Services through the truck’s lifecycle

A case study of the utilization of Scania’s long-haulage trucks

Louise Vximo
Marie Sundkvist

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Marie Sundkvist

Louise Vigmo

Marie Sundkvist

Louise Vigmo
Abstract

Scania is one of the leading manufacturing companies of long-haulage trucks, buses as well as industrial and marine engines. Offering services is becoming increasingly important for Scania, as well as for any other truck OEM company, to stay competitive. Today Scania offers several services connected to the company’s products. The current service portfolio targeting the long-haulage truck is mainly focused on meeting the needs of the first owner of the vehicle. However, the truck goes through different phases during its lifecycle, operating under varying conditions in different businesses. With this in mind, the study aimed at answering the following research questions:

RQ1 - What are the characteristics of the phases that a long-haulage truck faces during its lifecycle?

RQ2 - How do these phases relate to the nature of the customers’ businesses with their associated challenges, demands and needs?

RQ3 - Based on the results of RQ1 and RQ2, what service areas could a long-haulage truck OEM offer their customers?

In order to answer RQ1 and RQ2, an internal mapping including interviews with experienced Scania employees, was conducted. This was followed by an external mapping, in which hypotheses generated from the internal mapping were tested through interviews with owners of used long-haulage trucks as well as distributors. Based on the internal and external mapping, development of service areas targeting the later owners of the long-haulage truck’s lifecycle was carried out, including brainstorming sessions and workshops.

The result of the study showed that the long-haulage truck’s life is characterized by differences in utilization and not by distinctive owners groups, the phases in the truck’s lifecycle are consequently use phases. When describing the characteristics of the use phases, two parameters primarily define the life of the truck. Firstly, with the truck’s increasing age, the utilization of the truck goes from focusing on logistics to moving things from A to B. Secondly, with increased age, the emphasis on advanced technology shifts to basic technology in regards of the truck’s physical condition as well as the owner’s need and desire for technology. Advanced technology is related to a utilization focus on logistics while basic technology goes hand in hand with moving things from A to B. In addition, the further away in the lifecycle, the focus on delivery precision, need of the business having high use frequency of the used truck, the demand for technically advanced functions, need for vehicle reliability and tendency to turn to OEM for R&M decreases. Furthermore, the further away in the lifecycle and from the starting point Europe, the driver’s level of loyalty towards the business, incentive to use technical devices in driver environment and focus on the driver’s working situation is reduced.

Based on above description of the long-haulage truck’s life, a truck OEM company such as Scania can offer services related to R&M, the transition that occurs when the truck is sold or bought, safety and security aspects and driver convenience. The order the services areas are given in is the order the areas are considered to have the most offering potential.
Recommendations for future work involve development of the services, which currently are suggestions. To ensure further successful development, additional studies, including quantitative on-site examinations of for example users outside Europe, needs to be carried out.
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<th>Definition</th>
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</thead>
<tbody>
<tr>
<td><strong>Environmental zone</strong></td>
<td>A geographically defined area in which emission restrictions regulate which vehicles that are allowed to enter the area.</td>
</tr>
<tr>
<td><strong>Euro 5 (6)</strong></td>
<td>Levels of European emission standards defining the acceptable limits for trucks’ exhaust emissions.</td>
</tr>
<tr>
<td><strong>ICT</strong></td>
<td>Information and Communication Technology</td>
</tr>
<tr>
<td><strong>LCC</strong></td>
<td>Life Cycle Cost</td>
</tr>
<tr>
<td><strong>Long-haulage</strong></td>
<td>Long distance transports with on average less than 10 stops per 100 km.</td>
</tr>
<tr>
<td><strong>OEM</strong></td>
<td>Original Equipment Manufacturer</td>
</tr>
<tr>
<td><strong>R&amp;M</strong></td>
<td>Repair and Maintenance</td>
</tr>
<tr>
<td><strong>SOPS</strong></td>
<td>A data file in which parameters describe the truck’s physical specifications.</td>
</tr>
<tr>
<td><strong>Tachograph</strong></td>
<td>A device that automatically records the truck’s speed and distance.</td>
</tr>
<tr>
<td><strong>Telematics</strong></td>
<td>The technology and application area originating from the combination of computer science and digital telecommunication technology.</td>
</tr>
<tr>
<td><strong>Trader</strong></td>
<td>Someone who generally buys a big amount of trucks in order to sell them forward.</td>
</tr>
<tr>
<td><strong>Uptime/Downtime</strong></td>
<td>Uptime is a measure of the time the truck has been operating and been available. Downtime is the opposite of uptime.</td>
</tr>
<tr>
<td><strong>4*2 truck</strong></td>
<td>Axle configuration. The truck has two axles of which one is the drive axle. The drive axle has four wheels.</td>
</tr>
<tr>
<td><strong>6*2 truck</strong></td>
<td>Axle configuration. The truck has three axles of which two are steering axles and one is drive axle with four wheels.</td>
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1 Introduction

Companies are today facing continuously changing markets, which in turn has generated a highly competitive and turbulent market environment (Gebauer, et al., 2011). To respond to this dynamic context and to meet increasingly growing and complex customer needs, manufacturing firms have started to offer product related services as a source of competitive advantage (Mathieu, 2001). One of these advantages is related to the intangible aspect of services, meaning that they are less visible, which in turn serves as a way to complicate competitors’ opportunities of replication (Gebauer, et al., 2011). Relying on service offerings as an essential part of the business has also proven to improve the value of the company (Fang, et al., 2008). Market-leading companies which traditionally have been manufacturing products have most often acquired deep product knowledge and thereby have an enhanced opportunity to become a service provider (Kindström & Kowalkowski, 2009).

The transition from primarily offering a product to augment the offering with related services has created a shift in how value is generated. Manufacturing firms have normally obtained value from the product and its related technical aspects (Tan, et al., 2010). With the introduction of services, value is rather created from enhancing and supporting the use of the product (Tan, et al., 2010). This implies that services and value are generated through a co-creation process, based on competencies of both the customer and the company, which forms unique resources for the producing company (Gebauer, et al., 2011).

In addition, a product most likely changes owner and user during its lifecycle. New technology transforms previously modern and advanced products obsolete and outdated, which results in a replacement of still functioning products in good condition (Kwak, et al., 2012). Fortunately, consumers that seek, for example, lower costs do not require the latest technology, which creates a demand for reuse of products (Kwak, et al., 2012). According to Kwak, et al. (2012), the increasing focus on second-hand product value has generated a strong incentive for manufacturers to consider the second-hand market at an early stage in the development process. The authors further stress how this focus creates a need for companies to recognize alternative ways to enhance the second-hand market value of the product.

1.1 Problem definition

Long-haulage truck OEM’s (Original Equipment Manufacturer’s) product and service development is currently mainly focused on meeting the needs of the first owner of the vehicle. The vehicle does, however, go through many different phases during its lifecycle, operating in different types of businesses and under varying conditions. Since a few years back, it has become more common that newly manufactured long-haulage trucks are equipped with a telematics connection, enabling the possibility to measure and collect data about the driver and the vehicle. With this in mind, the long-haulage truck OEM Scania is now aiming at expanding their current service portfolio by developing telematic-based service offerings that meet the needs of truck owners further away in the truck’s lifecycle. These technology-based opportunities for Scania’s service development were emphasized by Scania’s CEO, who stated the following in the fall of 2013:

“As the vehicles increasingly become connected, a large amount of vehicle data and driver data will become available. This opens up for opportunities to offer brand new service offerings.” (Scania Inside, 2013)
The use of the telematics technology integrated in trucks offers the possibility to develop services that meet the needs and demands of the second and third owner in the vehicles lifecycle. According to Kowalkowski et al. (2013), the increased access to real-time information on product usage is a great foundation for creating a strong, value-based relationship with the customer. Utilizing ICT (Information and Communication Technology) enables the creation of product-related services such as preventative maintenance, fleet management and remote monitoring and control of the vehicle (Kowalkowski, et al., 2013). Scania is one of the OEM’s currently offer services targeting these areas, but are now aiming at creating additional areas for service offerings to meet the needs and prerequisites of the later owners in the product lifecycle.

1.2 Purpose

The purpose of this master thesis is to investigate how a long-haulage truck OEM’s service areas could be improved. This includes investigating how to improve a long-haulage truck OEM’s transition from being product-oriented to an organization focusing on development of integrated product and service offerings. Furthermore, the study aims to generate value-based areas for service offerings, which focus on addressing long-haulage truck owners in the later phases of the product lifecycle.

1.3 Objectives and research questions

The objective is to study the use of long-haulage trucks from a product lifecycle perspective. The focus will be to map the characteristics of the customer’s business and use of the long-haulage truck, as well as focusing on the driver’s situation. Furthermore, the core of the service development process will be based on integrating the use of telematics technology in relation to the use of the long-haulage truck. In order to fulfill the objectives, Scania will be used as an example of a long-haulage truck OEM.

RQ1) What are the characteristics of the phases that a long-haulage truck faces during its lifecycle?

RQ1 aims at gaining a deep understanding of the different lifecycle phases of a long-haulage truck. The acquired information will be an important prerequisite to create a picture of how ownership varies over time and which the primary factors are influencing the business in which the truck operates. With this picture in mind, a model of the different lifecycle phases will be developed.

RQ2) How do these phases relate to the nature of the customers’ businesses with their associated challenges, demands, and needs?

The purpose of RQ2 is to gain knowledge about the customer’s varying needs, demands and challenges. The different contexts in which the long-haulage trucks are operating in as well as how different factors affect the customer’s demands and priorities will be examined. This will further ensure that the service offerings are developed with the necessary information in mind and in turn meets the needs and demands of customers.

RQ3) Based on the results of RQ1 and RQ2, what service areas could a long-haulage truck OEM offer their customers?
Taking the information and knowledge gained from RQ1 and RQ2 into account, RQ3 will result in different areas for service offerings as well as suggestions of potential services for each service area.

1.4 Delimitations

The main focus will be on developing new commercial service areas based on the technology of telematics, with Scania’s and their customers’ demands as a starting point. The study will therefore not include detailed calculations of the potential financial gain of the developed new services. The developed service areas will further not be described in detail; they will be presented on a general system-level. Furthermore, the study will only focus on the first ten years of usage of the long-haulage truck. In order to ensure that the study does not become too complex and comprehensive, the study is further based on the assumption that the vehicles are located in Europe in the first life.
### 1.5 Report outline

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction</strong></td>
<td>An introduction of the study’s background, delimitations and a presentation of the research questions that the study aims at answering.</td>
</tr>
<tr>
<td><strong>Methodology</strong></td>
<td>Presentation and motivation of the research process and its including steps.</td>
</tr>
<tr>
<td><strong>The OEM Scania and characteristics of the transport industry</strong></td>
<td>A description of the company Scania, the characteristics of various long-haulage trucks, the transport operation as well as driver regulations. In addition, a summary of Scania’s current service offerings is presented.</td>
</tr>
<tr>
<td><strong>Theoretical framework</strong></td>
<td>Relevant theories related to the subject of the study are presented.</td>
</tr>
<tr>
<td><strong>Internal mapping of owner characteristics</strong></td>
<td>Presentation of the findings from interviews with Scania employees.</td>
</tr>
<tr>
<td><strong>External mapping of use characteristics</strong></td>
<td>Presentation of the findings received from interviews with distributors, customers and one representative of the Swedish transport association.</td>
</tr>
<tr>
<td><strong>Use characteristics through the long-haulage truck’s lifecycle</strong></td>
<td>The identified use characteristics obtained from testing the hypotheses in the external mapping are presented.</td>
</tr>
<tr>
<td><strong>The lifecycle model</strong></td>
<td>A visualization of a lifecycle model based on the findings of the internal and external mapping.</td>
</tr>
<tr>
<td><strong>The identified service areas</strong></td>
<td>Presentation of the identified service areas.</td>
</tr>
<tr>
<td><strong>Analysis</strong></td>
<td>An analysis of the visualized lifecycle model, the identified services and their potential to provide customer value, as well as an analysis on organizational aspects related to providing services.</td>
</tr>
<tr>
<td><strong>Evaluation of methodology</strong></td>
<td>An evaluation of the applied methodology throughout the study is presented.</td>
</tr>
<tr>
<td><strong>Conclusions</strong></td>
<td>A summary of the study’s most important results, answering of the research questions as well as recommendations for future work and studies.</td>
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2 Methodology

This chapter describes the methodology used for the service development process. The chapter includes a thorough description of the research framework, the methods used as well as justifications of the chosen methods.

2.1 Research framework

In order to conduct the study and enabling the identification of suitable service areas, Kowalkowski & Kindström’s (2012) service development framework was used as a base. Choosing this development model was primarily based on the framework’s holistic approach to service development, including examples of necessary elements and appropriate activities. Another factor contributing to the choice of service development method was that it left room for modifications, which enabled the development process to be adapted to the specific aim of the study.

According to the framework of Kowalkowski & Kindström (2012), service development is a circular and dynamic four stage model including Market sensing, Development, Sales and Delivery, see Figure 1 below. The third stage includes the selling of the service, which for example involves educating the sellers in the purpose and content of the service (Kowalkowski & Kindström, 2012). In the fourth stage the developed service is realized and concretized in the context of the user (Kowalkowski & Kindström, 2012). Due to the study’s aim to identify service areas and not including implementation of these services, the last two stages were excluded in the study.

The two remaining stages, Market sensing and Development, were modified to fit the study’s prerequisites and delimitations. In relation to the study’s research questions, the market sensing stage answered RQ1: What are the characteristics of the phases that a long-haulage truck faces during its lifecycle? and RQ2: How do these phases relate to the nature of the customers’ businesses with their associated challenges, demands and needs?. The development stage did in turn, with the previous stages as a base, answer RQ3: Based on the results of RQ1 and RQ2, what service areas could a long-haulage truck OEM offer their customers? Figure 1 illustrates the applied service development framework.

![Figure 1. Four stages of service development (Kowalkowski & Kindström, 2012)](image-url)
2.2 Market sensing

The first step in the market sensing stage is to summarize and map the services that the company is offering and thereby for example be able to identify free offered services. The second step includes searching for latent new service opportunities by examining the company’s value network, consisting of for example customers and partners. In addition, discussions with researchers and consultants within the business sector is also a way to identify new opportunities for service offerings. (Kowalkowski & Kindström, 2012)

With this in mind, the study’s market sensing stage was divided into four parts; Mapping of existing services, Internal mapping, Formulation of hypotheses and External mapping, where the second step in the market sensing stage included the three last parts. Below, the different parts are described and Figure 2 shows the relation between them.

2.2.1 Mapping of existing services

In this part, Scania’s existing service offerings were studied. Through meetings with employees within service development and through internal documents, an understanding of the current service offerings was created. However, due to the time restraints of the study and the largeness of Scania as a business, only the commercialized services related to operation were examined. Consequently, this part of the market sensing stage was primarily conducted to create awareness among the authors of the existing services and did not aim at finding, as exemplified above, free and perhaps unknown services.

2.2.2 Internal mapping

The internal mapping aimed to collect information from skilled and experienced Scania employees. Based on Patel & Davidson (2003) description of how qualitative interviews are suitable for an inductive way of working, aim at identifying the characteristic of a certain phenomenon and provides space for the interviewee to answer questions with his or her own words, this interview form was chosen as the way to collect information. The interview questions were formulated in an open way and left room for spontaneous answers as well as for follow-up questions (see Appendix A for the full range of interview questions). In order to enable distinguishing specific characteristics of the various owners in the product lifecycle, the questions were divided into three areas, targeting the first, second and third owner of long-haulage trucks.

A total of 13 Scania employees were interviewed. The interviewees were chosen based on their combined expertise within the areas of marketing and customer knowledge, research and development and workshop services. The main purpose of interviewing Scania employees with different backgrounds and experience was to receive necessary knowledge and insight into different
areas to create an accurate picture of owner characteristics in the truck’s lifecycle. The majority of the interviewees were chosen based on their extensive knowledge of owners of used long-haulage trucks, which many of them had obtained by living and working in countries to which second hand vehicles are often sold. The whole range of the professional roles of the interviewed Scania employees is presented in Table 1.

Table 1. Professional work titles of the interviewed Scania employees

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Professional work title</th>
<th>Interview date</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Head of operational performance</td>
<td>2014-01-30</td>
</tr>
<tr>
<td>B</td>
<td>Project manager (Vehicle electrics and fleet management)</td>
<td>2014-02-03</td>
</tr>
<tr>
<td>C</td>
<td>Project manager</td>
<td>2014-02-03</td>
</tr>
<tr>
<td>D</td>
<td>Product planner - Repair and maintenance</td>
<td>2014-02-05</td>
</tr>
<tr>
<td>E</td>
<td>Retail development manager</td>
<td>2014-02-06</td>
</tr>
<tr>
<td>F</td>
<td>Product director - Long haulage</td>
<td>2014-02-07</td>
</tr>
<tr>
<td>G</td>
<td>Technical product manager - Modularization</td>
<td>2014-02-11</td>
</tr>
<tr>
<td>H</td>
<td>Managing director - Vehicle related services</td>
<td>2014-02-11</td>
</tr>
<tr>
<td>I</td>
<td>Technical manager - Systems architecture</td>
<td>2014-02-13</td>
</tr>
<tr>
<td>J</td>
<td>Head of service support solutions</td>
<td>2014-02-19</td>
</tr>
<tr>
<td>K</td>
<td>Market analyst</td>
<td>2014-02-20</td>
</tr>
<tr>
<td>L</td>
<td>Manager - Service products powertrain</td>
<td>2014-02-25</td>
</tr>
<tr>
<td>M</td>
<td>Product support manager - Overseas markets</td>
<td>2014-02-28</td>
</tr>
</tbody>
</table>

To introduce the interviewees to the study a short description of the task was sent in advance. The interviews were approximately one hour long, recorded and thereafter summarized and sent to the interviewees for confirmation.

2.2.3 Formulation of hypotheses

With the result from the internal search as a base, hypotheses were formulated. According to Patel & Davidson (2003), a hypothesis shall be simple, have a wide range and not only refer to special cases. The hypotheses were consequently formulated in a way that covered general phenomena, aiming at answering research question RQ1 and RQ2. The hypotheses were divided into three areas: the business, the vehicle and the driver. These areas derived from the findings of the internal mapping regarding the most prominent aspects relating to the use of a long-haulage truck.

2.2.4 External mapping

A hypothesis should be tested through an empirical examination, which results in either a verification or a falsification of the hypothesis (Patel & Davidson, 2003). With this as a base, the hypotheses were tested through an external mapping including ten interviews. The interviews were conducted in a qualitative way, which consequently, as in the internal search, left room for the interviewees to answer the questions with their own words. The interview questions were divided into the three
areas: the business, the vehicle and the driver, all aiming at answering the hypotheses. The interview questions used for the external interviews are presented in Appendix B.

The majority of the interviewees were distributors of used long-haulage trucks. These interviewees hold extensive and structural knowledge regarding the second hand market, which has been compiled through broad contact with several second hand truck owners. The combined knowledge of these interviewees provided a wider picture of the life of the second hand long-haulage truck. The interviews were further complemented by an interview with an expert within the transportation area. Some of the interviewees were also customers that have acquired a used long-haulage truck. These interviewees provided insight, at an individual level, in a second hand owner business, the way the vehicle is used and the role of the driver. The professional roles of the external interviewees are presented in Table 2.

Table 2. Professional work titles of the external interviewees

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Professional work title</th>
<th>Interview date</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Head of service market</td>
<td>2014-03-03</td>
</tr>
<tr>
<td>O</td>
<td>Service deputy manager</td>
<td>2014-03-06</td>
</tr>
<tr>
<td>P</td>
<td>Head of transport policy for The Swedish Transport Association</td>
<td>2014-03-07</td>
</tr>
<tr>
<td>Q</td>
<td>Service manager</td>
<td>2014-03-19</td>
</tr>
<tr>
<td>R</td>
<td>Transport business owner</td>
<td>2014-03-19</td>
</tr>
<tr>
<td>S</td>
<td>Transport business owner</td>
<td>2014-03-26</td>
</tr>
<tr>
<td>T</td>
<td>Salesperson - used vehicles</td>
<td>2014-03-27</td>
</tr>
<tr>
<td>U</td>
<td>Salesperson - used vehicles</td>
<td>2014-04-01</td>
</tr>
<tr>
<td>V</td>
<td>Salesperson - used vehicles</td>
<td>2014-04-02</td>
</tr>
<tr>
<td>W</td>
<td>Sector Manager</td>
<td>2014-04-02</td>
</tr>
</tbody>
</table>
2.3 Development of service areas

Figure 3 illustrates the process for the development of the study’s suggested services. The process included three steps: Idea generation of service areas, Generation of service flow categories and Workshops with Scania employees. The three steps in the development process are further described in detail in the chapters below.

2.3.1 Idea generation of service areas

With primary input from the findings of the empirical study, the idea generation aimed at generating the most promising service areas targeting the users during the truck’s lifecycle. Based on Edvardsson’s, et al. (2000) description of how brainstorming is a technique suitable for service idea generation, this step was conducted through brainstorming performed by the study’s authors. Brainstorming is a method used for generating ideas, in which the participants uncritically produce suggestions that are subsequently evaluated. With this in mind, the brainstorming was carried out in iterations, in which each iteration generated a large amount of ideas. The suggestions that were considered to have the highest potential were further developed in the next iteration. The iterations ended when the generated service areas had targeted the empirical study’s identified needs, challenges and requirements.

2.3.2 Generation of service flow categories

In order to cover a wide range of services and create a clear flow of the services within each identified area, service flow categories were created. Each service area was divided into three separate categories, such as Prepare, Execute and Finish. The purpose of this categorization was further to have a clear starting point for development of the services and to be used as a tool for facilitating creativity.

Similar to the first step, Idea generation of service areas, the generation of service flow categories was carried out in several iterations. The final version of the developed service flow categories were further used as an inspiration during the whole service development process.

2.3.3 Workshops

According to Stickdorn & Schneider (2011), using different techniques for facilitating idea generation is a good foundation for inspiring brainstorming activities and creating an appropriate work structure. These approaches can be helpful in providing creating creativity in work sessions and give
the attendees a direction for discussions. A prerequisite in achieving an inspired work group and building a dynamic work space is the use of visual materials. (Stickdorn & Schneider, 2011)

The principles described by Stickdorn & Schneider (2011) were used as a base while carrying out two workshops with employees at Scania within the department of connected services – crossfunctional coordination. The workshop attendees were chosen based on their extensive experience within the area of service development and specifically within development of telematic based service offerings.

Prior to the workshops, preparatory material was sent out to the attendees. The material included the identified service areas as well as their associated service flow categories. In order to ensure that the meaning of the different categories was properly communicated to the workshop attendees, a situational example was included per category. The situational examples illustrated a typical situation in an everyday setting, in order to facilitate a quick understanding of the provided categories. The material sent out to the workshop attendees prior to the workshops can be found in Appendix C.

The workshops started out with a short introduction of the purpose and the arrangement of the workshops. The identified service areas were divided up between the two workshops, in order to promote deeper discussions and to enable the attendees to focus on the service area in question. In order to convey the characteristics of the user groups identified in the internal and external mapping to the workshop attendees, images were presented of typical attributes of businesses within the different use phases. This material was complemented by additional inspirational images, visualizing e.g. different environments, symbols, products and services that were in no way connected to the area. The main purpose of using these types of images was to trigger creativity and to generate unique ideas through thinking outside the box. Every attendee was given post-its to write down their individual ideas for every service flow category. This was followed by group discussions, generating additional ideas for service offerings.

2.4 Development of a lifecycle model

With input from the internal and external mapping, a lifecycle model of the long-haulage truck was generated. The main purpose of the lifecycle model was to illustrate characteristics of the use in the varying phases of the truck’s life. The development was carried out in an iterative way, meaning that the model repeatedly was improved, reviewed and further developed with the information that continually was received from the mappings’ interviews.

2.5 Personas

In order to ensure that the picture of the different interest groups on the market were conveyed as accurately and vividly as possible, the method of personas was chosen. Using personas is a method common in service design for conveying characteristics of a particular group through fictional descriptions (Stickdorn & Schneider, 2011).

The use of personas can provide a design team with a more holistic view of the needs and requirements of the various user groups within the target market. Despite the often fictional description of the characters visualized in personas, their interests and drive might still represent...
feelings of real people based on the material gained from a project’s research stage. (Stickdorn & Schneider, 2011)

According to Guo, et al. (2011), personas should be based on a number of different components in order to provide a good base for development of services. Creating a personas based on aspects such as background, motivations, mindset, objectives, needs and wants provide a valuable understanding of potential users that can be used throughout the entire design process (Guo, et al., 2011).

Four different personas were developed on the basis of the important factors described by Guo, et al. (2011). The most prominent findings of the internal and external mapping related to the identified needs and wants of the identified target groups, as well as the lifecycle model, were used as a base for creating the personas. The personas were only used as a source of inspiration and to promote creativity in the development process of the services.

2.6 Literature study

In order to find necessary information on appropriate methods for the service development process and to enable performing a general analysis of the study’s result, a literature study was carried out. By using online databases as well as visiting the libraries of Linköping University (LiU) and the Royal Institute of Technology (KTH), books and research articles were collected. The purpose of the literature study was to determine a suitable methodology as well as building a theoretical framework, including theoretical studies related to the area of services and a product’s lifecycle. To create a holistic view of services, the literature study was conducted through study of several research areas, all bringing up important aspects when analyzing the field of services. Combining the theories, an understanding of lifecycles, service development, how value is created and how companies actively should work with service offerings was generated. In addition, theories to support and construct the study’s research framework were obtained. The search terms were during the literature study frequently combined with additional search terms to limit the search to more subject-specific results. The used search terms during the literature study are presented in Appendix D.
3 The OEM Scania and characteristics of the transport industry

This chapter includes a short presentation of the company Scania as well as characteristics of the long-haulage transport operation and driver regulations, a description of the most common types of long-haulage trucks as well as a presentation of Scania’s current service offerings.

3.1 The company Scania

The company Scania is one of the leading manufacturers of long-haulage trucks, buses as well as industrial and marine engines. Scania is a global company, with 38 600 employees operating in approximately 100 countries. (Scania AB, 2013)

Scania’s modular product system focuses on providing a limited number of core components that facilitate a high degree of customization for the varying needs of the customer’s businesses. The vision of the company is to be the industry leader by delivering value to their customers, stakeholders and actors. In order to achieve this, Scania focuses on having a deep knowledge of the customer’s businesses and demands. This knowledge of the customer’s businesses is considered a valuable source of information by Scania in order to continuously improve the quality of the provided products and services. (Scania AB, 2013)

Scania today offers many different services and service packages that are based on the telematics technology. These various services target management of transport operations as well as driver training and workshop services.

3.2 The transport operation

The long-haulage segment is characterized by long distance transports and the cargo is most often picked up at one site and delivered directly to the planned end destination. There are generally few starts and stops during the transport operation, on average less than 10 stops per 100 km. (Eriksson, 2012)

The transport operation is either a single driver operation, where the vehicle is taken off duty after the drivers shift is completed, or multiple shifts where the drivers replace one another after a day’s work. Either the second driver is on-board, prepared to take over, or arrives at the site to start his/her shift. In one-shift driving operations, the driver often sleeps in the cab. (Eriksson, 2012)

3.2.1 The digital tachograph and driver regulations

Given the long transport routes, the driver needs to take regular breaks to rest. Regulations regarding driving hours vary significantly between different regions. In Europe, the allowed drive time and speed is strictly regulated by law and is monitored by a digital tachograph. (Eriksson, 2012)

Since May 1st 2006, all newly manufactured buses and heavy trucks operating within the EU are required to be equipped with a digital tachograph (Transportstyrelsen, 2012). The use of the tachograph registers the required data digitally in a truck unit as well as on a driver card (Arbetsmiljöverket, 2008). Every driver of a vehicle equipped with a digital tachograph and that is operating in an area where it is required must have a driver card to register their individual activities throughout the work day (Arbetsmiljöverket, 2008).
The purpose of the regulations regarding driving and resting times is to ensure a sustainable competitiveness between the actors in the haulage industry, provide a good working situation for the drivers and to contribute to improving road safety. The maximum allowed driving time before taking a break to rest is 4.5 hours. At this point, the driver is obligated to stop and rest for at least 45 minutes before starting to drive again. After the resting period, the driver can start another driving period of maximum 4.5 hours, creating a daily driving time limit of 9 hours. The weekly driving time is further regulated to a maximum of 56 hours. (Arbetsmiljöverket, 2008)

3.3 Different types of long-haulage vehicles

Long-haulage vehicles can be divided into different categories based on the differences in bodywork and goods handling. The most common are “tank and bulk”, “container and swap body” “flatbed and platform” and “box and curtain” (Eriksson, 2012). These different types are described below.

Tank and bulk

A tank and bulk vehicle is a tractor or rigid truck with either a silo or a tank unit. Commonly transported items are either liquids, including food, oil products or chemicals and solids such as powders or granulates.

Container and swap body

In this category, the vehicle is either a rigid or tractor truck with a swap body or a container. The goods are packaged in pallets or cages. The swap body may be temperature cold, which includes extra equipment such as a refrigerator or a cooling system. The truck can also be equipped for transporting dangerous goods.

Flatbed and platform

In this category, the vehicle is a rigid or tractor truck that typically transports goods such as concrete boards, plans, steel profiles and major one piece goods such as boats, construction materials or machines. The truck is often equipped with a crane.
Box and curtain

The truck is either rigid or a tractor transporting industrial or consumer goods, which are being packaged in pallets. The goods are often low-density goods, which implies that the truck is adapted for this purpose, for example through low chassis height. The vehicles that are carrying a box are more secure than the ones with a curtain and may also be temperature controlled. Curtains on the other hand, are more flexible when it comes to loading, which also makes them more efficient.

3.4 Scania’s current service offerings

This chapter includes a selection of Scania’s current service offerings, both telematic-based service offerings and general services.

3.4.1 Scania Fleet management

Scania’s fleet management services aim at facilitating effective and efficient transport management. The fleet management service is divided into three separate service offerings; “Monitoring”, “Analysis” and “Control”, targeting different areas for improving the customer’s business operations. The different functions related to the service offerings are accessible through the online Fleet Management Portal and some of the service functions can also be accessed through the Fleet Management app. (Scania AB, 2014 A)

Monitoring

The “Monitoring” service offering gives the customer the opportunity to get an overview of their fleet by receiving a weekly report on their fleet operations. It provides access to compiled data for all vehicles in various categories such as “heavy breaking”, “speeding” and “idling”. For every category, trend arrows in green or red indicate the current situation in relation to the last report. The combined data provides a general measurement of fuel consumption and level of carbon dioxide emissions. Furthermore, the service provides access to a service planning tool through the Scania Fleet Management Portal. (Scania AB, 2014 A)

Analysis

The “Analysis” service offering combines the driver-related and vehicle-related aspects into one service offering aiming at giving the customers a deeper understanding and a more detailed picture of their vehicle fleet. This service enables the customer to sort, filter and generate reports for analysis. Deviation reports, for example, give the customer an insight into important details that impact the daily operations. The user can choose the time period of interest and get direct feedback on driver- and vehicle-related results for the chosen period. The “Analysis” service further includes a service planning tool to facilitate keeping track of planned maintenance. (Scania AB, 2014 A)

Control

The “Control” service offering gives access to all reports in the service offering “Monitoring” and to all functions and tools of the service offering “Analysis”. In addition, this service offers the possibility...
to see all vehicles in real-time through the map tool, providing operational details on the vehicles in the fleet. This service offering aims at improving the customer’s transport process through the provided operational data in combination with the vehicle tracking option. (Scania AB, 2014 A)

3.4.2 Scania driver training
Scania offers driver training aiming at helping transport businesses to reach goals associated with environmentally sustainable driving, lowering costs and providing driver training for professional competence. (Scania AB, 2014 B)

Scania efficient driving
Driver education that maps out the driving style and driving skills in order to use this information to facilitate safer driving as well as lowering the cost of maintenance and fuel consumption. This course gives an understanding of the different factors that affect safety and fuel consumption and knowledge about how e.g. the tachograph can be used for efficient driving. (Scania AB, 2014 C)

Coaching
The Scania driver coaching service entails personal follow-up of drivers in order to assure a long-lasting driving approach that improves fuel efficiency and in turn lowers the environmental impact. The vehicle data obtained in the Fleet Management service offering is used as a base for the driver coaching. A Scania Driver Training Coach calls the driver on a monthly basis to go over the measured results and in turn gives driving improvement suggestions. (Scania AB, 2014 D)

3.4.3 Scania Tachograph services
Since May 2006, all commercial vehicles must have a digital tachograph installed that measures driving time and speed. The focus of the Scania tachograph services is to help the customer manage the operations associated with regulations related to speed and driving time. The tachograph services facilitate easy copying of driver and vehicle data, and activity reports can be accessed through the Scania tachograph portal. The calendar function gives information on belated copying, planned copying and copies that have already been carried out. Furthermore, the tachograph services also give an overview of the regulation violations that have been made per driver over the last few months. (Scania AB, 2014 E)

3.4.4 Scania Workshop services
Scania has 1500 workshops spread across different countries, offering various workshop services. The service offerings aim at optimizing the accessibility of the trucks through giving suggestions on preventative maintenance, appropriate maintenance intervals as well as the right parts. These various service offerings focus on providing the customer with the prerequisites to avoid unexpected downtime and costly technical malfunction. (Scania AB, 2014 F)

3.4.5 Scania Ecolution
Ecolution is a comprehensive offering that includes Scania products and services with the purpose to reduce the customer’s fuel consumption. The offering includes determining a, for the specific customer, tailored fuel consumption which the products and services aims at targeting. Ecolution embraces three areas:
• An optimized vehicle specification
• The services Scania efficient driving and Coaching
• Truck maintenance mainly focusing on ensuring the intended fuel consumption

In addition, a monthly report describing the vehicle’s fuel consumption in relation to the set target is sent to the customer. (Scania AB, 2014 G)

3.4.6 Scania’s Rental services

Scania offers the customers rental of long-haulage trucks, refrigerated trucks and construction trucks. The rental service provides the customer with a solution at a sudden vehicle need or at peaks in the customer’s transportation assignments. In addition, by renting a Scania truck the customer is spared substantial investments. (Scania AB, 2014 H)

3.4.7 Scania’s Financial services

Scania’s financial services offer the customers financial solutions provided during the truck’s lifecycle. By tailored offerings the customer can receive help with financing for example costs for vehicle maintenance, get monetary assistance in cases of purchasing vehicles or support with insurance coverage. (Scania AB, 2014 I)
4 Theoretical framework

This chapter provides theory targeting the areas of service development that are relevant to this thesis. Some of the theoretical areas included are product life-cycle models, incentives to provide services, value creation and organizing for services.

4.1 Existing product lifecycle models

Several authors have developed models, as well as theories, which aim at explaining the lifecycle of a product. The product lifecycle of Levitt (1965) is one of these models, which also has served as a ground for other authors. Levitt (1965) divides the lifecycle into four stages; the market development stage, the growth stage, the maturity stage and finally, the decline stage, see Figure 4. Furthermore, the author argues for time and sales volume as the two parameters that characterize the life cycle. Below Levitt’s (1965) stages are described.

Stage I: In the initial stage, the market development, a new product is launched. The product’s entry on the market does not respond to a proven demand and most often it is not fully technically tested. In this stage, the sales volume is low without a rapid growth and a need for creating a demand for the product exist.

Stage II: The second stage, market growth, is characterized by a increase in demand and serves as a “takeoff stage”.

Stage III: In the market maturity stage, the demands are flattening off and an increased competitive environment creates emphasis on differentiation. Services and deals related to the product are considered as one of the most effective way to achieve competitive advantage.

Stage IV: In the last stage, the market decline, the product starts to lose the attention of the customer and sales begin to decline.

Figure 4. The product lifecycle (adapted from Levitt (1965))
Hu & Bidanda (2009) argue for two types of life cycles; an open-loop logistics system, see Figure 5 or a closed-loop logistics system, see Figure 6.

Figure 5. Open-loop logistics system (Hu & Bidanda, 2009)

According to Hu & Bidanda (2009), an open-loop logistics system is a sequential chain. It starts with extraction of raw material, continuing with design and manufacturing of the product and thereafter proceeds to a distributor that distributes the product to areas of commercial, personal or service use. Finally, in the last step in the authors’ open-loop system, the product is scrapped after being used.

The authors further describe that the product goes through the same stages in a closed-loop system as within an open-loop system, with the exception of instead of being scrapped, the product is returned to the distributor. The distributor might once again distribute the product to several areas of use. Alternatively, the product is remanufactured or refurbished, with the first alternative resulting in a return to the distributor and the second resulting in disposal. Lastly, according to Hu & Bidanda (2009), in case of disposal the product is either recycled or turned into landfill.

Figure 6. Closed-loop logistics system (Hu & Bidanda, 2009)

With inspiration from Kiritsis, et al. (2003), Cao & Folan (2012) have created a life cycle model. This lifecycle model, similar to above mentioned models, includes the material flows during the product’s life. However, the authors add information flows as an enlarged way of describing the product life cycle, see Figure 7 below.
In the model of Cao & Folan (2012), the life cycle is divided into three phases; the beginning-of-life (BOL) phase, the middle-of-life (MOL) phase and the end-of-life (EOL) phase. In the BOL-phase the physical product is designed and manufactured. Furthermore, the BOL-phase passes forward material, the product, and information to the MOL-phase. However, the authors stress that the phase also receives information flows from both the MOL- and the EOL- phase that serves as feedback when it comes to aspects such as product usage or disposal, which in turn will enhance the quality of future designs and manufacturing processes. Cao & Folan (2012) further define the MOL-phase as the time where the product is bought and used by the customer. This phase includes maintenance and service of the product, which in turn include for example spare part management, repair and training. Regarding the different flows, the product is passed forward to the EOL-phase and information is consequently sent to BOL. In the last phase, the EOL-phase, the customer disposes the product while material and components are returned to the BOL and MOL. Information regarding maintenance is sent to the MOL and information regarding manufacturing and design is sent to BOL. Thus, this product life cycle model becomes a closed loop with continuous enhancements (Cao & Folan, 2012).

4.2 The importance of providing services

Traditionally, manufacturing companies have focused on developing, producing and delivering tangible products to their customers (Tan, et al., 2010). Many manufacturing companies have a deep engineering tradition and identity, focusing mainly on producing high quality products (Kowalkowski & Kindström, 2012). This is, however, not enough to respond to the market demands and maintain a strong market position (Kowalkowski & Kindström, 2012).

In order to keep up with today’s rapidly changing and competitive market conditions, many manufacturing companies have focused on combining innovate, customer-focused products with services (Gebauer, et al., 2011). This global competition and an increased demand for companies
taking responsibility for the product throughout its whole life-cycle are factors that have influenced many businesses to change their strategy (Tan, et al., 2010).

Services are especially important for companies operating on a cyclic market, where the product sales vary significantly depending on the economic cycles. Services, on the other hand, are often exemplified as less sensitive to economic cycles. Customers often avoid large investments in bad economic times but are, on the contrary, more prone to purchasing services. Despite of the existing market, there is still a demand for product maintenance and in turn service hours for the providing company. Furthermore, many customers choose to upgrade and maintain their current product, which often leads to increased service sales (Kowalkowski & Kindström, 2012).

Working in line with a service strategy is an important prerequisite for companies to distinguish themselves from competitors (Mathieu, 2001). Simply offering traditional services such as maintenance and product guarantees are no longer enough; companies must respond to the high customer expectations and provide services that satisfy these needs (Mathieu, 2001). Despite that many companies have realized the importance of providing services, many have difficulties in successfully implementing and maintaining a successful service strategy (Kowalkowski & Kindström, 2012). This entails that companies, despite approaches of providing customer value through service offerings, do not succeed in making profit and increasing service sales (Kowalkowski & Kindström, 2012). This is by Kowalkowski & Kindström (2012) called the service paradox, where companies fail to implement a transition from a product-orientation to a service-orientation. The authors further state that failing in increasing profitability through a transition is often related to underestimating the complexity and the resources and time needed to shifting the focus on providing services.

4.3 Value creation

This chapter includes important aspects related to providing customer value and loyalty as well as the role of technology in service offerings.

4.3.1 Creating customer loyalty

A service transition can lead to a company’s total offering having a higher level of uniqueness and being more difficult for competitors to imitate (Fang, et al., 2008). Offering services provides a higher degree of value to a company’s customers and in turn customer loyalty (Fang, et al., 2008). Focusing on aspects related to customer loyalty does not only entail mapping out customer behavior, but is also related to how customers perceive the company and their willingness to recommend the product or service to others (Martínez Garcia & Martínez Caro, 2009). Salvendy & Karwowski (2010) further state that the added customer value related to offering integrated product and service offerings creates an increased willingness to pay for the provided offerings. A customer’s buying behavior is to a large extent value-based, entailing the customer’s overall impression of the use as well as what is received and given (Martínez Garcia & Martínez Caro, 2009). This indicates that driving forces for loyalty are strongly related to driving forces for perceived value (Martínez Garcia & Martínez Caro, 2009).

According to Barry & Terry (2008), buyers of services are more prone to see the value in having a long-term relationship than buyers of tangible goods. The perceived value mainly relates to the intense interaction between the service providing company and its customers in combination with service support, which contributes to the creation of long-term relationships (Antioco, et al., 2008).
Focusing on value-creation through personal relationships is according to Barry & Terry (2008) of great importance in the area of industrial services, services that according to Kowalkowski (2008) can be defined as activities aiming at supporting the customer’s processes and thereby creating value. Examples of industrial services are repair, maintenance, performance upgrade, technical support and customer training (Kowalkowski, 2008).

Salvendy & Karwowski (2010) distinguish between two ways of satisfying the customer requirements: through an explicit or an implicit approach. Furthermore, according to the authors, fulfilling explicit requirements is mainly related to satisfying common needs communicated by the customer and implicit requirements refer to the silent needs of the customer that are not communicated to the provider. Salvendy & Karwowski (2010) further state that even though an explicit approach often leads to customer satisfaction, it is not enough for a company to gain competitive advantage and achieve enthusiasm amongst its customers. Lastly, Salvendy & Karwowski (2010), emphasize that by fulfilling both the explicit and implicit requirements, interesting integrated product and service offerings can be created that exceed the customer’s expectations.

Salvendy & Karwowski (2010) further emphasize the importance of that activities included in the development phase are geared towards identifying customer-focused packages that target the whole range of explicit needs, that satisfy the basic implicit needs that the customer takes for granted while at the same time bringing an added value. The added value aims at attracting potential customers and thereby generate an increased willingness to purchase. (Salvendy & Karwowski, 2010)

4.3.2 The role of technology in service offerings

The fact that many companies are shifting their focus towards offering services that aim at supporting the customer’s daily operations is to a large extent possible through the use of information and communication technology (ICT) (Kowalkowski, et al., 2013). Telematics is within the area of ICT, defined as the technology and application area originating from the combination of computer science and digital telecommunication technology (Nationalencyklopedin, 2014). This technology has a huge potential regarding enabling effective closed-loop product feedback, information and tracking whilst it allows product lifecycle information transform in to knowledge (Xu, et al., 2007).

Manufacturing companies’ profound knowledge of their own products and the market conditions provide a good foundation for carrying out service activities (Kowalkowski, 2008). Utilizing advanced and integrated technology is increasingly important in order to meet customer expectations such as speed and 24 h service availability. Furthermore, the acquired customer data through the use of service technologies facilitates the service-providing companies to gain further knowledge (Antioco, et al., 2008) and to in turn promote more value-based interactions with customers (Edvardsson, et al., 2000).

Edvardsson, et al. (2000) further state that the use of technology can improve a customer’s impression of a service by acting as a tool, allowing the customer to access perform service activities without interacting with the service provider. According to Edvardsson, et al. (2000), saving time through the avoidance of face-to-face contact is in some cases even a customer preference.

However, according to Salvendy & Karwowski (2010), it is important for companies to not rely too much on technology in achieving service quality and efficiency. Moreover, the authors stress that
this is especially important in services that are not simply of transactional nature and in turn require a closer relationship with the customer. Salvendy & Karwowski (2010) further state that eliminating the direct face-to-face interaction between service supplier and customer can create significant difficulties in identifying customer problems and receiving direct feedback. Furthermore, the potential negative impression of technology-based services related to aspects of privacy and confidentiality need to be taken into account (Edvardsson, et al., 2000).

4.4 Different levels of service offerings

Mathieu (2001) classifies services into two different categories; a service supporting the product provided by the supplier (SSP) and a service supporting a client’s operations in relation to the supplier’s product (SSC). The first category refers to offerings such as after-sales services and the second category, e.g. customer training related services (Mathieu, 2001). The purpose of SSP is to guarantee the use and access to the provided product and the focus of SSC is to optimize the customer’s operations, actions and strategies connected to the product (Kowalkowski, et al., 2013).

Achieving successful SSC approaches requires the manufacturing company to have a deep knowledge about the customer’s operations (Kowalkowski, et al., 2013). SSC is, unlike SSP, considerably relationship-oriented and puts large emphasis on achieving customized solutions and focusing on the people receiving the services (Antioco, et al., 2008). Traditional SSP such as repair services are often highly standardized and less knowledge-focused while SSC, such as customer operations consulting services, shift the focus towards meeting the customer’s specific needs (Antioco, et al., 2008).

4.4.1 Integrated service offerings

Windahl & Lakemond (2006) emphasize that the increasing importance for manufacturers to deliver value to their customers and manage the advancing market competition has resulted in companies focusing increasingly on combining services and physical products into integrated solution offerings. This type of integrated solution is often referred to as a product service system, which can be described as a combination of tangible products and intangible services, aiming at satisfying specific customer needs (Tukker, 2004). In Tukker’s model, three main categories have been identified; Product-oriented, Use-oriented and Result-oriented, see Figure 8.

![Figure 8. Main and subcategories of PSS (Tukker, 2004)](image-url)
According to the model of Tukker (2004), the product-oriented approach is generally focused on selling tangible products, with services considered as add-ons needed in the use of the product. Examples of services in this category are e.g. maintenance contracts, end-of-life product take-back agreement or consultancy-related services that entail e.g. giving advice on efficient product use. According to Tukker (2004), in the use-oriented category, the actual product is still in the center but the main focus is not on selling the product. The author further describes how the provider in this category owns the product and the user receives access to it and sometimes even shares the product with other users. Product lease, product renting/sharing or product pooling (where the product is used by several customers simultaneously) are by the author exemplified use-oriented services. In the last category, result-oriented services, Tukker (2004) describes how the focus shifts towards accomplishing a result and not on the use of a specific product. Tukker (2004) exemplifies these types of services by mentioning outsourcing, pay per service unit (where the customer buys the output of the product according to use frequency) and functional result (where the service providing company delivers a specific result).

The span of industrial services is also described by Kowalkowski, et al. (2011), categorizing offerings into unbundled or bundled services depending on whether the services are offered in packages or not. Figure 9 represents the authors’ classification model of industrial service offerings.

![Classification of industrial service offerings](image)

Figure 9. Classification of industrial service offerings (Kowalkowski, et al., 2011)

The product-oriented services “repair” and “operations training” and the process-oriented services “retrofit” and “process optimization” are the four unbundled services in the model of Kowalkowski, et al. (2011). Retrofit services represent performance enhancement through replacing or adding on hardware or software components. Process optimization refers to services offering technical expertise such as ICT services, aiming at solving a specific situation related to the customer’s processes. The bundled services include “service level agreement” offerings and rental services. The two SLA offerings in the product-oriented bundled services category represent different stages of service level agreements. The “safety inspection SLA” involves activities such as equipment inspection and testing of functionality while the “high-end preventive maintenance SLA” includes e.g.
preventive maintenance, repair and spare parts for a fixed price per time period. (Kowalkowski, et al., 2011)

The PSS way of viewing the activities and knowledge associated with the use of a product as the source for customer value creation has resulted in many companies adopting a service strategy approach (Tan, et al., 2010). Moving towards a service-oriented approach entails questioning the traditional product development approaches in order to achieve successful development of value-based service offerings (Tan, et al., 2010). The local and central systems are strongly shaped by the requirements of the type of service offering to be developed (Kowalkowski, et al., 2011). Tan, et al. (2010) further state that different types of service-oriented development methods are utilized depending on what types of services a company is aiming at developing, see Figure 10.

Figure 10. The span of service-oriented development methods in relation to different types of services (Tan, et al., 2010)

According to Tan, et al. (2010), above illustrated different development methods span from pure engineering design to pure customer-oriented service design. According to the authors, the design for serviceability approaches aim at assuring that the product is designed to facilitate easy repair and maintenance (R&M) through e.g. modularization and diagnostic systems. Furthermore, according to Tan, et al. (2010), the focus of design for supportability methods are mainly all after-sales activities, supporting maintenance and repair as well as e.g. installation, training, spare parts and consultancy. The authors stress the purpose of design for supportability as to acknowledge support requirements earlier in the design process and utilize the knowledge of field support engineers and managers. Further, Tan, et al. (2010) describe the design for service approaches as being characterized by shifting from offering a service connected to an existing product to designing a service and the product that supports the service. In the last development method, service design, the authors state
that the design approach completely is focused on designing a customer-related activity or process and not on a physical product.

4.5 The importance of a supporting organization

This chapter addresses different aspects related to organizational structures suitable for facilitating service development.

4.5.1 A service business orientation

Becoming a service provider most often requires a change within the internal organization. For manufacturing companies, which previously have had a strong product and manufacturing focus, a shift in orientation is required (Windahl & Lakemond, 2006). The new orientation includes a strong customer centered focus and an adoption of a market orientation (Windahl & Lakemond, 2006). This is supported by Brax (2005), stating that manufacturers that are moving towards becoming service providers, need to re-focus the entire organization’s attention and place an even larger interest in the business process of the customer.

However, according to Antioco, et al. (2008) a reorientation towards becoming a SSC business may be problematic within manufacturing companies, mainly due to the strong foundation in a core product. Antioco, et al. (2008) further describe how the organization can facilitate the wanted shift by re-orientating at an individual employee level through creating a service atmosphere where service-related aspects are appreciated and valued. The authors describe how this could be accomplished by communication that emphasizes service-related achievements and implementation of a service reward strategy, including service-related benefits, a service-related work environment and service-related compensation. According to Edvardsson, et al. (2000), the corporate culture serves as the basis for a successful customer-service culture and the authors further quotes Schneider and Bowen (1995): “The culture employees experience will be the culture customers experience”.

4.5.2 An interdependent network

According to Kowalkowski, et al. (2011), offering services require processes, strategies and structures that are new to multi domestic manufacturing firms. The authors describe a transnational structure as a network where local and central units highly depend on each other, and in relation to services this structure is the best way to achieve local as well as global efficiency and responsiveness. In addition, according to Kowalkowski, et al. (2011), services require, in comparison to products, a more intense relationship between local units and the customers. The authors stress that this further implies that managing services from a central unit may create tension within the corporate network and also reduce trust between the different units. However, the authors also emphasize that making the central organization become a connected center for the service offerings will facilitate knowledge transfer between different units within the network. In short, according to Kowalkowski, et al. (2011), this generates a situation where companies that are offering services need to find a balance between centrally controlled integration and still leave room for the local units to be autonomous. However, a high level of a shared culture, common values and norms within the entire company network is, according to the authors, a prerequisite for a successful transnational structure.

Windahl & Lakemond (2006) stress inter-organizational interaction as a prerequisite for innovation and value creation and state that the ability to manage these relationships increase the chance of
developing successful integrated product and service offerings. The authors also describe how the company’s position in the network and the horizon of the network create implications in relation to managing services, see Figure 11. Windahl & Lakemond (2006) define the horizon of the network as to which extent the company is viewing the boundaries of the network. The company’s position is further described as integrating or as a supplier to an integrating actor, meaning that either the company is responsible for the integration between the actors creating the service, or the company is a supplier to an actor responsible for the integration.

<table>
<thead>
<tr>
<th>Limited Network horizon</th>
<th>Integrating position</th>
<th>Supplier to integrating actor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish dependence on external actors</td>
<td>Involve important actors in the network and develop strong ties to end customer</td>
<td>Do not initiate if integrating party is not strongly committed and has limited network horizon</td>
</tr>
<tr>
<td>Identifying implications of indirect ties to end customers</td>
<td></td>
<td>Identify implications of indirect ties to end customers</td>
</tr>
</tbody>
</table>

Figure 11. Managerial implications related to the firm’s position in the business network and its network horizon (Windahl & Lakemond, 2006)

According to Windahl & Lakemond (2006), an integrated position, in combination with a broad network horizon is the most beneficial position for development of integrated solutions. This combination further favors, according to the authors, monitoring of the network, and in this situation it becomes essential to involve actors and create strong relationships to the customer. Furthermore, an integrating position and a limited view on the network requires, according to Windahl & Lakemond (2006), establishment of dependencies with external actors for delivery and development of services. The authors further stress how not being the integrator in the network complicates development of services. Hence, being a supplier and in addition having a limited network creates according to the authors a situation where development of offerings only is possible if the integrator is devoted and has a broad network horizon. The last situation, including a broad view of the network in combination with being a supplier, creates opportunities for investigating the consequences of not having a close relationship with the customers. This knowledge could be beneficial for companies to get a better understanding of the benefits of being close to the end customer.

4.5.3 Cross-functional collaboration

According to Antioco, et al. (2008), companies must make sure that sales employees related to a certain product, people working within Research and Development and people within the service area share details related to the customers. The authors further emphasize that this will enable companies to combine and customize SSC with products. Antioco, et al. (2008) also state that this cross-functional communication results in higher understanding, awareness and integration at an operational level but might have a marginal influence when it comes to higher management support of services.
Kowalkowski, et al. (2011) and Windahl & Lakemond (2006) are supporting Antioco’s, et al. (2008) reasoning of an integrated way of working. Windahl & Lakemond (2006) also state that cross-functional collaboration is required for creating credibility towards external actors. The authors further stress top management involvement and commitment as a prerequisite for an integrated way of working between the different functions. Kowalkowski, et al. (2011) state that companies that are trying to compete through services need to see the importance of cross-functional collaboration. According to Kowalkowski, et al. (2011) cross-functional collaboration, including closer integration between product and service organizations, enables companies to take advantage of the relationship between the two areas.

4.5.4 Organizing for services

Kowalkowski, et al. (2011) stress a separate organizational structure for services in cases of basic offerings and exemplifies this by mentioning repair services. Other authors, such as Windahl & Lakemond (2006), expand the view and argue that when it comes to organizing for services the internal service organization should be based on two factors; how strong the ties to important external relationships are and the degree of impact the integrated solution has on existing internal activities. When combining these two factors managerial challenges occur, see Figure 12 below.

| Achieve focus on project and maintain strong ties with external actors | Create processes and organizational structures to handle both internal and external dependencies |
| (1) | (2) |
| Secure the match to end customer’s needs | Secure internal commitment and match to end customer’s needs |
| (3) | (4) |

The integrated solution’s impact on existing internal activities

Figure 12. Managerial implications related to the firm’s position in the business network and its network horizon (Windahl & Lakemond, 2006)

When the impact of a service is low on the existing internal activities and the ties to important external actors are high, the authors argue for a separate project disconnected from the rest of the organization (1). According to Windahl & Lakemond (2006), this would enable a venture, focusing on matching internal with external competencies and thereby achieve the best service solution. The authors further describe how it in case of strong relations to external actors and a high effect on the existing organization, becomes important to manage both internal and external dependencies (2). According to Windahl & Lakemond (2006), a separate project is not an option in this situation and instead argue for additional structures, which contributes to integration.

Windahl & Lakemond (2006) further state that meeting the customers’ needs becomes essential if the impact on existing internal activities is low and the ties to external actors are weak (3). The authors mean that by ensuring that the customers’ needs are met reduces the risk of developing
unwanted services, which might be a risk when the service has both low impact on the organization as well as weak ties to important actors. Windahl & Lakemond (2006) propose involving customers in the service development process or creation of stronger relationships with external actors as a way to accomplish this. In the last situation, where ties to important relationships are weak but the impact on existing processes are high (4), it is according to Windahl & Lakemond (2006) also important to meet the customers’ needs. However, the authors also stress the importance of involving internal actors, which for example can be done by creating separated business units which are working with services. However, according to the authors it is essential with interaction between these units, which in turn puts emphasis on intra- and inter-organizational structures that support these processes.

According to Salvendy & Karwowski (2010), when offering services the service often needs to be carried out ad-hoc, meaning at the precise moment when the customer needs or desires it. The authors stress how this puts emphasis on the importance of having the right resources, including experience and skill, at right place at the right time. In addition, according to Salvendy & Karwowski (2010), internal service organizations need to fully integrate three business processes; Planning, Executing and Measuring. The authors describe Planning as prioritizing and selecting between the right service projects, Executing as assigning the right mix of people for achieving high service efficiency and Measuring as reviewing of deliverables and knowledge sharing.
5 Internal mapping of owner characteristics

In this chapter, the most prevalent information and described characteristics of the first, second and third owner of long-haulage trucks acquired from the interviews with Scania employees is presented. The chapter is further concluded by hypotheses derived from these interviews. The sources of the findings presented below are defined with the letters A through M, representing the 13 interviewees of the internal mapping. For full interviews, see Appendix E.

5.1 First owner characteristics

According to all of the interviewees, A - M, the first owner of a long-haulage truck is generally a large haulier business, with many vehicles in the business’ fleet. Furthermore, the same interviewees described how the majority of the long-haulage trucks sold by Scania end up in this type of a professional haulier business. These transport companies are experienced and have their main focus on logistics and efficient transport operations. The interviewees emphasized the fact that the trucks primarily are viewed as a tool in achieving successful, on-time deliveries.

All of the interviewees, A - M, stated that the most important aspects for the first owner of a long-haulage truck are product quality and up-time, transport efficiency and lifecycle cost. The same interviewees further stressed that having modern, well-functioning vehicles with low fuel consumption in the fleet is essential for large, professional haulier businesses. Lastly, as described by all of the interviewees, A - M, achieving delivery precision of the transported goods is crucial.

According to interviewee F, the first owners often operate their vehicles two or three shifts per day, which creates a high demand for up-time. Furthermore, the majority of the interviewee’s, A - M, stated that large transport businesses, due to their high use frequency of the trucks, have no room for vehicle malfunction. Ensuring that the vehicle is available for the intended transport operations is, according to the interviewees, essential.

As explained by interviewee K, the larger haulier businesses are generally not interested in having their own workshops and carrying out R&M work on their own. Interviewee I further expanded this view, stating that these vehicle owners often have service and maintenance contracts with Scania. Additionally, interviewee E described how the bigger the transport companies are, the larger the demand for package solutions supporting the everyday business operations.

According to all of the interviewees, A - M, first owner businesses typically sell their long-haulage trucks after four-five years, some of the largest hauliers even after only three years. Further stated by the interviewees, the reason for selling the vehicle is often related to a trade-off between maintaining the vehicle in good condition while at the same time selling the vehicle while it still has a good second-hand value. At this point, as expressed by interviewees A - M, the vehicle has a higher down-time and is in need for more frequent repairs, which causes operational difficulties in large, logistics focused businesses. Therefore, selling the truck while it still is in relatively good condition is, according to all of the interviewees, considered the most appropriate solution. Interviewees A - C, E, I and M stated that another common reason for selling the vehicle is related to environmental regulations, driving business owners to acquire new vehicles in order to keep emissions as low as possible.
According to interviewee K, even though the large haulier businesses represent the majority of Scania’s sold long-haulage trucks, a small percentage of the truck buyers are small hauliers with often only one vehicle in the business. The interviewee further stated that these truck owners, however, keep the vehicle for a longer time than the large haulier businesses.

5.2 Second owner characteristics

The internal mapping revealed two recurrent and prominent geographical areas that serve as an important aspect when describing a second owner. These areas, and the second owners that operate within these regions, are described in the sections “Second owner in Europe” respectively “Second owner outside of Europe”, see below.

5.2.1 Second owner in Europe

According to all of the interviewees, A - M, second owners of long-haulage trucks are generally found in Europe. Interviewee M stated that these vehicles might have a euro class high enough to match the existing regulations in Europe, making them attractive at the European market. Interviewee A, D, G, J and M described how some trucks are sold to eastern countries such as Russia and the Baltic countries. However, according to interviewee K, the transfer in regions depends on the financial situation within the countries, creating shifts in which countries that import used vehicles. Interviewee K described this phenomenon by stating the following:

“Which country that buys used vehicles varies along with economic cycles. Under many years, the classic case has been to sell used vehicles to Eastern Europe. However, today these countries buy trucks of equal quality as those used in Great Britain, creating a sudden shift in the second hand market.” - Respondent K

According to interviewee D, these trucks that are in good condition and have a potential of generating a high price at the domestic market, are kept within the same country as the first owner operates in.

However, according to interviewee K, the type of business, aspects related to the vehicle and the role of the driver differs within the group of second owners in Europe, making it difficult to identify one particular group of second hand haulier owners. This complex situation was by interviewee K explained by the following words:

“Every market is unique. You cannot generalize and even compare Italy with Spain. Different views on ownership and utilization of the vehicle are just a few mechanisms that affect every market.” - Respondent K

The same interviewee further stated:

“You cannot generalize and identify a certain type of second hand haulier business within Europe. Instead, what second hand owners have in common is the driving conditions and prerequisites that come along with owning a used truck.” - Respondent K
However, the internal interviews still revealed a majority of opinions that pointed out two categories of second hand owners of long-haulage trucks in Europe. These categories are described below.

**Business-related aspects**

According to each of the interviewees, A-M, the first category of second owner businesses is the most prominent and common group of second hand owners. These second hand owners are, as further stated by all of the interviewees, small long-haulage hauliers with one to a few trucks and that lack economical prerequisites for acquiring a new truck. Hence, the main reason for the hauliers to buy a second-hand vehicle is the reduced price that comes with a used truck. According to interviewee K, this reason is also related to the mindset within the businesses, which from a first owner differs in terms of a short-term and less mature view of how to manage businesses and what aspects that are considered important.

Interviewee K stated that the small haulier business is also event driven and has a shorter time horizon regarding planning compared to a first owner. All of the interviewees, A-M, described how this type of second hand owner business uses the truck for transportation operations within the long-haulage area. The fact that the vehicle stays within the same segment area of use as the first owner operates in – long-haulage – is, according to interviewee B, C and M, highly related to the difficulties that occur when a long-haulage tractor is rebuilt. Interviewee M further stated that this implies that the second hand truck is used in a transportation context that is similar to the first owner’s business.

However, declared by all of the interviewees, A-M, the second owner does not see just-in-time transport operations as equally crucial and has lower demands on up-time and utilization frequency of the truck in comparison to first owner businesses.

The interviewees further mentioned that this partly originates from the type of transportation operations that the second hand haulier is conducting, in which these aspects are of less importance and thereby less prioritized. Interviewee D enlarged this view by describing how less emphasis on use frequency and up-time also originates from the structure of the business, where for example one shift is very common, which naturally implies lower utilization of the used truck. Additionally, brought up by interviewee D, the choice to not use the truck around the clock is in some cases related to the low profit margins that two or three shifts would result in.

A few of the interviewees, F and K, mentioned a second category of second hand owners. However, compared to the first category, this category was described as a smaller and less distinctive type of second hand owners. This category consists of two types of businesses, sharing that they do not use the second hand truck as a part of the daily and regular long-haulage core business. The first type of business is, according to interviewee F, hauliers that use the truck as a spare vehicle within long-haulage transportation. Interviewee F explained this as the truck is used when a regular truck is taken out of operation due to e.g. need for R&M. In the second type, described by interviewee K, the truck is used within the same company, but is transferred from long-haulage transport operations within the core business to another field of operation. This implies, according to interviewee K, that the truck is used under less strenuous forms and not as often as when it still was used for core businesses transportations.
Vehicle-related aspects

Interviewee G stated that when the first category of second owner business buys the used truck, they are looking for a truck that is in good enough condition to be able to perform the intended transportations. According to interviewees A - C and E, this implies that the second hand truck owners most often settle with vehicles that are not optimized for the business or is what the owner desires. A majority of the interviewees, A - H, J, K and M, described how this type of owner carries out maintenance and basic repairs in their own workshops, alternatively turn to third parties that perform the repairs. Interviewee F further stated that these owners are thereby also, compared to a first owner, less inclined to sign service agreements with Scania. Interviewee D and E stated that the second hand owners only visit Scania workshops in case of problems that are too complex and hard to resolve on their own. This low visit frequency is, according to these two interviewees, mainly related to cost reasons, meaning that these second hand owners consider the price of visiting a Scania workshop too high in comparison to fixing it themselves or paying a less expensive independent workshop.  

“The amount of trucks that visit Scania’s workshops is very high during the first year of the truck’s life, but with increased age of the truck the number of visits decreases. The owner does not see the value in performing maintenance work or using Scania spare parts on an old truck.” – Respondent J

In addition, described by interviewee D, many of the first category second hand hauliers enjoy working on their trucks and see it as a hobby, serving as a reason for these owners to buy a used truck. On one hand, a used vehicle will most likely break down more frequently than a new one, on the other hand there is a return in costs by fixing the problems within the business and by not turning to a more expensive Scania workshop. However, according to interviewee D, as the trucks become more and more complex and the haulier owners get more skilled in calculating costs, this way of thinking is getting less and less prominent. The interviewee further describes how the fact that this category of second hand long-haulage businesses do not use the truck around the clock also makes it easier to fix problems that arise and still be able to use the truck for transportations during the next day.

As expressed by interviewees A - H, J, K and M, common for both categories is that the hauliers that buy or use a second hand long-haulage vehicle are prepared for decreased up-time and an increased R&M need. According to the same interviewees, this also goes hand in hand with the hauliers not expecting, compared to a first owner, equally high reliability of the truck. Besides this, the interviewees stressed that the second hand long-haulage owners also have higher acceptance regarding break-downs.

Driver-related aspects

Interviewee D described how the first category of drivers within second hand businesses have great influence when it comes to decisions regarding choice of which long-haulage truck to buy. The relationship between the drivers and the business owner is thereby strong. According to the same interviewee, the drivers are also often responsible for their own truck, creating a stronger tie and relationship to the vehicle.
Transition to next owner

Interviewees A - H, J, K and M stated that the second hand long-haulage truck is sold when the vehicle is approximately eight years old. The main reason for selling is according to the interviewees that the vehicle reaches a break-even point between decreased up-time and need for repair, making it more economical to sell the truck and acquire a new one.

5.2.2 Second owner outside of Europe

The interviews with respondents A - C, I - M revealed that the majority of the long-haulage trucks with right-hand drive are exported to countries in e.g. Africa or to countries in eastern Asia, such as Malaysia. According to these interviewees, the trucks are often purchased by vehicle traders from the country of origin and then exported to countries that also have left-hand traffic.

Business-related aspects

According to interviewee I, L and M, some of the transport businesses operating in for example Tanzania or Malaysia are large haulier companies owned by foreign, often European, stakeholders. Interviewee I and L further described how these hauliers often are well-organized and have a large number of trucks operating in various transport operations. However, the level of utilizing used vehicles and focusing on product quality varies significantly between different geographical areas. Interviewee I stated how large haulier businesses in Africa for example value high up-time, which in turn creates a need for higher quality vehicles. This either entails, according to the same interviewee, that these transport businesses mostly purchase new trucks or ensure that their contracted smaller hauliers keep their trucks in good condition. In Malaysia, however, interviewee L stated that the majority of the large haulier companies contract small hauliers, operating used vehicles. Furthermore, interviewee M described how African buyers of used vehicles mostly are smaller businesses with one to a few vehicles.

The main reason for a second owner in this type of an environment to purchase a used vehicle is related to cost. Two of the interviewees that had worked for longer periods of time in Malaysia and Tanzania, I and L, explained that a product lifecycle cost mindset is non-existing and that the initial price of the truck is of primary importance. Vehicle standstill and the time for carrying out repairs is, as stated by interviewee I, L and M, not considered a problem, creating an ad-hoc and short-term focus. Focusing on the economical benefits of e.g. fuel-efficient driving is not a priority. One of the interviewees stated the following about businesses in these contexts:

“They only focus on the initial price of the truck and the cost for repairs and spare parts. They only see actual money and thereby overlook aspects related to earning potential, capital tied-up and factors that influence loss of income.”

- Respondent L

Furthermore, high up-time and delivery precision are, according to interviewee I, L and M, not considered high-priority factors. Keeping transport costs to a minimum through cheap labor and hiring smaller hauliers utilizing used vehicles is generally prioritized higher than efficiency and delivering goods on time. Additionally, as stated by the same interviewees, in these contexts, focusing on logistics is not considered important and transports operations are often carried out ad hoc. The main focus of second owner businesses in these contexts is instead, as described by the
interviewees, fulfilling the basic need, meaning that the vehicle can be used for transports and not focusing on aspects related to convenience, comfort and high-technology features.

**Vehicle-related aspects**

Since the trucks often are exported to these environments that differ considerably from the country it originally has been operating in, the technical demands in turn shift significantly. According to interviewee I, L and M, the basic needs of transport businesses in these contexts create a lower demand for features related to high-technology, convenience or operational comfort; the main priority is that the truck has an acceptable functionality and that it can be used for transports. Interviewee M stated that the low interest for technically advanced functions in combination with that the trucks are not optimized for operating in the new environment, often creates problems related to vehicle malfunction. The interviewee further brought up how the traders that handle the acquisition and export of the used vehicles are often not interested in rebuilding the trucks to better suit the new operational context. This often results in that trucks with the wrong level of euro engine legislation end up in countries using lower quality fuel, which creates technical operational difficulties. In addition, the interviewee mentioned that other common issues are that the truck is not robust enough for the intended transports in the new environment or that it is not optimized for operating on the type of roads.

Interviewee I, L and M stated that R&M work is almost always carried out in-house or at local workshops. This is related to that the Scania workshop services are considered too expensive. Further, according to the same interviewees, standstill is not considered a big issue and the low labor cost is a significant contributing factor to that these vehicle owner carry out repair work on their own. The interviewees explained how there is generally a very short-term focus regarding keeping the vehicle in good condition and vehicle-related issues are taken care of as they appear. Vehicle owners in these settings generally only turn to Scania for repair work in cases of extremely complex vehicle malfunction that cannot be solved by themselves or by local workshop.

One of the interviewees, I, mentioned an example of a truck owner in this context, who had recently purchased a used truck that soon thereafter had serious engine malfunction. Turning to a Scania workshop was seen as a last resort, related to that neither the owner himself nor a local workshop had the necessary knowledge to repair the engine.

“While carrying out the engine repair work at the Scania workshop it was discovered that at least one of the truck’s front brakes was missing. The truck owner, however, was very clear on that these other problems were not to be considered a priority at the time. Generally, you only spend money on the most urgent repairs.” – Respondent I

Furthermore, investing in quality components is rare and pirated copies are instead used to a high extent. The reluctance for investing in quality components and turning to Scania for R&M was explained through an example by one of the interviewees:

“The cost of replacing e.g. an electronics unit is basically equivalent to hiring and paying two to three repair workers for a long period of time. Up-time is generally traded for the potential of saving money on repair work.” – Respondent I
Other interviewees, L and M, further stated that even the people that do realize the long-term benefits of investing in quality spare parts and turning to Scania for R&M might not always have the financial prerequisites to do so.

Interviewee L brought up the phenomena that the vehicles often are rebuilt and it is not uncommon that whole parts of the vehicle, such as the rear end, are removed and replaced through welding on a similar part from another truck manufacturer. Mixing pirated components with original parts as well as mixing in components from other manufacturers leads to the vehicle not functioning optimally and is sometimes even a safety risk. Vibrations and malfunctioning brake systems is therefore not uncommon. The complexity of the systems and how they correlate to one another creates complications when components are simply removed without taking the whole functionality of the truck into consideration.

“\textit{In order to hide vehicle malfunction, traders sometimes tape over warning lights from the inside of the display glass. Some of the buyers have not thoroughly inspected the trucks at the time of purchase and are therefore not aware of the quality and condition the vehicle is in.} “ – Respondent L

Aspects related to safety are, as described by interviewee I, L and M, generally not prioritized highly. The interviewees exemplified this by mentioning that the trucks often are loaded with cargo exceeding the appropriate weight limit, driving at a high speed is very common and the trucks’ speedometers are often even removed. Furthermore, since laws regarding emissions are less strict, components that control emissions are, according to the interviewees, not prioritized and removed as soon as they break down.

\textbf{Driver-related aspects}

Drivers in this type of operational environment have rarely received any formal driver training and are therefore not familiar with how to correctly operate the truck in an optimal and safe way. Interviewee I and M pointed out the fact that many of the local businesses have low standards for the level of needed experience to drive a truck, which in turn leads to inexperienced drivers driving the trucks in a careless manner. One of the interviewees brought up an example of an attempt to make the drivers focus more on driving carefully:

“\textit{In Africa, the roads are generally more bumpy and rough, which often leads to accidents related to careless driving. In order to facilitate more careful driving, some people install a hard driver seat, for example made out of wood.}”

– Respondent C

Furthermore, drivers and also e.g. mechanics operating on the vehicles in this environment are not used to the use of high-technology devices and functions. One of the interviewees gave the following statement:

“\textit{People in these contexts might not be used to the use of electricity and that the push of a button equals a function, such as light. They do not have the whole picture of technology, which entails a completely different mindset.} “

- Respondent I
Furthermore, as stated by interviewee I and M, the labor cost is negligibly low and the worth and role of the driver in the business is generally considered insignificant. Aspects related to the driver’s working situation are not a priority and working hours are not regulated. According to the two interviewees, the low salary and the poor working conditions often lead to a lack of trust and loyalty between the business owner and the drivers. Theft of fuel and vehicle components such as batteries and spare tires was by interviewee I and M exemplified as recurring problem in these contexts.

According to interviewee M, many businesses have resorted to putting locks on vehicle components that are easily accessible and theft-prone in order to protect against theft. Furthermore, interviewee I described the risk of robberies occurring during transport operations, primarily aiming at stealing the transported goods. Some businesses expect their drivers to protect the cargo and the truck overnight during long-haulage transports. Interviewee I stated that the drivers often sleep under the vehicle during longer transport operations in order to protect e.g. the fuel tank and the cargo, creating a very dangerous working situation.

**Transition to next owner**

As expressed by interviewee I, L and M, the trucks stay within the country until end-of-life in these operational contexts. The trucks are used for transports and repaired again and again until there is nothing left and the vehicles are almost literally falling apart.

**5.3 Third owner characteristics**

Third owners of long-haulage trucks are in some cases located, seen from Europe and the location of the second owner, further east in for example the Middle East or further east in Russia. These countries are, according to interviewee D, F, H, J and K, an attractive third hand market due to their considerably less strict emission regulations. However, as in the case of second hand owners, it is not possible to claim that these countries always will buy third hand long-haulage trucks. It is, once again, as explained by interviewee K, dependent on economical mechanisms. An alternative third life for a long-haulage truck is, as mentioned by interviewee A and M, the vehicle being scrapped into parts and then exported from the country that the second owner operates in.

**Business-related aspects**

According to interviewee B, C and J, a third owner acquires a two-timed used long-haulage truck due to, just as the second hand owner, financial prerequisites. The price, that is lower than the price for a new as well as a second hand owned truck, thereby serves as the incentive. Interviewee K described how a third owner business is a smaller and even less mature business than the second owner, meaning for example less consideration regarding time pressure and hence less emphasis on uptime. This implies, according to interviewee F and G, that third owner businesses generally have even more basic needs when it comes to transportation. Interviewee A, D and J emphasized that the vehicle is bought to support the core business, which is not logistics and long-haulage operations, and it is thereby not important that the truck is a long-haulage vehicle. Instead, the important aspect is that it is able to transfer things. The truck is therefore, according to interviewee M, sporadically used and within operations that are far away from the transportations that the truck originally, in the first owner business, has been used for.
Vehicle-related aspects

According to interviewee F, when a third owner buys a second hand truck, the main concern is that the vehicle is functioning for basic transportations. Third owners generally do not pay attention or care about complex technical features. Furthermore, interviewee B and C pointed out how a third owner is more or less willing to accept any unwanted technical, or non existing features, that comes along or is absent on the long-haulage truck. The important thing is that the truck is functioning decently and that it can move from “A to B”.

Several interviewees, F, G, H and M, stated that third owners have an even higher tolerance regarding vehicle malfunction and rarely visit Scania workshops compared to second owners. Instead, third owners generally carry out repairs on their own, alternatively turn to local workshops, using pirated component copies or second hand parts.

Driver-related aspects

The interviews revealed answers with a lot of uncertainty regarding driver-related aspects. The role and profile of the driver within a third owner business was thereby hard to identify.

Transition to next owner

As stated by interviewee K, a third owner uses the truck until the vehicle is being scrapped. This implies that a fourth owner is very rare or too far away in the periphery to be able to identify certain characteristics.

5.4 Hypotheses

With the information received from the interviewed Scania employees as a starting point, hypotheses related to the use of the long-haulage truck in different environments were formed. The hypotheses were divided into three main areas; “Business-related”, Vehicle-related” and “Driver-related”, covering the most important findings of the interviews. In Table 3, the most prevalent information and aspects related to long-haulage businesses are presented in three different hypotheses:

Table 3. Business-related hypotheses

<table>
<thead>
<tr>
<th>Business-related hypotheses</th>
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<tbody>
<tr>
<td>1</td>
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<tr>
<td>2</td>
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<tr>
<td>3</td>
</tr>
</tbody>
</table>

1) With the growing age of a long-haulage truck, it runs a higher risk of breaking down and is in a greater need of more frequent repair. These risks affect the business’ ability to always deliver goods on time. The further away in ownership, less focus is spent on transport operations that require just-in-time delivery.

2) The further away in ownership you get, the lower the demands for a high use frequency of the trucks. These businesses do not require the vehicles to be operated 24 hours a day and possibly just drive the trucks one or two shifts per day.
3) The business operations further away in ownership are less complicated in terms of e.g. coordinating large amounts of transport operations, trucks and employees.

In Table 4 below, three general vehicle-related hypotheses are presented:

### Table 4. Vehicle-related hypotheses

<table>
<thead>
<tr>
<th></th>
<th>Vehicle-related hypotheses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>The further away in ownership, the lower the demand for technically advanced functions</em></td>
</tr>
<tr>
<td>2</td>
<td><em>The further away in ownership, the lower the need for vehicle reliability</em></td>
</tr>
<tr>
<td>3</td>
<td><em>The further away in ownership, the lower the tendency to turn to OEM for repair and maintenance</em></td>
</tr>
</tbody>
</table>

1) Businesses further away in ownership have a decreased need and demand for technically advanced functions. This can be related to aspects concerning the vehicle’s functions in general, but also technology related to the use of the truck.

2) For vehicle owners further away in the product lifecycle it is not as crucial (as for the first owner) for the truck always to be accessible for transport operations. If the truck is in need for repair, it is not always considered a big issue if the transport operation is carried out one or a few days late.

3) The loyalty towards the OEM decreases considerably the further away you get in ownership. Repair and maintenance is most often carried out in-house or at a local workshop and the customer only turns to the OEM in cases of serious technical malfunction.

Table 5 presents the three driver-related hypotheses:

### Table 5. Driver-related hypotheses

<table>
<thead>
<tr>
<th></th>
<th>Driver-related hypotheses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>The further away ownership and from the starting point Europe, the lower the level of loyalty towards the owner and the business</em></td>
</tr>
<tr>
<td>2</td>
<td><em>The further away in ownership and from the starting point Europe, the lower the incentive to use technical devices in the driver environment</em></td>
</tr>
<tr>
<td>3</td>
<td><em>The further away in ownership and from the starting point Europe, the lower the focus on the driver’s working situation and comfort</em></td>
</tr>
</tbody>
</table>

1) The further away the truck has travelled in ownership and geographically from its starting point Europe, the lower the level of commitment to the business and the owner. The drivers focus less on long-term aspects and how they and their actions can contribute to the business.

2) Drivers in businesses further away in the product-lifecycle have less incentives and interest in using technically advanced functions and devices in the driver environment. The lack of interest is related to e.g. not being convinced of the benefits of such devices, or to not being used to operating technical devices.

3) The further away you get in the product lifecycle, less focus is spent on the driver’s working situation and aspects related to driver convenience.
6 External mapping of use characteristics

This chapter summarizes the most important discoveries during the external mapping and its including interviews. The sources of the findings presented below are defined with the letters N through W, representing the ten interviewees of the external mapping. For full interviews see Appendix F.

The external search revealed a high complexity regarding how to distinguish specific categories of businesses that buy used trucks, as well as correlating characteristics. Instead, different use phases of the long-haulage truck, with including characteristics appeared during the external search. Hence, in the following sections, the first, second and third use phase of the long-haulage truck are described. Furthermore, due to that a large amount of the findings in the external mapping confirmed the findings of the internal mapping, the characteristics are not described as detailed as in the previous chapter.

6.1 First use phase characteristics

According to interviewee N, and similar to what the internal search showed, the long-haulage truck is in the first phase used within a big haulier business, with a high number of trucks in the fleet. As described by interviewee P, the businesses in this phase need the truck to operate during the whole day and night, which, according to interviewee Q, relates to small operational margins. Interviewee N and O described the business further by explaining how the business owner also is more interested, compared to later owners, in performing regular maintenance. Despite the need to always keep the vehicles in good condition, this also relates to that the first owner business have a more present lifecycle cost (LCC) mindset, focusing on long-term cost aspects and performing regular R&M.

Several of the interviewees, N, Q, T and U - W, stated that the haulier in the first use phase typically sells the long-haulage truck after approximately five, perhaps six, years. Interviewee O mentioned the point of selling the vehicle as sometimes being even as early as after three years. According to interviewee N, Q, T, V and W, at the five year breaking point, the vehicle does not have high enough up-time and is too old, unreliable and costly to use for the intended logistic transport operations that the haulier is conducting. As described by interviewee Q, the decision of the appropriate time to sell relates to the wish to sell the vehicle while it still has a high value and is still in good operational condition.

6.2 Second use phase characteristics

In the sections below, the characteristics of the second use phase within Europe as well as in areas outside of Europe, are described.

Within Europe

During interviews with interviewee N, O, U and W, it was revealed that mostly the smaller haulier businesses in Europe are the businesses that choose to purchase second hand trucks, just as the findings of the internal search showed. Interviewee Q stated that these businesses generally have higher operational margins, while interviewee O explained how they often are family businesses, where the business owner also operates as a driver, takes care of administrative work and further hires a few additional drivers to help carry out the intended transports.
However, additional forms of businesses that buy or use used long-haulage trucks were also described and stated as just as frequent second use phase businesses as above mentioned smaller haulier. Interviewee P - R, T and W brought up businesses that purchase a used truck and use it as a spare vehicle or transfer the truck from its initial core business to an additional field of operation, which in the internal search was described as a non-distinctive group of second hand owners. In addition, interviewee R and S emphasized that bigger businesses, that have logistics and just-in-time transportations as core business, also buy used trucks in cases of a sudden vehicle need that needs to be fulfilled. However, the above-mentioned varying business characteristics all share the prerequisites that come along with a used long-haulage truck as well as how they affect the way the vehicle is used. The characteristics described in chapter 5.2.1 also apply for the external search.

According to interviewee N - R, V and W, the long-haulage truck is in the second use phase not used as frequently as in the first phase and is also used under milder forms and less frequent transportation operations. One of the interviewees explained the reason behind this transition in type of transportation operations by stating:

“Even if the truck is kept within long-haulage traffic it is not as time-pressed as in its previous life. The truck should of course work, but if you have business arrangements that require just-in-time transportations, then you have new trucks. The used truck is used in a new form of transportations where the vulnerability is not as high and the tempo is totally different.” – Respondent P

One of the interviewees, with experience from buying and using a used truck, complemented this picture by describing how a used long-haulage truck is not suitable in a long-term view and thereby utilized accordingly;

“What you have strict time-restraints you cannot have old trucks that run the risk of breaking down. I bought a used truck as an emergency solution. You do not plan to buy used trucks, in a long term planning you buy new trucks.”
  – Respondent S

According to interviewees N, O, R, S and U - W, when buying a used truck the hauliers settle with what they can get and what more or less corresponds to the haulier’s existing transportation need. Interviewee Q stated that owners of used vehicles are generally prepared for that the truck will not function as well as in its previous use phase. Despite that there are some risks associated with owning a used vehicle, businesses purchasing used trucks are according to interviewees O-Q, T and W, generally not interested in buying service and maintenance deals for the second hand truck. Interviewee O and Q explained how signing R&M contracts with Scania decreases significantly from a first to a second owner business. Interviewee O further stated that it can generally be said that the increased age and mileage of the truck corresponds to a lowered loyalty to turn to Scania for R&M. Instead, as described by interviewees N - P and R - W, the businesses commonly perform smaller repairs and maintenance by themselves, or turn to a cheaper third party workshop. The way the hauliers are viewing the repair and maintenance need also affects the way the truck is used, as one of the interviewee stated:
“When buying a used long-haulage truck, you get a cheaper vehicle but you also need to be prepared for half day of standstill now and then. This naturally causes a lower delivery precision, but you solve it from time to time.” – Respondent P

While some wear and tear according to interviewee O, Q and T is considered acceptable, the used truck still needs to maintain a high level of the reliability. In addition, these interviewees further stated that the increasing technological complexity of the trucks has started to drive customers to turn to Scania in order to keep their vehicles in good condition.

According to a majority of the interviewees, N, O, R, S, U and V, the drivers and owners in the smaller haulier businesses generally have a good relationship and an open dialogue. Despite varying from business to business, interviewee O pointed out that the drivers often have a relatively large impact on decision-making related to their own working environment. Reasons for this are according to interviewee O and U that these smaller businesses want to maintain a secure and close relationship with the drivers as well as keeping these drivers within the business.

The reason for the second owner in Europe to sell the truck is, as stated by interviewee Q, often related to a lack of profitability. The truck is at this point starting to need even more frequent repairs, generating high R&M costs.

**Outside of Europe**

Since only one of the interviewees, interviewee Q, has experience and knowledge about the second use phase in countries outside of Europe, the external search resulted in findings, described below, that solely are based on this person’s expertise.

Just as the internal search showed, the external search revealed that a big amount of businesses that buy used trucks are located in countries in for example Africa or countries such as Malaysia. However, the second hand owners in these countries share the way the second hand truck is used and which aspects that are considered important. The truck’s low price is what is seen as essential and in many cases the truck is rebuilt and reconstructed with parts from other vehicles and brands. Reconstruction complicates for example what kind of information that can be showed in the driver’s panel. The interviewee stated the following:

“In this life, driver education with for example driving indicators in the panel would be very important. However, in a reconstructed vehicle where functions and components have been removed the panel most likely does not work.” – Respondent Q

The main focus in this use phase is that basic needs are fulfilled, meaning that high up-time and just-in-time delivery is not considered a top priority. Technical features are further not viewed as of value as long as the truck is functioning and is able to carry out transport from one place to one other. The second hand truck is very often over-loaded with a weight high above the vehicle’s intended load and it is very seldom taken to Scania’s workshops for both repair and maintenance. Instead, the owners execute repairs on their own; alternatively, non-functioning components are removed or left unfixed.
The drivers in this second use phase are seen as of less value and in many cases they operate the trucks in inappropriate ways.

When the truck is used in the above described environments it is rarely sold to on to a third owner. Instead, the second owner uses the truck until it has reached its end-of-life and is scrapped.

6.3 Third use phase characteristics

At the point where the vehicle has reached a high mileage and no longer considered in good enough operational condition by the standards of the previous owner, it is according to interviewees O and Q sometimes exported to countries farther east or, as mentioned by interviewees N, T, U – W, through vehicle traders to third world countries. Interviewee N, O, Q and T stressed that it is also common to sell the vehicle components as scrap, mainly due to the potential of making a larger profit by selling the individual components than selling the whole truck. A common reason for selling the vehicle is, according to interviewee O, related to that it at this point is too old to live up to the current environmental regulations, which further causes problems when needing to carry out transport orders in strict environmental zones.

Interviewee P, Q, T and U stated that an alternative third owner is typically not a haulier business focusing on transport as a core business. There is no focus on business aspects anymore and it has moved far away from a logistical focus to moving things from A to B. If the truck stays within the same country it has originally been operating in a likely application area is, according to interviewees Q and T, to e.g. transport your own goods. Interviewees N and Q explained how the primary need is that the vehicle works for the intended transports and the business operations and the technical requirements of the truck are therefore generally of a basic nature. The vehicle is, according to interviewee O and Q, at this point in significantly decreased operational condition and is often used for shorter transports, alternatively as a spare truck.

Furthermore, the trucks are in their third use phase often rebuilt, operating under vastly different operational conditions in comparison to the first and second use phase. The use of pirated components is, as stated by interviewee N, O, T and V, common and unless the used truck has serious malfunctions, repair work is carried out in-house or at a cheaper local workshop. In this use phase in the product lifecycle the loyalty towards Scania and turning to the OEM for repair and maintenance is, according to interviewee O, T and V, considerably lower.
7 Use characteristics through the long-haulage truck’s lifecycle

In this section, the identified characteristics of use through the truck’s lifecycle are presented. The results are based on the findings from testing the hypotheses in the external mapping process.

7.1 Results of testing the hypotheses

The hypotheses shared the common assumption “The further away in ownership”. However, when testing the hypotheses in the external mapping, it became apparent that the term “ownership” was not the most appropriate term to use. This relates to that the context where a used long-haulage is used proved to be complex, making it impossible to generalize and distinguish a certain type of owner that buys used vehicles. This is further supported by that the truck can go through two or more different use phases within the same business, by moving from pure logistical transports to being used as a spare truck in for occasional transport orders. Therefore the utilization of the truck that comes along with its increased age was identified as the primary aspect that determines the characteristics of the three areas, Business, Vehicle and Driver. Hence, when verifying or falsifying the hypotheses, “The further away in ownership” was replaced by “The further away in the truck’s lifecycle”, see the bold text in Figure 13 below. By doing so, all of the hypotheses, with the exception of one, were verified by the findings of the external mapping.

### Business-related hypotheses

<table>
<thead>
<tr>
<th></th>
<th>Hypothesis</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The further away in the truck’s lifecycle, the lower the focus on delivery precision</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>The further away in the truck’s lifecycle, the lower the needs of the businesses to have a high use frequency of the used trucks</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>The further away in the truck’s lifecycle, the lower the level of complex business operations</td>
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</table>

### Vehicle-related hypotheses

<table>
<thead>
<tr>
<th></th>
<th>Hypothesis</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td></td>
</tr>
<tr>
<td>2</td>
<td>The further away in the truck’s lifecycle, the lower the need for vehicle reliability</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>The further away in the truck’s lifecycle, the lower the tendency to turn to OEM for repair and maintenance</td>
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</table>

### Driver-related hypotheses

<table>
<thead>
<tr>
<th></th>
<th>Hypothesis</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The further away in the truck’s lifecycle and from the starting point Europe, the lower the level of loyalty towards the owner and the business</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>The further away in the truck’s lifecycle and from the starting point Europe, the lower the incentive to use technical devices in the driver environment</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>The further away in the truck’s lifecycle and from the starting point Europe, the lower the focus on the driver’s working situation and comfort</td>
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[Figure 13. Verification and falsification of the hypotheses]
The only falsified hypothesis was the third of the business-related hypotheses, see Figure 13. This hypothesis assumed that the further away in the lifecycle, the level of complex business operations decreases. However, the findings from the external mapping showed that the trucks in the second use phase in Europe are found in both bigger and smaller haulier businesses. This entails that the vehicle can still be used in a business with a high level of complex business operations. Hence, when describing the characteristics of business-, vehicle- and driver-related aspects, the second use in Europe still includes both smaller and bigger business contexts. With this in mind, the result of this specific hypothesis was divided into two scenarios; a smaller or a bigger business context.

The figures in the chapters 7.2, 7.3 and 7.4 below illustrate and describe the characteristics of the business, the vehicle and the driver respectively related to the use of the used long-haulage truck, spanning over its lifecycle. The characteristics of the first use in Europe are used as a reference point, meaning that the figures are continually compared to a full triangle. The triangles are thereby only used to illustrate an approximation and visualization of how the different parameters within the areas of business-, vehicle- and driver-related aspects respectively depend on one another, based on the findings of the external mapping. Each area is divided into three parameters labeled on the triangle’s axes, varying depending on the area currently in focus. These parameters are based on the results of the testing of above illustrated hypotheses.

The different categories – Second use in Europe, Second and third use outside Europe and Third use in Europe – that are each described with business-, vehicle- and driver-related in mind, originate from the findings of where the used long-haulage truck is typically found geographically. The following descriptions of how the parameters differ in each category are exclusively based on the findings described in chapter 6.

### 7.2 Business-related parameters

Figure 14 illustrates the characteristics of European businesses utilizing used long-haulage trucks in the second use phase.

![Figure 14. The business characteristics of the first use vs. second use in Europe](image-url)
The business characteristics of the second use in Europe differ depending on whether the truck is located in a smaller or in a bigger business context. When the truck is used in a smaller business, illustrated by the green, dotted line in Figure 14, the complexity of the business is generally lower compared to a business that operates the truck in the first phase. This stems from the business having fewer vehicles as well as employees, creating a business that generally has a less complex type of coordination. On the other hand, if the truck is used within a bigger business as e.g. an extra vehicle used for less frequent transport assignments, the high level of business complexity naturally remains the same. Similarly, the focus on delivery precision is still high when the truck is used within the same bigger haulier company. In a smaller company, there is often a slightly decreased emphasis on precise delivery. Focus on high utilization of the used vehicles in the business is in both exemplified cases lower compared to in the first phase. This is mainly related to the truck’s decreased ability to perform high up-time, creating an operational context where the used vehicle is used less frequently.

Figure 15 illustrates the characteristics of businesses in countries further away from Europe, such as Malaysia, utilizing used long-haulage trucks.

Figure 15. The business characteristics of first use in Europe vs. the second and third use outside of Europe

In the second and third use outside Europe, all three parameters significantly decrease compared to a business in the first use phase. This is based on the truck being used in an environment where up-time and just-in-time delivery is of less importance. In addition, the decreased reliability of the truck related to its high age and mileage reduces the possibility to have a business with high focus on these parameters. In this case of use, the truck is often kept within the same business and also operates under similar conditions until its end-of-life, which entails that the third use phase is similar to the second. This creates more or less the same focus on delivery precision and level of business complexity within these two phases. However, the increased age and mileage of the truck naturally decreases the possible frequency of utilization of the truck, see the dotted line in Figure 15 above.
Figure 16 shows the business characteristics of the long-haulage truck’s third use phase in Europe.

![Figure 16](image)

**Figure 16. The business characteristics of the first vs. third use in Europe**

In the third use phase in Europe, the truck is used in a context where transportation is not considered the core business, creating a drastic reduction in all three parameters. Business owners using the truck for e.g. transporting their own goods entails that the truck more or less is used for its ability to move things from A to B, creating a minor focus on logistics and delivery precision. A focus on high utilization of the used vehicle is also decreased, due the truck not conducting pure transportation operations on a daily basis.

### 7.3 Vehicle-related parameters

In Figure 17, the vehicle characteristics of the long-haulage truck in the second use phase in Europe are illustrated.

![Figure 17](image)

**Figure 17. The vehicle characteristics of the first vs. second use in Europe**

In the second use phase within Europe, the vehicle characteristics, similarly to the previously described business characteristics, differ depending on whether the truck is used in a smaller or a bigger business context. However, comparing these two contexts illustrated in Figure 17, the
characteristics related to the vehicle are to a great extent similar. The need for vehicle reliability is in both cases lower in comparison to the first use phase, due to the truck being used less frequently and for transport operations that do not require exact delivery. The tendency to turn to Scania for R&M is further lower both in the smaller and bigger business context. This mainly originates from the truck’s increased age and mileage, viewed as an important aspect in making it not as economically justifiable to visit an OEM workshop as in the first use phase. In addition, the demand for technically advanced functions decreases. The reduction is related to decreased expectations and higher acceptance for lack of advanced features when acquiring a used truck.

Figure 18 further describes the vehicle characteristics in the second and third use phase outside of Europe.

![Figure 18. The vehicle characteristics of the first use in Europe vs. the second and third use outside of Europe](image_url)

In the second and third use phase in areas outside of Europe, the truck is used in a context where visiting Scania workshops for R&M generally is considered highly expensive, compared to turning to a local workshop alternatively fixing the problem within the business. In addition, the most important aspect for users in this use phase is that the truck is functioning on a basic level. This often entails that cases of non-vital components breaking are not considered a priority to repair. Combining these two aspects, the tendency to turn to an OEM workshop for R&M is marginal. Furthermore, since the truck’s condition is seen as good enough when the basic functions are working, the demand for technically advanced functions is generally low. Due to less emphasis on high up-time and just-in-time delivery in comparison to in the first use phase in Europe, the need for vehicle reliability is consequently low. As mentioned above in section 7.2, the truck is kept within the same business until it reaches its end-of-life state. The emphasis on the above mentioned parameters decreases in line with the truck’s age and shift towards the third use phase, illustrated by the dotted blue line in Figure 18.
Figure 19 illustrates the vehicle characteristics in the third use phase in Europe.

Figure 19. The vehicle characteristics of the first vs. third use in Europe

As mentioned in chapter 7.2, the third use in Europe is characterized by the truck being used in a setting where transportation is not the core activity. This implies that all three vehicle-related parameters decrease to a vastly lower level, in particular the tendency to visit the OEM for R&M. As the focus on logistic operations is absent, it becomes of less importance to turn to Scania for regular maintenance. The low use frequency of the truck as well as the type of basic transports it is conducting creates a relatively low need for vehicle reliability. Furthermore, since the truck is sporadically used for moving things from A to B, there is a low demand for technically advanced functions.

7.4 Driver-related parameters

Figure 20 illustrates the driver-related characteristics of the second use in Europe.

Figure 20. The driver characteristics of the first vs. the second use in Europe
In the second use in Europe, the importance of aspects related to the driver’s working situation is in both smaller and bigger businesses, more or less as high as in the first use phase. This is partly based on driver regulations that comprise every haulier in Europe, regardless of size or business orientation, as well as the second hand hauliers focus on attracting and keeping good drivers. This focus on the driver’s working situation, as well as the oft-occurring close relationship between the drivers and the owner, often creates a high level of driver loyalty towards the owner and the business. However, compared to in the first use phase, the incentives to use technically advanced functions/devices in driver environment is lower, more so in smaller than in bigger business contexts. This is partly related to the lowered need for coordinating a large number of vehicles and drivers within the business.

Figure 21 illustrates the driver characteristics in the second and third use phase outside of Europe.

In the second and third use in areas outside of Europe, all three parameters drastically decrease. The driver’s level of loyalty towards the owner and the business is generally low in comparison to first owners in Europe. This is partly based on that the role of the driver generally is seen as of lower importance, which sometimes creates mistrust between the driver and the business owner, in both directions. The mistrust and low level of loyalty is also reflected in the oft-occurring careless driving manner, risking accidents and truck damage, as well as problems related to theft of e.g. fuel or vehicle components. In addition, the driver’s low position contributes to that less emphasis is placed on aspects related to the driver’s working situation. Furthermore, some drivers are not used to using advanced technology in their daily life, which decreases the incentive to use technically advanced functions/devices in the driver environment. All of the above mentioned aspects are considered to be the same for the third use phase, due to that the vehicle stays within the same operational context through the third use phase.
Figure 22 illustrates the driver characteristics of the third use in Europe.

![Image]

Figure 22. The driver characteristics of first vs. the third use in Europe

As mentioned in the previous chapters 7.2 and 7.3, the third use phase in Europe is characterized by the long-haulage truck primarily being used for the basic action of transferring things from one place to another. This influences the driver-related characteristics in terms of a high reduction, compared to the first use phase, of all three parameters. The business is not a transportation company with full-time drivers; the truck is being used from time to time when necessary and viewed as a tool for moving things. This basic nature of the transport operations reduces the incentives to use technically advanced functions as well as focusing on aspects related to the driver’s working situation. The last parameter targeting the loyalty aspect was left inconclusive; see the blue dotted line in Figure 22 above. This is due to that the truck is not being used in a transportation business with full-time drivers, making it unclear how high the level of loyalty towards the owner and the business is.
8 The Lifecycle Model

Summarizing the findings in the internal and external mapping illustrated and described in chapter 5 and 6, two general and prominent parameters that describe the life of the long-haulage truck appeared. Firstly, the core purpose of use, meaning the way the truck is used with its increased age, is one of the parameters. The findings demonstrate a shift in use from a logistic focus to a utilization where the truck’s ability to move things from A to B becomes essential. Furthermore, the technical condition of the truck, meaning the physical state as well as the importance of advanced technology, is the second parameter. The findings show that with the truck’s increased age, the importance of advanced technology is replaced by a focus on basic technology. Additionally, the findings show that a high focus on logistics creates a strong need for a truck with advanced technology, while the ability to move something from A to B implies a truck where basic technology is important. Due to the complexity of distinguishing specific owner groups described in 7.1, the life of the truck is divided into phases characterized by use instead of ownership.

With the above reasoning in mind, characteristics of the truck’s use during its lifetime were compiled into an illustrative lifecycle model. The lifecycle model is presented in Figure 23, followed by a detailed description of the included parameters and use phases.

![Lifecycle Model](image)

**Figure 23. Product lifecycle model of the long-haulage truck**

8.1 The lifecycle model parameters

Based on the information obtained in the internal and external mapping, a logistic focus can be described as an area of use where the truck conducts coordinated and optimized transport operations in the most efficient way and where high up-time and high utilization level of the truck is crucial. Based on the mappings findings, the haulier business in the first use in Europe is an example of a setting with a logistic focus. On the other hand, when the truck is used for moving things from A to B, the vehicle is conducting transports with the intention to simply relocate something from one place to another, without taking above mentioned aspects into consideration. As described in the
internal and external mapping, the third use in Europe exemplifies a situation in which the truck only is used for relocation.

Additionally, based on the internal and external mapping, advanced technology can be described as when the truck is functioning correctly. All technological functions, systems and components are in good condition and intentionally kept this way to ensure a high quality of the truck and thereby be able to perform logistic operations. The mappings description of how first use hauliers very often sign service contracts is an example of a situation where focus on maintaining advanced technology is high. Basic technology is when only the main functions of the truck are functioning. Damaged or missing functions, systems and components are not restored due to focus on only keeping the truck in a condition where it is able to move things from A to B. As the information obtained from the internal and external mapping shows, disregard of repairing damaged components often occur when the truck is located outside Europe and is thereby an example of a setting in which basic technology is of importance.

8.2 The use phases within the lifecycle

The lifecycle of a long-haulage truck can be divided into a number of use phases, in which above mentioned parameters determine the way the truck is utilized. Based on the internal and external mappings, the truck has an age of zero to five years in the first phase. In the following phase, the truck is generally five to eight years old, meaning that the truck enters the third phase at the age of eight years old and is in this phase used until its end of life. The findings also show that the lifecycle of the truck can be divided into two areas of use; Commercial use and Private use. Commercial use is when the truck is used within a business and used for activities contributing to the success of the business. Private use on the other hand is when the truck is used for private purposes, not contributing to a specific business.

Based on the information obtained from the internal and external mapping, the long-haulage truck is in the first use phase found in a big European haulier business with its main focus on logistics. The vehicle is used in a setting where it is conducting efficient transport operations with high up-time while it also maintains a high product quality. Hence, both the level of logistics and advanced technology are high in this phase, see the green line in Figure 23.

Based on the findings, entering the second use phase the truck is, as the upper blue line in Figure 23 represents, used in a European setting where it conducts transportation operations. However, the operations are, compared to in the first phase, not as focused on for example up-time and the level of technology is also considered a little less importance. Hence, logistic and advanced technology still is of importance but with a lower level than in the first phase. When the second use phase transitions in to the third phase the internal and external mapping show that the truck is to be found in a European setting, alternatively the truck is transferred to countries outside Europe, represented in the upper respectively lower red line in Figure 23. When the truck is kept in Europe, transportation is not a part of the business and advanced technology is thereby naturally not seen as equally important as in the previous phase. This creates a drop in the importance of logistics and advanced technology, see the upper red line in Figure 23. Eventually, the focus on logistics and technology becomes less and less essential, and finally the purpose of the truck is only to move from A to B. When the truck is transferred outside of Europe, the use and the importance of technology is the same as in the third use phase outside Europe, further explained below.
The lower blue line in Figure 23 represents the second part of the second use phase; the truck is transferred to countries outside, in e.g. Africa, used in an environment where it transfers goods but with a lower and lower focus on efficiency and technology. Lastly, the truck enters the third use phase, see the lower red line in Figure 23, where the focus on above mentioned parameters becomes even less central. Finally it is only essential that the truck can move and has basic functions. In this phase, the truck is used until its end of life.

8.3 Personas

The chapters below present four different personas related to the first, second and third use phase in the product lifecycle.

8.3.1 First use phase - Benelux Logistics

Benelux Logistics is a big haulier within the long-haulage area, with 80 long-haulage trucks that are driven by 165 employees. The long-haulage business area is very strained and in order to obtain financial profit, the trucks are driven in three shifts.

Benelux Logistics transports goods, in many cases food, within the Benelux countries. To meet the customers’ high demands on quality and precision in delivery, high availability and reliability is very essential. To ensure this, the management of the company always buys new trucks and makes sure to, after depreciation time, sell the trucks that are not delivering high enough up-time.

Due to high fees in cases of delay as well as demanding customers, standstill is not an option. Hence, the company has signed R&M contracts with their truck manufacturer. These contracts facilitate and ensure that the trucks are always in good condition, which in turn reassures the management that the business will run smoothly. To coordinate 80 trucks, the management has decided to invest in a logistics system, which helps both the drivers and the transportation planner to manage the transport operations.

8.3.2 Second use phase - Anderssons Åkeri & Mwanza Transport

In the chapter below, two different business owner scenarios in the second use phase are described.

Andersson åkeri

Anderssons Åkeri is a small haulier business located in the south of Sweden. The business owner, Johan, started the business at the age of 23 after having previously worked as a long-haulage driver for a large logistics company. Currently, after ten years in business, Anderssons Åkeri has five employed drivers. Handling the coordination of transport orders and other administrative tasks are mostly handled by Johan himself and he also operates as a driver if needed.

Due to the size of the business and the amount of transport orders coming in, Anderssons Åkeri’s operations only require one shift transports. For a while, the owner was considering the idea of expanding the business by taking on more transport orders and hiring more employees. However, due to the tough market conditions and the poor profit margins, the risk of a business expansion and in turn operating in two shift transports was not considered feasible or economically justifiable.

Striving to keep the vehicle costs to a minimum, Anderssons Åkeri exclusively purchases used long-haulage trucks. Because of the owner’s interest in trucks he wishes deep down that he had the
financial prerequisites to purchase brand new vehicles. This is, however, not considered an option and since the one-shift operations leave margins for the potential need for repair work between shifts, purchasing used vehicles is considered the best option.

Furthermore, since the owner’s father in law works as a mechanic, the majority of the smaller vehicle malfunctions are repaired by him in Anderssons Åkeri’s own workshop. Because of the owner’s interest in trucks and will to perform some of the repair and maintenance work himself in the future, he makes sure to learn as much as possible from his father in law before he retires in a few years. Signing service contracts with Scania is therefore neither considered important nor economically beneficial. Situations when Johan turns to Scania are generally for repair work in cases of extreme vehicle malfunction or when it is time to trade an older truck in for a newer one in better condition.

Mwanza Transport

Mwanza transport is a haulier business located in Tanzania a few minutes driving distance from the town Mwanza. The business was initially a one truck operations business, where the owner himself started taking on transport operations for a large logistics business. In order to enable taking on more transport orders and in turn increasing the income, the business owner purchased an extra truck two years ago and also hired two drivers for a low salary. Transport operations are carried out ad-hoc and the drivers are expected to always be available when a transport order comes in.

In order to cope with the need for repair work on the used trucks, Mwanza transport has its own basic workshop. The owner recently hired a workshop worker to take care of the most urgent vehicle malfunction. He has no mechanic education but has proven to be able to provide temporary solutions to the most urgent problems, which is considered good enough.

Worrying about truck components getting stolen overnight is a constant concern of the business owner. He has within the last year had to replace the battery on one of the trucks and has, after the spare tires have been stolen on two occasions, chosen not to replace them anymore. In an attempt to prevent theft the business owner has put pad locks and cable ties on removable components, which has helped to some extent.

There is a lack of trust for the drivers, which is mainly related to the vehicles often returning after transport operations in bad condition. A few weeks ago, one of the trucks crashed due to the driver taking a corner too fast, which resulted in expensive and time-consuming repair work and that a large portion of the cargo had been rendered unusable. The low personnel cost for both the drivers and the mechanic fixing the damages has, however created come tolerance for the careless driving manners. He wishes though that he had a way to monitor the location of the trucks and the condition of the cargo.

8.3.3 Third use phase - Circus Copenhagen

The circus managers George and Anna own Circus Copenhagen. Circus Copenhagen is a travelling circus, which puts up shows in cities in Sweden and Denmark. The circus most often stays for five days in each city, performing every night. After these days the circus, including people, several types of animals, props, sound equipment, orchestra and tents is packed together in trucks, moving the circus to the next city. Anna and two of the acrobats, who also have truck driving licenses, drive the
circus from one city to another. Luckily, the next show is very often located in a city nearby the previous one, making the journey less straining for animals, people and equipment.

When George and Anna started the circus they needed to buy some type of vehicles that could move the circus from one city to the next. After some consideration they decided that three trucks would probably be the best solution. They started to look on the Internet for cheap trucks that they could afford. Eventually they found three, ten years old, previous long-haulage trucks matching their economic prerequisites. However, two of the trucks were not functioning properly and were also missing AC, ABS brakes and radio, but George and Anna still considered them to be good enough. They reasoned that the trucks only travel short distances and thereafter mostly stand still. In addition, the circus only performs during late spring and summer, making it unnecessary to buy expensive trucks that only will be used a period of the year.

Due to the trucks standing outside all year round and that the circus has expanded the last two years, they have had some problems with corrosion and heavily packed trucks, resulting in damaged components. However, Anna and George do not see this as a big problem. The trucks are at the moment capable of moving the circus and until they totally break down, Anna and George will not consider buying new trucks.
9 The identified service areas

With the information and insight gained from the internal and external mapping, four service areas were identified; R&M, Transition, Safety & Security and Driver Convenience. These service areas were based on the interviewee’s statements and descriptions of the most prominent needs and wants of truck owners in the later phases of the truck’s lifecycle. Furthermore, the perceived potential of providing value for these customers was a highly important factor. In Figure 24 below, the four service areas are described, in the order of the areas considered to have the most potential to attract owners of used vehicles and provide value-based service offerings.

<table>
<thead>
<tr>
<th>Service Area</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&amp;M</td>
<td>The need and cost for repair work typically rise as the mileage of the truck increases. This area focuses on providing service and maintenance offerings that meet the needs of owners of used trucks.</td>
</tr>
<tr>
<td>Transition</td>
<td>The area of transition aims at offering services that simplify the process of acquiring/selling a used truck as well as giving support at the event of changing the area of business.</td>
</tr>
<tr>
<td>Safety &amp; Security</td>
<td>The problematic situations connected to driver safety and frequent theft of vehicle components in some countries entails a potential opportunity for providing service offerings targeting safety and security.</td>
</tr>
<tr>
<td>Driver Convenience</td>
<td>Considering the often occurring close relationships between the business owners and its employed drivers and the strive to keep the best drivers within the business creates an opportunity to provide services aiming at improving driver convenience and comfort.</td>
</tr>
</tbody>
</table>

Figure 24. The four identified service areas

Due to different operational prerequisites, the service areas illustrated in Figure 24 above apply to different areas of use and owners within the truck’s lifecycle. The service area R&M is focused on satisfying the needs and wants of owners in the second use phase within Europe, illustrated as the top blue line in Figure 25 below. This focus mainly relates to the identified characteristics such as an increased need for repairs while at the same time requiring relatively high vehicle reliability due to the characteristics of the transport operations. In addition, this use phase is also characterized by not wanting to turn to the OEM’s workshops for R&M. This offers an opportunity for Scania to meet the vastly different R&M needs of owners within the second use phase in comparison to owners within the first use phase. This area is not aimed at owners within the second and third use phase outside of Europe or within the third use phase within Europe, primarily due to the identified low demand for R&M related services.

The second area, Transition, focuses on the shift from the first to the second use phase as well as the second to the third use phase within the truck’s lifecycle, illustrated by the grey dots between the
upper green and blue lines in Figure 25. Applying the services to these particular transitions between use phases is primarily related to the business characteristics of regularly selling and purchasing vehicles, as well as an identified potential of providing support in these operations. Reasons for excluding the trucks that are exported directly after the first use phase, illustrated by the lower blue and red lines in Figure 25, is primarily related to that the oft-occurring low demand for technically advanced functions, which the transition services mostly entail, combined with a lack of a long-term economical mindset characterizing these use phases.

The area of Driver Convenience is primarily geared towards owners in the second use phase of the product lifecycle, illustrated by the top blue line in Figure 25. The main reason for focusing the services on this specific use phase is due to the oft-occurring close relationship between the business owner and the employees in the smaller business contexts common in this use phase, hence wanting to keep good drivers within the business. The main reason for not applying the area of driver convenience in the other phases is due to the identified lack of focus on aspects related to the driver’s situation in the remaining use phases.

The fourth area, Safety and Security, aims at targeting the second and third use phase outside of Europe, illustrated in Figure 25 as the lower blue and red lines. This service area targets the most prominent difficulties identified in these operational contexts related to e.g. unsafe driving operations and theft.

Due to the focus of this study to primarily identify service areas targeting the second and third owner in the truck’s lifecycle, the first owner has not been incorporated into the service areas. Furthermore, none of the identified service areas apply to the third owner within Europe, illustrated as the upper red line in Figure 25. The reason for not focusing on identifying services aimed at owners within this use phase is due to the characteristics of only using the truck to transport things from A to B and the lack of interest in services supporting these operations.

![Figure 25. The identified service areas illustrated in the lifecycle model](image-url)
In order to facilitate the offering of a broad spectrum of services targeting a wide range of needs and wants of the customer, the four different service areas were divided into three different service categories separately. In the sections below, the four identified service areas as well as their included service flow categories are described. Due to confidentiality aspects, suggested services are excluded in this report. The excluded services are in the following chapters visualized with dashed lines.

9.1 R&M service offerings

The first service area R&M is divided into the three categories “Indicate”, “Manage” and “Solve”, offering services focusing on facilitating convenience and a potential of long-term financial benefits for the customers in connection to the area of R&M. “Indicate” refers to providing information on the status and condition of the truck. This gives the customer valuable prerequisites for foreseeing vehicle malfunction and thereby planning appropriate repair and maintenance actions. The second category, “Manage”, offers suggestions on suitable measures and guidance for which solutions are appropriate for fixing the indicated repair and maintenance work. The last category, “Solve”, refers to giving the customer more specific guidelines for how the needed repair and maintenance work can be fixed. Figure 26 presents the described categories and their identified services, in this report left out due to confidentiality.

9.2 Transition service offerings

The second service area, Transition, consists of the categories “Prepare”, “Transfer” and “Improve”. The focus of “Prepare” is to provide the customer with the necessary information on factors indicating the appropriate time to acquire/sell a used truck. This offers the business owners to receive support in the initiating phase of the transition phase, focusing on their business’ specific needs and prerequisites. The next category, “Transfer” aims at making the transition phase as smooth and convenient as possible for the customer. Lastly, “Improve” focuses on providing measures for maintaining the truck in good condition and creating good prerequisites for improving the second-hand value in preparation of selling it on to the next owner. Figure 27 illustrates the identified service categories and their including services, in this report left out due to confidentiality.
9.3 Safety and Security service offerings

The third area for service offerings, Safety & Security, is divided into the categories “Prevent”, “Handle” and “Reduce”. The purpose of the first category “Prevent” is to offer services aiming at preventing theft, accidents as well as vehicle damage related to an incautious driving style. The second category, “Handle”, focuses on actions related to managing the situation once it has occurred and also to prevent similar situations from happening again. The final category “Reduce” aims at reducing the negative effects of the occurred situation.

Figure 28 presents the identified service categories and their including services, in this report left out due to confidentiality.
9.4 Driver Convenience service offerings

The last of the four service areas, Driver Convenience, consists of the three categories “Prepare”, “Execute” and “Finish”. The focus of services in the “Prepare” category is to support the driver in pre-transport activities. “Execute” focuses on facilitating driver ease and convenience during transport operations. The third category, “Finish”, aims at supporting drivers in post-transport activities related to the completion of their shift. Figure 29 presents the identified service categories and their related services, in this report left out due to confidentiality.

![Diagram of Driver Convenience service offerings]

Figure 29. The identified Driver Convenience services
10 Analysis

This chapter includes an analysis of the lifecycle model, the developed service areas and their potential to provide value to a long-haulage truck OEM’s customers. The chapter is further concluded with an analysis of a potentially appropriate work structure for the further development, as well as a categorization of the identified service areas.

10.1 The lifecycle model

Several authors have previously developed and discussed product lifecycle models, which in many cases are based on each other, alternatively expands previous research. Levitt (1965) describes the correlation between time and sales volume and argues for a lifecycle in which the attractiveness of a product type changes during time. However, the lifecycle does exclusively discuss a product type in general and does not discuss the lifecycle of a single product, including activities such as manufacturing or scrapping. Other lifecycles such as Hu & Bidanda’s (2009) open-loop logistics system illustrate steps and material flows that are lacking in Levitt’s (1965) model. However, Hu & Bidanda’s (2009) open-loop logistics system excludes potential iterations in the lifecycle, which the authors’ closed-loop logistics system instead illustrates. The closed-loop logistics system includes iterations in for example use but lacks any further discussion regarding the characteristics of the use iterations. Cao & Folan (2012) extend the view of the closed-loop product lifecycle by adding information flows that continually are transferred backwards in the lifecycle, but the model is still lacking a lifecycle description of a potential reuse of the product.

When studying the long-haulage truck it becomes apparent that iterations in reuse are a comprehensive part of the product’s life. Furthermore, the study’s results show that the characteristics of reuse of the long-haulage truck differ, in some cases significantly. However, it is not only the use that is changing throughout the product’s life. Through for example reconstructions and disregard of R&M the truck itself is often changed. The changes create differences in which aspects that are considered important in a certain reuse, which is illustrated in chapter 7.1.

Combining all of the above mentioned findings, a need for a lifecycle illustrating the reuse of the truck is emerging and identified. However, when summarizing above mentioned theories it becomes clear that existing product lifecycles leave a gap regarding depicting the actual usage of the product, further arguing for a lifecycle model explaining the use and reuse. In addition, Cao & Folan’s (2012) description of how the product’s middle-of-life phase is characterized by spare part management as well as the customer using and repairing the product creates additional thoughts regarding a separate lifecycle explaining the use of the product.

The study’s generated lifecycle model specifically addresses the use and reuse of the long-haulage truck. Consequently, the model contributes to above explained lack of lifecycle models by illustrating the use phase. However, the model and its including parameters only target the long-haulage truck, making it specific and without opportunity to apply the model on products in general. Although the model is not applicable on any product, the lifecycle still gives an indication on that the use of a product is an essential part affecting the entire lifecycle.
10.2 Providing customer value

Tangible products, such as trucks, operate on a cyclic market where the product sales often correspond to the current economic cycles. As emphasized by Kowalkowski & Kindström (2012), services are less sensitive to economical changes on the market and are therefore of great importance to companies operating under these conditions. In order to ensure a continuous and stable competitiveness and reducing the risks associated with a cyclic market, developing and maintaining a strong service portfolio can be a beneficial competitive advantage. This corresponds well to Scania’s focus on expanding their development of service offerings by incorporating more services into their portfolio through targeting the second and third owner of long-haulage trucks.

As emphasized by Fang, et al. (2008), a service transition can enable companies to stand out amongst competitors, due to the possibility to through services provide a higher level of uniqueness. Moving towards becoming a service provider is a relatively new phenomena and especially the focus on covering service offerings through the whole product lifecycle. Along with the positive aspect of attracting new customers, it also provides good prerequisites for Scania to build an even stronger brand by including a wider range of customers in their service offerings. The increased value provided to these truck owners in the later phases of the lifecycle will also most likely bring a higher level of returning customers. This aspect is described by Martínez García & Martínez Caro (2009), stating that customer loyalty to a high degree corresponds to the customer’s perceived value of use. This indicates that Scania’s focus on reaching out to later owners in the product lifecycle is a positive transition that most likely will entail a significant competitive advantage.

In order to succeed in covering a larger part of the owners and use phases in a truck’s lifecycle, a deep knowledge of the truck’s different use phases is significant. This study has given an insight in the complexity of a long-haulage truck’s use characteristics and how these shift significantly between different use phases. As stated by Brax (2005), focusing on creating an understanding of the business processes of the customers is essential for manufacturing companies that are gearing towards becoming service providers. This is further supported by Kowalkowski & Kindström (2012), stressing the importance of using the customer’s value of use as a starting point for development of service offerings. Having a deep customer orientation and insight in the customer’s operations is especially important for Scania to maintain in their focus on offering services that attract and provide value to haulier business owners in the later phases of the truck’s lifecycle.

As described by Xu, et al. (2007), the access to ICT, such as telematics, provides the possibility to acquire lifecycle information and turn it into valuable knowledge. This offers a great opportunity for Scania to create an even deeper understanding of their customers and thereby enable development of value-creating service offerings, responding to the varying needs and wants of the customers through the truck’s lifecycle. Furthermore, the telematics technology offers an opportunity to identify silent needs not communicated by the customer. These silent needs are by Salvendy & Karwowski (2010) described as implicit needs, and are essential to incorporate in order to develop offerings that exceed the customer’s expectations. Using the telematics technology to correspond to these needs will most likely get increasingly important to provide customer value, promote enthusiasm and in turn improve customer loyalty.

Given the complexity of the use characteristics through the truck’s lifecycle, the above mentioned deep customer knowledge needs to be combined with a service mindset permeating Scania’s whole
organization (this aspect is further discussed in chapter 10.4 Promoting a service mindset). As stated by Kowalkowski & Kindström (2012) many companies underestimate the complexity and time needed to carry out mowing towards becoming service providers, thereby risking to end up in a so called service paradox.

In order to further continuously develop and deliver value-creating integrated service offerings and moving towards becoming a service provider, it would be beneficial for Scania to ensure awareness of the complexity and time this transition entails. This is especially important in order to ensure that the developed services correspond to the needs and wants of the customer and thereby provide value, which in turn reduces the risk of landing in the service paradox described by Kowalkowski & Kindström (2012).

10.2.1 R&M service offerings

The area of R&M services is considered to have the largest potential of all identified service areas. This is foremost related to the recurring need for R&M, especially in the later phases of the truck’s lifecycle. Furthermore, the use characteristics are to a high extent related to the growing age of the vehicle, meaning that the increased need for repairs strongly affects what type of operations are possible. These organizational and operational aspects related to the area of R&M were during the empirical study also identified as one of the main priorities of the customer, demonstrating how this area largely affect the customer’s business operations.

As stated by Barry & Terry (2008), buyers of services are more likely to see the value in having a long-term relationship with the service provider in comparison to buyers of goods. This offers a great opportunity for Scania to continuously offer value-based service offerings benefitting the customer’s business. Developing long-term relationships is an important prerequisite for succeeding in delivering customer value and facilitating that customers return to Scania for extending their current service as well as purchasing additional R&M service offerings. This could also lead to that owners in the later phases of the truck’s lifecycle turn to Scania’s workshops for R&M to a higher extent, in turn increasing R&M profits.

Furthermore, the telematics technology enables Scania to deliver value and maintain a close interaction with the customer from a distance through providing R&M support services. As stated by Edvardsson, et al. (2000), offering services that do not involve face-to-face contact and in turn can save the customer time is sometimes even preferred. This is especially valuable to Scania’s customers that operate far away from a Scania workshop or that prefer to carry out the R&M themselves alternatively at a local workshop. Furthermore, the willingness and financial prerequisites to turn to Scania for R&M services was during the empirical study identified as relatively low. However, the need for R&M increases significantly with the mileage of the truck, creating a great opportunity for Scania to offer valuable service solutions. Providing services that instead support the customers in carrying out their R&M actions is therefore considered to have a large value-creating potential. This aspect was taken into account and incorporated in the developed services focusing on supporting the customers in their R&M operations.

The area of R&M service offerings aims at targeting a broad spectrum of the identified needs and wants of the customers, with the common denominator of supporting the customers R&M operations, regardless if the customers choose to turn to Scania’s workshops or not.
Important to keep in mind, however, is to not rely on technology too much in promoting convenience. This is supported by Salvendy & Karwowski (2010), stating that the avoidance of face-to-face contact causes a risk of lacking the necessary insight in customer problems and receiving valuable feedback. Despite the fact that telematics technology enables great opportunities for achieving tailored service solutions, it is important to not overlook the value that lies in direct human interaction in creating a long-term relationship with the customer. This could be especially important in some of the more complex R&M services, requiring a higher level of expertise and a closer interaction is more suitable.

The different aspects discussed above indicate the necessity of ensuring that the provided R&M services include a wide range of offerings, where the customers themselves can choose the amount of personal interaction and level of complexity characterizing the services of choice.

### 10.2.2 Transition service offerings

The identified service area Transition is, as the R&M services, considered to have value-adding potential. This is mainly related to that the processes related to selling and buying trucks is an inevitable part of owning a used truck. This provides an opportunity for long-haulage truck OEM’s, such as Scania, to support this part of the customer’s business operations and in turn increase profits by getting involved in the transaction processes. The area of transition services is therefore considered to have a potential to, similar to for the service area R&M, facilitate a long-term relationship with the customer. As stated by Barry & Terry (2008), promoting a close relationship with the customer is considered especially important when providing industrial services. For the case of the transition services, this primarily relates to that situations of purchasing or selling trucks is oft-occurring and involves many aspects where the customer can receive support in making the transaction more successful. This further provides Scania with the natural opportunity to extend the relationship with the customer to cover a larger part of the owners within the lifecycle.

Getting this kind of transition support is most likely even more important for trucks owners in the later stages of the truck’s lifecycle, due to the uncertainty that comes along with handling used vehicles. This is primarily related to not knowing how the trucks have been previously driven, R&M frequency and other factors affecting the quality of the truck. This is an area where Scania can deliver value by creating a sense of security. Some of the proposed services provide the buyer of a used truck with the necessary information to feel confident in making the right purchase.

Furthermore, a large number of the identified transition services can be assumed to be especially valuable to less experienced owners of relatively young businesses, mainly due to that these owners can be assumed to experience more uncertainty. The uncertainty is related to e.g. knowing which type of truck is the most appropriate to acquire based on the business financial prerequisites, business operations and intended transport routes. This provides an opportunity for Scania to fill this gap and offer services facilitating ease of transition for these haulier business owners.

As discussed previously, the suggested services can be assumed to provide value by offering solutions to silent needs and thereby exceeding the customer’s expectations. As stated by Salvendy & Karwowski (2010) it is important to both fulfil the expected, explicit needs of the customer as well as the silent, implicit needs in order to achieve offerings that stand out. Since the services target a wide range of aspects related to the transition process and further most likely meet important needs
that have not necessarily been clearly communicated by the customer, it provides good prerequisites that the services will be received well.

Despite the many positive aspects related to providing the above mentioned services, they might in some cases run the risk of being perceived as invasive. As stated by Edvardsson, et al. (2000), technology-based services can sometimes be viewed negatively by the customer and considered to interfere with privacy and confidentiality. This could be sensitive in some of the proposed transition services that focus on receiving detailed information about the truck. A service that e.g. entails Scania providing the potential buyer of a used truck with detailed vehicle data might cause the buyer to reconsider the purchase. This most likely leads to that the service is considered valuable to the buyer, but not to the seller. This aspect is important to keep in mind when further developing the services in order to ensure avoiding difficult situations for one of the parties involved in the transition process.

10.2.3 Safety & Security service offerings

The area of Safety & Security is considered to have less potential for providing value to Scania’s customers compared to the two previous service areas. The main reason for this is that the service’s relatively high level of technical complexity runs the risk of not being applicable to the operational environments described acknowledged during the empirical study. This mainly refers to that the trucks are often rebuilt, with little consideration of how different units interact, which consequently offers a risk of that the needed technology to offer the services does not work properly. Furthermore, the demand for technically advanced functions was discovered to be low in these environments, further compromising offering these types of services.

Another potential risk with the Safety & Security services that entail monitoring and surveillance of drivers is that it might further worsen the sometimes-occurring lack of trust and loyalty between the drivers and the business owners in these environments. This aspect is described by Edvardsson, et al. (2000), who bring up the risk of experiencing technology-based services as interfering with privacy. In the area of Safety & Security some of the identified services include a high extent of interference with the driver’s daily work. Keeping this aspect in mind is therefore important when further developing the services. The identified services involving the driver do, however, also include services that target safety and security related issues without entailing monitoring and surveillance. These services target both driver safety and avoidance of vehicle damage related to unsafe driving styles, without risking affecting the owner-driver relationship in a negative way. As described by Kowalkowski, et al. (2013), the access to real-time information on product usage that telematics technology enables, is a good prerequisite for building a strong, value-based relationship with the end user. Despite the benefits of supporting the business owner as well as the driver through these services, it also enables long-haulage truck OEM’s to gain further knowledge on how the vehicle is utilized in these contexts.

The study showed a potential for services supporting business owners in these operational environments in delivering preventive actions related to safety and security. Despite some of the above discussed potential complications of a selection of the proposed services, these services might still have potential of attracting and providing value to truck owners outside the initially intended target group. Providing services aiming at preventing dangerous driving operations, vehicle damage and theft of both vehicle and cargo are most certainly recurring problems even in other
environments. Furthermore, the situation of low loyalty between owner and driver are not present to the same extent in other contexts, which further implies that the identified services can successfully be applied here.

10.2.4 Driver Convenience service offerings

The fourth identified service area, Driver Convenience, has a potential in making the driver’s working situation more comfortable and providing ease of the daily transport operations. This can be assumed to be considered especially valuable in smaller business contexts, where the employees and the business owner often have a close relationship and where the owner himself/herself also occasionally operates as a driver. The driver-related services can thereby serve as an incentive to promote ease of the daily operations through relatively simple, value-adding activities.

Despite the potential these services have to provide value to the drive and the customers, this service area is considered to have the least potential. This main reason for this is that the willingness to pay for these types of services can be assumed to be low. However, the combination of an already high level of comfort and driver convenience in today’s trucks and the oft-occurring limited financial prerequisites of owners in the later phases of the truck’s lifecycle can entail that these types of services are considered a luxury and therefore are given a low priority.

A potential way to avoid the difficulties related to the limited willingness to pay for these types of services could be to provide them as add-ons to existing services. As stated by Mathieu (2001), it is important to respond to the increasing customer demands and expectations and for companies to distinguish themselves from competitors. By providing the driver-focused offerings as value-adding complementary services, Scania can stand out amongst competitors through a higher level of uniqueness.

10.3 Classification of the service offerings

The findings of the literature study provided a variety of different classifications depending on the nature of the service offerings. Services can be classified into the categories of SSP and SSC (Mathieu, 2001), depending on whether the services primarily focus on guaranteeing the use and access to the product or to optimize the customer’s operations and actions connected to the provided product (Kowalkowski, et al., 2013).

Using the classification of Mathieu (2001), the developed service areas can be considered to target both of these categories, where each service area contains both SSP and SSC services. The area of R&M is the area that most prominently entails SSP offerings, since these services foremost aim at keeping the truck in good condition and facilitating all-time access. The Transition service area spans over a wide range of different services, targeting both SSP and SSC. However, the area most prominently includes SSC offerings, due to these services aiming at supporting the customer’s transition-related actions. The Safety & Security service area, despite a few SSP services, mostly contains SSC offerings focusing on promoting safe driving operations and preventing vehicle damage and theft. The last area, Driver Convenience, exclusively consist of SSC offerings focusing on supporting the driver’s daily operations.

Based on this reasoning, it becomes apparent that the new service areas to a larger extent can be placed within the SSC category described by Mathieu (2001). As stated by Antioco, et al. (2008), SSC
offerings are, unlike SSP offerings, not standardized and focus closely on the the customer taking part of the service as well as achieving customized solutions. The identified service areas and their included services build on the common base of providing a high level of customization and thereby facilitating future focus on providing customer value.

The model of Tan, et al. (2010), illustrates a combination of classifying different types of services with associated recommended development methods, targeting the whole span from pure product-oriented engineering design to more customer-focused and business-supporting service design. However, due to the fact that the study’s identified service areas are not detailed enough to enable choosing an appropriate aim for development, it makes it difficult to determine which approaches would be suitable for further development of the services. This model to a large extent resembles the product-service system model of Tukker (2004), in which the dimension of suggested direction for development is excluded. This makes the model of Tukker (2004) more appropriate for classifying the identified services within this study.

Tukker’s (2004) categorization of services into product-oriented, use-oriented and result-oriented in mind, the identified services can mainly be considered to be product-oriented. This area is described as focusing on selling the tangible product, with services mainly considered as add-ons. Scania’s current service offerings focus mainly on product-related services, however the company is also offering services that belong in the use-oriented category, such as leasing and renting. The identified services of this study further extend Scania’s service portfolio specifically within the product-oriented category. The result-oriented category, which entails moving far away from viewing services as add-ons to products and instead placing the focus on viewing the product as a tool in achieving a certain goal, could be considered as a future vision for Scania’s service offerings. Moving from the current primary focus on product-oriented and to some extent use-oriented towards a result-oriented approach entails a large transition and is therefore not considered realistic within the near future.

Classifying services is further described by Kowalkowski, et al. (2011), based on the parameters bundled vs. unbundled services as well whether the focus is on providing process-oriented or product-oriented services. Currently, the suggested services within the identified four service areas are not combined into complete packages but have the potential of being further developed into complete offerings. Furthermore, the services can be considered to include both process- and product-oriented services. For example, some of the R&M services fit into Kowalkowski’s, et al. (2011) description of product-oriented safety inspection SLA services, described as activities such as equipment inspection or testing of functionality. On the other hand, specific Transition services matches Kowalkowski’s, et al. (2011) process-oriented retrofit services, described as performance enhancement through replacing or adding hardware or software components. In conclusion, the suggested services provide a wide range of offerings, which most likely enhance the opportunity to target and attract a broad spectrum of customers during the lifecycle.

10.4 Promoting a service mindset

In order for a company to become an effective service provider, Windahl & Lakemond (2006) argue for a strong customer centered orientation. A customer-focused mindset is currently present at Scania to a large extent, putting emphasis on delivering customized product and service solutions. Extending Scania’s current service portfolio by including above described service areas for owners in the later lifecycle phases creates a larger complexity. This primarily relates to incorporating the
needs of these users into completely new offerings with a different focus, deferring from the current service offerings. Ensuring a continuously strong customer focus geared towards these customers and that the identified services take hold within the organization can to a large extent depend on a service mindset permeating the organization. This aspect is supported by the statement of Edvardsson, et al. (2000) emphasizing the importance of a service corporate culture as well as Antioco’s, et al. (2008) argument for a service atmosphere. Due to that the proposed service areas, as previously mentioned, differ widely from the current services, this indicates the need for an organizational culture supporting and initiating the extended service mindset.

In addition, ensuring a deep knowledge of the identified use phases that the services are aiming at targeting is an essential part in making sure that the services are well-received by the customers. When conducting the internal mapping, it became clear that Scania employees’ views and perceptions of the later parts of the truck’s lifecycle in some cases differed and contained some uncertainty. Moreover, the study’s result also demonstrated complexity in distinguishing specific owners within the varying phases of the truck’s lifecycle. Combining these two aspects, it may be beneficial for Scania to further encourage a culture enabling and facilitate gaining of deep knowledge of the users during the entire lifecycle.

However, as Antioco, et al. (2008) state, a reorientation towards offering services may be problematic within manufacturing firms. In the case of a big organization, such as Scania, with a large number of employees and multiple functions and departments, it is understandable that an establishment of a service mindset targeting the later parts of the lifecycle is a substantial and complex effort. Moreover, as described by Kowalkowski & Kindström (2012), many manufacturing companies have a deep engineering tradition and identity, focusing primarily on producing high quality products. Traditionally, Scania can be considered to have a strong focus on the physical product. Hence, moving towards extending the service portfolio and emphasizing a service mindset to a greater extent might create additional difficulties in shifting a part of the focus from the product to services.

10.5 Facilitating a service network organization

In order to enable the offering of services with high efficiency, Kowalkowski, et al. (2011) argue for a transnational organization in which all units highly depend on each other. The study identified R&M services as the area considered to have the highest potential and services supporting the transition of selling or buying a truck as priority number two. As a part of these services, the customer may decide to visit the OEM’s workshops and distributors, which in turn entails a high level of interaction with the customer. A truck manufacturer’s R&M services are carried out by local workshops, which entails that the customer mainly meets local workshop representatives when taking part of the services. Similar to the local workshops being the ones carrying out R&M, the distributors selling the trucks also operate locally, which consequently means that the customer once again meets local representatives when buying or selling a truck.

However, the proposed services could to some extent need to be governed from a central business unit. The suggested services of this study may therefore in turn include contributions from the central organization as well as from the local units. Hence, in order to enable efficient offering of the services, collaboration between the central organization and local units could be considered as an important prerequisite. In addition, only managing services from a central level may according to
Kowalkowski, et al. (2011) contribute to tensions and reduction of trust between local units and the central business unit, which further argues for a close collaboration.

However, making the central organization in control of the services is according to Kowalkowski, et al. (2011) a way to facilitate knowledge sharing between units, in turn generating a need for finding a balance between central control and local autonomy. Transferring knowledge, concerning the identified services, should be seen as an important element, especially when the services are completely new to the OEM’s organization and its employees. Additionally, as mentioned above, identifying user characteristics in the later parts of the lifecycle includes complexity, which can be assumed to be facilitated by knowledge sharing. However, since the customer mainly meets local representatives, autonomy in the local units should be promoted. This is supported by Salvendy & Karwowski’s (2010) argument regarding the importance of having the right resources at the right place at the right time to be able to efficiently meet a customer’s, sometimes ad hoc, needs. As stated by Kowalkowski, et al. (2011), services require a closer relationship between local units and the customer in comparison to products. This generates a need for ensuring that the R&M and Transition services are planned and organized in a way that allows the local units to build a good relationship with the customer. By doing so, the opportunity for successful service delivery is enhanced.

Having an integrating position and a broad view of the actors within the network is according to Windahl & Lakemond (2006) the most advantageous position for managing integrated product and service solutions. In order to facilitate successfully implementing the proposed service areas into an OEM’s existing service portfolio, this position is most likely the most beneficial for the OEM’s central business unit to have, see Figure 30 below.

<table>
<thead>
<tr>
<th>Limited</th>
<th>Broad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish dependence on external actors</td>
<td>Involve important actors in the network and develop strong ties to end customer</td>
</tr>
<tr>
<td>Do not initiate if integrating party is not strongly committed and has limited network horizon</td>
<td>Identify implications of indirect ties to end customers</td>
</tr>
</tbody>
</table>

**Integrating position**

**Supplier to integrating actor**

**Figure 30. Suggested position for implementing the service areas**

According to Windahl & Lakemond (2006), this combination enables efficient monitoring of the network. As concluded above, collaboration as well as knowledge sharing could be important prerequisites for a successful delivery of the identified services. Letting an OEM’s central business unit have an integrating position could enhance and provide the opportunity for the central unit to monitor the network and consequently increase knowledge sharing as well as facilitate a close collaboration. Additionally, having a broad view of the network can be considered as a necessity.
when a large part of the services are conducted at a local level. If an OEM’s central unit instead would have a limited view of the network it would, according to Windahl & Lakemond (2006), require establishment of dependencies with external actors. This could risk the opportunity to receive valuable knowledge insight into the customer’s operations. In the case of Scania, the central unit is determined to get closer to and gain knowledge of the users in the later stages of the lifecycle, this position would most likely not be considered as advantageous. Relying solely on for example local units carrying out the services may contribute to losses in knowledge about the service receiver, which is valuable input to the organization as a whole.

According to Windahl & Lakemond (2006), a prerequisite for making an integrated position and broad view of the network functioning, important actors need to be involved in managing the services and ensuring strong ties to the end customer. With above discussion in mind regarding the customer meeting local representatives, combined with the complexity that comes along with gaining knowledge about the users within phases further away in the truck’s lifecycle, involving local actors and developing strong ties to the end customer will most likely turn the implementation of the services even more successful.

### 10.6 Work structures for further development

The identified service areas and including services are currently suggestions that require further development and design to be offered as complete service solution packages to potential customers within lifecycle. This will involve continuous improvement and development work within the organization of Scania’s central business unit related to the services. According to Windahl & Lakemond (2006), the way a company manages the development of services should depend on the integrated product and service solution’s impact on existing internal activities in combination with how strong the ties with important external relationships are. All of the four identified service areas can be assumed to have a relatively high impact on existing internal activities, which is partially based on the identified services targeting new application areas. The newness of the services may require new development processes, alternatively entail difficulties when trying to integrate the services into existing processes and activities. The service area’s potentially high impact on existing internal activities also stems from the required involvement of, and coordination between, several functions and departments, such as marketing and R&D, when developing and delivering the services.

However, how strong the ties to important external relationships need to be, differ among the different services areas. As concluded in chapter 10.4, collaboration between for example workshops and distributors is an important prerequisite for successful offering and delivering of R&M and Transition services. On the other hand, when delivering services related to the areas of Safety & Security and Driver Convenience, involvement with external actors would most likely be of lesser importance in comparison to the previously mentioned services areas. In the area of Driver convenience, this relates to that providing these services rarely includes personal involvement of any other person than the drivers themselves. Similarly, the majority of the services related to Safety & Security neither naturally require support of external actors, such as workshops, to take part of the service. However, since the services are in the beginning of the development stage, these services may to some extent involve external actors when being fully developed. In conclusion, the services related to Driver convenience and Safety & Security will, compared to the R&M and Transition services, require weaker ties to important external relationships.
Summarizing above discussion, when developing services related to R&M and Transition the ties to external actors are strong and the impact on existing internal activities are high, see the green square in Figure 31. The services related to Driver Convenience and Safety & Security implies weaker ties to external actors but still have high impact on internal activities, representing the area within the dotted square in Figure 31.

<table>
<thead>
<tr>
<th>Achieve focus on project and maintain strong ties with external actors</th>
<th>Create processes and organizational structures to handle both internal and external dependencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secure the match to end customers’ needs</td>
<td>Secure internal commitment and match to end customers’ needs</td>
</tr>
<tr>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

The integrated solution’s impact on existing internal activities

**Figure 31. Suggested organization for further development of the identified services**

When developing services with a high impact and strong ties, Windahl & Lakemond (2006) emphasize the importance in creating processes and structures that enable managing of internal and external dependencies. Accordingly, coordinating processes and further promoting a close cooperation between the different parties involved in the service development is an important prerequisite for successfully providing the developed services. This is supported by Antioco, et al. (2008), arguing for that companies need to ensure that all of the employees needed for development of services share information related the customers, and Kowalkowski’s, et al. (2011) statement regarding cross-functional collaboration between product and service departments.

Furthermore, according to Windahl & Lakemond (2006), when developing services that have a high impact on the internal organization but weak ties to external actors (the lower right box seen in Figure 31), it is important to ensure that the customers’ needs still are met and to secure internal commitment. The service areas Safety & Security and Driver Convenience can be considered to belong in this category. Windahl & Lakemond (2006) further suggest that in order to counteract weak ties to external actors, service development actions need to be characterized by an extended customer involvement as well as being carried out in separate units. These units should according to Windahl & Lakemond (2006) work exclusively with service development targeting a specific area of services. Since the areas of Safety & Security and Driver Convenience most likely will not include extensive input from external actors, it creates a risk of not receiving the complete range of needed input regarding the customer’s situation. Hence, when further developing these service areas and their including services, a greater importance is placed on ensuring a deep insight in the customer’s needs and requirements through an extended involvement of the customer in the development process. In addition, promoting that the further development of these two service areas is carried...
out in focused units, which is currently already present to a large extent at Scania within the area of telematics services, creates good prerequisites for successfully delivering the services.
11 Evaluation of methodology

In this chapter, the methodology used throughout the service development process and the master thesis as a whole is described.

The study was, as explained in chapter 2.1, conducted by using an establish service development framework. By using an acknowledged method, which previously have been tested and proven effective, the execution of the study and most certainly its result was likely enhanced. Additionally, the chosen method was modified to fit the specific purpose of the study, most likely improving the study’s outcome.

To strengthen the study’s results and to give further support to the study’s discussion, additional interviews could have been carried out. Generally, by conducting more interviews, both internally and externally, the information obtained from the mappings would have become more substantial. However, within the study’s timeframe it would not have been feasible.

When interviewing Scania employees, some of the obtained information included uncertainty, mainly based on some of the interviewees limited experience from, and thereby knowledge of, customers buying used trucks. By more carefully selecting interviewees and ensuring that the chosen persons had the needed knowledge, the uncertainty might have been reduced. However, when choosing interviewees difficulties regarding knowing who actually could contribute to the study occurred. Furthermore, interviewed persons in turn recommended potential interviewees, making it difficult to know in advance if the suggested person had the needed knowledge.

In addition, many of the interviewees shared similar personal characteristics such as age, extensive years of working experience and that they were male. How these factors affected the obtained information is debatable. It may have contributed to that a biased picture was obtained, missing aspects that persons with different characteristics might have brought up or emphasized. However, the study required a wide and structural picture, which extensive work experience must be assumed to contribute to and be a prerequisite for. Furthermore, even though many of the interviewees shared above personal characteristics, they differed in terms of professional roles, most likely generating a wide spectra of opinions and experiences.

The external mapping mainly included interviews with distributors of long-haulage trucks, which consequently gave a structural picture of long-haulage truck owners and usage. However, additional interviews with long-haulage hauliers that own or have bought a used truck would most likely have contributed to enhance the external mapping’s outcome and given a counterweight to the information obtained from the distributors. However, it was during the study proven difficult to find, as well as to convince, long-haulage truck owners to take part in interviews, which underpinned the choice to mainly interview distributors.

Furthermore, interviews with experienced persons in Europe with knowledge about customers in other countries than Sweden would have added extra information regarding the usage of the long-haulage truck. Additionally, interviews with long-haulage owners in Europe would have complemented the study even more. Moreover, to strengthen the information obtained from the interviews regarding the usage of the truck outside Europe, information could have been obtained from customers and experienced persons outside Europe.
In addition, when verifying the hypotheses concerning the use of the truck in areas outside Europe, only one person’s experience was used as reference and only one person’s knowledge is thereby supporting the verification. This must be assumed to entail a certain level of uncertainty in the result of the hypotheses. However, this person’s opinions were consistent with the information that the interviewees in the internal mapping had provided, which strengthens the verification.

To complement the two workshops that were carried out, additional cross-functional workshops including persons from different departments would probably have contributed to a wider spectrum of experiences and perhaps an enhanced creativity. Furthermore, getting feedback from customers regarding the identified services would probably have ensured that the study’s result is attracting the intended customers. However, the identified service areas are just suggestions and require therefore further development in which feedback from customers and involvement of additional apartments most likely would be of more importance.
12 Conclusions

The study aimed at answering three research questions, described below. In the following sections, each of the research questions are answered through a presentation of the study’s conclusions.

12.1 RQ1 – The characteristics of the phases in a long-haulage truck’s lifecycle

The long-haulage truck’s life is characterized by differences in utilization and not by different owners that can be distinguished by distinctive features in for example business area. The phases in the truck’s lifecycle can accordingly be viewed as use phases. When describing these phases, two parameters appear as the most distinctive and are consequently the two aspects that primarily address the life of the truck. Firstly, during the long-haulage truck’s life, the utilization of the truck moves from focusing on logistics in terms of effective, coordinated, optimized and just-in-time transportations, to focusing on moving things from A to B. Secondly, the emphasis on advanced technology shifts to basic technology with the truck’s increased age, both in regards of the truck’s physical condition as well as the user’s focus on technology. The advanced technology is connected to focusing on logistics while basic technology is considered sufficient for moving things from A to B.

In the first use phase, the truck has an age of zero to five years, five to eight years in the second phase and finally, in the third phase, the truck is used from eight years old until its end of life. The truck is in the first phase used in a European logistics setting. Entering the second phase, the truck is to be found both in Europe and outside Europe. In this phase, the two above described parameters decrease, both in the European setting as well as outside Europe. In the third phase, in which the truck is still located in Europe as well as outside the continent, additional reduction of the parameters appears. The parameters are at this point approaching to focus primarily on moving things from A to B and having a truck with basic technology.

12.2 RQ2 – The customers’ challenges, demands and needs

When concluding the challenges, demands and needs of the customers it is once again important to note that it is the characteristics of the use that determine the challenges, demands and needs, not the ownership. The study shows that the characteristics can be divided into three areas, which the utilization of the truck affects: the business, the vehicle and the driver. In addition, as concluded above, the area of use changes during the truck’s lifecycle. Hence, the challenges, demands and needs change with the truck’s increased age.

In the case of the business, the further away in the truck’s lifecycle, the focus on delivery precision and need of the business having high use frequency of the used trucks is reduced. Regarding the vehicle, the further away in the truck’s lifecycle, the demand for technically advanced functions, the need for vehicle reliability and tendency to turn to OEM for R&M decreases. Lastly, in the case of the driver, the further away in the truck’s lifecycle and from the starting point Europe, the level of loyalty towards the owner and the business, the incentive to use technical devices in the driver environment and the focus on the driver’s working situation is reduced.
12.3 RQ3 – The service areas that a long-haulage truck OEM can offer their customers

Based on the results of RQ1 and RQ2, Scania can offer services related to R&M, the transition that occurs when the truck is sold or bought, safety and security aspects and driver convenience. The order the services areas are given in is the order the areas are considered to have the most offering potential.

The service area R&M aims at providing services supporting the customer’s repair and maintenance need that comes along with a used truck. This service area is mainly targeting the second hand users within Europe. The purpose of the services related to the transition of the truck is to support and facilitate the process of selling alternatively acquiring a truck. The transition services also aim at supporting in cases of transition between different business areas. The transition services address the transitions between the first and second user as well as the transition between the second user within Europe and the third use phase. Services related to safety and security aspects are primarily targeting the second and third users outside Europe. These services aim at handling the problematic situations that occur in relation to safety and security in some countries outside Europe. Finally, the service area driver convenience is mainly addressing the second hand users in Europe. The purpose of this area is to provide services improving driver convenience and comfort.

12.4 Recommendations for future work

The result of the study indicates a potential in offering services to users during the entire life of the long-haulage truck, creating an opportunity for long-haulage truck OEMs such as Scania to offer value-creating services. However, the identified service areas and their including services are at the moment not developed at a detailed level. Hence, if Scania decides to move forward with the service areas, further development of the services needs to be initiated. The service areas that in the study were recognized as the ones with the highest potential, R&M and Transition, would most likely be the most beneficial services to initially focus on. If Scania decides to develop the service areas that in the study were seen of less potential, Safety and Security and Driver Convenience, the suggested services would need additional focus in order to ensure successful customer reception of the services. In addition, the suggested service areas and including services could preferably be bundled, creating an opportunity to sell whole packages of services.

However, even though the study demonstrates interesting results, Scania’s further development of the services cannot solely be based on this study. To ensure further successful service development and delivery, additional studies need to be carried out. For example, on-site studies that examine users outside Europe would generate a more substantial mapping of the owners outside Europe. Additionally, a quantitative study of the lifecycle’s users would strengthen this study’s result that currently is qualitative. Furthermore, even if Scania carries out several studies, the development of the services will continually need user input to ensure that the services meet the users’ needs and wants. Moreover, the discussion of the study’s result, which includes suggestions on for example creation of value and a potential service network, can be taken under consideration when developing the service areas.
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## 14 Appendix

**Appendix A**  
Interview questions for the internal mapping

**Appendix B**  
Interview questions for the external mapping

**Appendix C**  
Workshop material – Service flow categories

**Appendix D**  
Literature search terms

**Appendix E**  
Interviews with Scania employees

**Appendix F**  
Interviews with distributors and customers
Appendix A – Interview questions for the internal mapping

Introduction

- Description of our master thesis and its purpose
- Can you briefly describe your work experience?
- Can you describe your work position at Scania?
- What does your department do?

Interview questions

First owner

1) After how many years does the first owner sell his/her long-haulage truck?
2) What are the primary reasons for a first owner to sell the truck?

Second owner

3) What are the characteristics of a second vehicle owner?
   - In which type of businesses and environments are the trucks typically used in?
   - Which parameters do second vehicle owners base their decision on to purchase a used long-haulage truck?
   - Which actors are typically present in second owner businesses?
     - How do these actors communicate with one another?
   - How do the technical product requirements of the vehicle differ (from the first owner to the second owner) in relation to the business and the context it is used in?
   - Which aspects can buyers of used long-haulage trucks overlook, even if they do not fulfill all needs and wants?
   - How does the second vehicle owner handle the potential risks/challenges associated with owning a used long-haulage truck?
   - Do the drivers in these businesses have an impact on decision-making on factors affecting the driver’s working situation?
   - To which extent are business owners willing to adjust/change the business to the used trucks capacity?
   - Is it common for second owner businesses to mix purchasing new trucks with purchasing used trucks?

4) When comparing a first owner and a second owner of a long-haulage truck:
   - How do the needs, requirements and challenges shift between the different business contexts?
   - What are the reasons for these shifting needs, requirements and challenges?
   - What aspects do the two groups of vehicle owners value the highest?

5) After how many years does a long-haulage truck usually get passed on to the third owner?
6) What are the main reasons for selling the vehicle?
Third owner

7) What are the characteristics of a third owner?
   o In which type of businesses and environments are the trucks typically used in?
   o Which parameters do third vehicle owners base their decision on to purchase a used long-haulage truck?
   o Which actors are typically present in third owner businesses?
     o How do these actors communicate with one another?
   o How do the technical product requirements of the vehicle differ (from the second owner to the third owner) in relation to the business and the context it is used in?
   o Which aspects can buyers of used long-haulage trucks overlook, even if they do not fulfill all needs and wants?
   o How does the third vehicle owner handle the potential risks/challenges associated with owning a used long-haulage truck?
   o To which extent are business owners willing to adjust/change the business to the used trucks capacity?
   o Is it common for second owner businesses to mix purchasing new trucks with purchasing used trucks?

8) When comparing a second and a third owner of a long-haulage truck:
   o How do the needs, requirements and challenges shift between the different business contexts?
   o What are the reasons for these shifting needs, requirements and challenges?
   o What aspects do the two groups of vehicle owners value the highest?

Ending

• Is there something you would like to add that we have not brought up?
• Do you have any reading material that could be useful?
• Can you further reference us to other knowledgeable Scania-employees within this area?
• Can we contact you again at the event of additional questions?
Appendix B – Interview questions for the external mapping

Business-related

1) Please describe your business:

   o Background
   o Actors within the business (how many employees and their work positions/responsibilities)
   o What type of transport assignments your business takes on (frequency of transports and length of transport assignments)
   o The process from transport order to delivery and how you coordinate the incoming transport orders
   o How many work shifts per day and the reason for this

2) What are your reasons for purchasing used long-haulage trucks?

3) What are your business’ requirements for delivery precision?

   o Is delivery precision an important requirement of your customers?
     o If yes: How do you ensure delivery precision?
   o What are your margins regarding delays in delivering goods?
   o What are typical consequences of delayed deliveries?

4) At what point do you usually sell the truck and what are the reasons for selling?

Vehicle-related

5) What are some typical aspects you have had to overlook when purchasing used trucks? Why?

   o Which specific functions/attributes of the truck have been of importance/less important at the point of purchasing a used long-haulage truck?

6) Describe some of the commonly occurring challenges related to owning a used long-haulage truck?

7) How do you handle the risk that comes along with owning a used truck? (Related to decreased vehicle reliability)

8) How important is vehicle reliability and that the vehicle at all time is available for carrying out transport operations?

9) Do you turn to Scania for R&M? Why/Why not?

   If yes: Have you currently signed any R&M contracts with Scania?
   If no: How do you handle the need for R&M?

10) What type of operational information/data related to the use of the long-haulage trucks within your business would be useful for your business?
Driver-related

11) How many drivers are currently employed in your business?
   - For how long have they been working for you?
   - Is it common for you to hire additional drivers temporarily in order to take on more transport orders?

12) Do the drivers in your business generally drive the same truck every time or do they between different vehicles?

13) Would you consider that there is an open work atmosphere where the employees share problems and suggestions on improvements related to the daily operations?

14) How important is driver comfort?
   - If yes: What aspects are prioritized highly? Why?
   - If no: What aspects are given less priority? Why?

15) How do your employed drivers view the use of technical devices in their driver environment, aiming at helping their daily work operations?
   - If negatively: What are the reasons for not wanting these types of technical aids?

16) Do the drivers experience that their work situation could be improved in any way?
Appendix C – Workshop material - Service flow categories

**Indicate**
Receive information facilitating R&M operations

**Solve**
Fix vehicle R&M

**Manage**
Guidance for appropriate R&M solutions

**Prepare**
Underpinning decision-making prior to upcoming transaction

**Improve**
Create value-adding prerequisites for next transaction

**Transfer**
Facilitate ease of transaction process

**Transition**
Getting the property valuated/inspected

**R&M**
Taking the temperature to determine illness

**Example of situation: Getting ill**
- Taking medicine or going to the hospital
- Calling a doctor for advice

**Example of situation: Selling/buying a house**
- Getting the property valuated/inspected
- Renovating and keeping the house in good condition
- Hiring a moving firm
**Prevent**
Decrease the risk for unsafe situations

**Handle**
Providing measures for reducing current threatening factors

**Reduce**
Decrease the level of damage

**Prepare**
Support of preoperational actions before start of driving

**Driver convenience**
Booking trip through travel agency

**Finish**
Post-transport activity assistance

**Execute**
Convenience during transport operations

Example of situation: In case of fire
- Installing a smoke detector
- Keeping a fire extinguisher close at hand

Example of situation: Go on a train trip
- Having access to Wi-Fi on the train
- Train station information desk for suggestions on tourist attractions
- Booking trip through travel agency
### Appendix D – Literature search terms

The table below presents each theoretical area of the literature study, used search terms and the database or library in which the search was carried out.

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<tr>
<th>Research area</th>
<th>Search terms</th>
<th>Database/Library</th>
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<td>Model</td>
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<td></td>
<td>Phases</td>
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<td>Competitive advantage</td>
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<td>Service provider</td>
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Appendix E - Interviews with Scania employees

Interview I – Respondent A

Background
The interviewee has worked at Scania since 1990. He started his career as a design engineer, continued as a test engineer and eventually moved on to working as a group manager within braking systems. He has further worked within powertrain development and is now since 2012 working with product planning, which includes getting an understanding of the customer’s needs and working closely with the company’s marketing department.

First owner
According to the interviewee, a typical first owner has a big fleet with at least 10 to 20 new vehicles. A first owner decides to sell a long-haulage truck after approximately five years. The reason for selling is a combination of too low up-time, increased repair costs as well as higher costs related to more strict emission legislations. The first owner also wants to ensure that he or she has a modern vehicle with the latest technical progress, such as lower fuel consumption.

Second owner
A second hand owner is in some cases a haulier with a growing business that is lacking the economical prerequisites, but not the desire, for buying a new long-haulage truck. A second owner is thereby also willing to accept the increased repairs that naturally come along with the increasing age of the truck. Another typical type of second owner is located in Russia and other eastern countries and buys the truck from other countries in Europe. In this case the long-haulage vehicle moves to operating on less fine roads, making the second life tougher than the first. In the eastern countries, a long-haulage truck is normally still used within the long-haulage segment. Which kind of goods that are transported may, however, differ, but there is no distinctive type of goods that is general for the eastern countries. The truck’s transfer to these countries is partly based on the fact that there often are lower emission requirements than the rest of Europe, thereby making it an attractive market for European hauliers to sell their old trucks to. In addition, the interviewee stated that Russian companies base their businesses on buying second hand vehicles.

According to the interviewee, Africa is also a location for second hand long-haulage trucks. Due to left-handed traffic, these trucks are often exported from Great Britain and are relatively new, with an average age of four to five years. In this second life the trucks are sometimes rebuilt and in some cases even put together with components from other brands. The reconstructions lead to that many technical features, such as breaking systems, stop functioning.

Compared to the first owner, second owners normally settle with the vehicle they can acquire based on the economical situation, even though it might not be optimized for the business. The interviewee also pointed out that a first owner most often is more established and monitors the transport operations more closely than a second owner. However, the interviewee stressed fuel consumption as a factor that both first and second owners prioritize. This is a factor that affects the businesses costs regardless of the haulier’s size.
The second owner decides to sell the long-haulage truck when it is more profitable to buy a new vehicle compared to the repair costs that increase with the age.

Third owner
In the third life of the long-haulage truck the interviewee stated that the vehicle might be scrapped. If not, the vehicle is possibly sold to countries even further east or to the Middle East. If the second owner is located in e.g. Latin America or Africa, the interviewee assumed that the third owner is typically located in smaller countries or goes even further into the country where the previous owner operates in. The interviewee further assumed that the area of use might shift to becoming a vehicle that supports the main business, for example at a mining site.

General comments
During the past 20 years the vehicles have become more and more complex with a high amount of integrated electronic systems. This implies that a breakdown of one system, even a quite insignificant, might create a situation where the whole truck stops functioning. This complicates the reconstructions that the second or third owners often want to conduct. A workshop would have major problems reconstructing a truck; it is even very problematic for Scania to do it in the laboratory at the factory. In addition, there are many features that become unnecessary in countries that do not find e.g. safety aspects necessary to prioritize or that are not regulated by law. In some countries, the drivers’ ethical value is thereby low.
Interview II and III – Respondents B and C

Background
Project Manager A has a work background at Scania as well as at other companies. During his early career he worked within production and the latest 20 years he has been involved in product development projects, currently working as a project manager. He has been responsible for a project focusing on reconstructions of the truck, making it possible to use it in countries with, compared to Europe, different fuel quality. These countries are for example located in Africa, the Middle East and South America.

The second interviewee, Project Manager B, has been working at Scania for 19 years. He has mostly been working with projects related to electrical and data equipment. During the last six years has he been working as a project manager within this area and has thereby been involved with projects related to services.

First owner
The interviewees stated that a first owner decides to sell the long-haulage vehicle after approximately three to four years. The decision is most likely related to financial aspects, including higher taxes related to emission regulations or increased repair costs.

Second owner
The interviewees stated that a second hand owner is typically a small haulier business. They further stated that second hand truck owners typically buy a used vehicle based on their economical situation. This implies that the second owner in some cases settle with trucks that are considered good enough, as long as the price is affordable. However, when buying a used truck, the second owner still looking for a robust and reliable vehicle.

Due to the fact that it is very problematic to rebuild a long-haulage vehicle, the interviewees assumed that the truck is still used within long-haulage transport operations in the second life. However, in cases where reconstructions are still carried out, the truck will most often become malfunctioning.

The interviewees approximated the age of the truck to six to seven years when the second owner decided to sell it. This decision is, as in the case of the first owner, also related to economical aspects and to increased operational costs.

Third owner
The third owner buys the long-haulage vehicle based on the fact that the truck is cheaper than both a new and a second hand vehicle. In terms of unwanted things that may come with owning an older truck, the owner is often willing to accept more or less anything. The important thing is that the truck is functioning decently and that it can move from one place to another.

General comments
How the drivers are treated differs a lot. In some cases the drivers may influence the specifications that are set when a haulier e.g. buys a new truck. In other cases, the driver’s situation is of no importance and is therefore not prioritized. Project Manager B exemplified this by describing how
the bumpy roads in Africa make the hauliers replace the driver seat with a hard wooden chair, thereby forcing the drivers to drive more carefully.

The interviewees stressed the influence of the Scania brand as a factor that becomes more and more important when the vehicle is sold on to a second or third owner, especially when they are located in countries outside Europe.

The interviewees also pointed out the fact that there are a lot of legislations affecting the import of used long-haulage vehicles. South Africa is given as an example of a country where all import of used vehicles is prohibited.
**Interview IV– Respondent D**

**Background**

The interviewee has been employed at Scania for 13 years and has during this time mainly been working at the Research and Development department with durability questions. Lately he has moved closer to the customer by becoming a product planner for R&M. The department to which he belongs focuses on strengthening the company’s service offerings by expanding the supply of services.

**First owner**

According to the interviewee, a first owner is typically a big logistics company that has industrialized its flow of logistics, that focuses on efficiency and that wants a predefined cost. The first owner decides to sell the long-haulage vehicle after approximately four years. Up until this age the vehicle rarely has technical problems and thereby also has a low level of downtime. In addition, during the first four years it is rather easy to calculate the costs that may arise. When combining these aspects, the first owner sees a breaking point where the costs exceed the expense of buying a new vehicle, which consequently is the base for the decision to sell the vehicle.

**Second owner**

The interviewee described how a long-haulage vehicle most often stays within the same country as the previous owner operates in. This is due to the condition of the vehicle, which is good enough to be attractive on the domestic market. However, some long-haulage vehicles are also sold to Russia and other eastern countries.

A second owner within the same country is most likely a smaller haulier with approximately five vehicles. These haulier businesses have often been inherited through generations and have their own workshops and belonging tools. By adding the fact that the owners often see the business not just as a profession but also as a hobby, it is very common that they themselves take care of maintenance and lighter repair work. However, the trend is that the new generation of haulier owners are not as interested in carrying out repair work on their own. This new generation is also more economically schooled than their parents and therefore put more effort into calculating costs. In addition, the vehicles are becoming more and more complex, making the hauliers tools in some situations non-sufficient.

According to the interviewee, second hand owners take care of maintenance and repair by themselves, which in turn serves as a reason why hauliers decide to buy used vehicles. On one hand, a used vehicle will most likely break down more often than a new, on the other hand there is a return in costs by fixing the problems within the business and by not turning to a more expensive Scania workshop. Another essential reason for buying a used vehicle is that the decrease in value of the vehicle is not as high as in the case of a new. However, one of the main reasons for buying a second hand truck is the reduced costs that are related to the financial investment and the belonging interest.

A second owner has not industrialized its logistical planning in the same way as the first owner, is driven by events and has a shorter horizon when it comes to planning. The up-time of the long-
haulage truck is also lower compared to a first owner. A haulier business that uses second hand vehicles most often operate in one shift transports, which typically results in 16 hours of standstill. This makes it easier to handle technical problems after the shift, thereby not affecting the next day of transportation operations. Due to the marginal reduction of costs that two or three shifts would contribute to, the hauliers have low incentives to increase the work time.

According to the interviewee, the drivers within a second owner haulier often have bigger influence on decision-making and a stronger relationship to the owner in comparison to drivers in a first owner business. This stems from the fact that drivers in smaller haulier businesses are often responsible for their own truck, making it important that the drivers are comfortable in their working environment (in this case the truck cab).

The interviewee estimated that the truck is typically sold on the next owner when it is six to seven years old. The second owner bases this decision on that the availability of the truck is becoming too low, on the increased costs related to strict emission legislations as well as expensive repairs, making a purchase of a new vehicle more economically beneficial.

Third owner
The interviewee describes Russia, other eastern countries and Africa as environments where you often find typical third owner businesses. If the vehicle stays in the same country as the second owner, the truck is often used as an extra resource within the second owner business.
Interview V – Respondent E

Background
The interviewee has worked for Scania for 2 ½ years, mainly within workshop operations. Her department handles aspects like how Scania’s workshops handle customer contact and carry out workshop services. The department is also responsible for developing work processes, services and implementing methods. She is also the regional coordinator for southern and western Europe, working closely together with the head of aftermarket to map out the needs and requirements of the workshops.

First owner
The interviewee approximated the time aspect for selling the long-haulage-vehicle on to the next owner to three to five years, the reason being to update the fleet. One of the driving forces is most likely related to the haulier company wanting to keep up a certain image towards their end customers. Regarding provided services, generally the larger the haulier company is, the larger the importance for total solutions supporting the everyday business. Furthermore she stated fuel efficiency and a high up-time to be crucial in first owner businesses.

The interviewee also mentioned that the first owner of a long-haulage truck does not necessarily need to be a large haulier business, but can also be small businesses owning only one single long-haulage truck. Common for the single-truck businesses is to take pride in owning a quality Scania-vehicle and putting a large emphasis on gadgets.

Second owner
The interviewee’s picture of characteristics of a second owner of a long-haulage truck is that it is usually smaller, privately owned fleet, employing two to three persons. It could be a family owned business with a few trucks, in some cases having an administrator to coordinate orders. These businesses generally adopt more “hands on” work procedures compared to first owner businesses. It could also be a single-truck business, where the owner has a contract with large haulier businesses like DHL and Schenker. The interviewee’s general picture of the driver’s role in decision-making is that they are often given the opportunity to get involved and give their opinion on driver related product aspects at the time of purchasing the long-haulage-vehicle. Driver convenience is important even in second owner businesses, however strongly related to organizational culture aspects.

The fleets can consist of both new vehicles as well as used vehicles, possibly as a result of the business growing. The image aspect of the company is most likely less important than for first owner businesses. The price of the used long-haulage truck is of primary importance for the second owner at the time of purchase. The initial cost and the truck being in the condition to perform the intended transports are the most crucial aspects. Over time more simple calculations are made regarding the daily operations. Less focus is placed on services connected to the vehicle.

A vital importance for second truck owners is the strive to perform necessary basic repair and maintenance on their own instead of going to a Scania workshop. This is mainly due to the high cost of bringing the truck into a specialized Scania workshop instead of fixing the problem themselves or hiring a less expensive workshop. Not hiring a Scania workshop could also be related to the availability aspect, owners of used vehicles are sometimes located in countries where Scania workshops are less frequent (e.g. Russia). Furthermore, the second owner is aware and prepared for
the implications connected to owning a used vehicle, such as a higher need for repair and maintenance, decreased up-time and in turn potentially delayed deliveries.

The interviewee further pointed out the importance of simplicity connected to offered services. In many cases services that are supposed to help the business in their daily operations are considered too complicate, administrative and time consuming for smaller hauliers. It is important that offered services are self-instructing. Furthermore, it can be difficult for the second owner to plan the appropriate times for repair and maintenance, which is an area where Scania could help the customer.

Third owner
The interviewee approximated the age of the vehicle when being sold to the third owner to about seven to 10 years. Reasons for selling the vehicle could be related to increased costs to keep the truck in acceptable condition or that the business is not generating enough profit.

Scania often looses track of the vehicle once it moves on to the second or third owner. The interviewee pointed out the importance for the Scania workshops to get information on changes in ownership in order to update customer information and start to build a customer relationship with the new owner.

General comments
According to the interviewee, Scania needs to have a more proactive approach regarding contacting customers, building a relationship and planning future service and maintenance. Scania often trust the customers themselves to contact Scania workshops, which however varies a lot between different countries. She further stated that the smaller the haulier business is, there is most likely a smaller demand for services.
**Interview VI– Respondent F**

**Background**
The interviewee started working at Scania in 2001 as a trainee. In the beginning he worked with service development, mainly with the fleet management services. He then moved on to being group manager for the order office, followed by the position as area sales manager (key account). Currently he is the product director of the long-haulage segment.

**First owner**
It is vital for the businesses within the long-haulage-segment that their equipment is of good quality and that the cost per km (in terms of oil change, fuel consumption, repairs etc.) is as low as possible. The drivers are away from home long periods of time and often sleep in their trucks during the duration of carrying out the transport orders.

A first owner is typically a professional and experienced haulier business, where up-time is crucial. After approximately four years, the first owner sells the vehicle while it still has relatively good functionality. However, the time of selling the truck varies substantially depending on where in the world the long-haulage businesses are located. In China for example, there is close to no second hand market for Scania’s vehicles and the trucks are usually used until their functionality is considered too poor. In countries like Russia or Brazil, the first owner might not sell the vehicle until after around six years, mainly due to a lower frequency of usage and hence more mileage needed for the initial investment to pay off.

Factors that affect the appropriate time to sell the vehicle are the available financial resources to maintain the vehicle in good condition, as well as on the residual value and the demand of the second hand market. Furthermore, the frequency of use is an important factor. In Europe, the long-haulage vehicles operate either two or three shifts per day.

**Second owner**
Characteristics of a second hand owner is a smaller haulier business within the same country, with only a few operating vehicles and less focus on vehicle performance reliability. For the owners of second hand vehicles, time is usually less crucial. They are more accepting on the risks associated with owning a second hand truck and are prepared to perform some of the light truck repair and maintenance work on their own. For second hand vehicle owners, the loyalty towards Scania regarding signing service contracts is considerably lower. According to the interviewee, the second owner of a long-haulage truck can generally be divided into three categories:

**Category 1:** A business that wants a less expensive vehicle and does not need as high up-time as the typical first owner business. The time of delivering the transported goods is not as critical, potential delays are not considered a big problem.

**Category 2:** A small business that is prepared to do some of the maintenance and repair work on their own. Professional hauliers might also have a used truck as a backup for less critical transport routes.

**Category 3:** A small business that want a premium brand truck but do not have the needed financial resources to purchase a brand new vehicle. This is a very small customer group.
Furthermore, some of the second owners could be small hauliers, operating mainly for larger businesses such as DHL or Schenker. The interviewee further stated that the main reason for the second owner selling the vehicle is reaching a breaking point where R&M is getting extensively more expensive. The cost of repairs combined with the risk of the truck breaking during transport is considered too large.

Third owner
After approximately 10 to 12 years, the vehicle is acquired by the third owner. The vehicles are usually purchased by a trader, shipping the trucks to e.g. Africa or the Middle East, where the legislations for emissions are considerably less strict.

The third owner business is usually located in a different country and Scania loses the traceability of the vehicle. These businesses have more basic needs and their main focus is that the vehicle is operational. These businesses are even less likely than second owners to invest money in workshop services and original spare parts; repair and maintenance is usually carried out by the business’ own mechanic and spare parts are often acquired through junkyards. Providing used parts to some extent and charging less for work hours in the workshops might be a way to reach out to these customers.

General comments
Regarding the event of acquiring a second hand vehicle, it varies extensively how much the driver’s input on technical product aspects is considered. Sometimes the driver is the owner of the haulier, while some hauliers hire cheaper labor from eastern Europe and do not consider the driver’s situation. High-end hauliers, however, most likely want to attract the best drivers to work for them and therefore consider the satisfaction of the driver.
Interview VII – Respondent G

Background
The interviewee has a long background within Scania and has worked as a mechanic, as a test engineer and has also been situated two years in India, working with mapping out the use of the vehicles in this environment. He is currently working as a technical project manager, focusing on complete vehicle product planning and identifying the needs of the customers.

First owner
The estimated time for the first owner to sell the long-haulage vehicle is after four to five years. At this point the customer has used the vehicle for a few years, it has a high mileage and selling the vehicle while it still has a good salvage value is therefore important.

Second owner
The interviewee’s picture of characteristics of a second owner in the product lifecycle is a haulier business, most often located in Eastern Europe. The main reason for these types of businesses to purchase a used vehicle is related to cost. The second hand vehicle owners still consider reliability and that the vehicle can perform the intended transport routes as crucial. The second owner is, however, more tolerant regarding costs for repairs and prepared for unexpected events. These haulier businesses still come in to Scania workshops to some extent, but also solve some repair work on their own.

Third owner
The interviewee approximated the time for the third owner acquiring the vehicle to eight years. Incentives for the second owner to sell the vehicle might be an increased need for repairs and a desire to sell the vehicle while you can still make a profit. The third owner is most likely a smaller haulier business located in countries even farther eastwards than the second owner.

Generally, third owner are small businesses that have more basic needs. They are mostly concerned with the vehicle functioning for the basic transport needs and do not focus on complex product performance aspects. These vehicle owners are less concerned with time pressure, are more accepting of the vehicle malfunctioning and often turn to temporary, cheaper and more simple repair solutions. Repairs are mostly either carried out within the business or at local, smaller workshops using pirated component copies. There is little interest in paying for new and expensive quality components and workshop services. The time aspect in combination with the low cost for repairs in some countries, facilitate more temporary solutions and “quick fixes”. It is for example not uncommon to reconstruct the vehicle by removing large components and welding on parts from other suppliers. The interviewee gave an example of a case in Asia, where the whole rear axle had been removed and in turn replaced by welding on a rear axle from another manufacturer.

General comments
In India, importing used vehicles is very restricted. Importing a used vehicle into the country is very expensive due to high duty rates, making import of used vehicles unprofitable. The main reason for the import restrictions is to support the national production. As a result of this, the long-haulage vehicles stay in the country during the whole product lifecycle. The typical first owner of a vehicle in
India is a large, professional haulier business that after some time sells the vehicle to a smaller haulier in the country.

The interviewee mentioned that he during his time in India met with a haulier in Mumbai, having several trucks in his business and carrying out transport orders for the company Shell. In this particular business, precision of delivering goods, monitoring speed and the vehicle’s overall activity was considered important. However, the interviewee mentioned that characteristics of second- and third-hand vehicle owners are less delivery precision, more flexibility, low transport efficiency and a focus on solving repair and maintenance related issues on their own or at a nearby inexpensive workshop.

Currently the infrastructure in India does not support the increasing demands for transporting goods long distances and on delivery time precision. As an example, the interviewee mentioned that currently almost half of the transports of fruit have started to rot before the time of delivery. Efforts of building large, four-six lane-freeways have been made in order to improve the transport efficiency. However, the traffic is still moving relatively slowly, which is mainly related to traffic jams, mopeds driving on the same roads or livestock appearing on the roads.

The interviewee mentioned Russia as another country that has import restrictions of used vehicles. Iran, on the other hand, imports a high number of used vehicles and are, together with closely located countries such as Turkey, typically third owners of long-haulage trucks.
Interview VIII- Respondent H

Background
The interviewee has a long history of working for Scania, starting at the company by writing his master thesis. After completion, he started working as a Scania trainee. He has been a part of many projects, among them vehicle related parts, an affiliated company that he is now the director of. He has also been a part of developing Scania’s product catalog for spare parts and technical information.

First owner
The interviewee approximated the time of the first owner selling his/her long-haulage vehicle to three-four years, the primary reason being increased costs for repair and maintenance. The first owner’s most highly valued parameters are up-time and fuel efficiency.

Second owner
According to the interviewee, second owner businesses typically do not have the same demands for up-time and the vehicles are not used as frequently as in first owner businesses. Second owners are most likely smaller businesses, not performing daily, just-in-time deliveries. Second owners could be varying types of businesses for example located in Iraq or Kenya. These companies usually have less delivery precision and time constraint, leaving room for frequent repairs. The interviewee brought up an example of a transport route from Kenya to Kongo, where the transport company only could carry out two transports a month on average due to the high amount of time it took to cross customs.

Third owner
The interviewee’s picture of a third owner business is that it is most likely located outside of Sweden, in areas in e.g. Africa and the middle-east. The third owner businesses are typically more flexible. In Africa for instance flatbeds are used most frequently which enables the haulier business to transport e.g. gravel one day and Coca Cola the next day.

A very common scenario is that an independent trader acquires the long-haulage trucks and sells them in countries in the mentioned areas. Countries with right-hand-drive, such as England, usually sell their vehicles to other countries with left-hand-traffic such as Kenya and Malaysia.

A big issue related to Scania in these cases not being involved in selling the vehicles is that they are not technically optimized for its new environment which often causes operational problems. For example, trucks being built for European diesel and European environmental regulations are not adapted for the less strict regulations in these environments, potentially causing engine failure during use. This causes a problematic situation, where the owner often is not aware of the differences and the need for reprogramming the vehicle to suit the environment it is used in, and the trader in turn not being interested in having a long-term relationship with the customer and giving the needed technical support. This is potentially harmful for the Scania quality brand.

Furthermore, reconstructions can cause significant difficulties for the owners in third owner environments. When rebuilding the car for example by adding an axle or elongating the vehicle, the truck needs to be reprogrammed in order to work properly. The integrated systems in the trucks form a complex system and many truck owners in these environments are not aware of how the systems interact and depend on one another. It is not uncommon that wires are cut during these reconstructions, often causing the CAN communication to stop working. This causes several error
messages to appear on the vehicle’s control panel, that are often not taken care of as long as the vehicle is rolling. Preventative maintenance is generally not a priority for vehicles in this type of environment.

Third owner businesses do not typically hire Scania workshops to carry out repair and maintenance work. The interviewee brought up his experiences from a business trip to Iraq, where he saw how the vehicle owners mainly bought used spare parts at local dealers and then mounted the parts on the vehicle themselves or at a nearby workshop. The interviewee stated that in one particular case, a truck owner came in to a Scania workshop to repair his truck. After many trouble-shootings and trying to identify the problem, the workshop worker finally realized that the cause of the malfunctions was that the owner had purchased and mounted the wrong type of diesel injector.

General comments

Generally, the character of the second and third owner businesses are need for more basic approaches to manage their everyday operations.
**Interview IX – Respondent I**

**Background**
The interviewee has worked at Scania for 25 years within product development. He has mainly worked with hardware development of electronic systems and also with software to some extent. He has also spent a period of time working in Tanzania, gaining knowledge about the context of use. For the last seven years he has been working as a technical manager focusing on systems architecture of electronic systems.

**First owner**
The interviewee approximated the time of the first owner selling the vehicle to four to five years. One of the reasons for selling the vehicle could be related to emission regulations and economical aspects. First owner businesses very often have service agreements with Scania and have regular maintenance to keep the vehicle in good condition. Up-time is typically valued very highly in first owner businesses.

**Second owner**
Because of the interviewee’s specific knowledge about Tanzania and the trucks that are exported directly from Great Britain to Tanzania, this case turned out to be the focus of the interview. Exporting vehicles from Great Britain to some countries in Africa is common, due to that these countries, like Great Britain, have left-hand traffic. Sometimes the vehicles are modified and serviced before the export, and sometimes this is carried out directly at the time of arrival.

In Tanzania, the incentive to buy a used vehicle is highly related to a decreased need for up-time and delivery precision. There is more time for repairing the vehicles and the service costs are low. The labor cost in Africa is significantly lower than in many other countries, making it more profitable to repair vehicles than investing in quality vehicles and product components. The interviewee stated that the cost for replacing an electronics unit for example could be equivalent of hiring and paying two to three workshop workers for a quite long period of time. Furthermore, the cost of driver labor is also low and the drivers often receive basic driver training.

Drivers and workshop workers in these environments are used to significantly different prerequisites regarding technical aspects than in western countries. The interviewee gave an example of that people working in these contexts might not be used to actions such as pushing a button in order to turn on a light, a result of not having electricity in their homes. He also pointed out the issue that warning lights and error messages are ignored, as a result of that the truck seems to work fine anyway. Furthermore, the driver situation might be very difficult due to the complexity of the vehicle’s user interfaces. These aspects indicate a completely different perspective on the complexity of the vehicle and the people operating it.

The needs of haulier businesses in Africa are relatively basic, focusing mainly on the core needs of the vehicle working for the intended transport routes. Aspects such as comfort (e.g. air conditioning) are not prioritized highly. These vehicle owners do not mind having functions such as air condition or components controlling exhaust emission, but do not have an interest in repairing these components if they break down. The latter is related to emissions regulations being less strict in Africa, in turn making vehicle components related to emission control a small priority. In some cases when there is
a serious malfunction that they are not able to repair on their own, customers turn to Scania workshops. The interviewee gave an example of a customer bringing his truck in to a Scania workshop to get the engine repaired, but did not want one of the broken brakes to get fixed at the same time. The repair of the brake was not considered a priority.

In Tanzania, there are also some larger foreign haulier businesses operating in the country that put more emphasis on quality and delivery precision. In these businesses, having high quality vehicles that can generate a high up-time is essential, which demands the contracted, smaller hauliers to keep their vehicle fleet in good condition.

The safety and protection of the vehicle and its cargo is an issue for business owners in these environments. Problems connected to unreliable and inexperienced drivers as well as risks of robberies indicate a strong need for communication and knowing where the cargo is located. The interviewee mentioned that many haulier businesses have welded a steel container onto the truck to hold the cargo instead of the common cover made of fabric, in order to minimize the risk of robberies during transportation. Furthermore, locks are placed on many of the truck components as another precaution to avoid theft. Sometimes the drivers even sleep under the truck during transport missions in order to protect the cargo.
Interview X – Respondent J

Background
The interviewee started her career at Scania as a trainee and then continued to work with development of motor systems. She has also been a Ph.D student within failure diagnostics at Scania. Currently she is working with service market aspects, which includes supporting the workshops and the mechanics with for example the needed tools and service programs.

First owner
The interviewee believes that the first owner sells the long-haulage truck after approximately five years. The reason for selling would is according to the interviewee most likely connected to the fact that the first owner wants a modern vehicle that is functioning properly and the vehicle is at this point considered too unreliable.

Second owner
The reason for buying a used truck is according to the interviewee related to the buyer’s lack of financial prerequisites for buying a new vehicle. The interviewee assumes that a second owner, compared to a first owner, is a smaller haulier business with a maximum of approximately 15 trucks. A second owner might also have lower requirements on up-time and generally drives shorter distances in comparison to the first owner. According to the interviewee, the second owner is more willing to accept the risk of vehicle break-down. Second owners often carry out repair work on their own. The interviewee further stated that a second owner may have a diversifying business when it comes to variation in transport assignments. A first owner might to a greater extent have a more specific business concept.

In the case of a first owner being located in Western Europe, the second owner might also be found in this area, but with a transition to the eastern parts of Europe.

The interviewee further approximated that the second owner uses the truck for five years and decides to sell it when the costs for repair increase to a level justifying selling the vehicle.

Third owner
In the third life the truck is sometimes transferred further east. Just as the second owner, the third owner buys a used vehicle due to lack of financial prerequisites for buying a newer truck. The interviewee’s perception of the third life is that the truck is used for operations even further away from the original transportation mission. The truck is used sporadically and is used to support the core business. She would also assume that the technical requirements become very basic and it is not of interest if for example the air condition breaks down.

General comments
The percentage of trucks that visit Scania workshops becomes lower and lower with the age of the truck. When owning an old truck it is not considered necessary to buy Scania spare parts, you may choose cheaper variants.
Interview XI – Respondent K

Background
The interviewee has been working at Scania for 27 years. The department to which he belongs works with business intelligence and monitors competitors and customers.

First owner
According to the interviewee there are several types of first customers within the long-haulage segment. Mature customers who have big fleets and often change trucks often stands for a small percentage of the total amount of customer. The majority of the customers instead buy fewer trucks and do not change vehicles as frequently.

The first owner most often has transportation and logistics as core business. The owner thereby finds the aspect of renting or owning a truck of less importance, as long as the transportation is performed successfully. First owners are also generally not interested in having their own workshops. A mature customer within Europe sells a long-haulage vehicle after approximately three to five years. The decision for selling the truck is typically related to increased repair costs and wanting to sell the truck while it still has a reasonable resale value.

Second owner
The second life of the long-haulage truck can be found within the company of the first owner, often a big haulier business. This entails that the first owner moves the truck from the core business to a second operational area where the truck is used under milder conditions.

If the truck is not transferred within the same company to a different area of use, it is sold to a haulier with the same characteristics as mentioned above, meaning a customer that does not have transportation as core business. In this context the vehicle is used under different operational conditions, including less frequent transports, less heavy loading and not as long driving distances as in the first life. In this phase the truck is seen as a cog in the value chain of the business. The second owner does most often have a workshop within the business and is aware of the fact that the truck might not run as smoothly, but knows by experience for how long it can be used.

The interviewee further described how someone that buys a used truck does not have the money for buying a new truck, or is less mature in their business mindset. This means having a different way of thinking when it comes to ownership of vehicles and how businesses are conducted. The interviewee exemplified this by equating a second owner with a less mature first owner. These owners focus on short-term profit, considers the price of the truck important, have their own workshops and use both OEM spare parts as well as parts from other brands. They further view personal relations with for example other workshops very important and appreciate up-time and quality. This thereby differs from a mature first owner, who requires up-time and quality, has R&M contracts with the OEM, cares about safety aspects and the drivers and is more loyal to the OEM.

Concluding this, it is according to the interviewee not possible to find a segmentation area for the second owner. The second owner business is consequently a company that is driven in a way that complicates the possibility to see a return and advantages in buying a new truck.
Third owner
The third owner of the long-haulage truck is even less mature than the second owner, which implies even less emphasis on previous mentioned aspects. The third owner typically uses the truck until it is scrapped.

General comments
According to the interviewee, Russia, as well as countries in the Middle East and Africa are areas where second and third owners can be found. However, it is not possible to claim that these countries always will buy used long-haulage trucks. Where used vehicles end up depends on economic cycles as well as on the financial condition of the country. The interviewee exemplifies this by describing how Russia used to buy many second hand trucks, but due to a recent economic growth and an increasing consumption in the country, the Russian businesses have also started to buy new and modern trucks.

The interviewee also stressed the fact that every market is unique and this uniqueness makes it difficult to generalize, even between two countries such as Spain and Italy. Regulations regarding import also have a big influence on the second and third life of the long-haulage truck. However, there will still be trucks imported in, by law prohibited, countries.
Interview XII – Respondent L

Background
The interviewee started at Scania writing her master thesis and has worked for the company since then. Throughout her career at Scania she has mainly worked with braking systems, working as a group manager within purchasing and as a quality manager within electronics among other positions. In 2011 she worked in Malaysia with a project aiming at customizing the often specified standard vehicles that are imported into the country. This entailed providing a technical solution by modifying the vehicle directly when it was brought in to the local workshop.

First owner
The interviewee approximated the time for the first owner to sell the vehicle to about five to seven years. First owner businesses are generally knowledgeable in aspects of lifecycle cost, costs for repair and maintenance and the cost of down-time. The risk of having used vehicles and thereby chancing that the vehicles break down is considered too high.

Second owner
The interviewee stated that many of the right-hand-drive vehicles are exported from Great Britain to countries such as Tanzania or Malaysia. Because of the interviewee’s specific knowledge about Malaysia, this case turned out to be the focus of the interview. About 1000 long-haulage trucks are imported to Malaysia each year, out of which 350 are new trucks and close to 700 are used vehicles from Great Britain. The trucks are generally directly imported from England via traders. All vehicles that are brought into Malaysia have in common that they stay in the country until end-of-life. The interviewee stated that many of the vehicles are driven until they literally fall apart and that older trucks were seen frequently on the streets in the area.

Many of the hauliers in Malaysia are big fleets, often owned by a foreign stakeholder. These businesses are usually very organized and have many used vehicles in their truck fleet. A characteristic of used vehicle owners in Malaysia is that the initial price of the truck and the cost of spare parts are of primary importance. Malaysia and also other countries, such as Indonesia and Thailand, do not focus on holistic lifecycle cost calculations for owning a used vehicle. The interviewee stated that her and her colleagues tried to convince these vehicle owners to trade their truck in for a better one, due to the long-term financial benefits compared to maintaining the old truck. However, this turned out to be challenging.

Loss of income in terms of e.g. standstill related to vehicle malfunction is not considered an important aspect. When the trucks break down they are simply towed to the closest workshop or repaired directly at the side of the road. Preventative maintenance is therefore generally not a priority and only the most urgent repair work is carried out, creating a very short-term focus. Focusing mainly on logistics in Malaysia is not common and delivery precision is therefore usually not considered important. The labor cost is extremely low and many large transport businesses in Malaysia hire small hauliers, operating used vehicles. The lowered cost for the transport operations is considered more important than being efficient and delivering on time.

The vehicles imported to Malaysia from England are usually rebuilt from 4:2 tractor to a 6:2 tractor, still however operating as a long-haulage vehicle. The interviewee stated observing frames being...
The lack of focus on driver safety is related to a poor view of human beings, where the business owners often do not view the driver’s comfort and safety as their responsibility. Furthermore, the business owners do not put much trust in their drivers and the drivers in turn do not have many incentives to focus on factors that contribute to financial gain for the business owner. Environmental aspects and lowering fuel consumption while driving is not considered a high priority. The speedometers are often removed and many of the drivers drive at a speed of over 100 km/h. Saving time by driving fast in combination with loading the trucks heavily with cargo is considered a good way to make profits.

A problem that many of the truck owners come across in Malaysia is theft of vehicle components. In order to avoid theft, easily accessible parts such as batteries, fuel tank caps and spare tires are locked with padlocks. Furthermore, the drivers are only allowed to fuel up the vehicles at specific fuel sites. The use of surveillance equipment to cope with this problem is often not an option due to financial limitations.

Third owner

The interviewee stated that the main reason for the second owner selling their truck is because of an increased frequency of standstill that complicates the transport business. The third owner uses more pirate components compared to the second owner of the vehicle; the loyalty towards the OEM is considerably lower the further away in ownership you get. The third owner only brings his/her truck into a Scania workshop if they cannot start the truck or in other cases of serious vehicle malfunction. Error messages and warning lights are not considered a problem and the most urgent repairs are carried out by themselves or at a local workshop.

General comments

The vehicles sold by traders are usually rebuilt before being shipped to other countries and sold. Customers buying used vehicles in countries like Malaysia rarely inspect the vehicles thoroughly before purchase and are often not aware of potential vehicle errors. The traders often try to hide vehicle problems. The interviewee stated that it was not uncommon for traders to put tape on the inside of the display, thereby hiding error messages regarding vehicle malfunction. In an attempt to interest more vehicle owners to consider Scania for repair and maintenance work, Scania has given vouchers to traders offering e.g. a free service, to in turn give to customers. This was, however, proven to be unsuccessful due to lack of incentives for the traders to pass the vouchers on to the customers. The interviewee stated that this is most likely due to the traders not wanting Scania to find errors that they have tried to cover up, such as the tape.
Interview XIII – Respondent M

Background
The interviewee has an educational background as a blacksmith but started at Scania as a mechanic. Further, he continued as a technical supervisor in Saudi Arabia. He has during almost the entire time of his professional life been working abroad and lived in countries such as Saudi Arabia, India, Ethiopia, Turkey, Malaysia and South Africa. During these employments he has been responsible not only for the country in which he was stationed, but also for surrounding areas. Today he is responsible for 48 of Scania’s markets, working with technical vehicle questions related to certain market conditions.

First owner
According to the interviewee, there are two types of first owners of long-haulage trucks; hauliers owning just one or a few trucks and hauliers with big fleets. Generally, the first owner sells the truck after approximately five years; the big hauliers may even sell the vehicle after as early as three years. The reasons for selling are mainly related to increased euro classes, which create incentives to change vehicles, and increased costs linked to the truck becoming worn out.

Second owner
If the truck has a high euro class, matching the existing regulations, the long-haulage truck is most likely sold to a second owner in Europe. In this case the truck is still operating in the long-haulage segment but within smaller haulier businesses. In this type of second life the truck is used more or less in the same way as in the first life; transporting goods at the same types of routes. According to the interviewee, this is partly related to the difficulties that come with rebuilding a long-haulage tractor. However, the interviewee describe how due to the age of the truck, the second owner do not expect the same availability of the vehicle.

According to the interviewee, a second owner of a right-hand driven long-haulage truck is found in Africa, in countries such as Tanzania, Kenya and Angola, and in Asia, in Malaysia. Second owners are in some cases also located in the Middle East and the Baltic. The transfer to countries outside Europe depends on the current emission regulations, which prevent the long-haulage truck from being sold to an owner in Europe. The origin of the trucks is most often in Great Britain and the trucks are often acquired and in turn exported through vehicle traders. The traders are generally not interested in rebuilding the truck’s to better fit its new operational environment. This often entails operational difficulties, related to that trucks with the wrong level of euro engine legislation end up in countries using lower quality fuel, or that the trucks are not robust enough for the vastly different road conditions.

The second owner in these countries buy a used vehicle only based on the reduced price. According to the interviewee, this aspect is all that counts which in turn make technical aspects insignificant when these owners buy a second hand truck. In countries in Africa and the Middle East, the second owner is most likely a smaller haulier with only one or a few trucks. However, in Malaysia big fleets buy second hand long-haulage trucks.

The interviewee described how the second hand truck in Africa often is more loaded with cargo than in the first life. However, the truck is not used in the same way as in the first life, meaning that the
European time pressure do not exist in these countries. The truck is often used ad-hoc whenever a transport order comes in.

According to the interviewee, the role of the driver differs a lot in these countries compared to the first life in Europe. The drivers are the lowest paid, with a negligible salary. There are no regulations regarding working time, the drivers are often inexperienced and safety aspects are of not considered a priority. The interviewee also described how loyalty does not exist between the drivers and the haulier owners, or even between Scania mechanics and Scania. These aspects often lead to that drivers e.g. steal components or fuel from the trucks. The interviewee exemplifies this by describing how the trucks do not even have a spare wheel.

According to the interviewee, second owners outside of Europe do not come to Scania for R&M. Instead, the repairs are fixed by the haulier themselves or the problems are left unsolved. Alternatively, the parts that are broken are removed from the truck until the truck stops functioning. Compared to a first owner, second owners in Europe are not that inclined to turn to Scania workshops.

A second owner in Europe uses the truck fewer years than the first owner and decides to sell the truck due to increased costs. According to the interviewee, a third owner typically does not exist in countries such as Malaysia or in Africa. These second owner uses and repairs the truck until end-of-life.

Third owner
The interviewee stated that a third owner often buys the truck to transfer something; in this life it is not significant that the truck is a long-haulage truck. Logistics and long-haulage transport operations is typically not the core business of the third owner. According to the interviewee, the third owner does not care about service and never visit Scania’s workshops. The third owner also to a large extent buys pirated or used spare parts.

The interviewee also described an alternative third life, where the truck is scrapped into parts and then exported. By scrapping the truck it is possible to evade regulations regarding import of vehicles.

General comments
According to the interviewee, it is important to remember that in some countries in the Middle East, Eastern Asia and in Africa it is difficult to get hold of both connected data and vehicle records. A lot of the information in these areas is missing and if it exists it is often controlled and restricted.
Appendix F – Interviews with distributors and customers

Interview I – Respondent N

Background
The interviewee has worked for Arver lastbilar for 14 years, the last four years as a service market director for the region Norrköping, Nyköping and Katrineholm. Before he started working for the company he worked within the armed forces for 15 years and has also worked as a design engineer for ABB.

First owner
The interviewee’s picture of a typical first vehicle owner is a big haulier business with a large number of trucks in their fleet. The first owner of the long-haulage truck is often located in Europe and generally sells the vehicle after four to five years. The reason for selling the vehicle is most often a break-even between expenses and income, which entails that purchasing a new truck is more economically beneficial. First vehicle owners are generally more interested than later owners in the product lifecycle in keeping the vehicle in the best possible condition and are therefore more prone to perform regular maintenance. The interviewee further stated that businesses that buy new long-haulage trucks are leaning more and more towards less specified, standardized vehicle solutions. The primary focus for these businesses is cost-effectiveness, that the truck is specified for the intended use and that the required emission regulations are met.

Second owner
Buyers of second hand trucks are according to the interviewee typically smaller haulier businesses with up to five trucks in their fleet. The interviewee further stated that trucks most often stay within the same country in Europe in the second life. Characteristics of owners of these types of haulier businesses are that they very often at the same time operate as drivers as well as plan the transport orders.

The main incentive for purchasing a used truck is the lower price. Second owners are also typically more willing to perform simple repair and maintenance work on their own. The risks associated with owning a used vehicle are handled by having enough resources, both time and financial, to manage unexpected events. Furthermore, the second owner is also willing to compromise regarding specific technical features, focusing mainly on basic product aspects such as the truck having the appropriate axle measurements.

Long-haulage trucks are usually used for long-haulage transport operations even in the second life. This is related to that the formation of the wheelbase makes it difficult to use a long-haulage truck for other types of transport operations. The interviewee further stated that the trucks in their second life usually are used for shorter transport routes.

Arver Lastbilar often sell the trucks in combination with a maintenance service deal, even for the used vehicles. Maintenance service deals are according to the interviewee often considered necessary even by second hand truck owners. This is mainly related to convenience but also to the high technical complexity of some repair work. Even older vehicles have highly complex electronic control units for example, which can be problematic to repair. The maintenance service deals further include necessary software updates.
Ensuring that the driver has a good working situation and having enthusiastic, reliable and satisfied employees is considered especially important in second owner businesses. This can, however, also be true in first and third owner businesses.

Lastly, the second owner typically keeps the long-haulage truck until it is eight to ten years old, most likely selling the vehicle due to strict environmental regulations.

Third owner
The third owner acquiring the vehicle is usually located abroad in a third world country. The vehicle could also go to scrapping, either handled by the company itself or by Scania. There is a big market for the spare parts and since the value of the vehicles is considerably lower by the time it has passed the second owner, selling spare parts is often considered being a better solution. The needs of a third owner business are more basic than previous owners’ and the main focus is that the vehicle is running. These owners typically perform their own maintenance and mainly base the acquisition of a used vehicle on the purchase price.

General comments
The interviewee stated that prices of used vehicles in Scandinavia are too high to attract customers from other countries in Europe where the prices are considerably lower. 4:2 trucks are further very common in other countries in Europe and there is therefore little need for these countries to import 4:2 long-haulage trucks.
Interview II – Respondent O

Background
The interviewee has worked at Scania for a total of 27 years and has had several work positions throughout her career. Amongst her previous work positions are buyer, product engineer, sales informant and parts manager. She is currently working as a service manager at the Scania distributor Scania-bilar Sverige in Hovsjö, which to a large extent focuses on repairs of vehicle collision damage as well as providing used spare parts.

First owner
The first owner is typically a large haulier business, operating three shift transport operations. This entails that it is crucial that the trucks within the business are in good condition at all time and there is no room for time-consuming and costly stand-still. These haulier businesses further have a LCC mindset, focusing on different factors influencing the total cost of the truck over its lifecycle. This leads to that these businesses have a larger interest in signing repair and maintenance contracts in order to make sure that the vehicle is always up and running. The drivers generally do not have an impact on aspects related to their working environment and making sure that the vehicles are customized for specific driver’s preferences.

First owner businesses typically sell the truck after three to five years, depending on the mileage of the truck. At this point the truck is starting to need more frequent repairs causing stand-still, and is therefore not considered in good enough condition to carry out the intended transports.

Second owner
The vehicle often stays within the same country of origin in the second life. Second owner businesses are generally smaller, often with around five trucks carrying out the transport operations. Often, second owners are family businesses, taking care of the administration as well as operating partly as driver, further hiring additional one or two drivers to enable taking on a higher number of transport assignments. It could also be businesses that primarily focuses on taking on shorter transport routes within a closer area and does not operate on the European continent. Delivery precision is considered important, especially in cases where this type of smaller business takes on transport operations for larger haulier businesses.

The trucks within the business are generally not utilized for three-shift transport operations. Since the truck is used and has a higher mileage, the owner acquiring the truck has lower expectations and is prepared for some needed repair work on components such as clutch and brakes. Despite the acceptance of some wear and tear, smaller malfunction and more frequently needed repairs, there is still an expectation of quality and that the main functionality of the truck is high.

Owners of used vehicles are generally foremost interested in repairing the truck as cheap as possible and often focus on the hourly price of workshop repair work. Even though second owners view truck maintenance as a priority, they do not always turn to Scania for this type of work. It might be carried out in-house or at a local workshop. The event of signing maintenance contracts with Scania is significantly decreased in comparison to the first owner and the older the vehicle gets, the lower the loyalty to turn to Scania for R&M work.
Furthermore, the interviewee stated that the younger generation taking over in e.g. family businesses are often not as interested in performing R&M work. This if further due to the increased technical complexity of the trucks related to electronics and control systems, which leads to a need to turn to Scania for repairing malfunction related to these factors.

Despite varying from business to business, the drivers generally have a larger impact on decision-making related to their own working environment than in first owner businesses. This relates to these smaller businesses wanting to maintain a secure and close relationship with the drivers as well as keeping these drivers within the business.

Third owner
The third owner of the vehicle is generally located in a different country, often being transported further east. This is sometimes related to that the vehicles are too old to be allowed to operate in the environmental zones, which creates difficulties. The interviewee estimated the time of the second owner selling it on to the next owner to 10 years. At this point, the vehicle is in significantly decreased operational condition and is often used for shorter transports, alternatively as a spare truck. Furthermore, the truck is often turned into scrap instead of reaching a third owner. The interviewee stated that sales of used truck parts such as rear view mirrors, truck cabs and other larger components are common.
Interview III – Respondent P

Background
The interviewee works at and represents Sveriges Åkeriföretag, the Swedish trade association of the haulage industry. The association monitors the interests of the haulage industry and supports their members businesses as well as their need for e.g. advocacy and business development.

Second owner
According to the interviewee, the characteristics and needs of second owner’s operations and area of usage are cannot be as clearly distinguished as for first owner businesses. In the second life, the truck might not be used strictly for long-haulage. However, the interviewee stated that it is difficult to use the truck in vastly different business areas than long-haulage. This relates to that the long-haulage truck is constructed for being used on asphalted roads in good condition, making it hard to drive the vehicle under poorer road conditions.

In addition, having a contract with big hauliers such as DHL or Schenker is not feasible when having a second hand truck. Instead, the truck is sold to someone who will use the vehicle under different conditions and less frequently. According to the interviewee you do not buy a second hand truck for using it 24/7. If haulier businesses want or need to have that high utilization, they buy a new truck. The interviewee stated that when buying a new truck, the owner does it due to a need of high reliability and a want for low service costs. A used truck needs more repairs, which in the end will end up in high costs and in standstill.

A haulier may also keep a used long-haulage truck in the company and either use it as a spare truck for example during the summer months or as a so called service truck, used when the other trucks are in the workshop for service. Just as when the truck is sold from the first owner to a second owner using the vehicle under milder forms, a spare truck is used less frequently and perhaps on more regional transport operations. Hence, according to the interviewee, even if the truck in its second life is kept within long-haulage traffic, it is used in transport operations that do not require as high focus on delivery precision. To sum up, the second hand truck is used in a different logistics setting with less sensitivity than in first owner businesses.

According to the interviewee, owners in the truck’s second life are generally not interested in buying service contracts. The truck is instead brought to third hand parties for R&M, alternatively the problems are fixed within the business. The truck is only brought to Scania in cases of problems that can only be fixed at a Scania workshop. The interviewee further stated that this low interest in visiting brand workshops complicates for the manufacturing companies, such as Scania, to be able to offer attractive service offerings to the second hand owner.

In addition the interviewee stated that the second hand truck does not need extensive service and maintenance. This relates to that the vehicle does not have the type of utilization that requires a truck to be operational 24/7. In comparison, a new truck always need to be kept in good condition, creating a higher need for continuous R&M.

According to the interviewee, the truck may in its second life be sold to another country. However, which countries that buy used trucks differs along with the worlds currencies and is thereby dependent on economic cycles. Previously, all used trucks were sold to the Baltic countries. However,
today theses countries to a large extent buy new trucks. When the truck leaves Europe and transferred to e.g. developing countries, the truck leaves the established logistic business world and enters an environment in which logistical flows are of low importance. Instead, basic needs such as “Can the truck move backwards?” become important. This also goes hand in hand with the interest and need for R&M becoming absent. However, in some countries in e.g. Africa, the truck driver’s prerequisites are totally different compared to for example Sweden, in terms of a less regulated and less comfortable working situation.

Third owner
According to the interviewee, in the third life the truck can be used for more or less anything. The truck is no longer used as a long-haulage truck, instead it is used due to its ability to transfer goods; the focus moves from logistics to be able to move things. In this life, the interest for service contracts are totally absent.

General comments
The second owner hauliers that conduct logistic transport operations are in need of trucks providing information that are facilitating the use. The interviewee exemplified this by stating how the information on the condition of the truck would be a suitable service. In addition, driver information and decent maintenance and service would most likely attract those owners that are using the truck as an extra vehicle. Lastly, according to the interviewee, IT support is a question of generation, meaning that younger generations are starting to appreciate and embrace the benefits with information technology.
Interview IV – Respondent Q

Background
The interviewee is working as a service manager at a Scania distributor in the western part of Sweden. Apart from being stationed in Sweden, the interviewee has for longer periods worked abroad, mainly located in Malaysia, where he recurrently met and had close relationships with long-haulage truck owners within these countries.

First owner
The interviewee described the first owner as a haulier business with small margins and which thereby has a need for constantly having the trucks operational. According to the interviewee, the long-haulage truck is approximately five years old when the first owner decides to sell it. The selling decision is underpinned by the end of the truck’s depreciation time and a wish to sell the vehicle while it is still in good condition. The biggest amounts of trucks are sold from Great Britain.

Second owner
When the truck in its second life is kept within Europe, such as in Sweden, the interviewee describes the second owner as a haulier with higher margins in comparison to a first owner and with the intention of possibly using the truck as a spare vehicle. These types of businesses have high acceptance when it comes to the truck being old and therefore use the truck in a milder way, in which the vehicle is not as highly utilized as in the first life. Second owner businesses are also okay with the truck not functioning as well as in its first life. Second owners are less inclined compared to first owners to turn to Scania’s workshop. However, due to the truck becoming more complex the second owners have started to visit the workshops more frequently.

According to the interviewee, the long-haulage truck is also sold to countries in Africa, Malaysia and the eastern parts of Europe. However, regulations regarding import and emissions increasingly determine which countries that can buy used trucks. Currently, Malaysia is a country to which a large amount of used trucks are exported. In above mentioned countries it is the truck’s cheap price that is seen as essential when buying a used vehicle. If the truck is not exactly what is wanted or needed, it is rebuilt. When rebuilding, components from other trucks as well as other brands are used.

In Malaysia, it is primarily big fleets that buy the used trucks. However these fleets are beginning to buy new vehicles as well. A truck that in Great Britain is considered to have a very high mileage is in Malaysia seen as a fully acceptable and useable vehicle. In Malaysia, as well as in countries in Africa, it is only essential that the truck’s basic functions and features are working and the truck is often loaded heavily. The interviewee exemplified the focus on basic technology by describing how for example broken rearview mirrors are removed due to being too expensive to replace.

In addition, in these countries the used truck is seldom repaired or serviced. If something needs to be fixed the problem is solved within the business. Furthermore, it is often considered better to remove non-functioning components instead of repairing them. However, if the truck still needs to visit a workshop repair workshop, labor costs more or less nothing. Additionally, according to the interviewee, thefts in the workshops are common.

The interviewee further stated that the driver in Malaysia has low ethical value and can get fired more or less on the spot. The interviewee emphasized the importance of driver education for drivers
in for example Malaysia. He further mentioned alerts or instructions on the truck’s panel as useful. However, the interviewee stressed the difficulties that probably would arise in relation to the truck being rebuilt and components removed, which in many cases creates a non-functioning panel.

When the second owner in Europe decides to sell the truck it is sometimes due to lack of profitability. The truck has been repaired to a large extent, which has generated high R&M costs. When the used truck is located in Asian countries such as Malaysia or in Africa, the vehicle is very seldom sold to a third owner. Instead, the second owner uses the truck until its scrapped.

**Third owner**

According to the interviewee, a third owner can be located within Europe. If the truck for example is found in Sweden it is used for simple transfers, such as moving firewood from one place to another or as a temporary vehicle. The truck is not used within in or for a business purpose. Even more, compared to in the second owner business, emphasis is put on the truck just having basic technology. An alternative third life for the long-haulage truck is the vehicle being scrapped.

**General comments**

The interviewee was involved in project in Malaysia, trying to increase the amount of hauliers that visited Scania workshops. The main difficulty in this project, as well as in Malaysia in general, was to convince and motivate the customers to see the advantages and positive aspects with visiting the workshops. The project tried hard to enlighten the customers regarding what the negative aspects of for example not changing oil could be. By doing so, the amount of customers visiting Scania’s workshops increased.
Interview V – Respondent R

The business
The interviewee has worked as a driver of long-haulage transports since ’65. After a few years he started up his own haulier business and has currently managed the company for 38 years, carrying out both domestic and international transport operations. The international transports included operations in countries like Spain, Portugal, Saudi Arabia and Iraq among others. As a result of making a low profit on international transports, the business shifted its focus in the 90’s to solely undertaking domestic transport operations. Due to running on contracts and the characteristics of the undertaken transport operations, on-time delivery is crucial. Late arrivals are not tolerated and penalties often entail having to set up a new time for delivering the goods.

The transport business operates in three shifts and currently employs 20 drivers. The fleet consists of 25 trucks, most of them purchased as new trucks in 2006. Two of the trucks in the fleet were bought used.

The vehicle
The business owner typically purchases a new vehicle and keeps it within the business an additional two to three years after the five year break-even point, in order to finance the next truck purchase. Keeping the vehicle fleet modern is important. According to the interviewee, having a whole vehicle fleet consisting of only used truck is not considered an option, primarily due to the just-in-time transport operations and that the need for frequent repairs is not considered sustainable.

The interviewee has not had any issues related to owning a used truck and he specifically only purchases trucks that are still relatively new (no older than seven to eight years). This is first and foremost related to ensuring that the vehicle is in an acceptable condition as well as responding to the strict environmental regulations. The interviewee further stated that he only purchases vehicles that has a mileage of 20 000 – 30 000 miles.

The used vehicles in the business’ truck fleet are generally expected to run almost as smoothly as the new trucks and standstill is not considered acceptable. The interviewee’s main reason for choosing to purchase a used vehicle is related to an urgent need to acquire a truck due to e.g. an incoming transport assignment. He further emphasized the importance in always responding to incoming transport orders and avoiding turning down customers. If a truck crucial for the planned transports suddenly breaks down, the time it takes to purchase a new truck can take up to four to five months, which leads to the need for quickly purchasing a truck. The interviewee stated that the used vehicles then run under the same conditions as a new truck, until a new truck is delivered. The owner stated that he usually purchases a used vehicle at the same time as starting the process of purchasing a new truck, in order to ensure that a truck is always available. The used vehicles are thereby seen as a temporary solution.

The trucks in the interviewees business are utilized until they have reached a mileage of about 100 000 miles. The vehicles generally operate under the same conditions despite the age of the truck, however gradually decreasing in usage towards the later years. The interviewee stated that one of the current used trucks is used as a back-up vehicle, used for less frequent transport assignments and for operations in environmental zones with stricter regulations.
The interviewee’s primary requirement when purchasing a used vehicle is that it functions properly and can be used for the intended transports. Luxury accessories and functions is not considered a priority. Since it is a used truck, it is not specified for the specific needs of the business owner, which leads to some compromise regarding details.

The business has its own workshop, where they according to the interviewee carry out up to 95 % of the needed repair and maintenance work. If one of the trucks for example is not running properly, it is taken into the workshop at night and repaired to be up and running by the morning. When purchasing a used truck, it is directly taken into the workshop to be inspected before being used for transport operations.

When the vehicles in the business have reached a high mileage (approximately 100 000 miles), they are sold. Usually, traders purchase the vehicles from him and in turn sell them to countries in e.g. Africa. The interviewee further stated that the vehicles used to be exported to countries in eastern Europe such as Poland and Estonia. However, these countries no longer import vehicles that have reached a high age and mileage.

The driver

The majority of the employed drivers have worked for the company for a long time, some even since start-up. Some of the drivers are hired temporarily when needed, people that he is familiar with. The close relationship between the company’s employees creates an open and transparent working environment, where issues are discussed together.

It is most common that the drivers operate their own truck and they generally do not switch vehicles. According to the interviewee, this is related to that he wants the drivers to feel a connection to their vehicle, thereby encouraging them to take good care of it and keep it in good condition. The driver’s working situation in terms of a comfortable driving environment is considered important. However, the interviewee stated that even the used vehicles have a high level of driver convenience, which is therefore not an aspect he focuses on to a large extent.

The business’ drivers are generally not interested in using technically advanced functions or devices in the driver environment. The interviewee exemplified this by that the drivers have a handheld device to scan the cargo, but still prefer writing on a waybill.
Interview VI – Respondent S

The business
The interviewee owns a haulier business, which he started in 1991 at the age of 19 years. Initially, the business was focusing on long-haulage traffic, which included domestic as well as foreign transport operations. During the following years, the domestic part became dominating and in 2006 the company made a transition to local distribution within the southern part of Sweden. Today the company has 45 employees and 30 trucks, exclusively Scania vehicles. Two of the employees manage the transport planning, which for example includes pickups and order handling. The interviewee’s wife manages the economy while he has the overall responsibility and handles purchasing.

A few years ago the interviewee decided to once again include long-haulage transports in the business. Hence, he initiated a small long-haulage part in the business. In connection with this decision, the interviewee bought a new long-haulage truck. However, the delivery time of the new truck was too long to fit the startup of the long-haulage transports. To handle this situation the interviewee bought a used long-haulage truck as a temporary solution until the new truck arrived. Eventually, the interviewee traded in the truck for a new one.

The interviewee described how he always tried to buy and have new long-haulage trucks in the business. He related this to how certain transport operations require precise delivery time, which in turn implies that used trucks, with the chance of breaking down, are not an option. The interviewee further described how he does not buy used trucks as a long-term solution or plan. He explained how a used truck is bought as a temporary solution, which is related to not wanting to take the risk with standstill and downtime.

The vehicle
When the interviewee bought the used truck, the important aspect was to find a truck that moderately matched the demands; he thereby had to settle with what was available. The used truck never suffered vehicle malfunction during the period the interviewee owned and used it within the business. However, the interviewee described this as luck and once again pointed out that the used truck would not have been a reasonable option in the long run. In this case, the interviewee also knew that the truck came from a big haulier business, which had had a R&M contract, which in turn made it easier to know that the vehicle was in good condition. However, the interviewee further stated that he relies on experience when estimating the condition of a truck.

The haulier currently have R&M contracts with Scania, which they also had in the case of the used truck. However, smaller repair work is carried out within the business.

The driver
The interviewee has always had permanent employees but has on some occasions expanded with extra staff. However, the temporary employees have in these cases been well known people. The drivers always drive the same truck and sometimes two drivers alternate.

The drivers and the rest of the employees have an open relationship, where the result from weekly meetings with the drivers contribute to improvements in for example processes.
Generally speaking, the interviewee would say that some drivers do take good care of the trucks, both used and new, and some do not. Nor can the interviewee relate the way of handling a truck to a certain business.
**Interview VII – Respondent T**

**Background**

The interviewee has worked at Scania for three years and is currently working as a salesman for used vehicles. His has an educational background in economics and has also prior to his work position at Scania worked as a truck driver.

**First owner**

Generally, customers that have good financial prerequisites and regular transport operations purchase new vehicles. According to the interviewee, the first owner’s acquisition of the truck varies. In Sweden, the customer either purchases the vehicle or chooses a hire-purchase, where owning the vehicle is most common in Sweden. The depreciation time in Sweden is usually five years and many of the vehicles that are brought in to Scania distributors to be traded in for a newer one are usually four to five years old.

The main reason for selling the vehicle is related to financial aspects. The vehicle owner sells the truck at the point where there is a break-even between the monthly cost for the truck and the cost of acquiring a new vehicle. After the truck has been used for a few years, the need for frequent repairs increases considerably.

**Second owner**

The second owner of the vehicle generally works under similar conditions and uses the truck for the same type of transport operations as the first owner. The interviewee estimated that 70-80% of the used vehicles buyers use the trucks as frequently as first owner businesses. A likely reason for purchasing a used vehicle is that the business owner is changing direction of the business or that is a new start-up. At this point, the business is not mature enough to invest in a new vehicle right away or does not have the financial prerequisites to do so. The interviewee further stated that buyers of used vehicles often take on transport operations that other businesses do not, e.g. taking over transport orders from businesses that have been declared bankrupt.

According to the interviewee, some businesses choose to only purchase used vehicles and regularly trade in their vehicles for higher quality trucks. There are also a small number of customers that choose to purchase a used vehicle with the intention to use it as back-up vehicle in the business. In this case the vehicle is not used as frequently as the other vehicles in the business and is primarily chosen for shorter transport routes. There are also used vehicle owners that keep the truck in the business until it reaches end-of-life. Once the vehicles have reached a higher age, they are most likely not used for everyday transports, and if they are, they are only used to a short time per day.

Buyers of used trucks generally have high expectations on quality, even though the truck has been used for a few years. The customers know that a Scania truck is a high quality product and therefore expect it to function properly. While some wear and tear is considered acceptable, it still needs to maintain a high level of the reliability. Furthermore, buyers of used vehicles are getting increasingly cost-conscious. Buyers of used vehicles are often prepared to travel a long way to acquire an affordable truck and the time it takes is not considered a big issue.

Even though there are some risks associated with owning a used vehicle, businesses purchasing used trucks are generally not interested in service and maintenance deals. This is mainly related to the vehicles often being in good condition and that the customers often have a conservative mindset.
These businesses often turn to smaller workshops for repair and maintenance. However, the
interviewee pointed out that the increasing technological complexity of the trucks drives customers
to turn to Scania in order to keep their vehicles in good condition.

According to the interviewee, an estimation of 90 % of the trucks sold in Sweden stay within the
country in their second life. Some of the vehicles are sold to traders in Holland that in turn export the
vehicles to other countries in Europe or to third world countries.

The second owner maintains the truck for about two to three years. At this point, the increasing
need for repair work drives the customer to sell the vehicle. Another reason is the strict
environmental regulations, driving business owners to operate modern vehicles that keep emissions
as low as possible.

Third owner
A third owner is typically not a haulier business focusing on transport as a core business. These
vehicle owners often choose to purchase a used vehicle in order to transport their own produced
goods. These owners are not used to owning a truck but often choose to acquire their own truck to
avoid buying expensive transport operations from other companies. If the truck has a significantly
high mileage it is most likely exported, most often through traders. Some businesses also choose to
purchase a used vehicle to use as a backup while they are waiting for a recently ordered, brand new
truck. It is also common that older used trucks are turned into scrap when the vehicle components
are considered more valuable separately than the truck as a whole.

The basic function of the vehicle is of main importance. Small vehicle malfunction that causes
temporary standstill is not considered a problem. However, the third owner is well aware of that
Scania is a quality product and therefore expects the vehicle to function properly.

The third owner of the truck is generally not interested in turning to Scania for R&M. The necessary
work is usually carried out in-house and the use of pirated components is common. These businesses
only turn to Scania’s workshops in extreme emergencies when the technical malfunction is too
complex to handle on their own.
Interview VIII – Respondent U

Background
The interviewee has for the past 10 years worked at Lecab lastbilar as a salesman for used vehicles. Prior to his current work position he worked for 22 years as a truck driver, transporting timber.

First owner
According to the interviewee, the first owner sells the vehicle after five to six years. The most common reason for selling is related to the high mileage the truck has reached at this point, which is an incentive to trade it in for a new truck.

Second owner
The second owner of the vehicle is typically a small haulage business with less than 10 vehicles in their fleet, working under similar operational conditions as first owner businesses. According to the interviewee, larger fleets generally do not purchase used vehicles.

The main reason for purchasing a used vehicle instead of a new one is cost-related. A smaller haulage business, where the owner also partly works as a driver, often has more room to handle temporary standstill and to carry out repair work on their own. Owners of used trucks are prepared for an increased need for repair work and in turn the risk of failure in delivery precision. Smaller haulage businesses with a few trucks in their fleet can rearrange their transport operations and thereby usually maintain good delivery precision. In larger haulage businesses where the trucks are used more frequently, standstill causes serious financial losses.

Although buyers of used long-haulage trucks have to overlook certain aspects such as color, wheelbase and cab size of the vehicle, the demands of the technical function are still the same as the first owner’s. Furthermore, the interviewee stated that the strict environmental regulations also drive buyers of used vehicles to purchase modern vehicles that have the right emission limit. Trucks with less than Euro 5 level engines are getting increasingly difficult for distributors to sell, which causes the prices to drop significantly. In turn, the vehicle owner selling the vehicle gets paid low amounts for vehicles that are still in good condition.

The drivers in smaller haulage businesses typically have a high influence in certain aspects concerning the driver’s working environment. According to the interviewee, the small hauliers generally focus greatly on keeping professional drivers within the business by e.g. ensuring a comfortable driver environment.

The second owner of the vehicle sells the vehicle at the point where it has a high mileage and it no longer works for the intended type of transport operations.

Third owner
In the third life of the truck’s lifecycle, it is almost always exported to countries outside of Europe or taken apart and sold as scrap. The interviewee pointed out that long-haulage trucks are rarely exported to European countries due to the height of Swedish long-haulage trucks, exceeding the European standard by 50 cm. The vehicles are therefore often exported through traders to countries such as Bolivia, Turkey, Iraq and Afghanistan, where they are taken apart and rebuilt to suit other types of transports. The third owner of the vehicle has vastly different expectations of the vehicle's
functionality than the first and second owner and it is used under more basic conditions. The interviewee pointed that it is very difficult to generalize characteristics of the different owners in the product lifecycle because it varies significantly.
Interview IX – Respondent V

Background
The interviewee works for the company Toveks lastbilar as a salesman for used vehicles.

First owner
The first owner typically sells the long-haulage trucks after six or seven years. At this point, the vehicle has run for about 90 000-100 000 miles and is thereby considered too old and unreliable to use for the intended transports.

Second owner
The second owner acquiring a long-haulage truck is often a startup within the same country that does not yet have the financial prerequisites to purchase a new vehicle. These types of businesses have not yet reached the maturity in their business to predict its turnover, which creates a carefulness regarding investing in brand new vehicles.

The second owner generally utilizes the used vehicle for the same type of transports as the first owner. However, the vehicle is not used as frequently as in first owner businesses. The interviewee stated that the second owner per year typically drives the trucks about 2/3 of the mileage in comparison to a first owner. Since the vehicle is not custom-made for the buyer of a used vehicle, they have lower requirements and focus primarily on basic elements. Furthermore, they are prepared for a decreased product quality and a higher frequency of repair and maintenance. Repair and maintenance is usually carried out in-house and the older the vehicle gets, this increases even more.

According to the interviewee, opinions and preferences of drivers in second owner businesses are often taken into account when purchasing a used vehicle; especially drivers that are professional. Furthermore, it is common that the business owner, besides managing the business, also carries out transport operations.

Second owner businesses typically maintain the used vehicles for two-two and a half years before selling them. According to the interviewee, the truck has at this point run for about 100 000 – 130 000 miles and the increased need for repairs is considered too time consuming, problematic and costly.

Third owner
According to the interviewee, almost all vehicles are exported in their third life. If the vehicle stays within the same country, it is most likely a business with even lower economical possibilities to purchase an expensive truck. The older the vehicle gets, the lower the loyalty to turn to Scania for R&M. This is mainly related to that these services are considered too expensive, which drives these vehicle owners to carry out the repair work themselves.
Interview X – Respondent W

Background
The interviewee is sector manager at a Scania distributor in a small Swedish city. The company has 64 employees and sells new as well as second hand cars and trucks. The interviewee started his career as a salesman for cars and continued with trucks. He has held his current position for three and a half years.

First owner
According to the interviewee, the long-haulage truck is approximately six years old when the first owner decides to sell it. The reason for selling is demands on having a new vehicle and keeping the fleet up to date. The first owner thereby changes vehicle to ensure that the trucks are functioning correctly and that they have a high up-time.

Second owner
The reason for buying a used vehicle is, according to the interviewee, related to economic prerequisites. However, the interviewee stressed that this is one of many reasons and aspects which together create a complex picture.

One type of second hand owners, in countries such as Sweden, is hauliers that have similar characteristics as the first owner. However, the haulier that buys a used long-haulage truck uses it as a spare vehicle in the long-haulage business. The interviewee also described a similar situation where the used long-haulage truck sometimes, in cases of acquirement of a new truck, stays within the company and is used as a spare vehicle. The third type of second owners are, according to the interviewee, businesses that only buy used vehicles. These businesses are long-haulage hauliers that, compared to hauliers with big fleets, do not drive and occupy the trucks as much. According to the interviewee, businesses that buy a new truck use the vehicle all day and night, while a second owner most often uses the truck for one shift operations. It is thereby, according to the interviewee, very common that the first owner utilizes the vehicle to a greater extent and the level of utilization decreases the older the truck gets. Second owners also want to be more cautious in their business. These hauliers do not have the same requirements on high utilization of the truck and also have transport operations that do not require a new truck. However, according to the interviewee, a second hand haulier still wants the long-haulage truck to function properly.

The second hand hauliers are, compared to a first owner, not equally interested of the technology that comes along with the used truck. This is related to the prerequisites that relate to buying a used truck; it is not possible to get the newest technology. The interviewee further stated that these haulier businesses want the truck to be able to perform the intended operations and thereby do not care about getting the exact technology that they would prefer.

According to the interviewee, some second owners fix R&M by themselves but many second hand hauliers do not have their own workshops. However, second owners do generally not sign service contracts or visit Scania’s authorized workshops as often as a first owner does. In addition, second owners fix problems when they occur and deal with problems when they arise. The drivers in a second owner business have low influence on the decision related to buying a certain used truck.
The second owner uses the long-haulage truck for four to five years and sells it due the need to renew the business.

Third owner
According to the interviewee, a lot of trucks are exported after being used in a second owner businesses. When being exported, the trucks are in some cases rebuilt. The interviewee further assumed that a third owner, compared to a second owner, has a totally different business including different needs.

General comments
According to the interviewee, due to the novelty of connected services it is hard to sell these offerings to second hand owners. However, services that support downloading information from the tachograph is interesting for every haulier.