higher potential for growth and profitability, although resources and competences are seen by service managers as insufficient. In addition, the degree of maturity for new service offerings is changing relatively slowly both internally and among many customer segments.

**Customers**

In general, customer demands are becoming increasingly challenging and difficult, products are improved, and the service needs are therefore reduced. At the same time, ITT Flygt is offering more and more services, which is difficult to communicate to some customers. In addition, contact points between the company and its customers are becoming fewer, which implies that more of the sales go through the service organisation not usually working with and having experience of sales activities. Local relationships are important in the operational phase of the customer relationship whereas relationships with managers higher up in the hierarchy are needed when more extensive and international contracts are signed, since their authority is required.

The cost dominating the customers’ total lifecycle cost is energy consumption and ITT Flygt offers systems engineering services such as energy and economy calculations and system design. There is a growth potential in offering more to the existing customer base; not only pumps but also complete, prefabricated, ‘intelligent’ wastewater pump stations and other subsystems. Too extensive undertakings however, involve a risk of channel conflict with major contractors, as do knowledge-intensive services such as energy-saving consultation, which may cause conflict with engineering consultancy firms.

On the sewage treatment market, ITT Flygt has three main parties to consider; end-users (mainly municipalities), consultants, and contractors, and different value propositions apply to each of these parties. Contractors generally only focus on unit price and they are uninterested in service aspects. Consultants often specify the requirements for the end-users, making it advantageous for ITT Flygt to be prescribed, i.e. that the consultant includes Flygt-specific equipment and/or designs the plant so that it suits ITT Flygt’s equipment. Facilities management (FM) companies and wastewater service providers constitute another party, and take over operations from municipalities on some markets and thus becomes the middlemen between ITT Flygt and the end-user. Since the industry is conservative and not very dynamic, having long-term relationships with the different parties and a strong, established market position is very important.

The earlier ITT Flygt is involved in the sales process, the more it is able to exert an influence over the interested parties. After the product sale and installation, the customer usually contacts either the local service workshop or a third-party service provider for service sales and resale. A standard product might need annual inspection and extensive maintenance every third to fifth year, and contacts between the company and customer representatives are made in connection to these supervisions. Major customers have daily or weekly contacts with their service provider, discussing when to make a repair or replace existing parts. With regard to service sales, ITT Flygt
usually approaches the customer when the equipment is delivered and installed, or in the case when the customer has no interest in discussing it earlier, when the guarantee time has expired. Typically, the service manager who has the customer within his district brings up the issue of services and service contracts.

As the European market has become mostly a retrofit market with few new sewage treatment plants being built, it is not sufficient to have relationships with major contractors and consulting firms. Thus, having relationships with smaller users is becoming more important and the service market is one way of nurturing these relationships. Particularly in the public utility segment, customers do not act professionally and rather than being profit driven, are controlled by a budget which they must not exceed. However, the outsourcing trend in many markets is perceived as a potential business opportunity for ITT Flygt, something expressed by one manager:

“today, our customers are not professional at all… But is seems to me that at the UK market where the customers are profit-driven, when we have a really good offering, it is easier to get through. If we have demonstrated the economic advantages, it gets a much higher impact.”

Customer segments
When handling services, customers are segmented in the same manner as products: Public Utility (wastewater), Construction & Mining, and Industry of which public utility customers are the most important. Although marketing activities and service delivery are adapted to specific customer segments, today’s offering is fairly standardised with the same contract forms being offered to all customers. There are contracts where ITT Flygt has made some customisation, but these contracts have often been seen as segment-crossover activities that the company is trying to perform as efficiently as possible. An adaptation to the customer segmentation made for product sales – Public Utility, Construction & Mining, and Industry – has been discussed internally, as it is not considered reasonable to have the same offerings for all customers.

One solution is to have a separate organisation/process for each customer segment as mining customers, for example, can have very specific needs that differ from public utility and industry customers. Establishing a workshop in a mining area with many pumps is an example of this. However, products and services are not necessarily divided according to customer segments; both industrial customers and municipalities can have very similar wastewater treatment systems for example.

Lifecycle cost awareness
The minimisation of the customer’s lifecycle cost, i.e. total cost of purchasing, operating and disposal, is a sales argument used in ITT Flygt’s marketing; it is even marketed as the driving force behind the company’s products and services. A possible reason why many customers,
especially in the public utility segment, hesitate about taking lifecycle costs into consideration when buying products, is that the extent of the offering increases many times over. Customers often prefer to purchase the pump equipment and continue as usual, instead of considering lifecycle aspects. A likely reason for municipalities and other local authorities to be reluctant about signing more extensive contracts is that the issue is then taken from an operational level to the utility manager's and local politicians’ desks. Therefore it is seldom brought up, unless there is a determined politician who wants to privatise parts of the operations.

A problem with signing arrangements that aim at minimising lifecycle costs with private customers can be that, when discussing a major maintenance or outsourcing contract, a customer with one or two pump stations does not only want to include the wastewater pumping, but also items such as fans, faucets, taps, and freshwater, which is usually not within ITT Flygt's field of competence. Although ITT Flygt has experience of equipment maintenance, there can be products the firm has no knowledge about and even if the competences needed exist, there can be a lack of competence for calculating the cost and price associated. Therefore, ITT Flygt is unwilling to undertake the deal because the risk becomes too high. Even though these problems exist, managers see many possibilities to take a more extensive responsibility when customers outsource parts of their operations.

**Customer relationships**

Relationships are valuable not only for the continuous feedback received from customers, but also for updates received on what projects the customer is involved in and when these are estimated to begin. The earlier ITT Flygt is involved in the sales process, the more it is able to exert an influence on the interested parties. Because the pump industry is a mature and rather conservative industry, relationships between individuals and between firms matter a lot. Relationships connected with industrial services however are mainly on an operational level only, with personal bonds between service personnel and customers' employees. In an example from France, the customer did not want the pump to be sent by lorry, but preferred to personally come over and have some coffee. Nevertheless, this example also illustrates that relationships can be costly in terms of time, and a question is how to account for these events. One local manager's view on personal relationships is that:

> “for certain customers they [i.e., personal relationships] are very important, especially when you start talking to larger customers who have the account management for instance. That is important, but we can still lose the contract even though we have great relationships with the customers if our service was not good enough. Although it is important, ultimately it is the service that we offer and the price that we charge that are the most important things.”

A way of thinking that has existed in the company for many years, is that the objective is to offer a solution to the customer’s problem, regarding both product sales and services. Many employees
do not talk about selling a pump and that an invoice will follow, but rather about solving a problem jointly with customers. Often, the customer has a problem in an existing pump station and this might lead to a new sale or a replacement deal in the end. Nevertheless, the relationships must be based on an economic exchange and the service production must be efficient. This can therefore be an internal balancing act; employees should not sit and chat with customers but they should not act in a strictly businesslike fashion either. Therefore, the focus is on improving back-office operations so that customers can receive better services and front-office support, in spite of lower costs.

In new development projects, ITT Flygt is increasingly working with customer involvement. This means that the ambition is to conduct customer interviews and site visits as well as workshops where representatives from all three critical parties (i.e., users, consultants, and contractors) participate in order to understand their perspectives. Because there can be a conflict of interest between the different parties, the firm is primarily choosing to focus on the users’ needs and to view consultants and contractors as secondary or tertiary segments.

**Competitors**

The largest market-related change in recent years is that private as well as public customers are outsourcing service operations, something which has created new opportunities for ITT Flygt’s service organisation. Among other pump manufacturers, the Swedish company ABS mainly works through authorised service partners, whereas the German company KSB has their own service organisation and also works through service partners. KSB is a major actor among industry customers and offers many pumps and other products that ITT Flygt does not have, which means that there is some overlapping between markets. KSB follows the market trend and pushes ahead with what they view as a development from being a pumps and valves manufacturer to a “modules and systems supplier for transporting liquids”, thus, seeking to combine its products and services to create more integrated offerings (Pump Industry Analyst, May 2003). In several countries, these competitors are more profitable on services than ITT Flygt. However, the competition from other pump manufacturers varies between markets.

The fiercest competitors on the pump service market are small, local, and flexible third-party providers that are more all-round than ITT Flygt and that sometimes possess specialist knowledge. Relatively often, these workshops are family-owned and ITT Flygt has considerable difficulties competing with them. These providers wind engines, screw pumps, and change bearings and seldom have the same considerations regarding environmental legislation and ISO certification. In addition, they are often able to take very low offers, especially for repairs. If a customer’s pump is out of order and the third-party provider has a personal relationship with the customer, the customer will call this local provider. Although no single third-party provider is a serious threat to ITT Flygt’s service margins, together all third parties have a considerable market share. In order to compete with these local rewind workshops, ITT Flygt offers repairs to
customers at a predefined fixed price regardless of the exact time and number of parts needed to solve the particular problem. The different repair levels are intended to suit common repair types and the advantages for the customers are simplicity when ordering and faster processes, i.e. less downtime. Besides the local rewind companies, on the UK market for example, there are national repairers offering a fairly broad spectrum of services. Since these firms are not experts in ITT Flygt's niche, they compete on speed/availability, rather than on expertise.
Toyota Material Handling Group

Toyota Material Handling Group (TMHG) is the world-leading supplier of counterbalanced trucks, warehouse trucks, manual trucks, and material-handling services. It markets itself as providing customers with trouble-free material handling operations worldwide. The Group is divided into four geographic regions (see Figure 1): Europe (Toyota Material Handling Europe, TMHE), North America (Toyota Material Handling North America, TMHNA), Japan (Toyota Material Handling Japan, TMHJ) and the rest of the world (Toyota Material Handling International, TMHI). TMHG net sales were $4.3bn (SKr31.6bn) in 2004 and with 170,000 industrial warehouse and counterbalanced trucks being shipped annually from its eleven manufacturing units, the Group holds approximately one quarter of the world market for industrial trucks.

Figure 1. The organisation since 2006.

If not otherwise specified, any information given in this study refers to TMHE’s operations. However, this information has been given by respondents who have previously worked for BT Europe and its subsidiaries. Therefore, when referring to events in the past in particular, we refer to BT Europe (or BT Industries), not TMHE.

BT Industries

The Swedish company BT Industries was acquired by Toyota in 2000. BT Industries was the world’s largest manufacturer of warehouse trucks and Toyota Material Handling Company held the number one position for counterbalanced trucks. BT Industries’ net sales totalled €1.6bn
subsidiaries are referred to as BT subsidiaries. Integration is not explicitly taken into account in this study. Furthermore, this means that the relatively recent and since the initial case study chosen was BT Industries, the BT-Toyota technicians than in the former BT Industries organisation. Because these local changes are merged. This implies that on many markets, there are approximately twice as many service out stepwise since 2007 and has meant for example that the local service organisations have been carried out stepwise since 2007 and has meant for example that the local service organisations have merged. This implies that on many markets, there are approximately twice as many service technicians than in the former BT Industries organisation. Because these local changes are relatively recent and since the initial case study chosen was BT Industries, the BT-Toyota integration is not explicitly taken into account in this study. Furthermore, this means that the subsidiaries are referred to as BT subsidiaries.

The integration of BT Industries and Toyota Material Handling

Despite Toyota’s acquisition of BT Industries in 2000, Toyota Material Handling Company (TMHC) and BT Industries Group had autonomous operations and no joint management structure until July 2005 when Toyota moved to formally integrate the two companies by creating one single global organisation; Toyota Material Handling Group (TMHG). The creation of this new organisation was part of Toyota's strategy to become “undisputed No. 1” (Toyota Annual report 2005) in the global lift truck market. This would be brought about by the two firms capitalising on synergy potentials in supplying each other’s brand products, sharing sales and manufacturing know-how, exchanging personnel, and jointly procuring goods. However, the two entities continued to use multiple distribution channels, with BT Industries having wholly-owned sales companies in Europe and Toyota which operated through dealers. As of April 1, 2006 BT Industries and Toyota Material Handling Company have formed a new operational structure; Toyota Material Handling Group (TMHG). The integration on the local level has been carried out stepwise since 2007 and has meant for example that the local service organisations have merged. This implies that on many markets, there are approximately twice as many service technicians than in the former BT Industries organisation. Because these local changes are relatively recent and since the initial case study chosen was BT Industries, the BT-Toyota integration is not explicitly taken into account in this study. Furthermore, this means that the subsidiaries are referred to as BT subsidiaries.

Business development

Following decreased customer loyalty and product commoditisation, an increased focus has been placed on finding new services and solutions, including trucks, services, and finance (i.e., rental plans). Much business development is initiated locally and the offerings and methods are then transferred also to other subsidiaries. Alternatively, attention is paid to local needs and a solution
is co-developed with the central organisation. In centrally initiated projects participants from subsidiaries already working with similar solutions are involved. Thus, good relationships between the centre and the subsidiaries are crucial. Currently, there is a lot of skill transfer with people coming from subsidiaries to work for the centre and many project teams consist of both central support people and senior members from some of the subsidiaries.

Because it is increasingly difficult to differentiate the hardware and because the truck market is considered to be mature, innovations tend to be small and incremental rather than huge, disruptive steps:

“Our history has not been a series of dramatic changes at all; it's been a series of minor adjustments along the way” (senior director).

Because of this, TMHG also tries to innovate by using software and services, thereby enhancing the value provided to customers. For example, fleet management reports are becoming increasingly common and such information can be used to help customers to reduce their fleet costs, damage, and wastage. Both locally and centrally, TMHG is working on fleet management systems (FMS), and often, new ideas are based on needs identified in the marketplace. One local service manager explained how his subsidiary started developing such systems:

“One example from recent years is that when we talked to customers, they were not able to show what their overhead costs are; they don’t know what their overhead costs are. They have, for example, ten machines operating but still no account for them. They say that they spent so and so much money on the ten machines, but in reality, they don’t know what they have spent them on. Therefore, we have developed a fleet management system… to sell to the customers. We can show them on a monthly basis, for each machine, their expenses, used spare parts, breakdowns, operating hours, etc.”

However, such information-based services are not necessarily unique to TMHG; competitors are also offering similar solutions. Besides, a problem with consultation and other information-based services is that sometimes the customer does not have the internal robustness in his business to take advantage of this.

In the central service organisation, business development is very much related to ICT development. As seen from one service manager’s perspective:

“it [i.e. service development] is very much IS/IT. Instead of sitting and discussing how to be able to quickly change oil in the truck, there has become very much focus on business systems, on mobile handheld computers…”

For example, developing different versions of FMS and the continuous maintenance and development of EASY, the mobile business system, requires a lot of resources and specialist competencies. That said, there is no polarity between traditional service development and ICT-
related business development, and service managers find the uniform processes in most sales companies (due to the same information systems) a major competitive advantage when it comes to implementing new ICT applications. The way the central organisation approaches the delivery of a new solution, especially when it comes to ICT, is that they include people from the subsidiaries. During the initial EASY project, representatives from the Swedish, the UK, and the Belgian subsidiaries were involved. BT Rolatruc (the UK subsidiary) for example, had two people on the project working almost fulltime all through the project, which enabled the subsidiary have an influence, and when it was delivered to the local employees it was received very well.

Customers increasingly demand FMS and one critical issue for TMHG when developing FMS is standardisation. The central service organisation recommends a model for the subsidiaries, i.e. different packages with guiding price models for certain customer segments. However, these models are not mandatory and it is not only a matter of centrally developing an offering and marketing it internally and externally; the local organisation must also have the resources and competences needed. If not, there is a risk of creating customer expectations which it may not be possible to live up to. Although TMHG wants to avoid the traditional focus on product unit price, customers sometimes expect to receive free FMS, for example, when they purchase extensive offerings and FMS can be the differentiator that becomes the order winner. Thus, what approach to take to pricing becomes a balancing act between traditional product sales logic and service sales. This issue is also linked to incentive systems; a salesman who is rewarded for truck sales undeniably leans towards giving such services away free in order to sell more trucks or rental plans.

Service managers have expressed their belief that the demand for solutions (e.g. rental plans) and additional value-creating services (e.g. FMS) will continue to grow and that these offerings as such will become order qualifiers in the future. Competitors are in a similar position, aiming to have as high a degree of trucks in rental plans and SLAs as possible since it is a platform for building and developing long-term customer relationships. Hence, BT/TMHG managers believe that the firm has a competitive advantage over the many competitors that operate through dealers, as BT/TMHG has a higher degree of control in the value chain due to their in-house service organisation.

The service market business is gaining importance internally as the strategic importance of services is increasing, not only in terms of sales volumes and margins, but also in terms of the importance of generating new customers and enabling additional sales to existing customers. At the same time, there are service managers who believe that future order winners will increasingly be integrated solutions and, thus, argue that no distinction should be made between product sales and after-market sales. When seen from a service market perspective, it is becoming more complicated to communicate new and more extensive offerings in terms of e.g. customer value and whereas the services sold use to be standardised SLAs, it becomes increasingly common to
have agreements with a higher degree of customisation (e.g. including FMS). An internal challenge is now not to offer separate service modules but instead to integrate the different parts of the offering into one service offering which the customer perceives to be both integrated and customised. Among other things, this implies that the role of service technicians increases from simply performing traditional repair and maintenance services to selling and consulting.

Driving forces for business development are both to achieve internal cost efficiency and to create new customer value. In general, a lot of service-related business development is either customer driven or technology driven. For example, demands for 24-hour service and replacement machines have been customer driven whereas EASY was internally driven, enabled by new possibilities for ICT applications at an acceptable cost level. However, when innovation is mainly technology-based and internally driven, it can be more difficult to understand actual customer demand and willingness to pay for the new offering. The fact that service development is either triggered by internal or by external factors was expressed in the following way by one local manager:

“In some way, with the larger ones [i.e. customers] they do force you to look at the products that you have and sometimes to change them. We also create our own products to match those needs, and we will often create our own internal products without any indication from the customer. Items such as the EASY project are self initiated and then we sell the benefits to the marketplace.”

In retrospect, a lot of opportunities, such as rental opportunities, have involved seeing customer demand, reacting to it, and then formalising it and offering it also to other customers. The rapid technological development means that technology is seldom the constraint for new offerings. Nowadays, the challenge is rather to keep pace with the technological development and develop a suitable business model as well as the resources and internal organisation needed:

“I guess that technology is not the biggest problem, rather, it is to make the organisation and business models to keep pace with it. Take wireless communication as an example; theoretically, in the future one could have a business model where the customer pays per tonne or running metre and we can follow it in real time. So there are endless opportunities there” (service manager).

Delivering solutions rather than products and following services has consequences for the way in which the firm organises and communicates and this has implications for its business model. Thus, if TMHG was to continue to expand its service offering and go downstream, offering more extensive material handling and logistics solutions, it would require very different competences. In addition to customer demand and technological development, another trigger for going downstream and developing new concepts is the risk of becoming a subcontractor or having to share the customer relationship with other actors in the business network (e.g. facilities management companies). Nevertheless, more than a decade ago, BT Industries had an in-house
organisation developing and selling automated warehouse systems. However, it was regarded as a non-core business, involving large business risk in proportion to the profits generated and taking time and resources from top management and other business areas. Consequently, it is possible that the company then had more material handling expertise in-house than it has today. This is competences it would need to strengthen if it once again offers these types of solutions.

**The service offering**

BT Industries/TMHG has incrementally increased its number not only of single services, but also extensive offerings sold. BT Industries/TMHG does not want to be regarded as a truck manufacturer, which has been expressed as an espoused strategy by BT Europe’s vice president for marketing, Hans van Leeuwen: “Our business is not just about trucks. We are today essentially a service organisation … it is the total service offer that is the key thing” (Industrial Plant & Equipment, November 2005).

**Service level agreements**

There are three general SLA levels across Europe, from Safety Inspection to Full Service:

- Safety Inspection; including chain inspection, fork test, and safety function test
- Preventive Maintenance; safety inspection, lubrication, and adjustments
- Full Service (similar to Rental); preventive maintenance, repairs, spare parts, and emergency breakdown response.

In the twelve Western European countries, all three SLAs are offered (although they are not always standardised). In Europe as a whole, not all 25 sales companies have yet the three mandatory SLA levels. Services may differ between countries due to country-specific laws and regulations on e.g. safety inspection. Many services are adjusted locally, e.g. Full Service exclusive of fork test, but international key account contracts imply standardised services and the increasing number of such contracts raise the requirements for standardisation.

Two other services are Resident Engineer, a TMHE technician working fulltime on a customer site, and Night Care, which is service support outside regular office hours. If a customer signs a Fleet Management contract, TMHE makes a systematic analysis of the customer’s fleet, examining e.g. breakdowns, and discussing with the customer what the focus areas should be (uptime, driver training, etc.). Workshop repairs mean that a network of workshops performs those jobs that it is not possible to do on site.

International customers, like IKEA, require the same service levels in all countries and they should rely on the fact that service technicians have the same skills regardless of country. While key account contracts are becoming increasingly similar regardless of the customer’s country/countries, smaller customers are more difficult to generalise as they differ in term of background, country, industry etc.
In a five-year contract, about 50% of the customer's costs are directly related to the truck investment and 50% are service-related costs. During a truck lifecycle, services, including spare parts, constitute a majority of the costs. About 95% of repairs take place at the customer site, which requires customers having such things as an overhead crane to facilitate the work of the service technician, and the remaining repairs are done through BT Europe's/TMHE's network of workshops. Today, service technicians are able to invoice about 85% of their time, but the aim is to increase this percentage.

**Rental**

Rental offerings have gradually increased, both in terms of the number of different offerings and in terms of service market share. Both long-term and short-term rental markets have grown and BT Europe doubled its rental turnover between 1999 and 2004. Rental plans are more common among major customers than smaller ones. If they sign a rental plan, customers generally lease a material handling solution with trucks, financing, maintenance, spare parts, and driver training, thereby having a stipulated cost for the material handling activities. Another selling point for TMHE is that customers will know their material handling costs in advance and be able to reduce the capital formation of material handling when they no longer need to have capital tied up in trucks. The rental plan can be complemented with additional rental services which supplement the core fleet with back-up trucks when requirements change or during peak seasons. Eliminating risks associated with ownership and disposal and environmental issues are additional aspects highlighted by TMHE.

The share of rental sales is higher in Northern Europe with the exception of Germany and in France, whereas it is lower in Southern and Eastern Europe. In countries such as Germany, Italy, and Spain, customers generally prefer to own their truck fleets. In these markets, it is therefore also more common to have two sales occasions; instead of the salesman selling a rental plan, the salesman sells trucks and the service technician sells related services. In countries where BT/Toyota trucks are sold through external dealers, it is also more difficult to sell rental plans.

Selling trucks instantly generates revenues whereas revenues are received continuously during the rental agreement period. Rental trucks are owned and administrated by TMHE and not by a finance company. The truck fleet is considered too large to reinsure and TMHE therefore takes the risk itself. It is possible to measure profitability per service employee and if a technician does not look after trucks and because of this they break down, this will increase TMHE’s rental cost and, thus, reduce profitability.

If a customer signs a rental plan, TMHE also serves the trucks of possible competitors which are in the customer’s fleet, although their objective is to eventually phase out these trucks. In some of the cases when TMHE takes over trucks, which mainly belong to a competitor, the customer might have local agreements and be dependent on interchangeable parts providers for the supply of spare parts. In these cases, TMHE prefers that the sales companies procure genuine spare
parts from competitors rather than counterfeit or unauthorised parts. This is not always possible however, because it can be difficult to obtain correct parts information. Thus, TMHE has a dilemma, as it has to use other sources of information than the internal organisation. A related issue is what measures to take in case of a guarantee-undertaking if the parts come from a non-genuine outlet, and how to show customers that counterfeit or unauthorised parts can be more expensive from a lifecycle perspective.

Many sales companies offer three general long-term rental plans: core fleet rental, flexible fleet rental, and payback rental. Support from the company within a specified response time is included in all rental plans, whereas other elements may differ. The core fleet rental plan is designed to match the predictable element of each customer’s capacity and it can be combined with other rental plans to cover current and future needs. The flexible rental plan offers a shorter-term plan for supplying less predictable elements of the customer’s capacity. It is based on pre-used machines from TMHE’s rental fleet and the plan can be combined with core fleet and short-term rental. Compared with core fleet rental, the flexible rental plan allows the customer to return the trucks earlier as the agreement period is shorter. Payback rental implies that TMHE takes over the customer’s existing fleet regardless of whether it contains BT/Toyota or competitor trucks (although this rental plan is not very common). TMHE also offers short-term rental offerings. This enables customers to rent trucks with specified performance levels from as little as a single day. Short-term rental provides peak time backup to supplement a customer’s core fleet capacity and it is particularly in demand during peak seasons such as before Christmas and Easter.

In reality, however, it can be difficult to find standardised concepts specified as long-term and short-term rental plans. When making a tender, it is vital to understand the customer’s actual needs and based on that information, be able to combine a value proposition with a higher degree of customisation than the competitors, combining different types of rental elements. As one local manager stated:

“He [i.e. the customer] can pretend to need something, but once you actually penetrate the customer it can turn out that it was not at all what he asked for. This is the essence; what does the customer need and what is he willing to pay for it? If one only has a standard concept, there will be someone else signing the deal.”

The product lifecycle for trucks that initially belonged to BT Europe’s/TMHE’s rental fleet is illustrated in Figure 2. After being used in short-term rental contracts, the used trucks sold usually end up in medium-size companies before they are further sold to small-scale companies.
Customers generally compare prices between different rental offerings but seldom compare them in detail, which has led the sales organisation to taking away parts of some agreements since they included more elements than did competitors’ corresponding offerings. One example of this is when BT Svenska (the Swedish subsidiary), in order to have a competitive offering and win the contract, had to remove driving wheels, worth SKr1m annually, from one rental plan because this was only included in BT Svenska’s rental plan and not in the competitors’. In the UK too, managers perceive that competitors sometimes have a lower grade rental offering; they may call it the same, but the package can be slimmer because competitors offer a lower basic package and sometimes additional charges are made when the contract starts.

One problem for TMHG and other truck suppliers is that there is no industry standard for how to measure uptime. For example, TMHG measures the time when the pump motor is in use, when the driving motor is in use, the time when both the pump motor and the driving motor are in use, the time when any of them is off, and the time when the key is turned on. On the other hand, one of the competitors for example adds 20 seconds to the time the engine is running when calculating uptime. All in all, such differences make it more difficult for customers to compare different propositions and also for suppliers to bid.

If TMHG were to take the rental plans one step further and offer ‘pay by the hour’ offerings it would have considerable implications for risk and how to manage the offering. It would also imply that the firm would need to integrate vertically and further align the supply chain. On an electric truck there is a battery which is supplied by a battery supplier who may well be providing manpower to maintain the batteries and if TMHG should want to guarantee some battery power commitment to the customer, the firm would need to have the commitment from the battery supplier and manage the risk. Today, TMHG tends to purchase batteries from suppliers (although it sometimes hires them for short-term use), the batteries are under warranty for five years, and the risk is taken by TMHG’s local rental department.

**Driver training**

From the turn of the year 2004/2005, BT Europe has been running its driver training services through a franchising model. The objective is to strengthen the service and become more competitive. Local decision-making processes are believed to become shorter for customers as
the franchisees usually have a local connection and experience of being the customer contacts. The franchisees are responsible for running all the customer contacts, administration, and driver training in the geographically specified franchising area. The franchisees in turn engage subcontractors, of which many previously have worked directly with BT Europe. Nevertheless, the service is developed and marketed as an integrated part of BT Europe's/TMHE's offering and TMHE still has the proprietor responsibility, including service development, training material, central marketing, and the responsibility of ensuring that the training lives up to the quality standards set.

**Spare parts handling**

Warehouse service levels are measured by completed orders to customer and the aim is to have 90% order fulfilment. The supply of A, B, C, and D articles is based on the inventory turnover rate whereas articles classified as I are critical and must always be available. The majority of spare parts are sold through BT Europe’s/TMHE’s own service organisation and not over the counter. With regards to the development of the spare parts handling, the supply chain has developed organically over the years. Strong service-market sales have led to a sharp increase in both spare parts volumes and the assortment handled. This in turn, has resulted in a number of logistical problems and challenges. Firstly, it has made it more difficult to maintain a satisfactory delivery capacity, secondly it has caused logistics-related costs to rocket, and thirdly, it has put constraint on what is an otherwise, according to managers, optimised service process. BT Europe even considered outsourcing the spare parts handling some years ago but chose not to do so.

TMHE has three different order types: Normal Order, Express Order, and VOR (Vehicle Off Road) order. Normal Orders imply that the delivery capacity has a high percentage for high-frequency deliveries and that these are delivered using timetabled vehicles, whereas Express Orders are delivered by courier or plane. A VOR order is reserved for critical needs and means 100% delivery capacity and it is handled through a separate organisation working around the clock. The ordinary organisation does not work nights and weekends when these situations occur.

**The service organisation**

The TMHE service organisation is responsible for the company’s service and spare parts development. Among the organisation’s goals and vision are to further develop the service market as part of the core business, to strengthen its brands and support sales of new trucks, as well as establish the view of service as 'sales between sales'. Furthermore, the service market should generate and support overall profit, improve service efficiency, and TMHE should be regarded as the best service provider by having 100% coverage of the active fleet, ensure truck availability, and help take costs out of customers’ operation.
Other tasks are to increase the efficiency and quality of service operation, intensify business development and improve the sales and profitability focus, and secure and develop service and spare parts support as well as training. At the start of the production of a new truck line, the parts catalogue, spare parts in the business system Movex, and service information, including the operators' manual should be 100% on time. It is also important to establish a common support structure. The service company's target rate for on-time preventive maintenance is 85%. Another important issue for TMHE is to introduce SLAs earlier in the sales process than today. However, it can be difficult to persuade salespeople to not only sell products but also services. Instead of emphasising the technical specification of the physical components, the seller should highlight possible solutions to customer needs that include both goods and services, e.g. a rental plan which includes FMS.

The service organisation is continuously growing and becoming increasingly important from a profitability point of view. Besides profitability, control, market knowledge, and the ability to sell contracts are important reasons why BT Europe had local service organisations. Compared to service strategies in the past, these strategies are more business orientated today and the boundaries between sales and service are becoming increasingly blurred. Nevertheless, whereas there is a more integrative way of managing customer relationships on many West European markets, a traditional structure may still prevail in Eastern Europe. The service sales process is generally the same regardless of whether it is for a traditional SLA or for a rental plan, even if different employees might be involved in the process. The larger sales companies usually have well-defined, formalised processes, whereas smaller sales companies possibly have more ad hoc character processes. Since many customers are international, the ambition is that key account deals are managed in the same way in every country. This is in line with the trend towards increased centralised service management and central agreements.

In order to increase the awareness of services and to better coordinate activities, a service market organisation working with business development and a service market council where central and local service managers meet approximately bi-monthly has been built up centrally. This has increased the internal focus on the service market. Previously there was only an organisation for technical support and no real commitment towards services. The service market council is seen as an important, although less formal, forum for knowledge transfer where ideas are shared and discussed. However, steering from the central organisation is to some degree necessary in order to align the local organisations. In this process, progressing subsidiaries can serve as references when change processes are initiated. One fact that makes it more difficult to streamline local processes is that different sales companies often have different service production processes.

In service market projects, it is vital to involve both central and local managers and specialists. The local organisation obviously has the best local market knowledge and they are the addressee of the project. Generally, workshops are held where local and central key people take part,
discuss, and decide. The local representatives have to decide whether to commit the project or not to and what elements to include. The central project leader then makes a business case, estimates the market potential, and receives feedback from local representatives. If there is acceptance, money is invested and the subsidiaries will have an annual running cost that they pay to the central organisation. There is a major difference between the local companies and BT Rolatruc is one of the driving subsidiaries:

“Generally speaking, if you were being a tactician and you wanted to put something new in place, if you got the UK, France, and Sweden to agree to it most other countries would follow” (local manager).

Compared to some years ago, there is an increased understanding of the need for common service strategies and policies not only between local and central organisational entities but also between subsidiaries. For example, TMHE has assigned a local service director to be a mentor for a number of newer and less advanced subsidiaries. In this way, these markets receive support and at the same time, the managers in leading subsidiaries increase their understanding of the others’ situation. The central service organisation does not have the resources required to support every local company on every issue, so sometimes central managers take the role of a ‘liaison centre’, mediating local contacts between subsidiaries. Thus, a form of cross-fertilisation is taking place locally. In addition, people working for a local company can later work for the central organisation, e.g. work with the implementation of an application that was developed in his/her subsidiary and that central management has found useful also on other markets. Nevertheless, it can be challenging, not only because of the different language and culture, but also because the starting point is different in every country. Although it has significantly improved in recent years, managers still believe that the understanding of each other’s roles and business as well as the clearness of the central-local interface can improve.

**Integration aspects**

Traditionally, the company has operated with subsidiaries that are fairly autonomous and there used to be very little central support. However, BT Europe has been working actively to increase the control of its national subsidiaries. Among these, the sales companies on major markets in particular have gained considerable independence and still have a strong position in relation to BT Europe/TMHE. The current situation is that the degree of central-local integration has increased significantly and the subsidiaries have become less autonomous, even if operations are still fairly autonomous from the day-to-day point of view. The Movex business system is a central solution which has been implemented locally, and Movex and other uniform information systems have enabled increased integration and centralisation. Major ICT projects, like the development of the mobile business system (EASY), would not have been possible for a subsidiary to succeed with because a single subsidiary would not be able to fund that kind of activity, and if it could, local managers believe that it would only be a halfway measure.
The need for closer central-local integration is also driven by international customers. These customers operate on several markets and are increasingly demanding uniform solutions regardless of market if TMHG is to attain a preferred supplier status. The external impact on integration and standardisation was summarised by two senior local managers as:

“You’ve got to be international but you’ve still got to be local. There’s got to be a balance between the two. We’re getting better and better and better; it’s “how far do you go?” and I think that’s the question. Once again, it’s the marketplace that will dictate how far you go.”

“I guess in essence you want as high a possible integration from the centre as the market will let you have. There’s no point having 80% control from the centre when you have a market that wants something completely different. Some countries may be 80% standard and 20% modified locally. Another market might be 50% standard and 50% local so there’s no point in making a standard market from the centre that doesn’t fit. It’s a balance for each country and some countries might be able to have a higher degree of push outs and others might need more flexibility locally or might take it.”

Today, the management board of a subsidiary can be made up not only of the local management team but also include both central managers and local managers from other subsidiaries. For example, the BT Rolatruc/TMHUK Managing Director (MD) is the chairman of two subsidiary boards and part of the central team. Thus, the organisation is more ‘fluid’ than before, which enables a lot of skill transfer, not only from central to local organisations but also from the subsidiaries to the centre. Before, the centre was much more of the factory and, consequently, the skill set was very different from that of the local organisations. Nowadays, many senior staff from the subsidiaries have come to work for the centre. It is also common that central managers, who are looking at ways to support the subsidiaries and to establish uniformity and best practice, have local directors and specialists as part of their project team. As one local director explained:

“If you’re looking into a central team you’ll have central support people, a senior person, and senior members from some of the subsidiaries to identify how things should work and how we should progress it.”

This increased integration has also facilitated knowledge transfer from one subsidiary to the others. For example, BT Rolatruc, developed a rental application, something which was noticed by a central rental manager who found it useful. Then, the central organisation acquired it and pushed it out to other subsidiaries.

**The central organisation**

The role of the central service organisation is to support the subsidiaries and their sometimes disparate needs. This can be a challenge when general solutions are developed as the local
markets and subsidiaries are heterogeneous in terms of matters such as level of market maturity, trajectories of development, business systems, and local competences. The high degree of internationalisation that is taking place across Europe implies that many international customers expect the same prices, conditions, and degree of service, regardless of country. This has also led to an increased understanding locally for the increased need for central coordination and central-local integration. In parallel to this development in the marketplace, the implementation of a common business system (Movex) has facilitated common European agreements and pricing structures. Nevertheless, too much centralisation is a danger as this could inhibit the entrepreneurial spirit of the subsidiaries.

When it comes to the service market and to aligning the local organisations, in recent years a lot of effort has been put into service contracts and KPIs such as ‘percentage contracts’. For example, training material and material for salesmen has been produced. There are also central and local specialists who are involved in sales support. However, these sales are generally major European Key Account deals and apart from that, the central organisation is involved in actual sales to a very limited extent. Regarding coordination between sales and service, after an organisational change a number of years ago one manager was appointed to have the overall responsibility for both Marketing and Sales (including product sales, rental, and service) in BT Europe.

With regards to the three general SLAs (safety inspection, preventive maintenance, and full service), BT Europe together with TMHC has defined what each service level should comprise. There are a number of exclusions, price lists (floor indoor, outdoor, dust, humidity, etc.) and terms of condition that have been defined centrally and that must be followed locally. However, these conditions are to be seen as framework agreements and the local organisations have the freedom to make adjustments and to extend the local offering based on these minimum requirements. Directives and service targets are generally communicated through the local boards, e.g. that certain KPIs are important and to be reported centrally. There are still a number of locally developed information systems, but in general, the systems are the same and the cooperation between central functions and sales companies is much closer than it was number of years ago.

**The local organisation**

In Europe, BT Industries/TMHG operates through wholly-owned sales companies and traditionally, the sales companies have had a high degree of independence and entrepreneurial spirit. The larger sales companies usually have well-defined, formalised processes, whereas smaller and/or younger sales companies have more processes more of an ad hoc-character. In the Baltic States, Russia, and Ukraine, for example, the organisation is still in its infancy and the processes identical to the ones in counties such as Sweden and the UK, are not yet operational. Local incentive systems also differ from sales company to sales company. Nevertheless, central
service managers support the subsidiaries with resources and try to establish uniformity and best practices. Managers and directors find it valuable to have central support for e.g., business system development and knowledge sharing. Since many ideas for new offerings are created in the dialogue between the local personnel and the customers, well-functioning central-local relationships are needed for successful service development. On a local level, the cooperation between sales and service is critical. Although the sales-service cooperation is better today than it was previously and although the boundaries between the two are becoming less sharp, it is difficult to get some salespeople to not only sell products but also services and total offerings, and the share of SLAs and rental plans differs significantly between markets.

**BT Svenska**

BT Svenska/TMHSE is BT Europe’s/TMHE’s Swedish sales and service company. After the new operational structure in TMHE, BT Svenska changed its name to Toyota Material Handling Sweden (TMHSE) in 2007. BT Svenska offers not only BT and Toyota trucks, but also the DanTruck, SMW, and MAFI brands. Additional brands are available in the rental fleet. Of the approximately 500 employees, 330 are service technicians in the nation-wide service organisation with 260 mobile service units. BT Svenska is divided into two regions; North and South, each with a regional service manager. Across the country, there are a number of service leaders who report directly to the regional service managers. In region South, there is also a service market salesman whose work is dedicated to service sales and customer relationship management. Only on the island of Gotland does BT Svenska not have an in-house organisation. Instead, a local service partner does the services on BT trucks.

As far as service strategies are concerned, the number one priority is to increase the share of rental plans, which is, if not the highest, at least one of the highest in Europe (~65% of new sales). A second goal is to sell more Full Service agreements and spare parts, and thirdly, to increase the share of Preventive Maintenance agreements. In recent years, the Swedish market has become more integrated with the rest of Europe and an increasing number of the largest customers’ procurements are centralised and take place outside Sweden, something which has had a negative effect on truck margins for example. Thus, BT Svenska has had to become more efficiently organised in order to maintain operating margins. Even if long-term relationships are seen as less important for those major customers today, local relationships with smaller customers are still vital. The BT Svenska organisation is illustrated in Figure 3.

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1 Although it previously operated through independent dealers in most parts of Europe, in Sweden, Toyota had BT selling Toyota trucks also before the new operational structure in THME. Before Toyota’s acquisition of BT Industries, however, Toyota’s counterbalanced trucks were sold by Atlet in Sweden whereas BT Svenska sold Clark’s counterbalanced trucks. There are still customers with old Toyota trucks which BT does not have service on.
There has been a lot of discussion between the service and the sales organisation in BT Svenska about where to draw the interface between sales and after sales. When trucks are delivered in parts to the customer and have to be assembled on site, salespeople consider the assembling a service market activity whereas the service organisation regards it as a sale-related activity and that the service organisation should take over when the trucks are up and running. In general, however, local integration between sales and service works well (in particular if the personnel are situated at the same site). A long-term employee expressed his opinion of the way in which, the internal view of the service organisation has changed over the past 10-15 years:

“In particular, the main change is that management has opened their eyes more to the service market and that we should cooperate more with sales. Before, sales was what was the important; sales, sales, sales. In principle, service was like something that the cat has dragged in; it was not very meticulous, it was a necessary evil.”

Today, the cooperation between sales and service is seen as vital from the senior management team’s point of view. For example, local sales-service meetings are held, which means that district salesmen and service leaders go through activities for common customers and what the status of the local business is. When salesmen meet customers and sell trucks (both new ones and used equipment), generally they try also to sell SLAs. In addition, when they sell new equipment, the salespeople should take up the customer benefits of signing a rental deal instead. Both salesmen and service technicians have individual budgets.

Figure 3. Organisational chart of BT Svenska.
A well-functioning and integrated service-sales interface has been one priority for BT Svenska and another has been to concentrate on the total service business and to look at two aspects in particular. Firstly, focus has been on efficient service production. For example, with more than 10,000 trucks operating in long-term rental plans, the rental business must be correctly dimensioned and efficiently managed. Secondly, there has been a focus on selling, bundling, and offering service to customers correctly. Today, more people are selling service; service technicians, service leaders, and salesmen, and they are rewarded accordingly, which has led to an increase in service sales. Furthermore, new ICT systems and applications have enabled BT Svenska to both cut costs and increase sales volumes. For example, administration has been right-sized and made more efficient and the reconditioning and sales of used equipment and short-term trucks has been centralised from being in several locations to being in only one, in Mjölby, next to the manufacturing plant.

Due to the high share of trucks in rental plans, BT Svenska is able to secure the utilisation of more than half of the service production when a new year is to begin. This means that internal efficiency becomes critical; for example, it is important that sales leaders do not send too many service technicians to a customer site or that parts are replaced unnecessarily. In the largest cities, BT Svenska has service leaders and service technicians who specialise on either rental or traditional field service. The reason for this is that the business logic differs between traditional service and rental and that different work processes are required. For example, the service leaders for rental participate in all customer operations meetings, whereas the service leaders for field service focus on selling SLAs and managing preventive and unplanned maintenance. The field service technicians are expected to make three visits per day on average and this working method differs from that of the rental technicians.

In order to increase customer orientation, BT Svenska has created an application group with a number of specialists who work solely towards major customers early in the sales process, when they are about to invest in new warehouses, terminals, or manufacturing plants. In those situations, BT could take on a more consultative role and take part in the design decision process. If BT gets to sign the equipment (and service) deal in the end, the company will not charge the customer but if the customer chooses a competitor instead, the customer has to pay for the material handling analysis which was carried out.

**BT Rolatruc**

BT Rolatruc is the UK sales company and since 2007 has been integrated with Toyota’s UK operations in the joint operation Toyota Material Handling UK (TMHUK). Before the integration, BT Rolatruc had approximately 800 employees in the UK of whom 530 were service technicians or belonged to the service organisation in some other way. If the subsidiary’s turnover is broken down, about half of it is machine sales and the other half is spare parts, services, and rental. In the early 1980s, Rolatruc’s management team realised that service could be
a defining factor; it could be used as a reason for buying from Rolatruc as opposed to from somebody else. Thus, having the necessary service technicians and the coverage that were needed became a critical issue and Rolatruc developed what they called the ‘Four hour fix’ which basically said that if a customer called the firm, Rolatruc would respond within 4 hours. Today, that four hour fix is an industry norm.

The UK market is highly competitive and very few suppliers make a local margin. Rolatruc is in fact the only major actor that manages to make a local margin. Since the price pressure has been mainly on the trucks and since 50% of the business comes from large customers and such customers tend to want to rent, that is a big influence on the overall figures. In total, over 70% of Rolatruc’s business is either full service or rental.

If things are measured in real time and if the price today is compared with the price five or six years ago, prices have fallen for everything including services. This implies that the service organisation has to constantly ensure that it can effectively use its skills and the business systems so that the costs do not increase. One direct effect of this is that Rolatruc went from being a regionalised structure with lots of locations and local people six years ago to comprising two locations only. Movex was utilised to maximise the company’s ability to coordinate service technicians from those two sites, thereby lowering the costs. Utilising economies of scale is another critical issue and, thus, it becomes vital to have sufficient service volumes and be able to manage these efficiently, and to maximise service technician productivity. EASY has worked very well in the UK and has facilitated several productivity improvements. In general, Rolatruc has been quite strict about controlling costs, measuring, and targeting. It also has a service sales group that focuses on not only getting service contracts for BT equipment but also on non-BT equipment. A well-structured and motivated service organisation is seen as one of the key differentiators on the truck market, because apart from BT and Jungheinrich, the other truck manufacturers operate through dealers. Also, there are specific service technicians responsible for rental trucks only and field technicians responsible for service on non-rental trucks.

Despite the competitive market situation, senior management finds the biggest challenge to be an internal one. HR management, training, organisational learning, and a strong corporate culture are seen as critical components for successful long-term operations. Compared to these issues, the introduction of a new product on the market is seen as a rather straightforward activity. BT Rolatruc’s organisation is illustrated in Figure 4. The sales organisation is built up of regional people, and there are also account salesmen that work over the whole country. The After Sales Director is responsible for the service organisation, which includes several sub-divisions. For example, there are three senior, regionally-based service managers. Other managers, such as the After Sales Development Manager, have responsibility areas more linked to business development (e.g. pricing, contractual issues, efficiency, and effectiveness).
In order to prevent weakening customer loyalty, a contract management group has been created. Whereas the service sales group has the task of working with new customers, the contract managers’ role is to look at existing key customers and manage these relationships. Thus, the importance of managing the customer relationship during the entire contractual time is highlighted.

The service, sales, and rental divisions are deliberately working very close both on an operational and on a senior management level. For example, if an account manager needs advice, the Sales Director, Rental General Manager, and After Sales Director will get together and go through the details with the account manager or the salesman and go through the details. The primary contributors to rental agreement sales are salesmen, the service management group (i.e., all the service managers, the After Sales Director, and the General Rental Manager), and the service sales group. Locally, there is a lot of communication between service technicians and engineers. However, due to the mobile business system and the organisational structure for example, informal meetings are less frequent than they were 15-20 years ago.

Today², the organisation is so big that people do not know everybody and it is possible that a service technician does not talk to anybody else in the organisation for days. Since communication between service and sales employees is vital, there are formalised breakfast meetings with service technicians for instance to which salesmen are invited. In addition, administrative staff rings every technician up once a week to see how things are.

² This refers to 2007, before the integration with Toyota. Due to the merger, the local organisation has significantly increased in size.
**Service technicians**

In BT Europe, there were approximately 1,700 service technicians equipped with PDAs (personal digital assistants, i.e. handheld computers) connected to the EASY system in 2007. Together with Toyota’s technician, the total number of technicians in Europe was approximately 4,500. If a customer has 50-75 trucks on one site, it usually implies that BT Europe/TMHE has one service technician on site every day. Often, these technicians have stronger social bonds with the customer organisation than with the local sales company.

An idea which originated from BT Rolatruc but which was then adapted by BT Svenska for example, is to divide service technicians into ‘ordinary’ technicians and rental technicians. This change was made from profitability considerations. Previously, profitability did not differ considerably between internal work and operation and fieldwork, as technicians worked with all types. Internal work refers to internal invoicing, e.g. services within the scope of rental contracts while operation work is managing existing service contracts where the customers own the trucks, and fieldwork refers to the work field technicians do for non-contract customers.

By separating internal and external customers in this way, BT Svenska managed to increase service technician productivity. Swedish service technicians receive commission on work performed but for rental contracts, service hours cost the company money instead of generating direct revenues. The rationale for subsidiaries using rental technicians is to reduce costs whereas technicians working externally strive to sell services, including spare parts. Thus, separating technicians into these two categories made it less attractive for rental technicians to waste with their time, because this directly affected their commission. This is an example of where different sales companies learn from each other and reutilise successful methods.

**Part-time service functions**

**Rental**

From 1946 to 2000, BT Svenska was the Swedish dealer for the US brand Clark’s counterbalanced trucks, and the rental offering was an idea that originally came from the US and was initially introduced in the 1960s. The first major rental customers of BT Svenska were the Korsnäs and Ingesund mills. Over the years, the concept was developed although the core idea, i.e. rental with maintenance included, has remained the same. Since the customer’s rent is dependent on the utilisation rate of the trucks, a critical rental parameter for BT Europe is the agreed operating time. In 2005, more than 80,000 trucks were on long-term rental/leasing across Europe. BT Europe has a European Rental Director to which the national rental directors report (as well as reporting to the local MD).

In the UK, an after-sales manager or a service sales manager is generally involved in the rental sales process (although salesmen also try to sell rental plans). On a major job, apart from the

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1 In Sweden, this is only current in major cities.
service sales manager, there would also be a sales account manager from the sales organisation and a project manager. Together, these three managers will look at the sales opportunity and if they are successful, the project manager implements the deal and ensures that everything goes smoothly up to the point when the rental fleet is delivered and installed. Once the fleet is delivered and installed, the responsibility is handed over to the contract manager who will manage the customer relationship and, when needed, use the sales, service, and rental resources (see Figure 5).

![Figure 5. A customer rental account.](image)

The rental managers work alongside their colleagues in service and sales, and their part in rental is generally to make sure that the salesmen have the skills to explain the benefits of the rental plan and to make sure that they are comfortable with it. In rental sales, a lot of time is spent negotiating with customers about ‘tweaks’; i.e. minor changes, but no major changes are made to the general rental plan. International customers are increasingly signing central rental agreements. However, because of legislation and accounting rules, the central agreement is a framework agreement. In each country there will be a local agreement with local regulations.

Compared to truck sales, there is little or no difference in the customer interface when selling rental plans to minor customers. For larger customers however, rental tends to complicate things because when multiplying the annual rental cost over the contractual time (e.g. five years), the amount of money can exceed the authority level of the local buyer. In such circumstances, negotiating the rental agreement may involve the customer’s financial director as well as lawyers, which slows the sales process time. In those situations, the rental managers review the contracts and give guidance to the salesmen as to what they can and cannot agree to.

When selling trucks to a customer, it becomes more difficult to see business opportunities in the customer. The only customer interaction may be the service technician doing the safety inspection and occasional repairs (provided that the customer does not have in-house technicians). A rental offering, on the other hand, implies a continuous customer interaction and enables TMHG to act more proactively, such as by reducing the customer fleet to instead, utilise
short-term rental trucks during peak seasons. A typical large customer contract will include a quarterly or bi-annual review. There will be an agenda and TMHG’s sales and service managers will go through the fleet management reports to identify trucks that are being overly used and ones that are being underused for example.

The sales organisation

Salespeople have thorough knowledge about TMHG’s trucks but less so about its industrial services. Whereas marketing new trucks is straightforward, marketing services, e.g. by demonstrating the mobile order system that service technicians use, is less obvious. Generally, on markets with a high share of service and rental sales, service managers consider that the sales force also has an interest in the service market and in selling services, although some consider that salesmen, particularly older ones, still tend to regard themselves as salesmen for trucks, not for material handling. To the question about the internal cooperation between sales and service, one service manager said:

“It works well. We have a good cooperation here… at least. It is difficult, I know this from previous organisations I worked for, because salesmen and service people are two different types of people. But it has also to do with who is selling. … I usually cooperate with three salesmen and these are a number of older gentlemen and they have their own ideas of how things should be, but overall, it works very well.”

Training and incentive systems are seen as important tools for changing the mindset of traditional salesmen. When setting new targets and goals for e.g. SLA sales in particular, contests and incentive systems are useful ways to trigger a new approach to service sales. BT Svenska started to map sales and service processes some years ago in order to change the way of reasoning among personnel; although tender data and checklists differ, salesmen should view the sales process as one process, regardless of whether it is a truck, a repair, or driver training. Subsequently, BT Svenska tried to include industrial services at the moment of product sales. Because many salespeople like to sell products and have little incentive and interest to learn and sell the company’s service offerings, local managers have encouraged salespeople to receive assistance from service employees and bring them on customer visits. In this way, it may be possible to avoid having one meeting where trucks are sold and an additional one where service is discussed. Although it may not be possible to substitute service personnel fully in the sales process, better service sales training and marketing material may facilitate for salespeople.

On many markets, salespeople receive commission when selling products but not when selling single services or bundled services such as maintenance contracts. In the past, salesmen often knocked services and/or spare parts off the price when signing central agreements. As a direct response, the sales manager position was initiated in order to look after these central agreements and ensure that customers were not able to haggle over the service part of a contract.

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Product development and manufacturing

On a central level, there is potential for better cooperation between organisational functions and for service issues to be taken into consideration to a higher degree by product development. Even if the service market is critical for TMHG, service managers believe that the trucks are still developed and designed mostly to fit manufacturing requirements. For example, according to service managers, product development tends to focus more on making it simple to assemble the wheels on the assembly line than on assembling the wheels in the field, where conditions are much more difficult. Wheels may be replaced twice a year during a truck lifetime and since more than half of the trucks are in some form of full service SLA or rental plan on many markets, it is TMHG that pays for this service. Since it can be difficult for product development and manufacturing to understand the needs of the service organisation, the service organisation has started working more structured towards product development. Some people in the service organisation believe that, although the inter-functional dialogue is better today than it used to be, product developers are not attentive enough to service needs, and that they sometimes tend to focus more on reducing component costs than on quality. With higher quality parts, maintenance and repair costs are lower, something which is important with a large share of rental trucks.

Key account management

In BT Europe, approximately 10-15% of turnover can be referred to the European Key Account Management (EKAM) organisation and the figures are continuously increasing. Compared to the number of national salesmen, relatively few people work in the EKAM organisation. In 2007, it was fewer than 20 people of whom only five or six had been working for a longer time. In addition, there are all the national KAMs, but these work with customers mostly on a national basis customers and are not included in the EKAM organisation.

In general, although margins are lower for these extensive agreements, volumes are higher and TMHE often receives a guaranteed service utilisation. It is becoming increasingly rare for agreements to be signed that do not include at least a Full Service SLA and it is very rare that agreements are for trucks only. Over the years, customers have become more focused on the actual agreements, wanting to have a specific structure centrally and to push the agreement down in the local organisations. Furthermore, many customers are trying not only to squeeze truck prices but also the price of service.

Critical factors for becoming preferred suppliers to global customers and being able to offer international key account agreements, are both global presence and the ability to offer a full range of warehouse and counterbalance trucks. Thus, for BT Industries, the acquisition of Raymond and Cesab, and also Toyota’s acquisition of BT Industries, are referred to as prerequisites for

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4 These figures refer to the time before the merger with Toyota’s Key Account organisation and the creation of the joint European Key Account (EKA) organisation.
becoming a preferred supplier. It is very seldom that major customers choose to have single suppliers of trucks and services, IKEA being one of the exceptions. Many services are adjusted locally but international key account contracts imply standardised services and the increasing number of such contracts raises the standardisation requirements.

Even if price is a key factor, trust and the experience of the customer-provider relationship history also matters. Furthermore, having FMS and a uniform business system is seen as advantageous when selling key account agreements. More and more, for example, customers want to be able to have fleet management reports for all sites in all countries included in the agreement in order to compare the costs and material handling performance between them. This means that it is vital to have a broad spectrum of services and financing alternatives in order to sell the KAM offering. Order winners can be commonality and the ability to have the same terms of condition regardless of local market:

“we like to be able to deal with a global company in a common fashion throughout the countries that they operate. So that forces us to have a high degree of commonality only modified locally where local conditions dictate. We see commonality and predictability as being a strength that a big customer who is global would like to use. We would not want to see different service levels and different offerings in different countries because it then becomes difficult for them to measure you and, I guess, to measure quality and effectiveness” (senior manager).

If an agreement is to be signed, BT Europe/TMHE usually puts together a customer support team. In general, an EKAM/EKA who has the responsibility for the account as well as with the customer contact is assigned where the customer’s headquarters are located or where the agreement is signed and the centrally responsible customer contact is located. Almost all sales organisations have a local KAM organisation and on every local market there will be a national contact person from BT Europe/TMHE for the account. The national KAM can have the responsibility for all KAM customers within one industry, for example the automotive industry, and will have the support of local salesmen (see Figure 6).

For a detailed description and analysis of the acquisitions, see Öberg (2008).
becoming a preferred supplier. It is very seldom that major customers choose to have single suppliers of trucks and services, IKEA being one of the exceptions. Many services are adjusted locally but international key account contracts imply standardised services and the increasing number of such contracts raises the standardisation requirements. Even if price is a key factor, trust and the experience of the customer-provider relationship history also matters. Furthermore, having FMS and a uniform business system is seen as advantageous when selling key account agreements. More and more, for example, customers want to be able to have fleet management reports for all sites in all countries included in the agreement in order to compare the costs and material handling performance between them. This means that it is vital to have a broad spectrum of services and financing alternatives in order to sell the KAM offering. Order winners can be commonality and the ability to have the same terms of condition regardless of local market:

“We like to be able to deal with a global company in a common fashion throughout the countries that they operate. So that forces us to have a high degree of commonality only modified locally where local conditions dictate. We see commonality and predictability as being a strength that a big customer who is global would like to use. We would not want to see different service levels and different offerings in different countries because it then becomes difficult for them to measure you and, I guess, to measure quality and effectiveness” (senior manager).

If an agreement is to be signed, BT Europe/TMHE usually puts together a customer support team. In general, an EKAM/EKA who has the responsibility for the account as well as with the customer contact is assigned where the customer’s headquarters are located or where the agreement is signed and the centrally responsible customer contact is located. Almost all sales organisations have a local KAM organisation and on every local market there will be a national contact person from BT Europe/TMHE for the account. The national KAM can have the responsibility for all KAM customers within one industry, for example the automotive industry, and will have the support of local salesmen (see Figure 6).

Figure 6. An outline of a European Key Account Management structure within BT Europe.

Nevertheless, many KAM agreements are also signed on a national level only. If the customer interface and the service organisation are taken into account, a possible local KAM structure can resemble the one in Figure 7.

Figure 7. Example of working method at BT Svenska towards Key Account customers.

Overall, there is more manoeuvrability for customisation in large agreements due to their extent. Flexibility may include possibilities to make specific changes in the fleet, the length of the agreement, how to manage the residual value, etc. Additionally, if a structural change is made, it may be possible to move trucks between different customer sites.

Today, the sales companies are more aware of the increasing importance of KAM agreements with major customers, compared to the situation a number of years ago. Key account managers perceive that the central EKAM organisation has become more important and has more leverage internally than before. For the customers, the challenge to achieve local alignment with centrally signed agreements can be even more challenging than it is for TMHE. Even if large customers have central agreements for service, it can still occur that locally customers buy services from local service providers instead of contacting the local TMHE organisation. For TMHE, it is difficult to ensure that locally a customer actually complies with the central agreement. Therefore,
it is vital for the buyer to achieve low costs in central agreements as in many customer organisations this is the only way to convince the local organisation to comply with the centrally signed agreement. If a better agreement was to be signed on a national level, the loyalty towards the central agreement would be much lower. Since service elements are increasingly becoming included in KAM agreements, it is becoming more difficult for both customers and TMHE to price and compare the offerings. Since there are numerous contractual forms and service variants, it is even more difficult for the buyer to convince the local organisations that the central agreement is favourable to them also. The burden of proof is generally on the central organisation, so in order to include service elements in a central agreement, a powerful central purchasing organisation is required. Due to financial and national legislation issues, rental agreements are signed locally, although a framework agreement is signed centrally.

**Externalised services**

From the turn of the year 2004/2005, BT Europe has been running its driver training services through a franchising model. However, apart from for driver training, the services which BT Europe offers are predominately performed in-house. BT Europe managers point at the advantages of having control over the local organisation for example when setting prices and terms of condition for new offerings. Furthermore, having the local interface towards customers is advantageous from a relationship point of view.

**Information and communication technologies**

BT Europe/TMHE regards itself as an industry leader when it comes to ICT systems and applications. As early as 1993, BT Compass, a logistics-planning software system to help customers improve their inventory-handling process and lower the total cost, was developed (cf. Anderson and Narus 1998). BT Compass helps BT Europe/TMHE to find new material handling solutions and provides customers with detailed performance results. Having a common business system in the subsidiaries has proven to be a strength and an enabler when ICT applications such as the mobile business system EASY are developed.

As competition has increased in the service market too, it is critical to continuously work with cost efficiency and capacity utilisation and ICT applications have had a major impact on such productivity improvements. The mobile business system EASY, for example, has enabled subsidiaries like BT Rolatruc and BT Svenska to consolidate and automate their administration workforces and simultaneously to improve service quality. Nevertheless, ongoing maintenance and development is needed for such types of systems and both centrally (or locally) developed applications like BT Compass, are not enough for material handling solutions, but local competence are always needed. When offering services that focus more on improving the customers’ business performance than on servicing the truck fleet as such, it becomes important to have the local competence to interpret the results of an analysis and turn it into a competitive value proposition for example.
**Key performance indicators**

BT Europe/TMHE measures service efficiency, both front- and back-office operations. A general key performance indicator (KPI) is the quotient of direct and indirect service personnel, and the target rate is 4.5. In order to calculate this KPI, it is therefore needed to define the employees’ functions, that is to say what they are working with. A common system for measuring rental profitability among other things will be implemented across Europe and customers will also be able to log on to a customer-specific web portal to see their fleet status, costs over time, etc. Another KPI is the quotient of promised preventive maintenance and actual preventive maintenance volumes. The total number of available service technician hours is also examined, how many of these are debited and the division between internally and externally debited hours. Further, gross margin per service hour is measured and compared between countries and workshops. Profitability per SLA and rental plan is also measured, as well as the number of SLAs compared to trucks sold. The objective is to sell an SLA in connection with all truck sales, and even though it is not the case today, there is a striking difference on markets such as the Swedish one compared to the situation a number of years ago.

**Incentive systems**

Local bonus and incentives systems can sometimes be problematic when international agreements are being coordinated. In some countries, for example, technicians are rewarded if they tip salesmen off about new sales opportunities. On another market, if a technician sells an SLA on a competitor brand truck, he will receive commission for some time ahead. Thus, he has no personal interest in sharing this information with the sales force, as they may want to replace the truck with a new TMHE truck with the result that the technician will lose his commission.

**Profitability**

Each year, the service market has increased steadily as a contributor, not only to BT Europe’s total revenues, but also as per cent of the total consolidated contribution. In 2004, the service market share was 48.2%, which can be compared with a 2000 share of 42.4%. When customers are choosing between different service agreements and rental plans, BT Europe/TMHE helps to compile a basis for calculation. Salespeople can spend days analysing customers’ operations before giving a quotation, and this analysis is not something the company is retroactively paid for.

Rental plans are more profitable than Full Service and other SLAs, partly because when customers haggle over SLAs, they haggle directly about services. For rental plans, services are bundled together with the trucks and salespeople have no right to reduce the price of the service element specifically. On the other hand, if a service technician does not complete the number of weekly working hours, it is more difficult for him to fill in and send an invoice for an hour or two to a customer than it is to invoice it internally on a rental plan. These practices makes external...
agreements (i.e. SLAs) sometimes look more profitable than rental plans, even if it is actually not the case.

One example of the different aspects of service production in service agreements is a discussion held at BT Svenska about contactors. Service technicians replacing a sheet metal shield consider that they are doing a good job, in spite of the fact that it would be better for both the company and the customer to change the complete contactor and avoid further turnouts in the future. In manufacturing, the same principle would be to not focus on manufacturing costs but rather on the lifecycle cost. This new logic is being communicated to service organisations as well as to manufacturing units (i.e. part-time service function), but a lot of work remains to be done. For instance, the large number of service technicians on many markets (there are over 300 in Sweden alone) makes it difficult to effectively disseminate information.

**Customers**

Customers can be found in many businesses even though most large customers are retailers. Since 2004, BT Europe has been segmenting customers according to business: automotive industry, food industry, paper industry, etc. Locally, customers are also segmented according to size (i.e. number of trucks). Although large customers are attractive in terms of capacity utilisation and giving response on market share, price formation is often low on most central agreements. Therefore, having smaller locally signed agreements is generally more profitable for BT Europe/TMHE. These local customers constitute a large part of the business of many subsidiaries and managing the relationships with those customers is seen as vital.

Ideas for new service offerings are generally created in the dialogue between the customer and the local employees. It is relatively common than an opportunity may come from a single customer’s expressed requirements and that opportunity may evolve into something that later becomes a standardised, formalised service, that is offered to other local customers also. Many elements of today’s offerings and contractual forms such as replacement trucks, flexibility, and 24-hour service, have been created in this way. Thus, customers are driving much of the development, but it is also a matter of what TMHE is able and willing to offer. If TMHE can also benefit from the new offering, like internal reports when offering fleet care reports, there are synergies which make the offering mutually beneficial.

The customer interface is gradually changing due to more comprehensive agreements and centralised procurement. Today, the buyers at major customers may be more professional than professional sellers and they make the truck brands compete against each other in order to lower the price. In some cases, the purchasing process initially has become a ‘faceless response’, where TMHE receives a request for information (RFI) or a request for proposal (RFP) and give demonstrations on local sites before the process goes into an e-auction. Thus, in this way, price is generally agreed beforehand and the competing firms that get through to the final stage then enter a face-to-face phase. It is therefore important for TMHE to try to influence the
specification and to build relationships with the buyers, although personal relationships matter less for such customers. If engineering or operations people are also involved in the procurement process, the specification is generally more advantageous to TMHE, whose service managers believe that a mutual long-term perspective is a win-win solution for both customer and provider.

Some managers argue that relationships are less important to customers today than was the case a decade ago, and they express frustration over the fact that buyers (and purchasing managers in particular) have insufficient understanding of material handling and, therefore, focus solely on unit price or price per hour. What knowledge different customers have can vary considerably even within industries, and the knowledge, priorities, and agendas of different actors in the same buying centre (e.g. foreman, truck driver, truck responsible, production manager, and purchasing manager) can differ greatly. Furthermore, the structures and politics of the local customer may prevent him from taking advantage of an offering. As one service manager put it:

“A customer wishes to buy 100 trucks. We’re more expensive than the competition so if we analyse it on a spreadsheet we’re 100,000 more expensive over five years. The other competitor has no innovation. We believe that the way we manage the contract we can save 20,000 per year, perhaps more, by helping them run the business better. What this requires is the customer’s operations, to have people who they can direct to help us help them. If they have no one or if the people in the operations are uncooperative, the customer won’t gain. On the other hand, if the person in operations wants this, but the person who is buying is measured on purchase price and this is not measured, and his bonus or salary is all about acquisition cost and capital, why would he consider this? He would always want to buy from the cheapest supplier. So while we use targets and measures to drive our people to higher performance, so do our customers, and sometimes, when those goals don’t line up, the customer might make the best decision for the purchasing department, they may not make the best decision for their company. Yet, goal incongruence is a huge issue with all cultures of companies and it’s very frustrating when you know that you have a product that will save the customer money over time, but he’s not brave enough or measured in the wrong way to take advantage of it” (service manager).

However, there are also examples of the opposite; customers who find that TMHE or competitors with similar value propositions and service focus, despite long-term customer-provider relationships, do not act proactively and suggest measures to improve uptime and reduce material handling costs. Instead, sales and service teams on a local level may be quite content with the ongoing relationship and continue to focus mainly on selling trucks, knowing that the customer is likely to buy SLAs once the warranty has expired.
Nevertheless, relationships are considered important both for TMHE and for the customers, and successful service offerings include frequent dialogue between representatives of the two organisations:

“I think if you talk to a salesman that has been here for 20 years he would probably say that ‘it’s not the same as it used to be because I used to have a very good and warm relationship with my contact who was responsible for buying the machines, and we went back 10-20 years and as long as I did my job he was happy’. And now today we have things like e-bid. But relationships still matter, and even when you are doing an e-bid. One or two companies are tougher because they work to make sure that you don’t get a relationship in place. But because we’re delivering a product and a service through its lifetime, it is important that they get their specifications right and we match our offer to their requirements. And then it works. So any company that understands that making a decision today that’s going to last for five or six years that needs to work, are better to work with. So some of our better, very big customers, still have engineering people or operations people very involved in the process; get the specification right, the service right, etcetera. And the last thing they do is maybe to give it to a buyer, but say to the buyer ‘you must give me that’. These companies are fine… It’s not as easy as it was 20 years ago in that sense from a relationship point of view. But relationships are still the most important thing, because you need to have a relationship even with the buyer, because the tendency can be for a sales manager to say ‘ah, bloody buyers, I can’t work with them’. You need to understand them and how they think and what their objective is. And if you can get into the mind of the buyer and you are honest and they start to trust you, even a tough buyer will give you some lead in terms of what you need to do. So relationships are really really important and we should never forget that, because if we start saying that it’s all arm’s length and relationships don’t count, it’s not true” (senior manager).

Established relationships facilitate TMHE getting the specifications and identifying requirements with the buyers before the bidding procedures. For local business in particular, TMHE managers view the personal relationship as something which it is critical to maintain and cultivate. If the customer has a long term perspective, managers are convinced that the service quality will be better and that more value will be created for both parties. Despite complaints about increased price pressure, many managers regard price as an order qualifier; instead, the decision maker is the quality of the offering (trucks and/or service and knowledge) and the relationship.

If TMHE wants to make a deal with a customer it has not previously had an agreement with, correct timing in the purchasing process is critical and relationship management becomes important in all phases of the sales process. If the deal counted as a major business opportunity, a
representative from the subsidiary’s senior management such as the managing director, sales
director, service director, or finance director is appointed to be responsible. It is considered
important that large/strategic customers see top management commitment, and both personal
and company-level relationships are vital.

On markets like the UK, there are facilities management (FM) companies that act as the middle-
man between TMHE and the customer. This can be problematic, because the FM company can
have a 15-year contract on the site and use a third-party logistics (TPL) firm to manage the
material handling. If TMHE delivers trucks and service to the TPL firm and the firm does not
perform well enough for reasons not related to TMHE’s operations, the contract may stipulate
that the TPL provider can be sacked after one year. Thus, TMHE also takes a risk if they deliver
to the TPL provider on similar short-term premises.

Reference customers
When selling service to existing or to new customers, people in the service team can invite these
possible service customers to some reference customer. Personal relationships may decide which
customers become reference customers, but obviously, it is also dependent on what types of
material handling solution the potential customer may be interested in.

Pilot customers
Since TMHE generally needs pilot sites where new trucks and solutions can be tested, pilot
customers are regularly involved in business development projects. The selection of pilot
customers depends on what project TMHE is carrying out and on the requirements the company
has. In a project about communication between trucks, TMHE chose the customer because of
the truck fleet the customer had. What always is important, regardless of project, is that TMHE
has a working relationship with the customer and trust is therefore essential. After identifying a
suitable customer site, pilot projects are run in order to receive opinions and feedback. Usually,
there are no fixed timetables; instead, projects are scheduled relatively freely. Before the project is
initiated at the customer site, a fairly thorough preliminary study is conducted, and includes
payoff calculations and often involves both the customer and the end-customer. Customers give
their opinions about the service and potential willingness to pay. In addition, sales companies, key
account managers, and sales personnel from TMHE also give their verdict on the service.

Competitors
Driven to a great extent by customer demand, the market trend is towards larger actors that offer
a complete product range and have a global presence. Thus, not only TMHG but also many
other major actors have grown through mergers and acquisitions. Competitors too are looking
for ways to offer more services and are aiming to increase the share of SLAs and rental plans in
order to maintain a long-term customer relationship and defend reduced margins. On small
markets like the Swedish one, competitors know each other well and belong to the same trade
association (Maskinleverantören). There is a common board in the association where the managing directors of each company meet and talk regularly. Overall market shares of each brand are also known due to statistics from Maskinleverantören.

The KION Group (until 2007, Linde Material Handling with the three brands Linde, STILL and OM) has 18,900 employees and is the number two company worldwide and number one in Europe, with 2005 sales of €3.6bn. In 2004, Linde’s service business, including rental and leasing plans, SLAs, and fleet management, amounted to 40% of its total sales and more than 50% of its profit. Other significant actors are the US company Nacco (Hyster & Yale), German Jungheinrich, Mitsubishi/Caterpillar, the US company Crown, and the Japanese company Nissan (including Swedish company Atlet).
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