Towards managed services

- A case study of Scania IT

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Abstract

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The purpose of this study is to examine how Scania IT can apply the delivery model managed services in order to meet the increased demand of IT services. Managed services mean that organisations hand over specific IT operations to a service supplier. Focus in this study has been on sourcing of application support and maintenance. The study comprehends an analysis of the perspectives why, what, who and how of sourcing and the organisational and technical challenges following from implementation of managed services. The material analysed in this study is collected during interviews performed at Scania IT and a benchmarking study performed with external customers and suppliers of IT services. A benchmarking study was executed to learn from other organisation's methods for managed service arrangements and apply these findings on a suitable method for Scania IT. Findings from the study show that incentives behind managed services are for example to keep up with the fast ongoing digitization and to get predictable IT costs. Suitable areas for managed services are activities that are not core and selection of supplier is partly based on volumes and trust. Identified organisational challenges involve dedicating resources for the managed service arrangements, align the employees' objectives with the organisation's, handling the concerned employees and to let go of control. Technical challenges found in this study are to create sufficient volumes, insufficient documentation, to select suitable areas for sourcing and to set up suitable quality metrics.

Populärvetenskaplig sammanfattning

Dagens samhälle har genomgått och genomgår fortfarande en omfattande digitalisering. Detta har lett till en ökad tillgång och efterfrågan på IT tjänster som på olika sätt används för att använda och förvalta information. Den snabba utvecklingen har gjort att det ständigt kommer nya tjänster, vilket också innebär att teknik blir gammal snabbare än någonsin tidigare. IT tjänster är idag en nödvändighet för att företag ska kunna behålla sin konkurrenskraft på marknaden vilket i kombination med att användare blir alltmer medvetna, ställer höga krav på organisationer i deras leverans av IT. För att kunna fokusera på det i sin verksamhet som är unikt måste företag därför outsourca sådan IT som inte bidrar till verksamhetens unika kompetens. I och med att outsourcing blivit en viktig del i rollen som IT leverantör, har olika metoder och modeller tagits fram för hur detta ska göras på bästa sätt. I denna uppsats undersöks just en sådan leveransmodell, managed services. Syftet är att undersöka hur en organisation kan arbeta med managed services för att outsourca sina IT-tjänster. Detta syfte undersöks med hjälp av att undersöka incitamenten till att outsourca med managed services, vilka aspekter som är viktiga i kund-/leverantörsrelationen samt vilka organisatoriska och tekniska utmaningar som detta medför och hur de kan hanteras. I denna uppsats används Scania IT som fallföretag för att exemplifiera hur denna modell kan användas. Det specifika område som undersökts inom Scania IT är applikationssupport och förvaltning.

Metoden som används i denna undersökning har varit av kvalitativ karaktär där totalt 22 semistrukturerade intervjuer har genomförts. Som tidigare nämnt används Scania IT som fallföretag i denna uppsats. Anledningen till detta är ett intressant fallföretag är att det är ett dotterbolag till Scania, vilket innebär att Scania IT uppgift är att leverera kostnadseffektiva IT lösningar som bidrar till Scanias konkurrenskraft. Under studien har totalt 15 intervjuer genomförts på Scania IT. För att kunna bredda förståelsen för hur andra organisationer använder sourcing och managed services görs också en benchmarking. I denna intervjuas de fyra IT kunderna Nordea, Coop, Sandvik IT GSS och IT leverantörerna L&T Infotech och IBM.

Materialet som samlats in har analyserats med hjälp av det teoretiska ramverk som presenteras. Eftersom att managed services är en metod för outsourcing har teorier som berör outsourcing också använts. Områdena incitament till att outsourca, vad man ska outsourca och inte, vad som är viktigt hos en leverantör och vad managed services är analyserade med teorier som rör outsourcing och managed services. Vidare analyseras material rörande organisatoriska och tekniska utmaningar med hjälp av teorier som berör organisatorisk mognad gällande outsourcing och risker som är kopplade till outsourcing.

Från studien har flera slutsatser nåtts. Scania IT och andra företag använder managed services som ett sätt för att hänga med i den tekniska utveckling som idag pågår. Genom att använda managed services kan man uppnå högre flexibilitet i organisationen som snabbare time to market. Modellen ger en förutsägbar IT budget och genom samarbete med leverantörer finns förhoppningar om skalfördelar. Genom managed services slipper också organisationen ansvaret för att hantera personal. En teknisk utmaning som upptäckts är att det är svårt att veta vad som passar att outsourca via managed services. Studien visar dock att tjänster som inte anses kärnverksamhet, som är industristandard, innehåller repetitiva uppgifter och inte innefattar direkt kundkontakt lämpar sig att outsourca. Vid val av leverantör är det bland annat viktigt att välja en leverantör som kan kompensera för den organisatoriska mognaden då en omogen kund behöver en mogen leverantör. På Scania IT har man en del utmaningar som måste hanteras vid arbete med managed services. På ett organisatoriskt plan innefattar det utmaningar att sätta dedikerade roller och ansvar, att fästa arbetssättet i organisationen och att våga släppa kontrollen till leverantören. Utmaningar av teknisk karaktär som måste hanteras är att skapa volymer av applikationer att lämna till leverantörer och att systemen ofta är odokumenterade.

Sammanfattningsvis har studien visat att det i princip är nödvändigt för företag att outsourca IT för att kunna fokusera på och behålla konkurrenskraft inom de områden som anses kärnverksamhet. Detta skapar i sin tur nya affärsmöjligheter för företag som specialiserar sig på att hantera IT tjänster som inte anses kärnverksamhet hos andra företag såsom Scania IT.

Preface

This thesis has been written during the spring of 2016 as the final part of the Master of Sociotechnical Systems program at Uppsala University. The work in this thesis has mainly been performed and written in collaboration but there have also been individual responsibilities. Frida has focused more on outsourcing and the analysis of challenges regarding the organisational and technical implementation of managed services while Therese has focused more on managed services and the analysis of sourcing strategies. The study has been performed at Scania IT at the IT Vendor Management Office. The supervisor at Scania IT has been Anders Karnfält who has contributed with valuable input in his role as sourcing specialist. At Uppsala University Marcus Lindahl from the Department of Engineering Science has been supervisor. He has contributed with new perspectives to the subject and been a valuable person for discussions. We would like to thank both of you for your time and commitment to this thesis.

Further on we would like to thank all people that have taken time to meet us for interviews. These interviews have taught us a lot about sourcing, outsourcing and the IT industry. We would also like to thank the whole IT Vendor Management Office at Scania IT that has contributed to a lot of knowledge about Scania IT and brought other valuable input to our thesis. Further on we would like to thank all people that in some way have contributed to this thesis. Finally we would like to thank friends and family that have motivated and supported us during our studies at Uppsala University.

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1. Introduction

During the last decades digitization has been a discussed subject. Digitization means that information transfers from for example physical images, videos and audio into digital forms where information can be accessible to anyone (Oshiri & Weeber, 2006). Werner (2016) emphasises the importance of digitization within organisations and he points out that more than 60 % of Swedish organisations have budget allocated for investments within digitization upcoming years. He defines digitization as a strategic area which comprehends the introduction of Information Technology (IT) services in core processes of a business. Further on, Gottschalk & Solli-Sæther (2005) emphasise that IT services are more important to the success of a business than ever before. This might be a reason why the spending within the IT field has increased quickly during the last decades and that it is still increasing. According to Gartner (2015) the worldwide spending on IT in 2015 is expected to increase by 2.4 percent compared to 1.9 percent in 2014. Further on Werner (2016) point out that the manpower within IT is increasing and that 4.8 percent of the Swedish workforce are engaged within Information and Communication Technology (ICT) 2016.

Because of the digitization, new technology have been developed faster than ever before. New software and IT services are constantly developed, which means that technical solutions get old faster than before. This sets high demands on organisations in the delivery of IT services (Ahmed, 2006). A result of the changed conditions has been that IT suppliers have been forced to search for alternative methods of providing and managing IT services. Even if IT never has been considered more important to a business, organisations choose to hand over more responsibility to external suppliers and the outsourcing phenomena has evolved in an unprecedented rate (Gottschalk & Solli-Sæther, 2005). According to Agrawal & Carpenter (2006) outsourcing has been used as long as there has been business. However, outsourcing has gained more attention and usage in recent years. Jenster (2005) agrees that outsourcing is not a new idea within the field of management but that the volume, extent and character of outsourcing lately have been changed. This means that current challenges are not simple "make or buy" decisions, but also what some people call the new round of globalization. This means that more than manufacturing jobs are offshored to developing countries.

The digitization has led to new ideas of how outsourcing and delivery of IT services can be done (McIvor et al., 2008). One such delivery model is managed services, which means that organisations outsource IT services that a supplier manages and delivers according to certain service agreements for a predetermined price (Gartner, 2016; McCabe, 2009). Kumbakara (2008) describes that it is common to set up managed service arrangements for services that are needed for the day-to-day operation of IT systems. In this study Scania IT is used as a case company in order to study the incentives and challenges behind the implementation of managed services. Scania IT

has earlier had a trend to take care of the majority of the IT demands in-house. However, the organisation has during recent years come to the insight that it is challenging to hold a leading position within all segments of IT which has led to a wish to outsource more IT services. In order to retain the control of the quality of the IT deliveries Scania IT consider managed services a good method for outsourcing IT services.

1.1 Purpose and research questions

The purpose of this study is to examine how an organisation can work with the delivery model managed services to source IT services. To set the research in a context, Scania IT will be used as a case company with focus on application support and maintenance. The process of implementing managed services will be analysed according to following questions:

- What are the incentives to source IT services with managed services?
- What are important aspects of the relationship between the supplier and customer in a managed service arrangement?
- Which organisational and technical challenges do managed services bring and how can these be handled?

2. Theory

2.1 Sourcing & Outsourcing

Da Rold (2007) argues that it is almost impossible for internal resources within global organisations to satisfy the IT demands. It is often a mix of both internal and external recourses that is needed to meet these demands (Da Rold, 2007; Herz et al., 2013). To create a successful sourcing environment organisations must have other objectives than tactical and cost savings, when making outsourcing decisions. Other sourcing objectives can be alignment with certain business outcomes that the organisation wants to achieve. To find out if a service shall be managed internally or externally a sourcing strategy can be used to create an understanding of *why* the organisation wants to source a service, *what* service they want to source, *who* is a suitable supplier and *how* it shall be done (Da Rold, 2007). Jivan et al. (2015a) emphasise that IT sourcing decisions shall be based on whether a service or a supplier has potential to bring value and differentiation to the business with respect to the required level of competence and performance. Basing sourcing decisions only on costs has in many cases led to failure.

Since the use of internal and external resources are different in all organisations there is no one-size-fits-all-model for sourcing (Da Rold, 2007; Da Rold et al., 2011; Gadde & Jellbo, 2002). According to Herz et al. (2013) the use of single-sourcing with big deals valued to more than one million USD has become less frequent during recent years (see Appendix 1: Glossary). Despite this decrease in big outsourcing deals, it is possible to see that the number of signed IT outsourcing deals are increasing (Herz et al., 2013). Organisations nowadays have a more selective approach towards what to source, which is done by using multi sourcing (Da Rold, 2007; Herz et al., 2013)(see Appendix 1: Glossary). Further on Da Rold (2007) discusses a trend towards a higher demand on globally delivered services from India and other global locations.

Agrawal & Carpenter (2006) emphasise that every time an organisation use resources from an external source in order to meet organisational objectives they engage in outsourcing. Examples of outsourcing that Agrawal & Carpenter (2006) point out are when manufacturers buy raw materials from a supplier, when a wholesale company creates a contract with an external delivery firm and when a company hires an IT-consultant. McIvor et al. (2008) define outsourcing as a process that involves sourcing of services or goods from external suppliers that previously have been developed internally. Tayntor (2001) compares outsourcing to a marriage since it is legally binding, in many cases a monogamous engagement, a long-term engagement and in most cases includes a divorce clause. Willcocks & Kern (1998) defines IT outsourcing

as *"the handing over to a third party management of IT/IS assets, resources, and/or activities for required results"*.

According to McIvor et al. (2008) IT outsourcing has in many organisations become a key tool for implementation of business strategies. The cause of the growing outsourcing phenomena is the increased demand of more flexible organisations that have to be more responsive to requirements from customers. However many organisations lack a deep understanding of outsourcing, especially regarding benefits and risks. Further on Jivan (2015a) and Vitasek & Manrodt (2014) argues that a critical success factor for an outsourcing contract is to create a win-win environment between the supplier and customer (see Appendix 1: Glossary).

2.1.1   The incentives behind outsourcing

According to McIvor et al. (2008) outsourcing is not a straightforward financial or purchasing decision. Both Tayntor (2001) and McIvor et al. (2008) emphasise that outsourcing often is a major strategic decision triggered by the fact that organisations want to focus on a limited number of core competencies (see Appendix 1: Glossary). As an example of this, Tayntor (2001) draws parallels to the manufacturing industry where a manufacturer can decide that their core business is to produce widgets rather than distributing them and therefore choose to outsource warehousing and distribution. Similarly an IT department can decide that certain services are not core competence and therefore transfer the responsibility to a supplier.

Further on McIvor et al. (2008) emphasises that benefits of an outsourcing strategy can be cost reduction, predictable costs (Tayntor, 2001), performance improvement, flexibility and specialisation (McIvor et al., 2008). Cost reductions can involve benefits from the suppliers' cost advantages, such as economies of scale, experience and location. Further on McIvor et al. (2008) argues that suppliers often have the ability to achieve higher level of performance compared to internal resources. The performance benefits might not only be reduced costs, but also higher levels of service quality due to specialist competence provided by the supplier. Tayntor (2001) emphasises that services that do not vary substantially from industry to industry and company to company can be considered a commodity. This makes it possible for suppliers to standardize these services, which leads to economies of scales. Because of cost pressures, rapidly changing technologies and more proficient consumers organisations have difficulties to control and excel all processes and to be competitive. Organisations might be more flexible when outsourcing technology that are rapidly developing, since suppliers with specialist competence have the ability to respond better to new technology (McIvor et al., 2008).

Tayntor (2001) further points out that IT departments might have major competence gaps and no short-term plan how to fill these gaps. Outsourcing can be used to obtain this competence. Another benefit following from outsourcing is that resources that earlier had to execute the outsourced tasks instead can participate in projects with higher

priority. By outsourcing, the risk of losing key employees is transferred to the supplier which often is a company whose primary purpose is to recruit and retain technical competence. Since suppliers often have to meet certain quality metrics they have strong incentives to perform cross-training, which reduces the dependence on individuals.

2.1.2 Risks associated with outsourcing

Even if the benefits of outsourcing seem convincing, Agrawal & Carpenter (2006) argue that there also are risks associated with outsourcing. There are several reasons why an outsourcing project can fail, for example selecting wrong supplier, insufficient performance of the supplier or inefficient handling of contracts. According to King (2005) there are cases where outsourcing can be more expensive compared to managing the same service in-house (see Appendix 1: Glossary). Mears (2005) presents results from a survey which indicates that 70 % of 25 large companies with substantial outsourcing contracts had bad experiences associated with outsourcing projects, which has led to a more careful approach. One fourth of the participating companies had moved back outsourced functions in-house and almost half of the companies had failed to meet expected cost savings.

Tayntor (2001) argues that a major concern regarding outsourcing is that the IT department loses control over the business and Da Rold (2007) explains that organisations often are unwilling to leave too much of the business or control to a supplier. Tayntor (2001) emphasises that outsourcing involves transferring responsibilities of daily operations from an IT department to a supplier. This means that the IT department gives up the ability to control the work on detailed level. If an IT manager does not feel comfortable handing over this responsibility to a supplier, outsourcing is not a suitable way of working.

Another concern regarding the risks of outsourcing involves reduced flexibility, since it often is a long-term engagement bounded by contracts that are not designed for daily changes in the scope of work. Even if a good outsourcing contract enables periodical adjustments, it does not leave room for frequent changes. This means that if the workload is volatile, outsourcing might be an inappropriate strategy (Tayntor, 2001). Artunian (2006) argues that a common mistake is to forget termination and exit when setting up outsourcing contracts. She further emphasises that the outsourcing organisation shall be involved in the end-game transition and commit enough time for the transition.

2.1.3 What to outsource

There are different types of outsourcing, which means that organisations for example can transfer an entire business process to a supplier or keep some activities in-house and transfer some activities to a supplier (McIvor et al., 2008). According to Luftman et al. (2004) decisions within the IT sector regarding what and whether to outsource or not shall be connected to an identification and understanding of core competencies and

critical success factors within an organisation. Although the process behind identification and understanding of core competencies often is time consuming, it is the best method for determining if a project shall be outsourced. In cases where services are considered both core competence and critical success factor, outsourcing shall not be considered since such services are directly connected to the overall success or failure of the organisation. A service that is both core competence and a critical success factor is often critical for the day-to-day operations within the organisation, the capability to distinguish itself competitively, the capability to deliver value to partners and customers and finally the capability of innovations (Luftman et al., 2004). Further on, Artunian (2006) emphasises that it is not preferable to outsource IT functions that provide the supplier with strategic information about the organisation and the industry. She also argues that an organisation shall keep its help desk functions and other activities involving interaction with customers in-house. Further on Naciri & Janati Idrissi (2014) point out software maintenance as one of the most concerned areas within outsourcing.

2.1.4 Outsourcing maturity

According to Lui (2003) market research executed by Gartner in 2003 indicates that half of IT outsourcing projects fail because they are unable to deliver expected value. This often happen when communication between the customer and supplier does not work, when there is no plan how to manage the relationship between the customer and the supplier and when there are rapid changes in the business plans and technologies. According to Fairchild (2004) organisational immaturity can be the reason that many of these problems occur. Further on Gottschalk & Solli-Sæther (2006) present a maturity model for IT outsourcing relationships, which is a three-stage model for the evolution of an outsourcing relationship. The model consists of *cost stage*, *resource stage* and *partnership stage.*

The cost stage is motivated by Gottschalk & Solli-Sæther (2006) theories describing that IT outsourcing often is initiated to make cost savings and that organisations can choose to outsource parts of their IT services to obtain cost advantages from the suppliers' economies of scale. Further Gottschalk & Solli-Sæther (2006) emphasise that agency theory is a part of the cost stage. Agency theory implies that an organisation engage a supplier in order to execute a service on its behalf. This engagement provides the supplier with some decision-making authority. According to Eisenhardt (1985) two key features are recognized in agency theory. The first key feature is the divergence of preferences among members in an organisation, which implies that people might have their own preferences and there is a risk that these preferences does not align with the preferences of other members. Therefore the purpose of control within organisations is to provide measures and rewards to ensure that the individual interests and achievements align with the organisations'. The second key feature is the outcome uncertainty of organisations, which means that it is impossible to predict the future and that it might bring for example success or bankruptcy. In an outsourcing relationship this risk is shared between the different parties.

Gottschalk & Solli-Sæther (2006) emphasise that the real source of competitive advantage is unique resources, both of tangible and intangible nature. Within the resource stage outsourcing arrangements make it possible for a customer to access the suppliers' resources. These resources might produce innovation or competitive advantage to the client. Important to bear in mind is that the resource stage not only is characterized by the access to the suppliers' resources, but that the customer also will focus on internal resources at the resource stage.

Gottschalk & Solli-Sæther (2006) emphasises that the partnership stage is a less accurate defined analytical framework. However, literature regarding partnership within Information System (IS) sometimes mention shared risks and rewards, but the most common aspects are intangibles such as understanding, trust and comfort. Partnership can also be referred to as alliances, which Koh et al. (2004) define as collaborative efforts between at least two organisations where all involved organisations can take advantage of the collaboration. Further on Gottschalk & Solli-Sæther (2006) point out that stakeholder theory can illustrate the partnership stage and emphasise that stakeholder theory concerns the balance of the stakeholder's interests.

2.2 Managed services

Gartner (2016) defines managed services as when a supplier delivers applications, systems, e-management and network to several customers using a "pay-as-you-go" pricing model. Webopedia (2016) defines a "pay-as-you-go" pricing model as when customers pay in advance for a specified amount of a service where the volume can be extended for additional cost. The payments can be done on daily, weekly or monthly basis. Further on, McCabe (2009) defines managed services as when organisations hand over specific IT operations to a service supplier. These responsibilities can include managing, monitoring and/or problem solution for chosen IT systems. According to Sharma (2015) managed service arrangements were initiated within the information and technology sector, and has thereafter spread among different industries. Kumbakara (2008) describes that managed services often are a set of services that are needed for the day-to-day operation of IT systems, which organisations let a so-called managed services provider manage. An example of a common managed service arrangement is when an organisation hires a supplier for the operation of printing services.

Both Kumbakara (2008) and Jivan et al. (2015c) describe managed service as a trend within the IT sector and Kumbakara (2008) further explains the advantages managed service provide to its customers. These advantages are:

- Reduced total cost of ownership.
- Predictable and stable budget.
- Increased support level and availability.
- Access to the latest technology with limited investment and risk.
- Access to larger body of knowledge.

- Easier adaption to new business processes in the aspects of flexibility and scalability.
- Frees time for the IT department to focus on core processes.

(Kumbakara, 2008)

Further on Jivan et al. (2015b) describe that in managed services suppliers can achieve simplification, standardisation, automation and innovation in their processes, which in turn enables continuous improvements.

Jivan et al. (2015a) argue that to get most business value from managed services arrangements there are some key attributes that need to be understood:

- The importance of defining and documenting a clear scope of work.
- Service level agreements (SLAs) and key performance indicators (KPIs) are used to measure and manage performance.
- That managed service models must include financial risks and rewards as well as joint governance amongst the supplier and the customer.
- That managed service arrangements shall include plans for continuous improvement and partnership.
- The importance of dedicating sufficient time for transition and steady state.
- The importance of identifying certain roles as "key" for the service.
- That the risks associated with delivery are shared with the supplier.

(Jivan et al., 2015a)

2.2.1 Governance of managed service arrangements

According to Parmenter (2010) and Jivan et al. (2015b) performance measures are used to ensure that daily activities align with strategic objectives within the organisation. Examples of such performance measures are SLAs and KPIs.

According to Jivan et al. (2015a) and Naciri & Janati Idrissi (2014) SLAs are service measures associated with performance levels and SLAs define the expectations of service deliveries. Larson (1998) further emphasises that the service measures shall reflect the customer requirements. Further Larson (1998) points out that the results from a poll performed by KPMG and Nolan Norton Institute in 1997 indicate that half of the respondents with experience of outsourcing services wished they had put greater effort into creating well defined and clear SLAs. Further on, Larson (1998) emphasises that SLAs shall identify the commitments of the supplier and customer of the service and to be effective the SLAs shall specify *what*, *where* and *when* of a contracted service. Jivan et al. (2015a) point out that SLAs are supposed to be specific, measurable, actionable, relevant and time-bound. This method is called the SMART-method. They emphasise that five to seven SLAs are preferred and that it is more favourable scheduling yearly revisions of the SLAs than adding SLAs only because data exists.

Further on Jivan et al. (2015a) emphasise that KPIs are necessary to create successful managed service arrangements. Parmenter (2010) defines KPIs as following: *"KPIs represent a set of measures focusing on those aspects of organisational performance that are the most critical for the current and future success of the organisation."* The monitoring of KPIs are supposed to be done 24/7, daily or weekly. If the monitoring is done monthly, quarterly or annual the measurement cannot be classified as a KPI, since it cannot be a key success factor to the business when measured so infrequently. The purpose of KPIs is to inform organisations regarding which actions that are needed. Further on Jivan et al. (2015a) point out that KPIs make it possible for customers and suppliers to identify specific areas in which performance efficiency and organisational objectives can be measured and reviewed regularly.

Jivan et al. (2015b) point out that SLAs and KPIs shall address the following areas:

- *Timeliness*: Resolution time, turnaround time, etc.
- *Performance quality:* Accuracy, first time right, percentage of rework and compliance.
- *System availability:* Applications/infrastructure uptime and access.
- *Productivity:* Year-on-year improvement.
- *Customer satisfaction*: Operational as well as relationship.

(Jivan et al. 2015b)

3. Methodology

3.1 Research

According to Eriksson & Wiedersheim-Paul (2011) knowledge acquisition can be made both from surroundings as well in already established theory. The collection of data illustrates both actual distribution of different relations (income situation, age and gender distribution, consumer behaviour) as well as creating the foundation for model and theory formation. This facilitates description, analysis and discussion of these relations. In cases where rapid changes are taking place research helps creating an understandable picture of what is happening, which makes it possible to analyse consequences and discuss alternative choices of paths.

Further on Eriksson & Wiedersheim-Paul (2011) argue that the starting point for a research or an investigation always is a question that shall be answered. The question can either be a practical question (e.g. how can we improve the productivity in our manufacturing?) or theoretical (e.g. which factors have positive impact on the productivity and which have negative impact in competence based companies?). Many questions are both theoretical and practical. In an educational situation the primary purpose is to improve the students' capability of investigating and researching. In context of research the aim is to contribute to new knowledge and insights, which is not necessarily a requirement when writing a master thesis. This means that the question might have been answered to some extent earlier and that the answer might be found in a summary of existing information. However, the question is of great importance since it guides the thesis and it is the question the authors and the readers get back to when reading the report (Eriksson & Wiedersheim-Paul, 2011). To answer the questions in this thesis, a case study at Scania IT has been performed. The material have been collected by interviews and a study of internal documentation at Scania IT and by a benchmarking study with external suppliers and customers of IT services. Focus during the interviews has been on application support and maintenance, which can be read about in Appendix 2: Application maintenance. However, the findings might be applicable on other areas within IT.

In figure 1 the working procedure behind this study is illustrated. In the beginning of the study the theoretical framework was developed. Thereafter the methodology applied in this study was compiled. According to that methodology the interviews at Scania IT and the benchmarking interviews were performed. In parallel to interviews, transcription was done. Thereafter the collected material was compiled, which was followed by an analysis of the material together with the theoretical framework. Finally some time for preparations of the presentation and opposition was dedicated.
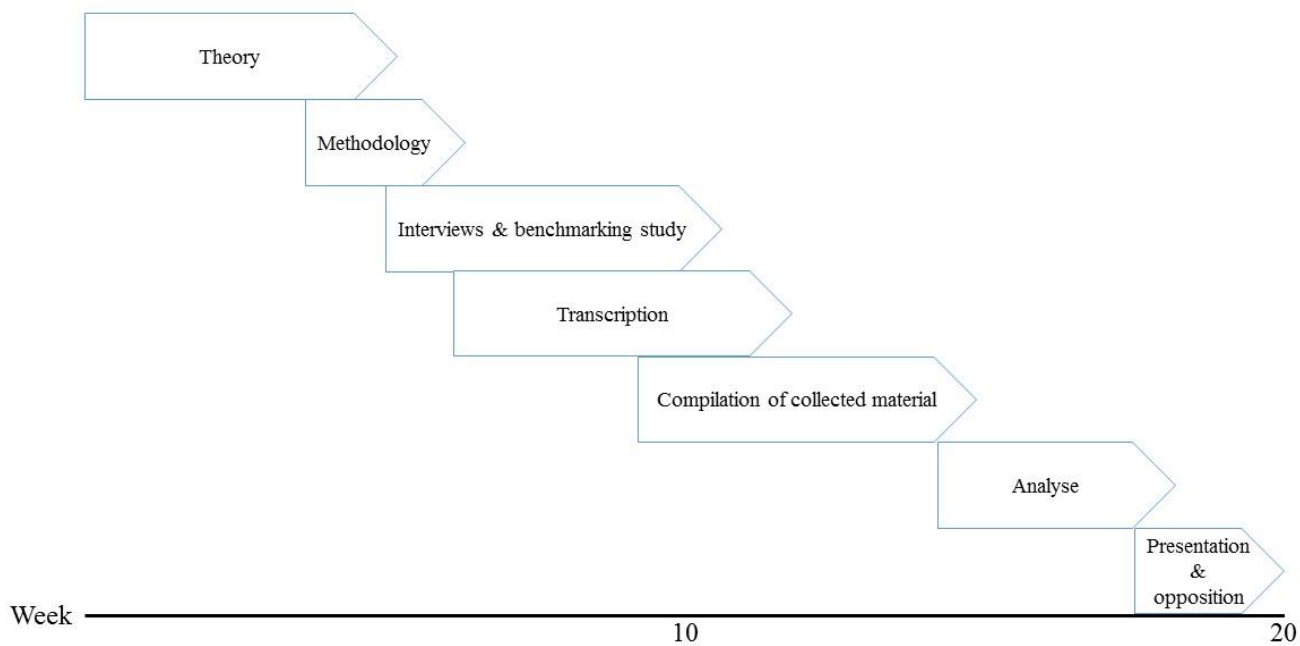
Figure 1: Timeline of the work procedure of the study.

3.2 Case study

According to Gerring (2007) the definition of a case study is "the intensive study of a single case where the purpose of that study is - at least in part - to shed light on a larger class of cases". Further on Gerring (2007) defines the term case as a "spatially delimited phenomenon (a unit) observed at a single point in time or over some period of time". Jensen Kjaer (1991) points out that a case study is a qualitative method. A qualitative method is in general considered to have higher degree of validity since it makes it possible to ask interviewees questions and make clarifications. This increases the possibility that interviewees understand the questions correct as well as making the interviews deeper. What might be worth taking into consideration while using qualitative methods are that problems associated with reliability might occur due to lack of standardisation. This means that the acquired results might be specific for the individual case (Gerring, 2007).

In this case study Scania IT has been selected to exemplify and analyse sourcing strategies within IT with focus on managed services. Scania IT is a captive organisation that has been founded to serve the IT demands at Scania. One challenge captive IT organisations face is the difficulty to offer the wide range of IT-services available on the market which motivates the use of sourcing. Since Scania IT is an older company the

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age of their applications are spread, which makes sourcing of support and maintenance of applications more complex.

3.3 Benchmarking

In this study a benchmarking has been performed to compare Scania IT with other IT suppliers and customers, with the aim to learn from other organisations experiences. Karlöf (2009) emphasises that within the field of management the word benchmarking is used to describe objectives for efficiency in the shape of correct ratios. These ratios primary aim is to make changes within the organisation that improves the operations, the precision of the strategies or the quality and/or productivity. Karlöf (2009) points out following elements of benchmarking that are considered to be the most important:

- A complete and correct description of the processes and activities that creates valuable performance.
- Correct comparisons with another part - a good role model.
- A deep understanding of the causality between the organisation, competence, etcetera that explains the difference in performance, why this difference exists and how.
- Changes in organisation and routines and renewed competences in order to make the organisation more effective by inspiration from the partner, not by imitation.
- An improvement work with stated goals and rewards which has benchmarking as a base for organisational learning with searching for a new role model for continuity and improvement within other fields.

(Karlöf, 2009)

The benchmarking study involves four customers and two suppliers of IT-services. Customers interviewed in this study are Coop, Nordea, Sandvik and Uppsala kommun. The similarity between these customers is that they use of a large amount of IT services, but their core business is not IT. This is similar to Scania whose main task is to produce trucks and buses rather than to deliver IT-services. However, IT is used in many parts of the organisation and a necessary component to execute the core business. The suppliers interviewed in this study are IBM and Larsen & Toubro Infotech (L&T Infotech), who both deliver different types of IT services to customers all over the world. In table 1 a short description of the benchmarking organisations is presented which includes type of industry, number of employees and geographic location.

Table 1: List with information about the benchmarking organisations.

Customer company	Industry	Short description
Coop	Grocery trade	Around 15 000 employees. The IT department consists of 55 employees (not including consultants). Active in Sweden (Coop, 2016).
Nordea	Bank	Around 30 000 employees. The IT department consists of 1500 employees (including consultants). Active in Sweden, Finland, Norway and Denmark (Nordea, 2016).
Sandvik	Engineering	Around 46 000 employees. Sandvik IT GSS consists of 1300 employees (including consultants). Global organisation (Sandvik, 2016).
Uppsala kommun	Public Welfare	Around 12 000 employees. The IT department consists of 180 employees (including consultants). Active in Uppsala, Sweden (Uppsala kommun, 2016).
Supplier company	**Industry**	**Short description**
IBM	IT	Around 378 000 employees. Global organisation (IBM, 2016).
L&T Infotech	IT	Around 20 000 employees. Global organisation (Thiruvengadathan, 2016).

3.4 Data collection

Data collection in this study has been done during interviews and by studying internal documentation within Scania IT.

3.4.1 Interviews

Eriksson & Wiedersheim-Paul (2011) emphasise that data collection can be done according to two approaches: interviews and/or surveys, which either can be used independently or together. In this study interviews have been used to collect information. According to Jensen Kjaer (1991) interviews can be performed in two ways: unstructured or structured. The unstructured interviews are free in the sense that the interviews do not have predetermined questions or a clear structure, while the structured interviews are done with help of predetermined questions that are asked in a certain order.

Unstructured interviews

To make sure that the problem formulation got right and was applicable at Scania IT, several unstructured interviews were performed with the supervisor Anders Karnfält and the sourcing specialist Rosel Sandberg. These interviews were used to discuss important areas that the study concern and to gain insights about Scania IT.

Semistructured interviews

The interviews within Scania IT and in the benchmarking study have started from the same questions with open answering alternatives but resulted in different attendant questions, which makes it possible to identify the interviews as semistructured (Bryman & Nilsson, 2002). According to Gillham & Jamison Gromark (2008) it is possible to argue that the semistructured interview is the most important type of interview since it comprehends a flexibility that is balanced by structure, which results in good quality data. The characteristics of a semistructured interview is that all interviewees are asked the same questions and that the time for the interviews are approximately the same. Parts that are less structured are questions that are open, which means that the direction or the character of the answer is open. Deeper questions are asked if the interviewer thinks that there is more to tell at a certain time during the interview (Gillham & Jamison Gromark, 2008). This type of interview was chosen to collect similar material that enables comparisons but does not restrict the interview too much, since the individual's unique competences and insights are important. In the beginning of the study a couple of questions were compiled together with the supervisor. As the study proceeded some questions were exchanged and some were added according to what kind of role and knowledge area the interviewee had.

Selection of interviewees

The first interviewees were selected after discussions with the supervisor. In the end of each interview, the interviewees were asked to recommend relevant names. These names were then screened to find suitable interviewees with competence within IT and sourcing. According to Bryman (2011) this way of working is called the snowball effect. The snowball effect means that the researcher initially gets in contact with a number of people that are relevant for the theme of the research. These people are then used to get in contact with additional interviewees. In table 2 and table 3 the interviewees are presented including information about the persons that participated in the interviews. The table contains name, title, company, type of interview and which date the interview took place.

Table 2: List of interviewees at Scania IT.

Name	Title	Company	Type	Date
Magnus Lännholm	Senior Manager: IEC - Vendor Management Office	Scania IT	Personal	2016-01-27
Rolf Leek	Maintenance Manager: IKB - Workshop Process	Scania IT	Personal	2016-02-02
Mats Olers	Service Responsible: ITBC - Datacom	Scania IT	Personal	2016-02-03
Mikael Weckström	Senior IT Architect: IAA - Enterprise Architecture Office	Scania IT	Personal	2016-02-04
Lars-Åke Larsson	Contract Manager: IWAC - Product Management	Scania IT	Personal	2016-02-08
Jerzy Hopfinger	Manager: IK - Service Delivery	Scania IT	Personal	2016-02-10
Rosel Sandberg	IT Outsourcing Specialist: IEC - Vendor Management Office	Scania IT	Personal	2016-02-15
Paul Eriksson	Commodity Manager: SAI - Commodity IT & Services	Scania	Personal	2016-02-17
Per Andersson	Senior Manager: IBB - End User Services	Scania IT	Personal	2016-02-18
Björn Jonasson	Manager: IWBI - Business Intelligence	Scania IT	Personal	2016-02-26
Rita Fernandes	Senior Manager: IEC - Vendor Management Office (2006-2015)	Scania IT	Personal	2016-03-03
Tomas Sandstedt	Head of IW - Solutions (2012-2015)	Scania IT	Personal	2016-03-09
Dick Lyhammar	Senior Manager: IWN - .NET development (-2015)	Scania IT	Personal	2016-03-17
Marika Taavo	Information Risk & Compliance Manager: IEA - Risk & Compliance	Scania IT	Personal	2016-04-13
Jan Andries Oldenkamp	Managing Director	Scania IT	Personal	2016-04-18

Table 3: List of interviewees in the benchmarking study.

Name	Title	Company	Type	Date
Narayanan Thiruvengadathan	Account Director	L&T Infotech	Personal	2016-02-18
Agneta Äng	Senior Sourcing Manager	Nordea	Personal	2016-02-23
Johan Bojestig	Manager Architecture, IT-strategy and governance	Coop	Personal	2016-03-16
Avinash Jha	Head of Hub	Sandvik IT GSS	Telephone	2016-04-01
Olle Bergdahl	E-strategist	Uppsala Kommun	Personal	2016-04-14
Ove Ahlström	Commercial Contract Manager (outsourcing professional)	IBM Svenska AB	Personal	2016-04-19

3.4.2 Document study

Knights & McCabe (1997) emphasise that gathering data from internal documents makes it possible to combine qualitative and quantitative methods. Therefore internal documentation at Scania IT have been studied. This study has focused on documents that can contribute with an understanding of formal ways of working with IT and sourcing questions. Table 4 presents the documents that have been included in the study. Table 4 also shows the length and type of the documents.

Table 4: List of internal documents that have been studied.

Title	Document type	Number of pages
Introduction of a framework and mindset for offshoring at IT@Scania	Internal document	•
IT@Scania Core values and principles	Internal document	44 pages
Scania IT company presentation 2015	Internal PowerPoint presentation	24 pages
Scania IT guide	Internal document	20 pages
Scania IT sourcing framework SSF	Internal document	17 pages
Staff augmentation resource consultancy	Internal webpage	•

3.5 Validity & Reliability

Saunders et al. (2012) emphasise that two important concepts concerning the trustworthiness of a study are *validity* and *reliability*. According to Eriksson & Wiedersheim-Paul (2011) validity can be defined as the capability of a measuring instrument to measure what it is intended to measure. If the purpose is to measure efficiency then the investigation shall provide a measure of the efficiency. Further Eriksson & Wiedersheim-Paul (2011) point out that the most important requirement of a measurement instrument is the validity. If the instrument does not measure what is intended to measure it does not matter whether the measurement was good or not.

Depending on the view of science additional requirement can be added. A commonly added requirement is reliability, which means that the measurement instrument (e.g. interviews) shall result in reliable and stable results (Eriksson & Wiedersheim-Paul, 2011). Eriksson & Wiedersheim-Paul (2011) and Saunders et al. (2012) argue that reliability indicates whether other researchers should obtain the same result if performing the same study. This means that in order for a method to have high reliability the result should be the same if another person performed the same study on another occasion. If the study is expected to be generalizable the investigation shall be independent of the studied units (persons, organisations, etcetera).

According to Golafshani (2003) many qualitative researchers use triangulation to achieve reliability and validity. Triangulation means that several methods and sources are included in the collection of data. By using triangulation the bias are reduced and the trustworthiness of a certain social phenomenon is increased. In this study, triangulation

has been achieved by collecting data from several sources such as internal interviews, external interviews and an internal document study.

Magnusson & Marecek (2015) emphasise that when analysing collected data, it is important to work close with people's words which makes it necessary to either listen to the recorded interviews or work from notes. To ensure this, transcription has been done in this study. Further on Magnusson & Marecek (2015) argue that the interviews shall be transcribed as soon as possible after they are performed when the interviewer has the interview fresh in mind. In this study all interviews were transcribed to process the collected material and ensure that all relevant information was intercepted. The interviews were all transcribed within a week after they were performed.

3.6 Methodology discussion

Most of the empirical findings are collected within Scania IT, which makes it more difficult to generalize the results. Consequently, it is important to keep in mind that the results of this study to a large extent can be specific for Scania IT even though some of the perspectives might be applicable on other organisations. However the benchmarking study makes it possible to put Scania IT in perspective to other IT customers and suppliers in order to identify more general trends within the IT sector. The benchmarking on the other hand can be criticized because of the fact that it is only based on one interview per organisation. A consequence of this can be that the study is influenced by personal opinions. If several interviews had been conducted at each company it would have been possible to increase the probability that the mediated view align with the view of the organisation.

4. Empirics

In the first part of the empirics chapter Scania IT and some of its important principles are presented. This is followed by the findings from the interviews at Scania IT which concern the definition, incentives and challenges regarding managed services. Finally the benchmarking study is presented containing findings about sourcing in general and managed services from both the customer and supplier perspective.

4.1 Scania IT

Scania IT is an important part of building innovative trucks, buses and engines to the business of Scania (Scania, 2015a). This means that Scania IT provides new services and products, which creates opportunities for Scania to grow to new markets, segments and services (Scania, 2013a). Today there are about 800 employees and 450 consultants at Scania IT. The main mission within Scania IT is to "*deliver IT that secures daily business operations and accelerates business development, for the realization of the Scania Group objectives*". Important visions that are set for Scania IT 2020 are that the organisation shall not be dependent on consultants, they shall deliver services instead of applications and employees shall mainly be use for innovation and development, and to a more limited extent daily business operations (Scania, 2015a). The aim of Scania is to provide its customers with the best profitability throughout the lifecycle of the product. The operations of Scania IT shall help the entire company by delivering the right IT solutions to the rest of Scania with the customer as prime focus. At Scania IT there are several customers, both Scania's end-customers and internal customers. There are mainly two triggers that are important for the development of IT at Scania which are business-driven initiatives and technology-driven initiatives (Scania, 2013a). Scania IT has shared core values and methods which makes it possible to create a common view within the company. This motivates the need for a shared method for managed service arrangements (Scania, 2013b). Recently Scania IT has been re-organised. Earlier Scania IT was organised according to technical platforms and activities. The new organisation is structured according to business processes at Scania, such as Sales & Marketing. Oldenkamp (2016) says that the organisation are expecting pressure to have the same type of IT solutions within the different business units at Scania IT, which in turn means that the number of applications probably will decrease. Currently Scania IT has about 400-500 applications. About 200 of these are bought applications but a lot of the bought applications have been adapted to Scania (Sandstedt, 2016).

4.1.1 Sourcing at Scania IT

One core value within Scania IT is elimination of waste, which means that Scania IT shall minimize the amount of tasks and services that does not provide value to its customers (Scania, 2013b). Sourcing is one important approach to achieve this objective. Scania IT has a sourcing framework that unifies the way of working with sourcing and clarify roles and responsibilities. An important aspect of sourcing is to

analyse what to source and not to source, which at Scania IT is done according to the following three strategies, illustrated in figure 2 (Scania, 2015b):

- Keep core activities 100 % in-house.
- Keep strategic activities such as base volume and competence in-house.
- Non-strategic activities will only be kept in-house if there are proven competitive advantages.

(Scania, 2015b)

Sourcing guidelines

Figure 2: Matrix for sourcing decision at Scania IT (2015b).

Since 2007 L&T Infotech has been a preferred offshoring partner to Scania IT. The main purpose of the partnership has been to ensure that Scania IT has access to IT professionals with both broad competences and experiences. The partnership also makes it possible for Scania IT to provide both efficient and cost effective support to Scania's business processes (Scania, 2015c). Scania IT mainly sources by staff augmentation (Scania, 2015c; Hopfinger, 2016), which is a full time employee that is either onsite in Södertälje or offshore in India (Scania, 2014). However, Hopfinger (2016) emphasises that Scania IT earlier has done a large amount of the work in-house instead of using sourcing, due to a good financial situation.

When outsourcing, Taavo (2016) emphasises the importance of keeping information security in mind and Lännholm (2016) argues that before a service can be outsourced a risk matrix has to be done in order to identify potential risks. If applications lack traceability sourcing is not preferable since it is more difficult to have control over changes within the applications (Taavo, 2016). According to Taavo (2016) a Business Impact Assessment (BIA) is done before choosing whether to engage in a collaboration with a supplier or not. The BIA is done to classify and identify the importance of the information for Scania and consists of four levels, which each represent the level of damage caused by misused information. According to Taavo (2016) it is possible to

hand over secret information under controlled circumstances, which means that the supplier fulfils the specified security requirements and that the application has traceability.

4.2 Managed Services

During several interviews at Scania IT it has been clear that they would like to source more of their IT services and that the delivery model managed services can be used to do this (Lännholm, 2016; Oldenkamp, 2016; Sandberg, 2016). Today Scania IT are working with managed services to some extent but with no stated methods or guidelines (Sandberg, 2016).

Eriksson (2016) and Fernandes (2016) emphasises that in managed services, organisations hand over the responsibility of a service to a supplier. Andersson (2016) and Sandstedt (2016) describe that managed services are when an organisation buys some functionality to a certain service level. Oldenkamp (2016) emphasises that managed services are when an organisation buys a certain result which he means is "output-based". Leek (2016) means that managed services have a certain scope that an organisation let a supplier manage. The customer's only concern is to connect the delivery to certain business results. Further on Larsson (2016) brings up the importance that both the supplier and customer can quantify the service in order to agree on the delivery and to predict the outcome and cost. Lännholm (2016) also talks about the delivery, which is something he thinks shall be possible to govern to a certain quality. Jonasson (2016) describes that it is up to the customer to set the requirements and Sandberg (2016) emphasises the importance of being a good buyer to do this. According to Fernandes (2016) managed services are a lot about letting go of control and to follow up the services with SLAs and KPIs to ensure that supplies meet agreed requirements. Andersson (2016) and Leek (2016) emphasise that Scania IT does not need to know all details of how the service is produced. Further on Sandstedt (2016) points out that the service delivery of applications shall be seen as a delivery of functionality rather than a number of hours that the supplier has spent.

Andersson (2016) thinks that managed services shall have a fixed price according to the service levels. Larsson (2016) emphasises that the price shall start from a baseline but involve mechanisms that can affect the price. He thinks this would be a suitable pricing method since corrections (change requests and maintenance) are difficult to estimate and predict which makes it hard to agree on a fixed price. He further emphasises that fixed price might be applicable for larger volumes of applications. Lyhammar (2016) and Oldenkamp (2016) do not think that the pricing necessarily must be fixed, however Lyhammar (2016) means that it shall be controllable over time. Further on Oldenkamp (2016) emphasises that the price shall be fixed per month, per ticket, per story point, etcetera. Eriksson (2016) thinks that the pricing does not necessarily need to be fixed but that it can vary according to a factor that does not include hours spent.

Several interviewees talks about the fact that in managed service arrangements, the supplier manages the resources and how they are used to meet the delivery (Fernandes, 2016; Jonasson, 2016; Larsson, 2016; Leek, 2016; Lännholm, 2016; Sandberg, 2016). Jonasson (2016) compares managed services with a black box in which things happen according to an agreement between the customer and the supplier. What exactly happens inside that box is up to the supplier to decide. Olers (2016) agrees with this view as long as the activities within the black box are performed according to the agreed SLAs and responds to the required security levels.

4.2.1 Incentives behind managed services

Several interviewees have the impression that a primary incentive behind managed service arrangements is that the organisation wants to reduce costs (Hopfinger, 2016; Jonasson, 2016; Larsson, 2016; Leek, 2016; Lyhammar, 2016; Weckström, 2016). However Leek (2016) is dubious that these kind of arrangements are cheaper than executing the service in-house. According to Andersson (2016) an incentive behind managed services at Scania IT is that the organisation does not need to do everything in-house. If a supplier has built a suitable solution it is more likely cheaper and faster to buy rather than to build it in-house. Olers (2016) emphasises that in some cases, for example WAN services, it is industry standard and therefore beneficial buying rather than building. Hopfinger (2016) argues that the cost can be lowered by increased efficiency, either in terms of lower cost per hour or same price per hour but increased value per hour for the same price. Further on Lännholm (2016) emphasises that a supplier can achieve economies of scale by delivering similar services to several customers. Larsson (2016) argues that an advantage with managed service arrangements is that it provides the organisation with a fixed price, which makes it possible to predict the costs associated with the service.

Lännholm (2016) and Andersson (2016) emphasises that by sourcing IT-services the organisation might expect that the supplier can scale up and scale down easier than the own organisation. A result of this flexibility is, according to Andersson (2016) that managed service arrangements make it easier for the organisation to adapt to prescribing conjunctures. Olers (2016) disagree with this view and emphasises that managed service arrangements are suitable for stable services. Another advantage Lännholm (2016) and Hopfinger (2016) point out is obtained by using a supplier is risk diversification.

Weckström (2016) and Sandberg (2016) emphasise that suitable services for managed services are services that can be seen as "butter and bread". Sandberg (2016) defines butter and bread as services not considered core business. According to Andersson (2016) and Sandberg (2016) Scania IT shall work with tasks that give Scania competitive advantages. Several interviewees emphasise that an incentive behind managed services is that Scania IT wants to focus on its core business and outsource tasks not considered core (Fernandes, 2016; Lyhammar, 2016; Lännholm, 2016; Sandstedt, 2016). Examples of such services are according to Sandstedt (2016) standard systems, for example Microsoft Word. Lyhammar (2016) emphasises that Scania IT

historically has been caught in a trap where internal resources have been working with support and maintenance while consultants have been used for new projects.

According to Larsson (2016) an advantage with managed service arrangements is that it frees resources that currently are occupied. Sandstedt (2016) emphasises that bought applications often involve unique competences which are not always applicable on other applications. However it can be necessary to support these applications 24/7, which might require several resources even though the amount of work only corresponds to one full time employee. Sandstedt (2016) emphasises that managed services are suitable in cases of small volumes of competence where the amount of work is not enough for one full time employee. Fernandes (2016) implies that the applications within Scania IT are relatively stable which means that accidents normally occur infrequently. As a consequence, keeping internal resources to maintain these applications can be ineffective and focusing internal resources on tasks that are considered critical may result in shorter time to market. Another advantage Larsson (2016) points out is getting away from dependence of specific resources. As an example Larsson (2016) describes an incident when the dedicated resource was on vacation and had to be called in. The structure of managed service arrangements makes the supplier responsible for ensuring that competent resources are available.

According to several interviewees a benefit managed services can provide is that suppliers by focusing on specific areas are able to gain higher competence than the customer (Jonasson, 2016; Leek 2016; Lännholm, 2016; Sandstedt, 2016). However, Weckström (2016) emphasises that outsourcing that are used to obtain specialist competence often are of other nature than managed services

According to Larsson (2016) and Sandberg (2016) the managing director of Scania IT wants the organisation to set up more managed service arrangements. Sandberg's (2016) impression is that he is pointing in this direction as a solution to the current problem with high dependence on consultants. Further on Eriksson (2016) emphasises that Volkswagen has given clear signals that their vision is to implement more managed service arrangements within the corporate group.

4.2.2 Challenges implementing managed services

Lännholm (2016) thinks that a challenge with managed services is to identify which services that are core business to Scania IT and which that are not. To do this Scania IT is currently working on a new sourcing strategy that shall make it possible to ease this identification.

Several interviewees think that the new structure of the Scania IT organisation makes it more difficult to create volumes of applications (Fernandes, 2016; Hopfinger, 2016; Larsson, 2016; Lyhammar, 2016; Oldenkamp, 2016; Sandstedt, 2016). According to Larsson (2016) this is because applications that previously were based on the same technical platform now are spread over several business units. If the organisation hands

over the support and maintenance of applications based on for example Java there are several groups or departments involved. However Larsson (2016) emphasises that managed service arrangements also can be based on for example business processes, roles, etcetera. Fernandes (2016) argues that the difficulty of finding sufficient volumes makes it harder to set up arrangements that are profitable for the supplier. Weckström (2016) also thinks that it is challenging to create sufficient volumes of applications and that a trend within Scania IT is to pick several suppliers in order to create competition.

Eriksson (2016) emphasises that another challenge with managed services is to be a good buyer and that the competence varies within the organisation. Olers (2016) agrees and points out the importance of being sure of what to buy. Further on Eriksson (2016) thinks that buying managed services require more competence than buying time and material. According to Sandstedt (2016) the distance between the purchasing department and Scania IT is quite big. However, Olers (2016) emphasises that the collaboration between Scania IT and the purchasing department in some cases are close. Several interviewees point out that Scania IT is a relatively immature buyer of services (Hopfinger, 2016; Jonasson, 2016; Sandstedt, 2016). A consequence of this is that many employees want to retain control and therefore are unwilling to give up detailed control to a supplier. Jonasson (2016) emphasises that a reason for the immaturity is that Scania IT lacks experience of setting up requirements. According to Hopfinger (2016) the first step towards gaining an understanding of managed services is to identify the differences between managed services and time and material. To define and quantify the work Hopfinger (2016) thinks a prerequisite is to have good control over the processes.

Sandberg (2016) emphasises that a challenge within Scania IT is the immaturity to trust the supplier. To achieve trust Olers (2016) thinks it is important to have concrete KPIs. Further on he compares outsourcing to a marriage that works fine as long as no conflicts occurs. Sandberg (2016) points out that the existing climate within the organisation is that the majority of the employees want to do things in-house. To prevent this climate it is important to spread information within the organisation and clearly state the responsibilities of the supplier and Scania IT since a recurring problem is that the organisation wants more than the supplier has promised. Therefore Sandberg (2016) emphasises that Scania IT needs to set up better requirement specifications and mediate these to the supplier. According to Andersson (2016) it is important to not trust the supplier completely and to have in mind that the suppliers' ambition is to make money. Because of this it is important to create a win-win situation for both the customer and the supplier. Olers (2016) argues that it is important to find a suitable pricing level and ensure that the suppliers do not get too much paid but not too little either. The reason for that is because if the suppliers get too little paid they will not feel satisfied with the deal, which means that they might not deliver as expected and search for another source of income. Leek (2016) agrees and emphasises that a common mistake is to focus too much on the price and forget to look at the business result.

Another challenge Hopfinger (2016) and Sandberg (2016) point out is the lack of internal documentation about some applications. According to Sandberg (2016) this lack of documentation is a consequence of non-existing documentation requirements. Further on Sandberg (2016) emphasises that Scania IT needs to put higher demands on documentation from suppliers.

Andersson (2016) and Weckström (2016) emphasise the importance of bearing the staff perspective in mind. When setting up managed service arrangements the people currently involved in the services will be affected and eventually their scope of work will be changed. If these people are employees the organisation must plan how to re-allocate these resources. Another challenge Leek (2016) points out with regard to resources is the risk of employee turnover at the supplier, which in some cases can be as high as 80-90 % in five years. According to Leek (2016) another resource aspect is the loss of internal competence that occurs when applying a managed service model which is important to have in mind.

Leek (2016) argues that the supplier needs sufficient understanding of the business in order to create suitable solutions. Further Leek (2016) describes that it is difficult to achieve the same level of quality when the service is managed by a supplier, partly because it is hard to set up contracts that comprise everything. When it comes to quality metrics like KPIs and SLAs Jonasson (2016) thinks that Scania IT are too friendly and needs to be better on following up suppliers that do not live up to the quality metrics.

4.2.3 Steps towards managed services

To succeed with managed service arrangements it is important to understand what areas that are suitable for managed services. When discussing suitable areas for managed service arrangements Larsson (2016) points out incident management, which he emphasises involves "keeping the light on in a system". Hopfinger (2016) argues that work including repetitive tasks, for example support and maintenance, is suitable for managed service arrangements. Several interviewees agree that support and maintenance of applications are suitable for managed service arrangements (Eriksson, 2016; Jonasson, 2016; Sandberg, 2016). Lyhammar (2016) thinks that suitable applications for managed service arrangements are applications with low rate of change. The changes within the applications can be changes performed only to keep the application alive rather than implementing new functionality, which can be easier to predict. Further on Lyhammar (2016) argues that applications in innovation phases are not suitable for managed service arrangements. Sandberg (2016) argues that applications or tasks that involve secret and/or unique information can be handed over to a supplier only if approved by the security department. Eriksson (2016) thinks that it can be a good idea starting with a service with lower risk in order to learn and become more mature as a buyer of managed services. In the future Larsson (2016) and Oldenkamp (2016) emphasise that it is good to strive towards as much standard applications as possible since these make it possible for the supplier to deliver the same service to several customers, which can make the service cheaper. However Larsson

(2016) emphasises that it is difficult to buy standard applications due to requirements regarding security and knowledge about Scania's business processes.

Andersson (2016) emphasises that implementation of managed services cannot be done over one night. According to Oldenkamp (2016) and Lyhammar (2016) it might be a good approach to set up managed service arrangements in steps, where Oldenkamp (2016) thinks it can be initiated by measuring the service. Oldenkamp (2016) further emphasises that the first step can be based on hours spent. However he thinks that this step can be avoided if the organisation has control of their applications. According to several interviewees it is important to get control over what the organisation has before handing over the support and maintenance of applications to a supplier (Fernandes, 2016; Larsson, 2016; Oldenkamp, 2016). Larsson (2016) and Olers (2016) think that if the organisation does not know what they have, they shall not hand it over to a supplier since the supplier cannot solve the problems for them. Olers (2016) therefore thinks it is important to be certain of what outcome the organisation expects, for example cost reductions. Further on Leek (2016) argues that in order to set up successful managed service arrangements the supplier needs to have knowledge about the business. Olers (2016) disagree with this view and emphasises that Scania IT needs to know what they want to buy and that the supplier does not need deep knowledge but just an understanding. According to Sandberg (2016) the challenges regarding lack of documentation can be solved by collaboration with the supplier since they might have valuable input to the process of documentation.

Further on Hopfinger (2016) and Lyhammar (2016) emphasise the importance of clear visions and directives from directorate and managers in order to spread the vision to employees. To anchor a strategy for managed services within the organisation Andersson (2016) consider it important to have good arguments in order to convince the organisation. Further on Olers (2016) emphasises the importance of having a clear business case comprehending the incentives for the implementation of managed services.

According to Leek (2016) managed service arrangements shall be connected to business results such as the time required to fix an error and the amount of implemented functionality. To set up successful managed service arrangements Jonasson (2016) thinks it is important to have clear technical specifications, for example technical dependencies, specification of the system environment and uptime. Jonasson (2016) also emphasises the importance of setting up sufficient KPIs and SLAs, and to set up sufficient quality metrics Larsson (2016) points out that it is important to have clear expectations of the delivery. Further on Sandstedt (2016) thinks that the organisation shall set demands on suppliers to make services more effective. Jonasson (2016) argues that it can be beneficial to have a point system in order to control and ensure that the supplier deliver expected quality. Jonasson (2016) and Oldenkamp (2016) emphasise that it can be beneficial to expose suppliers to competition in order to ensure that their offers align with the market. Sandstedt (2016) emphasises that it can be good to perform

an internal benchmarking and evaluate the service levels obtained in-house to ensure that the organisation can set up sufficient requirements. To follow up the delivery and control the quality metrics Weckström (2016) points out the importance of implementing methods and tools to do the internal measurements. Further on he emphasises that monitoring the delivery requires resources with competence of setting up specifications and requirements. Lännholm (2016) thinks that the internal monitoring of the delivery has to be effective. Olers (2016) argues that it is important to ensure that a managed service can be set up with another supplier in the future.

Andersson (2016) and Sandstedt (2016) emphasise the importance of a close collaboration between Scania IT and the purchasing department to set up a successful managed services arrangements. Andersson (2016) experience that Scania IT sometimes starts working before getting in contact with the purchasing department which can cause problems. Therefore Sandstedt (2016) thinks it shall be possible to use a standardized method for how to buy managed services to ensure that things are done the right way. Further on Eriksson (2016) emphasises that it is possible to obtain the competence as a buyer by using an experienced suppliers in the beginning of setting up managed service arrangements.

4.3 Benchmarking

In this section a summary of the key findings from the performed benchmarking is presented. The key findings are based on the organisations' processes and experiences regarding sourcing with focus on managed services.

4.3.1 Customers

The performed interviews with external IT customers are based on their experiences of IT sourcing as a customer with focus on managed services. The aim of the summaries is to identify what customers have identified as key success factors within sourcing and managed services and which steps they have taken towards managed services.

Nordea

In 2003 Nordea negotiated an extensive outsourcing contract with a large IT supplier where big parts of their IT functions, mainly infrastructure, were outsourced. Currently the majority of this contract is terminated but some parts remain. The reason for terminating this contract was that Nordea wanted to regain control over these functions. Earlier Nordea had a lot of its IT functions located in India but the present strategy includes more nearshoring based on directives from the new CEO. The reasons for this are dissatisfaction with the deliveries and expectations that nearshoring would be easier to manage. By nearshoring Nordea consider Poland to be a good alternative (Äng, 2016).

The definition of managed services at Nordea is that the supplier has full responsibility of the service and that it is up to the supplier to decide how many resources that is

needed to perform the service. When initiating managed services arrangements it is important to set up sufficient and correct requirements and to do that the customer must be clear on the expected outcome. Äng (2016) points out that managed services is a delivery model and that the pricing model can differ. The pricing model currently used by Nordea is target pricing but in the future Nordea wants to go more towards fixed price. To achieve this Nordea has to be a competent buyer of services and set higher demands on suppliers. Nordea introduced their first managed services contract in 2006. Future plans at Nordea are to set up more managed services arrangements for application support and maintenance, but Äng (2016) emphasises that it is difficult working with managed services. Äng (2016) points out maturity as a key success factor which she emphasises that the organisation achieves by having control of its applications. Nordea has come to the insight that the organisation is not mature enough and is therefore planning to initially start working according to managed capacity, before engaging in managed service contracts. The core in managed services is that the supplier takes responsibility for the delivery and that there are SLAs to follow up the delivery. SLAs shall be connected directly to the service and its functionality and can for example be response time. Äng (2016) explains that Nordea uses KPIs for softer parts of the service such as allowed staff turnover at the supplier.

Incentives for Nordea to use managed services are to free internal employees and to make cost reductions. Another benefit managed services can bring is innovation from the supplier, which means that Nordea wants to make profit from suppliers previous collaborations. A challenge at Nordea is that the organisation have had difficulties to let go of control. To illustrate Äng (2016) describes that Nordea often wants to hire resources they can give directives and therefore keep control. In some cases Nordea has an internal project manager even though the supplier has an assigned project manager. To gain approval for managed services within the organisation Äng (2016) emphasises the importance of clear directives from the top management. Measurements like KPIs can be a good tool for the top management to ensure that the work within the organisation align with the strategy.

Coop

Bojestig (2016) emphasises that Coop during recent years has worked hard to improve their profitability and to do this sourcing of IT has been one way of cutting costs. Currently Coop has outsourced most of their IT services like for example development and maintenance of their IT systems. Bojestig (2016) estimates that it would require 300 to 500 employees to do everything in-house. In 2010 Coop put a big effort into outsourcing and the IT department was down to 20 employees, however the experience was that 20 employees was not enough to manage the IT department. According to Bojestig (2016) Coop has done a lot of mistakes when they have outsourced which he believes has contributed to their maturity as a buyer. To become a good buyer it is important to have knowledge about Coop's business which motivates the need of an IT

department. Currently the IT department at Coop is a pure control and buy function that is organised according to business units such as logistics and purchase.

The definition of managed services at Coop is according to Bojestig (2016) when Coop buys an IT system, the people managing it and the processes needed to make it work. The pricing model of managed services at Coop comprehends a specified price for a certain number of corrections and development, but additional development can be added for an extra cost. Further on Bojestig (2016) discusses the balance of buying and developing applications. He thinks that it is beneficial to buy an application that is used by other organisations to gain advantages from shared resources. Bojestig (2016) talks about the difficulty to have competent staff within all areas since the need of different competences varies over time. An advantage with outsourcing is that Coop does not need to manage resources. Instead Coop's task is to set up the requirements and what price they are willing to pay. Further on Bojestig (2016) compares managed services to a black box. To manage the relationships with suppliers Coop has application managers who are responsible for managing several services which involves managing contracts and deliveries.

When choosing what to outsource, Bojestig (2016) emphasises that it is important to choose services from a Coop perspective. When a system within for example human resources is not working for a day or two the business of Coop is still working, while getting groceries to the stores is more critical. To manage this Coop has recently made a prioritization of how critical different applications are. Further on Coop did a roadmap over all their applications to understand how to bundle 5-15 applications to create sufficient volumes during their outsourcing in 2010. The applications were bundled according to either dependencies and integrations or according to business processes. Within these divisions different technologies like for example .NET and Java were mixed. These bundles also involves applications that are considered core. According to Bojestig (2016) Coop has offshored some maintenance of applications. However he emphasises that it has been a long journey to successfully offshore the maintenance since Coop's applications often are old, undocumented and completely in Swedish. To manage this Coop has had the strategy to give away what they have on the systems and dedicate a resource to answer questions.

Bojestig (2016) thinks that going towards managed services shall be seen as a journey. It is important to have a clear final goal and then divide the journey into different stages. If an organisation is not in a pressed situation there is no reason to do everything at once and the organisation should therefore instead choose more carefully what to source and not.

Sandvik

Sandvik IT GSS (Global Shared Services) delivers IT solutions to meet the demands within Sandvik. Currently sourcing decisions at Sandvik IT GSS are based on need, rather than according to a spoken strategy. Sandvik IT GSS has outsourced infrastructure, end user services and smaller parts of their application development, maintenance and operations as managed services. In the future Jha (2016) emphasises that Sandvik IT GSS would like to source more of the non-core areas.

Jha (2016) defines managed services as when customers get a certain outcome and do not need to worry about how that outcome is reached. In managed services the customer transfers the direct control and associated risks of the three important ingredients that are needed to produce any kind of IT service; people, tool and location. Therefore it is up to the supplier to manage the risks of for example employee turnover, failing tools and natural disasters. According to Jha (2016) it is easier to set up managed services when the organisation is structured according to business needs. The reason for this is that the organisation orders a system from Sandvik IT GSS speaking in term of business needs, not technology.

Further on Jha (2016) explains that applications often interact with other applications, which need to be taken in consideration when bundling applications to create volumes. This means that the division of applications shall depend on how the organisation is divided. It is also important to consider which supplier the organisation wants to attract since the larger suppliers often need bigger volumes, while smaller niched suppliers can be unable to deliver if the volumes are too extensive, particularly in a multinational setup.

Jha (2016) says that many people tend to think about managed services as a way of cutting costs. However, he thinks that if cost is the only perspective there is a risk of missing other important parameters. Jha (2016) emphasises that in certain areas, such as internal monitoring, the cost actually increases when outsourcing. He also describes managed services as a way of keeping up with the fast changing landscape of IT, since captive IT companies like Scania IT or Sandvik IT GSS have difficulties to do everything in-house. As an example Jha (2016) emphasises that an organisation in theory can do its own phones and firewalls but he thinks that it is important to decide that services below a certain level are non-core and therefore shall be outsourced. He further argues that an organisation never shall outsource a problem or something they are unable to manage internally. Therefore a pre-study shall be done before initiating a managed services to be clear about organisational expectations. It is also important to educate the organisation within outsourcing and to dedicate the right employees for managing the outsourcing contracts. To anchor managed services within the organisation Jha (2016) thinks that it is important to start with a manageable chunk within areas the organisation is confident in.

Uppsala kommun

According to Bergdahl (2016) Uppsala kommun is working according to two business areas. The first area is to increase the service for private persons and companies, which for example can be infrastructure. The second area is rationalizations and potentiation in order to reduce unnecessary costs. One example of such task is that much work that today are performed manually in the future could take advantage of the digitization and be performed automatized. Before the political shift 2014, Uppsala kommun had plans of implementing a major outsourcing arrangement where they were planning to outsource IT operations and telephony. But when the change of government took place the new government called of these plans. Bergdahl (2016) describes that when an IT demand is acknowledged the IT department performs a make-buy analysis. According to political decisions Uppsala kommun shall strive towards having as much standard applications as possible. However there can be cases where the standard applications on the market do not fulfil the requirements which motivates developing the solutions in-house.

According to Bergdahl (2016) Uppsala kommun currently has much of their IT outsourced. An example is that the telephone switchboard is kept in-house but remaining parts of telephony is handled by a supplier. Another example of what is kept in-house are parts of the server management since it contains sensitive information. Bergdahl (2016) emphasises that a current trend within Uppsala kommun is to buy more services. Incentives to outsource are cost reductions and increased efficiency. The financial benefits are obtained by the access of continuous updates of software which facilitates for Uppsala kommun to keep up with the ongoing digitization.

Bergdahl (2016) describes that most of the service contracts Uppsala kommun has are managed service arrangements where they buy a parcelled service for a fixed price. These arrangements contain SLAs which ensure a certain level of quality of the delivered service, which for example can be availability. Further on Bergdahl (2016) defines managed services as a delivery model where the organisation access a service with scope and expectations described in a contract. The customer does not manage tasks like operation, support and maintenance of the service but are just a consumer that benefits from the result. Examples of managed service arrangements within Uppsala kommun are data communications, the system for handling of support cases, the personnel system and the student administration system. According to Bergdahl (2016) most of these services are bought as a service from the beginning but some are initially handled in-house and then handed over to a supplier. Bergdahl (2016) argues that managed service arrangements are preferable in cases where the handling of the service in-house does not bring any additional value to the organisation but rather brings disadvantages. Further on Bergdahl (2016) emphasises that it might be time consuming and costly to maintain competence in-house with regard to for example turnover. To govern managed service contracts Uppsala kommun has a system maintenance organisation with dedicated object leaders and object owners.

Bergdahl (2016) describes that applications that have been handed over to suppliers have been single applications. Therefore Uppsala kommun has focused on handing over big applications in order to create sufficient volumes to attract suppliers. In the future Uppsala kommun is planning to cluster applications based on business processes such as educational and health care systems in order to achieve synergy effects. Bergdahl (2016) further emphasises that these clusters can involve several technologies. The reason behind the planned division is that Uppsala kommun thinks that such division will ease governance. Bergdahl (2016) describes that further sourcing plans involve establishing more partnerships with longer agreement lengths, like for example 10-15 years. Bergdahl (2016) thinks that longer agreements are more attractive for the suppliers which might result in more beneficial contracts. According to Bergdahl (2016) partnerships also increase the possibility for a greater exchange of knowledge between the supplier and customer. Further Bergdahl (2016) points out that there are major administrative costs associated with procurement of an agreement. Other future strategies within Uppsala kommun are working more with steering based on categories and cost/spend analysis to identify the major costs and volumes in order to focus more on those procurements.

4.3.2 Suppliers

The interviews with external suppliers have focused on identifying how the suppliers work with customers' demands and the suppliers expectations on the customers when engaging in outsourcing arrangements.

Larsen & Toubro Infotech (L&T Infotech)

According to Thiruvengadathan (2016) the most used pricing model by L&T Infotech is managed services. Managed service arrangements involve a fixed price, a monthly or yearly contract or a pay-as-you-use models (Thiruvengadathan, 2016). The impression within L&T Infotech is that managed services often include outsourcing of operational tasks with the ambition to reduce operational expenses and put the internal resources into value adding work. Therefore the definition of managed services at L&T Infotech includes repetitive maintenance work or anything that is done as an ongoing operation, not a project. Managed services at L&T Infotech is primarily support and maintenance activities. Thiruvengadathan (2016) emphasises that L&T Infotech in most cases have core competences within those areas since they offer the same service to multiple customers which means that they can do it faster and cheaper compared to the customers.

According to Thiruvengadathan (2016) managed service arrangements shall be governed by certain KPIs. L&T Infotech works according to three levels of governance: detailed weekly status report, monthly tactical governance meeting and strategic governance meetings every three months. Managed service arrangements shall have a fixed price or be usage based, which depends on several parameters. One of these parameters is SLAs, for example response time, reaction time and if an incident is

solved right the first time. Another parameter might be service hours, for example if the service is needed 24/7. Service volumes, for example the number of incidents, number of servers and number of databases, are other parameters influencing the price of the contract. Finally Thiruvengadathan (2016) points out that whether you want the resources in a low cost region for example India or a high cost region like Europe results in different prices.

In order to create a win-win situation within managed services Thiruvengadathan (2016) emphasises that the customer needs to hand over sufficient volumes to the supplier. The impression at L&T Infotech is that the work needs to include at least 10 employees to obtain economies of scale. Thiruvengadathan (2016) describes that volumes can be created by bundling several applications. Another success factor of managed services is getting the organisation on-board. In order to do this the management team has to cascade the importance of managed services in the organisation. Another aspect Thiruvengadathan (2016) emphasises to be a success factor is to have a clear responsibility matrix between the customer and supplier. Transparency is also mentioned as a success factor which is achieved by open communication where issues and concerns are raised.

The first step L&T Infotech takes in a managed service arrangement is an aggregation of the work. In some cases the work can involve 20 different departments at the customer and instead of working with each department L&T Infotech needs to see the bigger picture to be able to bring a more cost-effective approach. To set up contracts for managed services L&T Infotech has a standard way of working in terms of workshops, how they handhold the customer and a prerequisite checklist. Further on Thiruvengadathan (2016) describes four types of knowledge transfers that can be used. The first type is used if there is an existing supplier involved. The second type is used if the internal organisation wants to transfer its responsibilities to the supplier. The third type involves that the customer wants to move back an application in-house since it is re-evaluated to be core. The fourth type can be take-over of the client's employees or consultants. Further Thiruvengadathan (2016) explains that if the documentation is insufficient L&T Infotech offers to help customers setting up sufficient documentation. To avoid dependence on a few individuals L&T Infotech executes cross-training. As an example Thiruvengadathan (2016) illustrates that if L&T Infotech support 100 applications with help of 20 team members they make sure that these members are educated in at least 10 or 15 applications.

IBM

Ahlström (2016) has noticed that IBM during last years has been working more with softer parts of their customers IT, such as services and support that are not directly connected to the operation of hardware. According to Ahlström (2016) IBM does not have a standard definition of managed services and the definition varies from contract to contract and can either include the whole spectra of a service or just a part of it. A few years ago the amount of standardized services increased. This was not always easy since

many of the customers are big companies that have specific needs and requirements. Ahlström (2016) prefers to describe managed services as when a supplier manage the operation of a service to certain service levels. He emphasises that the customer buys a certain functionality and that the details of the operation to a large extent are managed by the supplier. Ahlström (2016) further describes that IBM often sign outsourcing contracts but they not necessarily call them managed services contracts.

According to Ahlström (2016) it is common to start an outsourcing arrangement by supporting parts of the customer's service and over time try to extend the arrangements to new service areas. When customers have decided to engage in an outsourcing arrangement they normally hand over their current setup of the service to IBM. In this phase IBM learns the customer's environment and to work according to existing conditions. The phase when the operation of a service is transferred from the customer to IBM is usually called transition. Following phase is the transformation phase in which parts of the service is exchanged and the environment is transformed. The further the transformations phase gets, the more structured governance with SLAs is initiated and to define and set up sufficient SLAs the customers need to know the expectations from the end users. The transition phase requires more involvement from the customer than the transformation phase. Time for transition and transformation processes vary but normally it takes one to two years and the total length of outsourcing contracts are often between five to seven years. Since it is an extensive process for customers to change supplier the length of outsourcing contracts is often long and for example IBM Sweden has managed some contracts for more than ten years. Most contracts also contain some expectations of improvement of the service (Ahlström, 2016).

According to Ahlström (2016) the incentives for a customer to engage in an outsourcing arrangement are often connected to increased productivity and reduced cost. In many cases the customers do not want internal resources to manage services that are not considered core business. Therefore it can be better handing it over to a supplier where the delivery of such services are the supplier's area of expertise. Ahlström (2016) reasons that outsourcing arrangements might not be cheaper at first but that it will pay off in a longer perspective. He also thinks that customers have become more mature in their way of setting up outsourcing arrangements during recent years. He believes that customers in some cases hire expert competence to set up the procurements and therefore the structure of the outsourcing contracts are getting more standardized.

In outsourcing arrangements Ahlström (2016) emphasises that it is important to have a clear and well defined scope to achieve a win-win situation between the parties. A clear scope can be achieved using the RACI model (see Appendix 1: Glossary). The SLAs are often discussed between the supplier and customer in order to define a sufficient level of SLAs and IBM tries to have similar SLAs to different customers even if every contact is unique. The SLAs shall be measurable and not based on guesses or estimates. To achieve successful outsourcing deals, Ahlström (2016) thinks that it is important that the supplier and customer work together. Another important success factor in

outsourcing arrangements is transparency between the supplier and customer. Ahlström's (2016) experience is that organisations sometimes keep information to themselves because they think that it is confidential, which makes it more difficult for the supplier to make a delivery that agrees with the customer's expectations.

5. Analysis

5.1 Sourcing of IT services

To analyse sourcing, outsourcing and managed services Da Rold's (2007) sourcing strategy comprehending the questions why, what, who and how is used. Naciri & Janati Idrissi (2014) describe that outsourcing and managed services are similar terms that are related to sourcing of application maintenance activities. Therefore questions and theories regarding outsourcing in general also concern managed services.

5.1.1 Why source by managed services?

As McIvor et al. (2008) describe, the digitization sets high demands on organisations in the delivery of IT-services and Ahmed (2016) emphasises that software products become old faster than ever before. At the same time organisations shall be cost effective, competitive and meet the demands of proficient consumers (McIvor et al., 2008). During interviews Jha (2016) and Bergdahl (2016) speak about the fact that digitization and the fast changing landscape of IT create a need of sourcing. This is supported by McIvor et al. (2008) who argue that sourcing can be used to keep up with the fast changing technology. During the interview with Jha (2016) he emphasises the difficulty for a captive IT company like Scania IT or Sandvik IT GSS to do everything in-house. This aligns with theories arguing that organisations need to use both internal and external capabilities to meet IT demands from their customers (Da Rold, 2007; Da Rold, 2011; Herz et al., 2013).

As a delivery organisation, Scania IT (2013b) wants to provide the best profitability throughout the lifecycle of products to its customers and they want the customers to be the prime focus in all solutions. The demands for more flexible organisations that can be responsive to customer requirements is what, according to McIvor et al. (2008), has started the outsourcing phenomena. Hopfinger (2016) describes during an interview that Scania IT earlier has done a lot of the work in-house instead of using sourcing due to a good financial situation. However several respondents argue that there currently is a clear focus to source more IT-services (Lännholm, 2016; Oldenkamp, 2016; Sandberg, 2016).

During interviews Ahlström (2016) and Bergdahl (2016) describe that the incentives to source often are connected to cost and performance. However, Jha (2016) emphasises during an interview that that using sourcing and managed services to cut costs is the right way looking at it, since there is a risk of missing other important parameters. These thoughts align with Jivan et al.'s (2015a) and Da Rold's (2007) argument that it is important to base the sourcing decision on other objectives than just cost, which for example can be certain business results. Jha (2016) further emphasises that the cost in certain areas such as internal monitoring can increase. The risk of increasing costs is an issue that Leek (2016) also raises during an interview. However, during the interview

with Ahlström (2016) he points out that the costs will increase in the beginning but decrease with time.

An advantage with managed services that Larsson (2016) points out during interview and that is described by Tayntor (2001) is that managed service arrangements have a fixed price, which makes it possible for organisations to predict costs. Another perspective of cost that Lännholm (2016) brings up during an interview is that suppliers can achieve economies of scale. This is supported by McIvor et al. (2008) and Tayntor (2001) who argue that a supplier with specialist competence can standardize solutions and achieve higher performance which lead to economies of scale. This is something Da Rold (2007) emphasises can be achieved by outsourcing.

Another incentive to use outsourcing brought up during several interviews is to focus internal resources on core business. According to Sandberg (2016) there is currently a high dependency on consultants at Scania IT, but for 2020 Scania IT has a vision to get away from the dependency of consultants (Scania, 2015a). Lyhammar (2016) describes that Scania IT earlier has been caught in a trap where internal resources work with support and maintenance while consultants are hired for new projects. This is something Scania IT's 2020 vision aim to avoid (Scania, 2015a). During interviews Larsson (2016) and Fernandes (2016) emphasise that managed services makes it possible to reallocate internal resources to more critical tasks. Fernandes (2016) also thinks that this can decrease the time to market. This is supported by Tayntor (2001) who argues that an advantage of outsourcing is that resources that earlier had to execute less critical tasks instead can participate in projects with higher priority. At Nordea, Äng (2016) agrees that an incentive to use managed services is to free internal resources.

According to Tayntor (2001) an advantage with outsourcing is that it can be used to fill competence gaps in the organisation, which is an objective that Weckström (2016) emphasises is used at Scania IT. However, it is often done by other arrangements than managed services at Scania IT. Bojestig (2016) says that it would be difficult for Coop to maintain competent staff in all areas since the need of different competences varies over time, which is managed by outsourcing. Another incentive to source by managed services is according to an interview with Larsson (2016) to get away from dependence of specific resources. This incentive aligns with Tayntor's (2001) argument that the risk of losing key employees is transferred to the supplier, who are responsible to recruit and retain technical competence. Therefore the supplier has strong incentives to perform cross-training in order to reduce the dependence on individuals, which is performed by L&T Infotech within outsourcing arrangements (Thiruvengadathan, 2016).

5.1.2 What to source by managed services?

Scania IT has three main strategies concerning what to source and not (Scania, 2015b). These strategies align with many aspects brought up during interviews. Scania IT shall according to Sandberg (2016) and Weckström (2016) source services that are

considered "butter and bread", which are things that are non-core. Further on Andersson (2016) and Sandberg (2016) emphasises that Scania IT shall focus on tasks that contribute to the unique Scania competence. The strategy to source non-core areas is something that Jha (2016) emphasises that Sandvik IT GSS also would like to do. At Uppsala kommun, Bergdahl (2016) consider managed services a suitable method when the operation of a service in-house does not bring any additional value. During an interview Jha (2016) says that an organisation can do everything themselves but he emphasises the importance of deciding that services below a certain level are not considered core. This is supported by McIvor et al.'s (2008) argument that organisations shall focus on a limited number of core competences. Services that are considered core are according to Luftman et al. (2004) often services that are critical for day-to-day operations, services that has the capability to distinguish itself competitively, the capability to deliver value to partners/customers and finally the capability of innovations. During an interview Bojestig (2016) exemplifies core businesses as activities directly connected to Coop's day-to-day operations, such as getting groceries to the stores.

Interviews with suppliers indicate that customers want suppliers to manage services that the customer do not consider core. Such services are the supplier's core competence, which means that they often can do it more effective than the customer (Thiruvengadathan, 2016 and Ahlström, 2016). This is an incentive to use managed services raised by several interviewees at Scania IT (Lännholm, 2016; Leek 2016; Jonasson, 2016; Sandstedt, 2016). Further on Nordea has expectations of getting innovation from the suppliers within these areas (Äng, 2016). According to Jivan et al. (2015a) sourcing decisions shall be based on if a service or a supplier has potential to bring value and differentiation to the business. At Scania IT, innovation and differentiation can be achieved by accessing the supplier's expert competence within areas that are not core at Scania IT. McIvor et al. (2008) describe that suppliers with specialist competence can respond better to new technology than large vertically integrated organisations like for example Scania IT. Further on Olers (2016) emphasises during an interview that some services are industry standard to buy, for example WAN services.

Ahlström (2016) describes that IBM currently is working more with softer part of their customers IT than before. Softer parts of IT involves services and support that are not directly connected to hardware. In theory, support and maintenance of applications is pointed out as a common area to outsource (Ahmed, 2006; Artunian, 2006; Idrissi, 2014). When L&T Infotech initiates managed service arrangements it mainly involves activities that are done as an ongoing operation, not a new project. Thiruvengadathan (2016) exemplifies this with support and maintenance of applications. Support and maintenance is an area that Nordea and Sandvik IT GSS have chosen to outsource (Jha, 2016 and Äng, 2016). Since Scania IT has about 400-500 applications, support and maintenance of applications are a major part of Scania IT's operation, which makes it a

suitable area for managed services. Tayntor (2001) emphasises that managed service arrangements do not leave room for frequent changes which makes support and maintenance that involves volatile workload unsuitable for managed service arrangements. However, Fernandes (2016) emphasises that Scania IT has relatively stable applications, which further motivates sourcing of application support and maintenance.

Further on, Artunian (2006) argues that organisations shall be careful to outsource IT functions that provide the suppliers with strategic information about the company or industry. She further emphasises that companies shall keep help desk functions and other activities involving interaction with customers in-house. This means that Scania IT shall keep activities involving direct customer interaction in-house.

5.1.3 Who is a suitable managed service supplier?

During interviews at Scania IT the importance of understanding what kind of supplier the organisation wants to attract has been frequently discussed. These discussions indicate that if the volumes are big, larger suppliers will most likely be attracted. However, there is a risk that smaller suppliers do not have the ability to meet those demands. On the other hand, if the volumes are small, it is a risk that larger suppliers not are interested. Ahlström (2016) emphasises that IBM often starts with smaller volumes and increase the volume with time. However Thiruvengadathan (2016) describes during an interview that L&T Infotech needs sufficient volumes to create a win-win situation within managed services. Creating a win-win situation between the supplier and the customer is important to achieve a successful outsourcing arrangement (Ahlström, 2016 and Andersson, 2016), which in theory is supported by Jivan (2015a) and Vitasek & Manrodt (2014).

Other important aspects of outsourcing relationships are trust and understanding (Gottschalk & Solli-Sæther, 2006) and Ahlström (2016) points out during an interview that high transparency between the supplier and the customer is critical in outsourcing relationships. However, Scania IT has had difficulties trusting suppliers and therefore has had a tendency to get involved with the details. These difficulties can probably be traced to Scania IT's immaturity as a buyer and their limited experience of setting up sufficient requirement specifications. To manage this Scania IT can work with an experienced supplier that can support the organisation during this process. This is an approach Äng (2016) emphasises that Nordea has used when setting up managed service arrangements. Ahlström (2016) has experienced that IBM's customers engage expert competence in the process of setting up managed service arrangements.

Another recurring aspect during the interviews is the location of suppliers. However, Jha (2016) describes during an interview that within managed services it is up to the supplier to decide the location, if not any other agreements have been done. Bojestig (2016) explains that Coop keeps activities that need a deeper knowledge about their

business in Sweden while less critical activities are offshored. Nordea earlier had a lot of its IT functions offshored but are currently focusing more on nearshoring to get more control (Äng, 2016). Therefore Scania IT can choose to offshore less critical activities while a closer location is preferable for more critical activities. Since the responsibility of the location within managed services is transferred to the supplier it is important for Scania IT to state if there are any specific requirements regarding the location.

Tayntor (2001) compares an outsourcing relationship to a marriage since it is legally binding and considered a long-term engagement, which is a comparison that Olers (2016) also makes during an interview. Ahlström (2016) explains that outsourcing contracts often are long and exemplifies that IBM has contracts that have lasted for ten years. This motivates that it is important for Scania IT to have a long perspective when choosing suppliers, in order to gain the benefits they would like to achieve in terms of lowered costs and increased efficiency.

Sandstedt (2016) emphasises that Scania IT shall set demands on the supplier to make the service more effective which Ahlström (2016) says that IBM often works with in their outsourcing arrangements. This is supported in theory by Jivan et al. (2015a) who argue that managed service arrangements shall include plans for continuous improvement which Jivan et al. (2015b) suggests can be a year-on-year improvement. Setting up plans for continuous improvement is a good way for Scania IT to ensure that sufficient updates and improvements of the service are done.

5.1.4 How is sourcing done according to managed services?

Scania IT works from principles that guide how the work is planned and performed (Scania, 2013b). Currently there are no clear guidelines of how to use the delivery model managed services, and the definition of managed services varies amongst the interviewees at Scania IT. According to Ahlström (2016) IBM does not have a standard definition of managed services which is another incentive for Scania IT to have a clear definition of managed services when getting involved with a supplier.

Thoughts regarding managed services that recur during several interviews can be expressed in Eriksson's (2016) and Fernandes' (2016) words that the organisation hands over the responsibility of a service to a supplier. This aligns with McCabe's (2009) definition that in managed services an organisation hands over specific IT operations to a service supplier. McCabe (2009) exemplifies that transferred responsibilities for example can be managing, monitoring and/or problem solution for a chosen IT system. At Nordea, Äng (2016) explains that the responsibility for resources managing the service is handed over to the supplier. During an interview Jha (2016) emphasises that within managed services, responsibilities regarding people, tools and locations are transferred to the suppliers. Handing over the responsibility of managing people are a recurring aspect during several interviews at Scania IT (Fernandes, 2016; Jonasson, 2016; Larsson, 2016; Leek, 2016; Lännholm, 2016; Sandberg, 2016).

During interviews Andersson (2016) and Sandstedt (2016) argue that the delivery of managed services shall be seen as a functionality with certain service levels, rather than a number of hours spent. The fact that managed services has a pre-defined scope makes it possible to set a fixed price, which is something that several interviewees at Scania IT emphasise. Gartner (2016) describes that a pay-as-go model is used for pricing managed service arrangements. Pay-as-you-go is the pricing model that L&T Infotech uses for managed service arrangements (Thiruvengadathan, 2016). Coop's offshoring collaborations concerning application support and maintenance are also priced similarly since their pricing model includes a certain amount of corrections and development, where additional development can be added for an extra cost.

The combination of fixed price and transferred responsibilities put high demands on Scania IT. As an example of this Jonasson (2016) argues that it is up to Scania IT to set up the requirements and Sandberg (2016) emphasises the importance of Scania IT to be competent buyer. Bergdahl (2016) emphasises during an interview the importance of documenting the scope and expectations of the managed service in a contract with the supplier. This is supported by Jivan et al. (2015a) who point out the importance of defining and documenting a clear scope of work. Äng (2016) says that to set up sufficient and correct requirements Nordea must be clear on the expected outcome. Further on Bojestig (2016) points out that Coop's tasks in a managed service arrangement are to set up requirements and decide on a price that they are willing to pay, and not interfere with how the supplier manage the service. To distinguish the responsibilities of the customer and the supplier L&T Infotech works with a responsibility matrix (Thiruvengadathan, 2016).

To ensure that the service is delivered according to the scope and requirements, SLAs and KPIs are used to measure the performance (Jivan et al., 2015a). Further on Larson (1998) argues that service measures shall reflect the customer requirements in a clear defined scope. During interviews with Ahlström (2016) and Larsson (2016) they emphasise the importance of setting up measurable SLAs that are not based on guesses or estimates. In order for Scania IT to set up sufficient and measurable SLAs the SMART-method can be applied, which Jivan et al. (2015) emphasise is beneficial to use when defining SLAs.

5.2 Challenges implementing managed services

In the following section organisational and technical challenges regarding implementation of managed service arrangements are analysed. To propose solutions to different challenges the risks and key success factors of outsourcing presented within the theoretical framework are analysed.

5.2.1 Organisational challenges

A challenge brought up during interviews and within the theoretical framework is to identify and dedicate roles for implementation and governance of managed service

arrangements. This motivates the need for Scania IT to identify and dedicate roles both internally and at the supplier. This is supported by Jivan et al. (2015a) who argues that resources assigned by suppliers is a key success factor within managed services. An example of an internal role can be a resource with expertise within requirement specification. Further on interviews within Scania IT indicate that the competence of buying IT services varies within the organisation. As McIvor et al. (2008) point out many organisations lack deep understanding of outsourcing, especially regarding benefits and risks. This is important for Scania IT to keep in mind in order to gain the knowledge and competence necessary to set up successful managed service arrangements. As mentioned earlier, Ahlström (2016) from IBM has the impression that many customers hire specialist competence to set up procurements. Since Scania IT lacks experience of buying managed services it would be suitable engaging expert competence to set up processes and methods for procurement to increase the internal competence of buying IT services. Another challenge that Sandstedt (2016) points out is the distance between the purchasing department and Scania IT. In order to prevent the risks associated with this distance it is important for Scania IT to have a clear responsibility matrix for managed service arrangements, stating the responsibilities for the purchasing department and Scania IT. Another important success factor pointed by Lui (2003) is communication, which motivates the importance of creating communication plans between the stakeholders involved in the arrangements.

Results from the interview with Ahlström (2016) supports the importance of clear visions and a specified scope. As previously mentioned IBM does not work according to a clear definition of managed services since their way of working varies depending on the customer. This aligns with research presented by Jivan et al. (2015a) regarding the importance of defining and documenting a clear scope of work in order to set up successful managed service arrangements. Within the given theoretical framework the risk that preferences among members within the organisation diverges from the organisational objectives is discussed. This motivates the need for Scania IT to cascade a clear vision and definition of managed services within the organisation in order to increase the probability that the employees work according to Scania IT's objectives.

A challenge brought up during several interviews within Scania IT and the interview with Nordea is the importance of letting go of control when engaging in outsourcing arrangements. Äng (2016) describes that Nordea often has an internal project manager even though the supplier has an assigned project manager. If an internal project manager is not necessary but assigned anyway, it probably makes the outsourcing more expensive than managing the service in-house. Therefore it is important for Scania IT to inform employees that managed service arrangements comprehend handing over responsibility to a supplier and as Gottschalk & Solli-Sæther (2006) point out some decision-making authority. However Tayntor (2001) emphasises that it is not suitable to outsource if the IT manager does not feel comfortable handing over the responsibility. Therefore anchoring managed services as a strategy within the organisation becomes an important step for Scania IT in order to create successful arrangements.

Since managed services means handing over responsibilities that often have been handled in-house it is important to keep the staff perspective in mind. To succeed with managed service arrangements, Andersson (2016) and Weckström (2016) point during interviews out the importance of developing a strategy for how to re-allocate these resources. Since Scania IT has a big amount of consultants, it can be a suitable strategy to outsource tasks currently handled by consultants prior to tasks that are managed by employees. Further on results from interviews and the theoretical framework indicate that it is a long journey from managing a service in-house to handing it over to a supplier as managed services. As proposed by Lyhammar (2016) and Oldenkamp (2016) during interviews, it can be a suitable approach dividing the journey towards managed services into steps. This is in theory motivated by McIvor et al. (2008) who describe that many organisations lack a deep understanding of outsourcing. Further on, Tayntor (2001) emphasises that staff augmentation makes it possible for the organisation to keep control of the staff. Staff augmentation can therefore be seen as a first step towards managed services in order to gain deeper understanding regarding outsourcing. Nordea is an example of such journey, since they are planning to start with managed capacity, which is similar to staff augmentation (Äng, 2016). Further on, Bojestig (2016) supports during an interview the thoughts of managed services as a journey. He further emphasises that organisations not pressured by time shall let this journey take time, which is something Scania IT can keep in mind.

5.2.2 Technical challenges

The interviews at Scania IT indicate that finding sufficient volumes for managed service arrangements is challenging within the new organisational structure. This challenge is based on the fact that interviewees find it easier to set up managed services based on technical platform. Findings from interviews show that IBM, Sandvik IT GSS and Uppsala kommun prefer setting up managed services based on business needs and not technical platform. Jha (2016) emphasises that it is beneficial for Sandvik IT GSS to outsource based on business needs, since Sandvik orders systems from Sandvik IT GSS speaking in terms of business needs. Bojestig (2016) describes that Coop outsources based on integrations and business areas, which can involve a mixture of technical platforms. These findings indicate that outsourcing arrangements not necessarily have to be based on technical platform but can be based on business needs, which aligns better with Scania IT's new organisational structure. Further on, Naciri & Janati Idrissi (2014) point out the importance of controlling and monitoring the delivery and Lui (2003) points out that half of IT outsourcing projects fail because the supplier is unable to deliver as expected. Therefore it is important for Scania IT to have clear expectations of the delivery, which can be difficult before the new organisational structure has been established. This means that within the nearest future it is probably more challenging for Scania IT to outsource based on business needs. However, an incentive for Scania IT to outsource based on business needs is the fact that it aligns with the organisational structure within rest of Scania's organisation which probably makes communication easier.

Another challenge brought up during interviews at Scania IT is to outsource support and maintenance of applications with insufficient or non-existing documentation. This is important to keep in mind, but shall not stop the implementation of managed services. To deal with the lack of documentation there are two examples of approaches that can be applied. The first is setting up correct and sufficient documentation in collaboration with the supplier, which L&T Infotech offers their customers. An advantage with this approach is that knowledge transfer is done during the process of documentation, which eases the transition. The second approach is setting up the documentation in-house before initiating managed service arrangements. An advantage with this approach is that Scania IT gets control of the application and therefore reduces the risk of outsourcing a problem. To deal with the risks associated with insufficient documentation, it is important to identify which applications that have insufficient documentation. In the future Scania IT can avoid problems due to insufficient documentation by introducing requirements for the minimum level of documentation.

A challenge detected during interviews within Scania IT is to identify suitable services for managed service arrangements. As previously mentioned, the impression within Scania IT is that confidential information and core business not shall be outsourced. Further on, Lännholm (2016) emphasises during an interview that it is challenging to identify which services that are confidential or core. A suitable approach for Scania IT to identify confidential information is to use the Business Impact Assessment (BIA), which is used to classify the importance of the information. The results from the BIA can therefore be used to determine if it is possible to source a service with regard to information security. To determine if a service is core business, Scania IT can use the previously mentioned definition of core business presented by Luftman et al. (2004). Further on, Bojestig (2016) describes that Coop has set up a roadmap that indicates how critical different applications are, which is an approach Scania IT can adopt in order to choose which applications to source. Luftman et al. (2004) supports the idea that decisions regarding what and whether to outsource shall be connected to an identification and understanding of core competences.

An important aspect of managed service arrangements pointed out during interviews and within the theoretical framework is to identify suitable quality metrics to govern the delivery. Within managed services, possible quality metrics are SLAs and KPIs. Nordea uses both these quality metrics and distinguish them by connecting SLAs directly to the service and KPIs to softer parts of the service (Äng, 2016). Jivan et al. (2015a) support this usage of SLAs. This distinction of SLAs and KPIs can be a good approach for Scania IT to adopt in order to deal with for example high turnover at the supplier described by Leek (2016) during an interview. Further on Parmenter's (2010) five aspects of setting up performance measures can be used by Scania IT to set up a framework for SLAs and KPIs. In addition, Scania IT can also use the specifications of what, where and when described by Larson (1998) to set up a framework for SLAs and KPIs. Ahlström (2016) describes that IBM chooses the SLAs in collaboration with the customers, but that they try to have similar SLAs to different customers. Even if it is

important to identify suitable SLAs for Scania IT, it is also worth taking into consideration the benefits of using SLAs that suppliers offer several customers. If a supplier measures similar quality metrics to several customers they have competence of how to deliver as expected. Further on, Jonasson (2016) has the impression that Scania IT is too friendly when controlling quality metrics. Therefore, if deviations from the SLAs occur it is important for Scania IT to follow up in order for the SLAs to fulfil the intended purpose. This is supported by Jivan et al. (2015a) who argue that managed service models must include financial risks and rewards. To follow up the delivery Scania IT must decide how to internally measure the delivery, which is done in order to control that the performance presented by the supplier is correct. One way of dealing with the internal monitoring is to measure the service levels in-house before handing it over to a supplier, which also facilitates setting up service levels (Sandstedt, 2016).

6. Conclusions

The conclusions of this study have been summarized according to the results of the analysis. The purpose is to give the reader an overview of the key findings from the study. Parts of the conclusions are not directly connected to managed services but to outsourcing in general. However, these findings are also applicable for managed services, since it is a method used for outsourcing.

6.1 Sourcing of IT services

6.1.1 Why source by managed services?

- **To keep up with the fast ongoing digitization.**
- **To obtain flexibility and decreased time to market.**
- **To get predictable IT costs with opportunities to achieve economies of scale.**
- **To transfer the responsibility of retaining competence to a supplier.**

6.1.2 What to source by managed services?

- **Activities that are not considered core and do not bring additional value to the business.** Scania IT's core business is to deliver IT services that add competitive value to Scania's business of providing innovative trucks, buses and engines. Such services are critical for the daily business of Scania, for example a system supporting Scania's production. An example of an activity that can be considered not core is a human resources system.
- **Areas that are industry standard to buy and where the supplier has specialist competence.** At Scania IT an example of this is WAN-services.
- **Ongoing operation/repetitive tasks.** Scania IT has many stable applications and the ongoing operation of these involves repetitive tasks. This makes support and maintenance of applications a suitable area for managed services at Scania IT.
- **Activities that do not involve direct interaction with customers.** An example of such activity at Scania IT is corrections of code within an application. Telephony support of applications is on the other hand an activity that Scania IT shall keep in-house.

6.1.3 Who is a suitable managed service supplier?

- **A supplier that is attracted by the volumes of the service arrangement.** Since cost reductions are an important incentive to use managed services at Scania IT it is important to create sufficient volumes to attract larger suppliers that have the ability to achieve for example economies of scale.

- **A supplier that compensate the organisational maturity.** Since Scania IT has limited experience of buying managed services they shall work with a mature supplier.
- **A supplier that the customer trusts and are willing to have a high transparency with.** In order for Scania IT to have high transparency with a supplier, it is important to ensure that the supplier fulfils requirements regarding for example information security. An example of when trust can be reached, is when Scania IT and the supplier are working with quality metrics to monitor the service.

6.1.4 How is sourcing done according to managed services?

Sourcing by managed services at Scania IT shall be done according to following definition:

The definition of managed services comprehends that Scania IT hands over the responsibility of a specific IT operation to a service supplier. The responsibilities that are transferred to the supplier are management of people, technology and location, as long as it aligns with agreements and requirements from Scania IT. The delivery of the service is governed with SLAs and KPIs, which reflect the scope of the service. Pricing is done according to a pay-as-you-go pricing model where additional volumes can be added for an extra cost. Scania IT's responsibilities are to define a clear scope according to the demands from the business and control that the supplier reaches agreed service levels.

6.2 Challenges implementing managed services

In the following section identified organisational and technical challenges are summarized. For each identified challenge a solution suitable for Scania IT is proposed.

6.2.1 Organisational challenges

- **To dedicate roles and to set up a responsibility matrix.** Scania IT needs to identify and dedicate roles that are critical to handle the service, for example a service responsible. The RACI-model can thereafter be used by Scania IT to identify the responsibilities of the stakeholders.
- **To anchor managed services within the organisation.** In order to establish managed services within Scania IT it is important that the management team cascade a clear directive for managed services.
- **To hand over control to the supplier.** Stated responsibilities and quality metrics makes it easier for Scania IT to understand which areas to not get involved in.
- **To handle affected employees.** Before entering a managed service arrangement Scania IT needs to set up a plan stating employees' responsibilities before, during and after the transfer.

6.2.2 Technical challenges

- **To create sufficient volumes.** Scania IT needs to map dependencies and integrations between applications in order to create volumes by bundling applications.
- **Insufficient internal documentation.** Scania IT can either set up the documentation in-house or in collaboration with the supplier.
- **To identify suitable areas for sourcing.** Scania IT needs to evaluate how critical different applications are for the business to identify sourceable applications.
- **To set up sufficient quality metrics.** At Scania IT quality metrics, like SLAs and KPIs, can be set up based on internal measurements. The quality metrics shall state the activity, where the delivery is executed and when the service is supposed to be available.

6.3 Concluding discussion

For captive IT companies it is necessary to source IT services to meet requirements of proficient customers in a cost effective way. Historically, captive IT companies have mainly had a technical role, but with the digitization their role is extended to also comprehend an orderer function. This means that captive IT companies must obtain expertise within for example procurements of complex IT services. However, it is impossible for an organisation to make all sourcing decisions correct. Therefore it is important to keep in mind that when an IT service has been outsourced, it is difficult to move the service back in-house due to competence loss within that area. Outsourcing also increases the vulnerability since the success of the organisation is dependent on the supplier's ability to deliver successful IT services. Therefore there is always a trade-off between the benefits and disadvantages in the decision regarding whether to source or not.

Further on the era of digitization creates opportunities for new businesses to be developed since tasks that are non-core for one organisation can be core for another. Because of the fast technical development organisations must specialise and focus on their core business in order to retain a leading position on the market. Therefore organisations also need to source IT services to suppliers with core competence within the areas that are not core business for the organisation.

6.4 Suggestions for further studies

This study analyses why, what, who and how to source IT services by managed services and the challenges this delivery model brings. Further research can therefore include a study of how to set up managed services arrangement in practice by creating a model, including dedicated roles, SLAs/KPIs, structures of governances, etcetera. For such study it would be interesting to create a case and implement the model, in order to investigate the usability and identify areas of improvements. The results can be more

generalizable by performing case studies within other organisations according to the same structure. Focus within this study has been support and maintenance of applications and therefore further studies can be performed with respect to other IT services, for example IT infrastructure. Many theories regarding sourcing emphasise that core business shall be kept in-house. However it is difficult to determine if a service is core business which motivates further studies that develops a strategy for how to determine if a service is core or not.

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Appendix 1: Glossary

Customer

BusinessDictionary (2016a) defines a customer as a party consuming or receiving goods or services. The customer has the possibility to choose between different suppliers and products.

Core competence

Quinn (1999) defines core competencies as the competences that define how the organisation delivers value to its customers and why these customers prefer the value created or the operations within the organisation to those of competitors.

In-house

Investopedia (2016) defines in-house as when an organisation manages an operation or activity within the company, instead of engaging a supplier through outsourcing. This means that the organisation uses its own employees for managing the operation or activity.

Multisourcing

Herz et al. (2013) defines multisourcing as a disciplined method for provision of services using multiple suppliers. These suppliers are both within and outside the company.

RACI model

According to Project Smart (2016) the RACI model is a tool that is used for the identification of roles and responsibilities. The purpose with the RACI model is to avoid confusion regarding responsibilities between different stakeholders. The letters in RACI stands for *responsible*, *accountable*, *consulted* and *informed*. Responsible is the resource that is expected to perform the work in order to achieve the task. Accountable is the resource that is accountable for the task, often a sponsor. The consulted resource has the responsibility of providing information, often subject matters experts. Resources who are informed are people that are affected by the outcome and therefore need updates about the progress.

Single-sourcing

BusinessDictionary (2016b) defines single-sourcing as when an organisation uses one supplier without a competitive bidding process between several suppliers.

Supplier

BusinessDictionary (2016c) defines a supplier as a party that offers services or goods.

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Appendix 2: Application maintenance

According to Lientz et al. (1978) and Ahmed (2006) maintenance and enhancement is a big part of the cost in the life cycle of a software application. Ahmed (2006) also points out that it is the longest phase in the life cycle of a software application. Lientz et al. (1978) describes maintenance and enhancement of a software application as the activities that keep systems operational and make sure that it meets user needs. McKeen & Smith (2012) says that application maintenance is what keeps the lights on and have defined it as *"any modification of an application to correct faults, to improve performance, or to adapt the application to a changed environment or changed requirements"*. Naciri & Janati Idrissi (2014) emphasises that software maintenance contains all activities within support and engineering of software changes that have to be done in order for the application to meet the user's needs. These activities can either improve a feature of the software or be a change that has to be done in order for the system to work. Maintenance of the software is very important when it comes to ensuring continuous use of the software and to ensure that customer requirements that has not been implemented during the development phase will be met (Naciri & Janati Idrissi, 2014).

Naciri & Janati Idrissi (2014) describe that in software maintenance there is also a customer support that does not require any programming activities. The customer support is crucial for effective communication between maintainers and customers that want to submit a change request. Naciri & Janati Idrissi (2014) describe that the support activity includes giving the support that is needed to the software product end-users, to qualify detected bugs, to ensure their relevance and to train end-users in the features of the product.

The process of software maintenance is similar to development of the software but the focus is on correction and adoption rather than transformation of requirements to software functionalities. According to Naciri & Janati Idrissi (2014) the following environmental factors may influence the software maintenance process:

- Maintenance activity type: This can for example be corrections, new requirements, enhancement for existing requirements or change of the implementation mode.
- People: Can concern a person's skills and ability. How they will influence the software will also be affected on whether the person is a customer or user.
- Product: its size, age, type and product technical architecture.
- Process organisation: it is concerning the management approach that is used, team organisation, methods, resources and technologies.

Maintenance activities requires regular contact between the customer and the supplier with short cycles, many iterations and decreased deadlines for replies (Naciri & Janati Idrissi, 2014). According to Ahmed (2006), reliable maintenance can only be achieved

if suitable measures have been collected during the project's development and maintenance planning phase.

References

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Appendix 3: Interview questions

Interviews at Scania IT

1) Vad innefattar dina arbetsuppgifter?
2) Hur ser Scania IT:s sourcingstrategier ut i dagsläget?
   a. Vad tycker du om dessa?
   b. Hur tycker du att de bör se ut?
3) Vad anser du vara viktigt att tänka på när man lägger ut tjänster till en extern leverantör?
4) Vilka krav bör man ha på leverantören?
5) Vilka krav behöver man se till att uppfylla in-house innan man är redo att outsourca?
6) Hur skulle du definiera managed services?
   a. Vad vill man uppnå med managed services på Scania?
   b. Vilka typer av tjänster anser du lämpade att köpa in managed services för?
   c. Anser du det att man ska använda en och samma leverantör eller fler?
   d. Vilka svårigheter ser du med att använda managed services?
   e. Vilka vinningar ser du med att använda managed services?
7) Är det någon typ av tjänst på din avdelning som outsourcas i dagsläget?
   a. Om ja, hur ser det avtalet ut?
8) Hur tycker du att avtal rörande managed services bör se ut?
   a. Uppgiftsformulering
   b. Uppföljning
   c. Villkor
9) Har du tips på personer vi bör kontakta?
10) Har du tips för företag som kommit lång inom managed services?

Interviews with external customers

1) Vad innefattar dina arbetsuppgifter på XX?
2) Kan du berätta kort om IT-verksamheten på XX?
   a. Hur många anställda?
   b. Anställda/konsulter?
3) Hur arbetar ni med sourcing?
   a. Historiskt
   b. Nuläget
   c. Framtiden
   d. Offshore/onsite
4) Arbetar ni med managed services på XX?
   a. Hur definierar ni managed services på XX?
   b. Vilka typer av tjänster (förvaltning och support av applikationer) har ni managed services på?

    c.   Vad var incitamenten för att införa managed services?

    d.   Vad har det gett för resultat?

    e.   Vad ser du för vinningar med att arbeta med managed services?

    f.   Vad ser du för utmaningar med att arbeta med managed services?

    g.   Hur går planeringen av ett köp till när ni ska göra managed service på en tjänst och var tas beslutet?

    h.   Hur avgör ni om en tjänst är lämpad för managed services?

    i.   Kan du kortfattat beskriva managed service processen, det vill säga hur det går till från idé till implementation?

    j.   Hur ser governance ut för dessa tjänster?

    k.   Hur arbetar ni med att informera och förankra managed services inom organisationen?

5) Om inte, har ni funderat på att arbeta med managed service?

6) Har ni arbetat med någon typ av outsourcing inom XX?

    a.   Om ja, vad för typ?

    b.   Vad har det medfört för utmaningar?

    c.   Vad har det medfört för vinningar?

7) Vad ser du för trender inom sourcing?

8) Vad har ni stött på för utmaningar inom XX:s IT-verksamhet de senaste åren?

Interviews with external suppliers

1) Vad innefattar dina arbetsuppgifter?

2) Kan du berätta lite om XX:s organisation?

    a.   Anställda?

    b.   I vilka länder?

    c.   Verksamheter?

3) Hur definerar ni på XX managed services?

    a.   Hur länge har ni arbetat med managed services?

    b.   Hur har utbudet/efterfrågan sett ut?

    c.   Ungefär hur stor volym managed service arbetar ni med?

    d.   Vilka krav/förväntningar har ni på en kund för att kunna ingå i ett managed services avtal?

    e.   Hur stora volymer krävs för att uppdraget ska vara intressant för XX?

    f.   Vilka utmaningar ser du att företag har med att implementera managed services?

    g.   Kan du berätta lite om processen när XX upprättar ett managed service avtal med en kund?

    h.   Kan det finnas flera steg att ta innan man når en managed service struktur. I sådana fall, vad innefattar dom? (Time and material/ Managed capacity)

4) Säg att ni har kund som kommer med en gammal odokumenterad applikation. Hur hanterar ni det?

5) Kan du ge exempel på kvalitetsparametrar som du anser vara lämpliga att använda för att mäta leveransen inom support och förvaltning?
6) Vad föredrar ni - leverans baserad på teknologi eller verksamhetsprocess?
7) Vad tror du är viktigt för att upprätta ett lyckat managed service samarbete?
8) Vad tror du är vanliga orsaker att managed service avtal inte blir lyckade?
9) Har ni någon dokumentation rörande manged services som vi kan ta del av?
10) Har du något att tillägga?

Appendix 4: Proposed model for managed services at Scania IT

1. Managed services at Scania IT

This document is a proposal of a method for managed services at Scania IT. The method is based on the report "Towards managed services – A case study of Scania IT" a master thesis at Sociotechnical Systems Engineering, Uppsala University spring 2016 written by Therese Elmelind and Frida Rawet. The supervisor at Scania IT has been Anders Karnfält who works as a sourcing specialist at IEC - IT Vendor Management Office. The proposed method is intended to be further developed by this department.

1.1 Incentives

Some of the incentives behind managed services arrangements are:

- To keep up with the fast ongoing digitization.
- To obtain flexibility and decreased time to market.
- To get predictable IT costs with opportunity of economies of scale.
- In order to transfer the responsibility of retaining resources to an external supplier.

1.2 Suitable areas

The following areas can be suitable to source by managed services:

- Activities that are not considered core and do not bring additional value to the business of Scania IT.
- Areas that are industry standard to buy and where the supplier has specialist competence.
- Ongoing operation/repetitive tasks.
- Activities that do not involve direct interaction with customers.
- Applications that can be handed over to a supplier in a profitable way with regard to the relation of remaining life length and complexity of the application.
- Sufficient volumes (read more in glossary).

1.3 Selecting supplier

When selecting a supplier it is important to take following aspect in consideration:

- Finding a suitable supplier by adapting the volumes based on whether Scania IT wants to attract a big or small supplier.
- Since Scania IT is an immature buyer of managed services it is beneficial to collaborate with a mature supplier.
- A supplier that Scania IT trusts and are willing to have a high transparency with.
- Finding suppliers with core competence within certain areas.

1.4 Definition

The definition of managed services comprehends that Scania IT hands over the responsibility of a specific IT operation to a service supplier. The responsibilities that are transferred to the supplier are management of people, technology and location, as long as it aligns with agreements and requirements from Scania IT. The delivery of the service is governed with SLAs and KPIs, which reflects the scope of the service. Pricing is done according to a pay-as-you-go pricing model where additional volumes can be added for an extra cost. Scania IT's responsibilities are to define a clear scope according to the demands from the business and control that the supplier reaches agreed service levels. The supplier shall deliver the agreed service according to given SLAs and KPIs.

1.5 RACI model

RACI model is a responsibility assignment matrix. The RACI model describes the participation by various roles in completing tasks or deliverables for a project or business process. These roles could participate in different ways and in this RACI model the different types of participation are the following:

- **Responsible**: Those who do the work to achieve the task. There is at least one role with a participation type of responsible, although others can be delegated to assist in the work required.
- **Accountable:** The one ultimately answerable for the correct and thorough completion of the deliverable or task, and the one who delegates the work to those responsible. In other words, an accountable must sign off (approve) work that responsible provides. There must be only one accountable specified for each task or deliverable.
- **Consulted**: Those whose opinions are sought, typically subject matter experts; and with whom there is two-way communication.
- **Informed:** Those who are kept up-to-date on progress, often only on completion of the task or deliverable; and with whom there is just one-way communication.

	Activity	Role 1	Role 2	Role 3
Scope				
	Purpose			
	Specification			
	Work task			
	Location			
	Deliverables			
	Industry specific standards			
	Mapping dependencies			
Procurement				
	Payment plan			
	Terms for termination			
Governance				
	Dedicated resources for governance			
	Plan for governance			
	Service Level Agreements (SLAs)			
	Key Performance Indicators (KPIs)			
	Internal monitoring			
	Management of resources			
Application details				
	Traceability			
	Documentation			
	Volume			
	Business impact analysis			

2. Glossary

2.1 Scope

The scope shall reflect Scania IT's requirements and expectations of the service. In managed services this is one of the most important steps to be able to fully hand over the responsibility to a supplier. At least the following parts should be included in the scope:

- **Purpose:** Describe the purpose of the managed services arrangement.
- **Specification:** Make a specification of the application. This shall include a description of the functionality, added business value and technical specifications.

- **Work tasks:** Make a description of the of work tasks and the amount of work that are done handling the application.
- **Location:** Describe the location of work during transition and transformation.
- **Deliverables:** A description of deliverables shall be done. This shall include a description of what should be delivered and when.
- **Industry specific standards:** Make a description of industry specific standards that need to fulfilled.
- **Mapping dependencies:** A mapping of dependencies between applications shall be done. This is used to understand what applications that can affect and be affected by the application that is sourced. This mapping will result in a list of applications that are important to the application that shall be sourced.

2.2 Procurement

2.2.1 Payment plan

The payment of managed services is done according to a pay as you go pricing model. This means that the payments are done in advance for a specific amount of a service and that volumes can be extended for an additional cost. Therefore the scope of the service constitutes the basis for the pricing. The payments shall be done regularly according to a predetermined time interval like for example on a monthly basis. At every tactical/strategic governance meeting it should be possible to extend the volume of the service that are included in the predetermined price. Pricing of additional volumes shall also be done in advance. The conditions of the payments should be stated in a payment plan.

Example of a payment plan

Date of payment	Price per month	Additional volume
31/1	*10 000*	*600 kr/h*
28/2	*10 000*	*600 kr/h*
31/3	*10 000*	*600 kr/h*
...	*...*	*...*

2.2.2 Terms for termination

In order to handle the delivery of the service when the managed services contracts end it is important to set up terms for termination. This is important to retain the competence about the application and to ease a possible knowledge transfer to a different supplier or back in-house.

Example of how the terms for termination should be stated

Activity	Currently responsible (supplier/customer)	Future responsible (new supplier/customer)	Location for knowledge transfer	Dedicated time for knowledge transfer
Incident management L3	Emma Emmasson (supplier 1)	Johan Johansson (supplier 2)	Supplier 1	6 months

2.3 Governance

2.3.1 Dedicated resources for governance

The success of a managed services arrangement depends heavily on the personnel assigned by the service supplier. In many cases specific leadership roles are assigned with purpose to oversee the account. Scania IT can therefore identify certain roles as "key" for the specific service. Examples of such roles are:

- Portfolio responsible
- Maintenance manager
- Account manager.
- Service delivery coordinator.
- Program manager.
- Offshore service delivery lead.
- Subject matter expert.
- Testing lead.
- Maintenance manager

2.3.2 Plan for governance

The governance of the service should be done according to the existing governance model and the document found on following link:
https://inline.scania.com/scripts/cgiip.exe/WService=inline/cm/file/showfile.p?fileid=325212

2.3.3 Service level agreements

Service Level Agreements (SLAs) are service measures associated with performance levels and the SLAs define the expectations on service delivery. It is important that the service measures reflect Scania IT's requirements and that the service measures has a clear defined scope. The purpose of SLAs is to provide the information that is necessary in order to understand and use the contracted services to the user. Five to seven SLAs are preferred. In order to be effective the service level agreements should specify following attributes:

1) **What:** What defines the facilities and functions that comprehend the components associated with the service. The focus of what is on the end result from the Scania IT's viewpoint.
2) **Where:** Where includes geographic locations such as buildings and/or departmental points where delivery is executed as well as the medium used for service delivery.
3) **When:** The when parameter specifies when the services are expected to be delivered which might include both deadline for which time the service element is to be delivered, which time the service is supposed to be available or the response time.
4) **Internal monitoring:** In order to control that the supplier delivers according to the agreed levels it is important for Scania IT to set up how to monitor the delivery internally.

Example of how the SLAs should be stated

Type	What	Where	When	Internal monitoring
The name of the SLA	Description of the SLA	Name of building, address (including floor and room) and phone number	Specification of hours	Description of how the internal monitoring should be done

Below follows a list of SLAs that could be applied:

- **Resolution time:** The amount of time between when the client first creates an incident report and when that problem is actually solved.
- **Response time:** The amount of time between when the client first creates an incident report (which includes leaving a phone message, sending an email, or using an online ticketing system) and when the supplier actually responds

- **First time right:** Measures how often an incident is solved right the first time which means that no time and money is wasted correcting errors.
- **Percentage of rework:** Measures the amount of rework executed.
- **Uptime:** Part of active time during which an equipment, machine, or system is either fully operational or is ready to perform its intended function.
- **Year-on-year improvement:** A defined agreed yearly improvement of the service.

2.3.5 Key performance indicators

Key Performance Indicators (KPIs) are necessary in order to create successful managed service arrangements. KPIs represent a set of measures focusing on those aspects of organisational performance that are the most critical for the current and future success of the organisation. The monitoring of KPIs are supposed to be done 24/7, daily or weekly. If the monitoring is done monthly, quarterly or annual the measurement cannot be classified as a KPI since it cannot be a key success factor to the business if it is measured so infrequently. The purpose of KPIs is to inform the organization regarding which actions that is needed. KPIs can, in contrast to SLAs, be used for softer parts of the service that are not directly connected to the functionality. Below follows a list of KPIs that can be applied:

- **Employee turnover at the supplier:** Specifies how high employee turnover the supplier is allowed to have. The purpose of this KPI is to ensure that the competence is retained at the supplier.
- **Customer satisfaction:** Customer satisfaction can be both operational as well as relationship.
- **Customer Lifetime Value (CLV):** Minimizing cost isn't the only (or the best) way to optimize your customer acquisition. CLV looks at the *value* Scania IT is getting from a long-term customer relationship. This performance indicator is used to narrow down which channel helps Scania IT gain the best customers for the best price.
- **Number of customers:** By determining the number of customers that Scania IT gained and lost, it is possible to further understand whether or not Scania IT are meeting the customers' needs.
- **Time allocated for administration, management and training:** Can be used in order to ensure that the supplier has for example a sufficient knowledge transfer.

2.3.6 Management of resources

When doing a managed services it is possible that several resources are affected by the sourcing. In order to create a successful environment for the sourcing it is important to make a plan for how the affected resources are managed. This plan should include who the affected resource is, its current position and responsibility, its responsibility during transition and transformation and its future position and responsibility.

Example of how the resource plan should be stated

Resource	Current position and responsibilities	Responsibility during transition and transformation	Future position and responsibility
Anders Andersson	Developer Java development within application X.	Teaching the supplier the parts of the application that concern Java development.	Developer Java development of the new application Y.

2.4 Application details

2.4.1 Traceability

Traceability is the ability to verify the history, location, or application of an item by means of documented recorded identification. This includes security log where it is possible to see who that has done what and when it is was done. Traceability is important in order to be able to follow up changes within the applications which is necessary particularly if the supplier handles secret or confidential information.

2.4.2 Documentation

In order to set up managed services arrangements it is necessary to have sufficient levels of documentation for the applications. Since the level of documentation varies within Scania IT two approaches can be applied if an application lacks sufficient documentation:

1) **Set up correct and sufficient documentation in collaboration with the service supplier.** L&T Infotech offers this to their customers. One advantage with this approach is that some knowledge transfer is done during the documentation which eases the transition.
2) **Set up the documentation in-house before initiating a managed service arrangement.** One advantage with this approach is that the organization gets control of the application and therefore reduces the risk of outsourcing a problem.

Further studies: defining a minimum level of documentation for managed services.

2.4.3 Volume

In order to set up managed services arrangements it is necessary to have sufficient volumes of applications to create a win-win situation for Scania IT and the supplier. The volumes are important to consider with regard to what kind of supplier Scania IT wants to attract. If the volumes are big, a bigger supplier will most likely be attracted but it is possible that smaller suppliers do not have the ability to meet those demands. If the volumes instead are small it is possible that the interest from the bigger supplier are not big enough but it makes it possible for smaller suppliers to get involved in the deal. If the outsourcing is done in order to get access to specialist competence it is important to not create too big volumes, since it might scare off smaller suppliers. What volume that is considered to be sufficient varies from supplier to supplier and therefore needs to be agreed for each individual case. Two approaches could be applied in order to set up sufficient volumes:

1) **Finding applications that are big enough alone. Some** applications might involve enough volumes to create a win-win situation alone.
2) **Bundle smaller applications. Some** applications do not alone involve enough volumes. Several such applications can be bundled in order to create a sufficient volume.

2.4.4 Business Impact Analysis

Before initiating a sourcing commitment it is important to classify the information within the application. This shall be done with a Business Impact Analysis (BIA) which is done in order to classify and identify the importance of the information for Scania. The BIA consists of four levels which each represent the level of damage caused by misused information. These four levels are secret information, confidential information, internal information and negligible information. The BIA is performed by Scania IT IEA - Risk & Compliance. The performance of a BIA should be initiated early in the sourcing process.