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# **Future Business Model for OEMs in the Automotive Industry**

Business Model Adaptation Based on the Role an OEM Takes in a Future Business Network

Master's Thesis in Master's Programs Supply Chain Management and Management and Economics of Innovation

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Gothenburg, Sweden 2018



MASTER THESIS E2018:027

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# Abstract

Many trends are affecting the automotive industry today and the whole industry is expected to change rapidly the coming years. OEMs in the industry need to adapt their business models to these trends to stay competitive. This thesis has identified challenges and opportunities with the new way of selling mobility and aims to provide guidance to OEMs in the automotive industry that need to reposition. To identify key success factors in a future business model, two things have been analyzed. First, how the OEM can adapt to a more service-based business model. Literature about servitization and business models have been combined with findings from interviews. The findings are from interviewed companies that are from other industries and have service-based business models to some extent. To succeed with service-based business models, OEMs need to work with modularization, not only for products but also for services and in the interaction with customers. They also need to focus on customers' needs rather than wants, handle parallel business models and set up the right organizational structure as well as make sure that they have the right KPIs and measurements to create the right incentives both internally and for customers. Second, a model of a future business network has been designed to identify the roles that will be needed in the future. The business network has been used to analyze two of many different strategies an OEM in the automotive industry can take, either taking the role as just OEM or taking the roles as both OEM and owner of the mobility solutions. Interviews with companies that have comparable roles as the ones in the future business network have been conducted and used to identify important factors to consider in the business model when being a part of the future business network. Competence within the business network, market maturity, and target customers affect which role an OEM can take in the business network model. Guaranteeing uptime will be important for both roles but when taking the fleet owner role, OEMs must also be able to offer a total solution which is cost efficient and adapted to customers' needs. This thesis provides an understanding for a future business network in the automotive industry and the implications it will have on OEMs as well as presenting success factors of service-based business models. This thesis will therefore help OEMs in the automotive industry reposition and succeed when new mobility solutions are emerging.



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# Definitions

**Advanced services:** related more to supporting the customer than on the actual product, for example fleet management and integrated solutions.

**Business Concept:** Describes the business, brand or product and include basic information about target demographic, competitive advantages, selling proposition etc.

**Business Network:** The business network consists of actors such as suppliers, customers, distributors and others that support the business. The actors in a business network, work together to accomplish common goals.

**Disruption:** “innovations that lead to new classes of products that are cheaper, better, and more convenient than their predecessors” (Christensen, 2001).

**Enterprise architect:** Enterprise Architecture gives a well-defined structure to describe the connection between strategy, business processes, IT-infrastructure and the interaction between different systems. The goal is to be able to handle changes better, get more out of processes and systems while lowering costs.

**Fleet:** A group of vehicles sold to the same customers and then often used by other end-users. For example, company cars, taxis, buses, commonly bought by one customer and driven by someone else.

**Fleet Operator:** Role that includes the activities necessary to make sure that a fleet is up and running. Performs activities such as staffing of drivers, planning of service and maintenance and make sure that vehicles are available at the right place at the right time.

**Integrated mobility:** Different modes of transports that are being combined to transport something from A to B.

**Integrated solutions:** “When services and products are integrated into a seamless offer addressing customers’ requirements by focusing on solutions rather than products” (Siri Jagstedt, 2016).

**Intermediate services:** Focus on the product’s condition with repair, condition monitoring, and field services etc.

**Mobility:** Movement of people from A to B.

**OEM:** Original Equipment Manufacturer, the company that manufactures the final product that is sold on the market. The final product often consists of a combination of own-labeled and purchased components.

**Platform:** A marketplace and/or an integrator for a service, connecting the service/ product with the end-user. One example is Apple’s App Store and Västtrafik’s app.

**Robotaxis:** Self-driving car fleet.

**Service-based business model:** A business model that is based on services and integrated solutions rather than selling products.

**Servitization:** The transformational processes whereby a company shifts from a product-centric to a service-centric business model and logic.

**TaaS:** Transport-as-a-Service, means that transport becomes a commodity.

**Total solutions:** OEM or fleet operator that offer advanced services such as full-service contracts and fleet management. A total solution aims to maximize the uptime of the fleet and is closely related to total cost of ownership.

**Value Chain:** A set of activities performed by a company to deliver valuable products and/or services for its customers. The concept is a tool for analyzing a company's competitive advantage and was introduced by Michael Porter. Business environments and value systems have become more complex and the term business network is therefore used to highlight this complexity in the thesis.

**Uptime:** The degree of which a resource is available and can be utilized. Uptime is an important value proposition in fleet sales business models.

# 1 Introduction

The following chapter is an introduction to the thesis. The research context and a summary of current trends in the automotive industry is presented from a wide perspective and is narrowed down to the background of the thesis. Finally, the purpose and research questions of the thesis are presented.

## 1.1 Introduction to the Research Context

In today's fast-moving environment, new trends are emerging fast. Digitalization and servitization are two major global trends and can be identified in most, if not all, industries. Digitalization concerns the integration of digital technologies into everyday life (BusinessDictionary.com, 2018). Servitization is when companies are going from just manufacturing a product to developing capabilities that make it possible for them to offer services and solutions as a complement to their basic product offering (Poklar, 2015). A commonly used example of servitization is Rolls-Royce. They went from manufacturing and selling airplane engines as a one-off sale to selling them through a "TotalCare program" where customers pay per used hour instead. Rolls-Royce is responsible for all services, such as repair and monitoring, and the customer pays a set price per hour (Rolls-royce.com, 2018). Another example of servitization is Volvo Buses that now offers the possibility to purchase their buses as a total solution at a cost per kilometer (Volvobuses.se, 2018).

Digitalization and servitization change many industries, one of them is the automotive industry. In addition, there are four megatrends particularly effecting the automotive industry: electrification, shared mobility, autonomous drive, and connectivity. Due to those, the business models, the roles in the business network and the future customer segments are expected to change and the industry is expected to be disrupted. The four megatrends are challenging the current model of selling cars to private persons through dealers. Technology and shift in mobility preferences increase the subscription and pay-per-use business models. At the same time, the technology for autonomous vehicles has made huge advancements which will enable new business models with self-driving car fleets, robotaxis, in the coming ten to fifteen years (Arbib & Seba, 2017)(PwC, 2017)(Roland Berger, 2016). Robotaxis is predicted to drastically change the automotive business network and replace the current model of owning private cars by lowering the total-cost-of-ownership (TCO).

Technology and digitalization will according to PwC (2017) enable full autonomous vehicles around 2027 which forces firms in the automotive industry to act and reconsider their strategies. Decreasing cost of mobility is the main driver to the fast development of, and transition to, robotaxis (Arbib & Seba, 2017)(PwC, 2017). Platforms and self-driving car fleets enable new revenue streams where transport becomes a commodity, so-called transport-as-a-service (TaaS). TaaS enables new business models which challenge the current ones of selling cars as a product. Digital tech firms, fleet operators and platform owners such as Uber and Didi are predicted to gain shares of the industry profit. PwC (2017) predicts that the share of the profit will be cut in half (from 85%) for OEMs, suppliers, and, dealers. It is difficult to predict how fast autonomous vehicles will gain market shares but PwC (2017) predicts that 37% of traveled kilometers will be with shared autonomous vehicles in 2030. Arbib & Seba (2017) are more

aggressive in their prediction and state that by 2030, 95% of the passenger miles traveled in the U.S. will be with on-demand autonomous electric vehicles owned by fleets.

These predictions stress the automotive industry to react and OEMs have started to reconsider their current business models. New customer segments such as fleet operators, Uber, and governments are being evaluated as well as new competition from tech companies and potential platform owners. As a consequence of that, fewer customers are expected to own their cars privately in the future and fleet sales is expected to become a larger segment and take market shares. OEMs such as BMW, Volvo Cars, Porsche and Hyundai together with start-ups and auto lenders are therefore testing their way forward by offering car-as-a-service solutions (Martinez and Walsworth, 2018). It is clear that OEMs need to adapt to the changing business environment by deciding which actions to take. According to Arbib & Seba (2017), OEMs can take four different actions. These four alternatives reflect the strategic choice of what degree they will follow the trend of servitization and become a service provider or continue to focus on their current business model, providing cars.

1. Focus on hardware manufacturing and assembling
2. Build and operate fleets for TaaS providers (OEM + fleet operator)
3. Become a TaaS platform provider (OEM + platform owner)
4. Vertical integration and participating in all parts of the value chain

The alternatives are illustrated in Figure 1 below with examples from different industries.

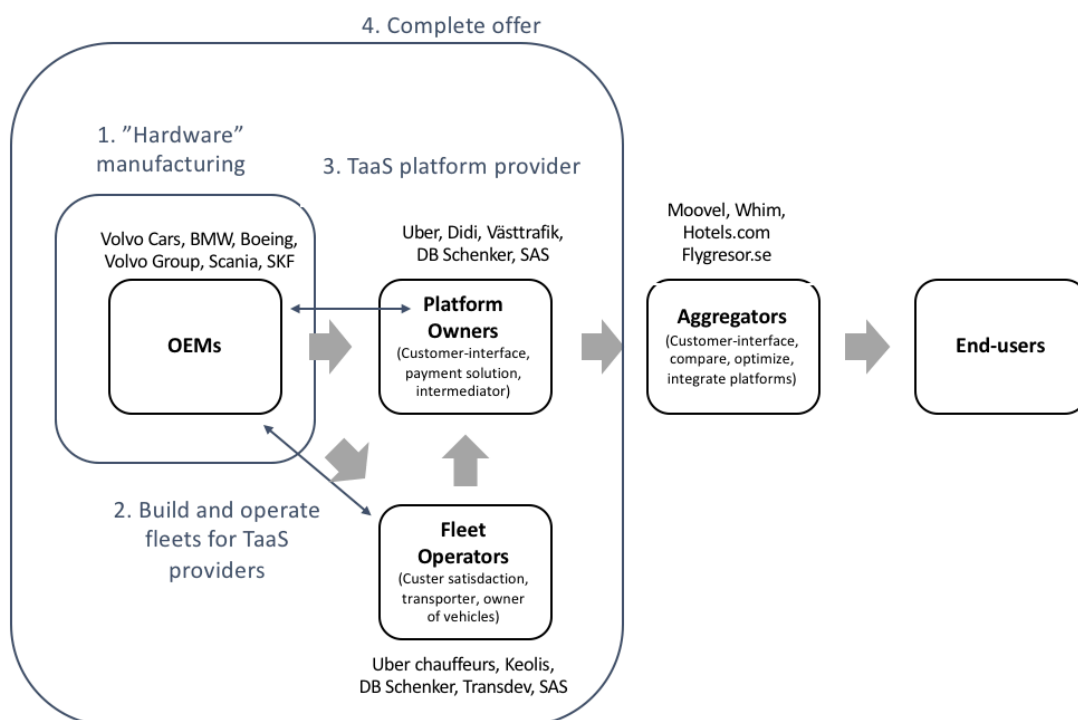


Figure 1. Four different actions an OEM can take in the business network with autonomous car fleets. The figure is inspired by Arbib's & Seba's (2017) four different actions presented above and the examples of companies are provided by the thesis authors.

This thesis will mainly focus on the first alternative, where the OEM is focusing on manufacturing cars in this new business environment with fleet sales. Within that alternative, an OEM can then take two separate strategies, selling the car fleets or keep the ownership of the fleets.

**Strategy 1:**

The OEM sells the car fleets to fleet owners that will either own and operate the fleet or just own the fleet and let another actor operate it. The OEM can offer services through partners to the fleet owner.

**Strategy 2:**

The OEM owns the fleet and move forward in the business network. The strategy enables the OEM to sell its products as services with new payment models.

Owning the car fleet or selling it to a fleet owner represent two or more different business models, the choice has a large impact on the revenue streams as well as the costs. It is therefore important to compare the different alternatives and identify key elements in both business models to be competitive in the long run as an OEM in the automotive industry.

## 1.2 Background to the Study

A common mistake for companies that are coping with disruptions is that they keep focusing on what they are good at today and are biased by their current resources and capabilities, instead of focusing on what the customers want tomorrow (Christensen, et al., 2001). To avoid that for OEMs in the automotive industry, this thesis is an external analysis that provides insights concerning key elements in future business models. Thus, the thesis authors could explore future opportunities without being limited by current situational context.

## 1.3 Purpose

Megatrends affecting fleet sales are likely to disrupt the current business network in the automotive industry and enable new more service-based business models. The purpose of this thesis is to give insights to OEMs in the automotive industry about what they can learn from other industries as well as from existing research to adapt to these changes. Little research has previously been made on how an OEM's business model is affected by the role it takes in a new business network with fleet sales. This thesis therefore aims to identify key elements in a future business model for an OEM in the automotive industry selling fleets, based on the role it takes in the business network.

## 1.4 Research Questions

Given the purpose described, the overall research question is formulated as:

- *What are success factors in a future business model for OEMs in the automotive industry when introducing new mobility solutions?*

The research question can be broken down into the following sub-questions that will help answer the overall research question:

- *What can OEMs in the automotive industry learn from other industries regarding their transition from a product focused to a service-based business model?*

- *How does the role an OEM takes in the future business network affect its business model?*
- *What are key elements in a future business model with fleet sales for an OEM in the automotive industry?*

## 1.5 Delimitations

This thesis will focus on the business network from the manufacturing company to the end-user and will not consider how first and second tier suppliers are affected by the servitization trend. To make the insights useful in a near future, the main focus of the thesis is when OEMs in the automotive industry are continuing taking the role as an OEM in the business network shown in Figure 1. This role is described by Arbib and Seba as “focus on hardware manufacturing and assembling”. The other three alternatives in Arbib’s and Seba’s list, concerning the roles as operator, platform owner and aggregator will be used to understand how to succeed with alternative one. However, the discussion about the implications an OEM will have if taking those roles will be limited.

The purpose of this thesis is related to the corporate strategy of companies and will mainly focus on the opportunities for OEMs in the automotive industry rather than for a specific company. That way, the current resources and capabilities within a company will not be considered and OEMs will benefit from getting new perspectives within the area without being limited by what they know today.

## 1.6 Disposition

This thesis will follow the following structure, chapter 1 starts with an introduction and background to the thesis, followed by the purpose, research questions and delimitations. Chapter 2 is a review of previous literature and frameworks, related to the topic, to give a good understanding of the area. The methodology and the research process used in the thesis will be presented in chapter 3. Chapter 4 contains the findings of the research which is followed by an analysis and discussion in chapter 5 and 6. Lastly, chapter 7 provides a concluding summary of the thesis with the most important findings.

## 2. Theoretical Framework

The first part of this chapter focuses on service-based business models and concerns literature about servitization and integrated solutions. This understanding is important to have to be able to identify key elements in a future more service-based business model and will help answer the question of what OEMs in the automotive industry can learn from other industries regarding their transition from a product to a service-based business model. Following, literature about value chains and business networks will be used to get a better understanding of the transformation of the automotive industry. It will help answering the research question concerning how the role in the business network affect the business model. This chapter will also provide a general understanding of key elements in a business model and how these might change when the business environment is changing and based on the role an OEM takes in the business network. Gaining a better understanding of elements in business models, will help in answering the research question concerning key success factors in a future business model.

### 2.1 Servitization

The term servitization is defined as “*The transformational processes whereby a company shifts from a product-centric to a service-centric business model and logic*” (Kowalkowski et al. 2017). In Oliva and Kallenberg (2003) three arguments for integrating services into core product offerings are presented. Their arguments are within the areas economic, customer demand and competitive. Services have higher margins in general and by offering services a company can enable more stable revenues. Furthermore, customers are requesting more services because of increasing technological complexity, pressure to become more flexible and narrower definitions of core competencies. Lastly, since services are less visible, and hence harder to imitate, increasing the amount of services offered is a competitive advantage that is sustainable. Kryvinska et al. (2015) argues that the competitive advantage is due to differentiation and that it drives strategic aspects.

The advantages of servitization are many but so are the challenges. The transition brings with it a need to build new capabilities (Oliva and Kallenberg, 2003). Mentioned successive hurdles to overcome are that firms do not always see the economic potential, the firms see services as something outside their scope of competencies, and that firms fail in creating a successful service strategy. Going from manufacturing products to becoming a service provider is a major managerial challenge. Organizational principles, structures, processes that are new to the product manufacturer are needed and measurements and incentives need to be updated. The main challenges with servitization described by Oliva and Kallenberg (2003) are consolidating the product-related service offering, to enter the service market and expand, and lastly, taking over the customers’ operations. Moreover, Kryvinska et al. (2015), that argues that servitization pushes sales and enable closer customer relations. All this will have effects on the business model that will change and become more service-based.

Kryvinska et al. (2015) further discussed how to succeed with service integration. They summarized their findings in a six step framework presented below in Table 1. The table presents actions to take and things to consider in each step.

Table 1. Six Step Framework for Successful Services Integration (Kryvinska et al. 2015).

1	Identify which Products to Cover	<ul style="list-style-type: none"> <li>- Support all products</li> <li>- Support only complementary products</li> <li>- Support even competing products</li> </ul>
2	Create a Portfolio of Service Products	<ul style="list-style-type: none"> <li>- Too few or too many service products reduce quality levels and profits</li> <li>- Separate through different performance levels</li> </ul>
3	Select Business Models to support Service Products	<ul style="list-style-type: none"> <li>- Establish funding mechanism to make aware of service value</li> <li>- Apply different models for different products and life cycle stages</li> </ul>
4	Modify after-sales organizational Structures	<ul style="list-style-type: none"> <li>- Employee management through additional recruiting and trainings</li> <li>- Consider outsourcing of service units to third-parties</li> </ul>
5	Design and manage after-sales Services Supply Chain	<ul style="list-style-type: none"> <li>- Match supply of resources with demand</li> <li>- Deliver right materials, through right people, with appropriate infrastructure, at the right place, within an agreed-upon time at the lowest price</li> </ul>
6	Monitor Performance continuously	<ul style="list-style-type: none"> <li>- Deeply understand customer problems and perceptions</li> <li>- Evaluate performance against benchmarks</li> </ul>

### 2.1.1 Integrated Product-Service

Integrated products and services is an area within servitization. It is an effective strategy to create value and to meet varied and rapidly changing customer needs (Parc et al., 2012). There are many different concepts describing integration of products and services, bundling, full service, solution and integrated solution to mentioned some. Park et al. (2012) use the term integrated product-service for these different concepts that all to some degree overlap. There are slightly differences such as purpose, origins, degree of integration and point of integration. The concepts can further be distinguished based on their orientation, some are more marketing-oriented (bundling, full service etc.) while other are more engineering-oriented (solution, integrated solutions etc.). Those that are more marketing-oriented focus on sales promotion and is a mean to differentiate offerings. This means that the product and service can easily be separated and provided independently. In engineering-oriented categories, the product and the service together provide functions to solve customers' problems and are so integrated that they cannot be separated from each other.

Baines and Lightfoot (2013) distinguish between three different degrees of servitization, depending on the focus on the product itself, the degree depends on how integrated the products and services are. The first one is base services, focused on the product provision. The second one is intermediate services, that focuses on the product's condition with repair, condition monitoring, and field services etc. and lastly, advanced services which is related more to supporting the customer than on the actual product, for example fleet management and integrated solutions.



### 2.1.2 Focus on Core Business

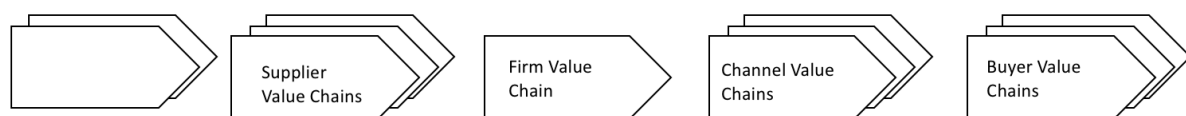
In line with Oliva's and Kallenberg's argument, that customers are requesting more services, Kumar and Kumar (2004) state that users and operators are becoming more interested in buying performance rather than products. This affects OEMs and suppliers in different industries, who are to a larger degree owning, operating, maintaining and supporting customers. When doing this, some of the ownership risk is transferred to the OEM and/or supplier. OEMs and operators can according to Kumar and Kumar (2004) maximize the profitability by developing relationships that allow them to share the risks and benefits by using "total solution selling". Total solution selling is a way of optimizing service and maintenance by letting the OEM/supplier solve problems related to the product. The trend of total solution selling can for an example be found in the airline industry and the mining industry. Servitization has a large impact on companies' business models and is important to understand to develop a successful business model.

## 2.2 The Value Chain

Literature on value chain and business network literature will be used to understand how the business environment affects a company's business model. It is further important to understand how the business environment in the automotive industry is changing to understand what roles an OEM in the automotive industry can take in the future.

### 2.2.1 Porter's Value Chain

Michael Porter (1985) introduced the value chain as a tool for analyzing a company's competitive advantage by examining all the activities performed by the company and how these activities interact. According to Porter, it is not enough to understand a firm's value chain, to gain and sustain a competitive advantage, one must also understand how the firm fits in the overall value system. The value system includes suppliers' value chains, the firm's value chain, channel value chains (different distribution channels to customers) as well as buyers' value chains, see below Figure 2. These different chains influence how well a company meet its customers' needs.



*Figure 2. The Value System (Porter, 1985).*

Vertical links, links between a firm's chain and the chains of suppliers and channels, affect the costs and the performance of a firm's activities (Porter, 1985). It is important to understand the buyers' value chains since the firm's products work as input in their value chains. How well a firm's value chain relates to the buyer's value chain depends on the point of contacts between the both value chains. Contact points, where the firm's and the buyer's activities interact is a potential source of differentiation. Value is created when a firm creates competitive advantage for the buyer by lowering the buyer's cost or by increasing its performance.

### 2.2.2 The Value Chain in the Automotive Industry

Lind et al. (2012) use six different elements to describe the value chain needed for producing and delivering a car for end-customers. These key elements are raw material suppliers, refined raw material suppliers, component suppliers, system suppliers, OEMs and car dealers, see below Figure 3.

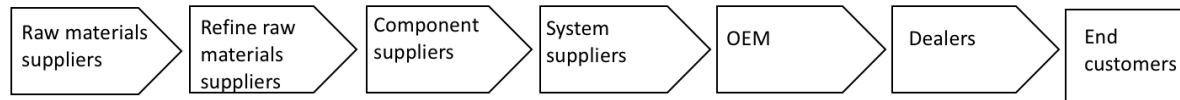


Figure 3. Automotive Value Chain (Lind et al., 2012).

This thesis mainly focuses on the elements in the value chain between OEM and end-customers in the automotive industry which will be presented below.

### 2.2.3 How the Value Chain in the Automotive Industry Has Changed

Until the middle of the 1990s, little consideration was given the end-users, despite the intense and growing competition among OEMs in the automotive industry (Ansart et al., 2006). One reason to this is according to Ansart et al. (2006) that the dominant distribution channels where dealers worked as a filter between the manufacturers and their end-users. By that time, OEMs focused on cost reduction and quality and spent limited attention on customer services and customer satisfaction.

New cars have been distributed through dealer networks for decades (Ansart et al., 2006). This resulted in that OEMs in the automotive industry gave away their control of sales of new and second-hand cars as well as of maintenance, spare parts, distribution and activities as financial solutions and insurance. It was not until the middle of the 1990s that OEMs in the automotive industry realized the potential of services and its contribution to its overall profit margin as well as realized that complementary services could become an important factor that would influence customers' choice of cars.

Some transactions, mostly second-hand cars were made through e-commerce as off 2006 but the automotive industry was lagging behind other industries since there were no stabilized business model for selling cars on the Internet. OEMs realized that services can facilitate sales and increase the brand loyalty. A lot have happened since the middle of the 1990s and Ansart et al. (2006) predicted already by 2006 that OEMs would start selling cars-as-a-service, the assumptions were based on both financial reasons and due to major changes in lifestyle.

Ansart et al. (2006) was right and the automotive industry is today drastically changing. Both OEMs as well as other actors in the business network have launched new business models to adapt to consumers' behaviors (Martinez & Walsworth, 2018). Martinez and Walsworth, (2018) argue that *"The way consumers choose their next car might have more in common with Netflix than the traditional retail system that is defined the automotive industry for more than a century"*. Within the past year, actors as BMW, Volvo, Lincoln, Cadillac, Hyundai and Porsche as well as start-ups, auto lenders and dealership groups have all experimented with vehicle subscription services. These new models offer customers the ability to make month-to-month payments where everything, except gas, is included as well as the option to frequently

change vehicle to match their needs. The subscription models vary, some are comparable with short-term leases whereas other models are short time renting solutions. Care by Volvo, Volvo Cars' subscription model, is an effort to make cars more accessible and includes additional services (Newstex, 2017). Cadillac's BOOK service as well as Ford's Canvas service are other examples of automakers who have launched subscription models.

Millennials and Generation Z (born in 1995 or later) are particularly positive to subscription models but studies have also shown that older generations have an interest in these sorts of models due to the depreciating cost related to new cars (Martinez & Walsworth, 2018). Vehicles are expected to become more expensive and subscriptions models are therefore one strategy to make cars more affordable. Despite the strong interest for these new models, subscription models are according to Martinez and Walsworth (2018), unlikely to supplant the more traditional payment models as leasing and vehicle ownership. To be able to capitalize on subscription models, automakers are still struggling with questions like how much to charge, few subscription models cost less than \$1,000 a month today, how to handle inventory and distribution.

#### 2.2.4 Towards a Business Network Perspective

Distribution demands of users as well as different types of distribution relationships highlight the complexity of distribution solutions and the span of involvement between supplier and customers (Ford et al., 2003). This diversity results in tough requirements on the resources and skills of suppliers. At the same time, customers often want to reduce their supplier bases and therewith increase the responsibility of each supplier. To cope with this, suppliers must either be able to offer different types of distribution solutions and relationships involvement to different customers themselves or they must develop relationships with others that can help them meet customers' needs. This complexity has transformed arrangements more network-like rather than channel-like (Ford et al., 2003).

End-users in the network have a range of different requirements. Some end-users require at cost-efficient solution, others are willing to pay for additional services and consultancy services (Ford et al., 2003). As a result, companies often have many actors in their network that can provide different sort of items and services. Kumar and Kumar (2004) have also identified this complexity in networks. They found that many users of complex systems and products, such as in the mining industry, prefer to outsource the maintenance since it is not part of their core business whereas others only want after-sales service or partial outsourcing. Consequently, new ways of operating and new business models arise and suppliers must offer a range of service offerings.

When activities such as maintenance are outsourced, they become embedded in business networks where they influence the performance, productivity, value creation and revenues of different actors (Hedvall et al., 2016). It is therefore necessary to have an inter-organizational perspective, a network view, when analyzing how resources and activities are organized among actors.

## 2.3 Characteristics of a Business Model

Business models should explain how enterprises work by answering questions like who the customer is, how the enterprise makes money as well as the underlying economic logic of how the enterprise delivers value to customers at an appropriate cost (Magretta, 2002).

According to Johnson et al. (2008), a business model should consist of four elements that together create and deliver value: customer value proposition, profit formula, key resources and key processes. Customer value is created when a company help customers by solving a fundamental problem in a given situation that needs a solution. The profit formula defines how the company should become profitable while providing value to its customers. It contains the following elements; revenue model, cost structure, margin model, resource velocity (how well we need to utilize resources). Example of key resources are people, technology, products, facilities, equipment, channels and brand. Focus should be on the resources that create a competitive advantage. The last element, key processes, are managerial and operational processes such as planning, sales, services and manufacturing but also includes rules, metrics and norms that the company have.

## 2.4 Business Model Canvas

One commonly used and well-known way of working with, and presenting, the different parts that are included in a business model is the Business Model Canvas by Osterwalder (Osterwalder and Pigneur, 2010). Osterwalder's definition of a business model is "*A business model describes the rationale of how an organization creates, delivers and captures value*" and that is presented in nine different categories or "building blocks". These are customer segments, value proposition, channels, customer relationships, revenue streams, key resources, key activities, key partnerships and cost structure. The canvas provides a good overview of the business model, and makes it easy to discuss it, make changes and set up different scenarios. In Figure 4, the Business Model Canvas is presented. Figure 4 presents the main contents in each building block and following is a further presentation of selected blocks that are of most importance for this thesis.

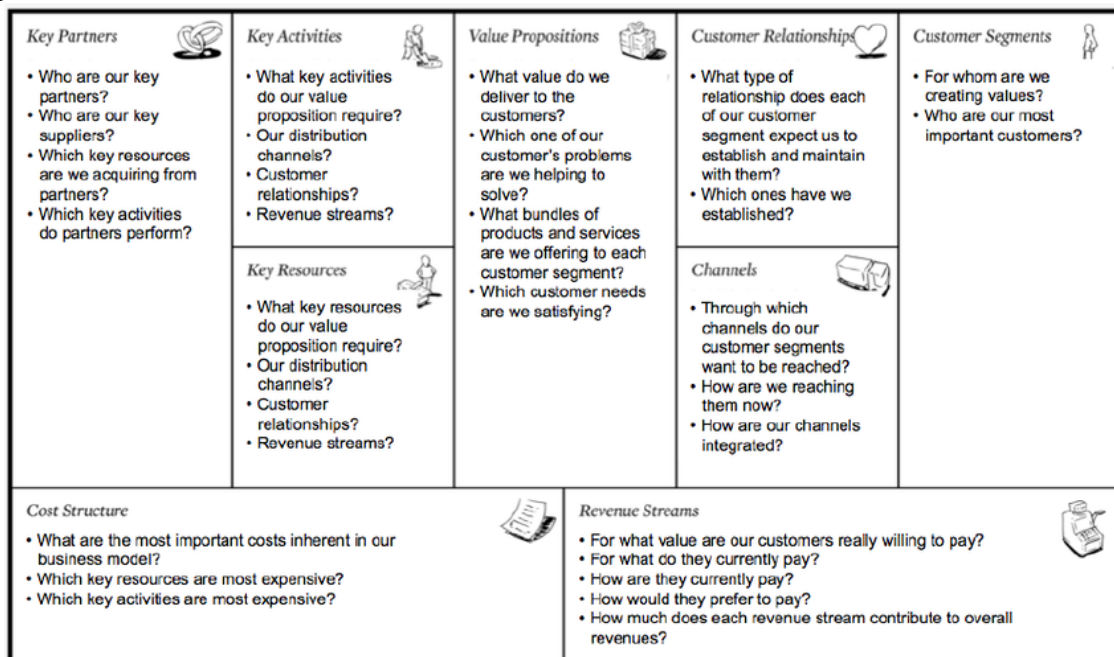


Figure 4. Osterwalder's Business Model Canvas with descriptions of the different building blocks (Boillat & Legner, 2013)

## **Value proposition**

This block presents the reason why a customer chooses one company over another, and is therefore important to be aware of to stay competitive (Osterwalder and Pigneur, 2010). Values can be both of quantitative and qualitative nature. Elements that create value that are mentioned are newness, performance, customization, design, brand/ status, price, cost and risk reduction, accessibility and convenience/ usability. The value proposition solves a problem and/ or satisfies a need that the customer has which makes it important to know which the customer segments are and what needs and/or problems they have.

### **2.4.1 Revenue Streams**

A firm can gain revenues from one or more stream from each customer segment (Osterwalder and Pigneur, 2010). Two examples of revenue streams are transaction revenues and recurring revenues, with the difference of being one-time payments or ongoing payments. The revenue streams can have different pricing mechanisms, fixed or dynamic pricing. The most common being fixed list prices, bargaining, auctioning, market dependent, volume dependent and yield pricing. Revenue streams can be generated in many ways, for example through asset sale, usage fee, subscription fees, lending/renting/leasing, licensing, brokerage fees and advertising. The payment model(s) used will not only affect the revenue streams but also the value proposition and other blocks of the canvas.

### **2.4.2 Cost Structure**

The costs driven by operating the business model are presented in this block (Osterwalder and Pigneur, 2010). A business model can be classified as cost-driven or value-driven, however, most companies are in between. A cost-driven business model focuses on minimizing costs whereas a value-driven business model focuses on creating value. The costs that are included in this block are fixed costs and variable costs that are needed to operate the business model.

### **2.4.3 Key Partnerships**

There are different types of partnerships and they are important in many business models (Osterwalder and Pigneur, 2010). The rationale behind having partnerships can be to optimize different parts in the business model, to acquire resources or reduce risk and uncertainty.

### **2.4.4 Customer Relationships**

It is beneficial to clarify what relationship the company wants with each customer segment (Osterwalder and Pigneur, 2010). Important factors to consider when choosing the type of relationships that will be established is costs, expectations from customers, how the customers are integrated with the rest of the business model, current type of relationship etc..

## **2.5 Two Business Model Canvases in the Automotive Industry**

The Business Model Canvas can be used to understand both one's own business model as well as the competitors' (Osterwalder and Pigneur, 2010). Van der Pijl (2017) uses the Business Model Canvas as a tool for analyzing BMW's and Tesla's business models which are summarized in the table below.

Table 2. Summarizing table of BMW's and Tesla's business models based on Van der Pijl (2017).

Business Model Element	BMW	Tesla
<b>Value Propositions</b>	Ultimate driving experience through below elements: Focus on new technologies. Performance. Connected Drive. Accident and roadside assistance. DriveNow.	Safety. Quickest acceleration. Longest range. Charging stations.
<b>Customer Relationships</b>	Co-Pilot Driver Assistance. Often have loyal customers that keep buying a BMW.	24/7 service every day with own personnel. Smart monitoring.
<b>Channels</b>	Dealer network for sell and services. Apps as MyBMW.	Direct sales through own stores. Service centers and mobile service vans.
<b>Revenue Streams</b>	Car sales. Service and maintenance. Leasing fees. Rental fees.	Sales of vehicles. Maintenance Plans. Wall Connector product.
<b>Key Partners</b>	Innovative partners. Other car companies. IT companies.	Charging locations such as hotels and garages.
<b>Cost Structure</b>	Innovation and exploration costs to be able to offer the ultimate driving experience. Sales and marketing. Training for personnel.	Developing and working with cutting-edge technology. Software development and ICT. Production related costs.

This example shows how OEMs in the automotive industry must identify new value propositions, such as Tesla's charging stations and BMW's Connected Drive which differentiate them from competitors. It also shows how new business concepts such as DriveNow have been introduced by OEMs in the automotive industry today to cope with the changing business environment. This example lastly shows how OEMs in the automotive industry choose different strategies and how their choices impact elements in the business models. A more thorough discussion about business concepts, which change the traditional business models, is presented below.

## 2.6 Business Concepts

Since the Business Model Canvas is limited to its nine boxes, it will be complemented with more theory about business models to provide a wider perspective on important things to consider when developing a new business model. Lay et al. (2009) present business concepts where factors outside the scope of the Business Model Canvas are discussed. For example, questions concerning who takes the role as the owner, who takes care of service and maintenance are raised in the article. Further, the business model concepts provide an overview of the complexity and number of different combinations of features that adds up to one or several business models within a company.

Similar to a business model, a business concept describes the business, brand or product and also include basic information about target demographic, competitive advantages, selling proposition etc. (businessdictionary.com, 2018). Alternative business concepts are being applied in manufacturing industries, leading to a change in the traditional relationships between

suppliers and their customers (Lay et al, 2009). At the same time, new payment models and ways of consuming products and services are emerging. As a summary of these changes, Lay et al. have created a framework from a range of different scientific papers in the area. This framework describes new service-based business concepts and is presented below in Figure 5. It is a typology for business-to-business markets.

<b>Characteristic Features</b>		<b>Options</b>			
Ownership	during phase of use	Equipment producer	Leasing bank	Operating joint venture	Customer
	after phase of use	Equipment producer	Leasing bank	Operating joint venture	Customer
Personnel	Manufacturing	Equipment producer	Operating joint venture	Customer	
	Maintenance	Equipment producer	Operating joint venture	Customer	
Location of operation		Equipment producer's establishment	Establishment "fence to fence" to the customer	Customer's establishment	
Single / multiple customer operation		In parallel operation for multiple customers		Operation for a single customer	
Payment model		pay per unit	pay for availability	fixed rate	pay for equipment

Figure 5. A framework to describe new service-based business concepts (Lay et al., 2009).

As shown in the figure, important factors to consider are who the owner will be, who will perform services and take care of the product, where the operation will take place, if the customer operation is single or multiple and what the payment model will look like.

Traditionally, the owner role has been taken by the user/ customer (Kumar and Kumar, 2004). Today, taking the role as owner and buying a product as a one-off sale is getting less popular and many industrial users will rather buy performance. For example, in the asset heavy mining industry they are increasingly outsourcing non-core business processes, such as maintenance, to be able to better focus on core business. The maintenance is then usually taken care of by the OEM or contractors. Further, it is becoming more common that the OEM own, operate, maintain and support their products because of customers' willingness to buy product performance rather than products. The trends of how to deliver a product is changing and Kumar and Kumar (2004) has described five different types of delivering a product/ offering, presented in Figure 6 below.

**Type 1 After-sales-services: Physical Product Selling Offering**

Customer buys the system, performs the operations and maintains the equipment. OEM/third party assist and offer spare parts and warranty.

**Type 2 Partial Outsourcing: Product + Service/Maintenance Selling**

OEM sells system with a bundle of service and maintenance. Customer owns the equipment but maintenance is partially outsourced to OEM or third party.

**Type 3 Full Service: System + Service + Support+ Knowledge**

Customer owns the system but all required support and services are provided by the OEM at an agreed price or part of the selling price.

**Type 4 Solution Selling: Sale of Process/Function**

OEM is responsible for the delivery of performance as per agreed terms and conditions. Customer outsource the system / equipment and the OEM can get revenues from more than after sales. The product support can be costly for the OEM.

**Type 5 Total Care Solution**

OEM sells performance and function but also helps the customer to realise its visions and goals. The total care solution aims to deliver performance and services that fully support customer activity and help them to achieve their goal.

*Figure 6. Types of offerings. Based on the five types of offerings described in Kumar and Kumar (2004)*

The first three types are conventional product scenarios where the user owns the product or system (Kumar and Kumar, 2004). What separates them is how service and maintenance is offered and packaged. The OEM focuses on compensating for system weaknesses through product support and helping the customer to maximize the product's profit making potential. Systems are sold either directly or through regional networks based on customers' needs and preferences. In the last two types of strategies, shown in Figure 6, customers buy performance rather than a product and a service deal. These are more focused on providing a solution, for example full-service contracts and total-care solutions as well as helping the customer to optimize their processes. Characteristics of full-service contracts are according to Kumar and Kumar (2004) that the equipment provider/OEM is responsible for all maintenance activities and that customers pay the provider based on the outcome of the service. Going back to the mining example, these types of total solutions work well there since the equipment is expensive and specialized.

## 2.7 Business Model Innovation

The business environment in the automotive industry is changing. This requires OEMs to adapt their strategies and to introduce new innovative business models. Introducing new business models as an established company comes with challenges and therefore, this chapter presents the concept business model innovation as well as the challenges related to it.

### 2.7.1 Definition of Business Model Innovation

Business model innovation is according to Björkdahl and Holmén (2013) “*the implementation of a business model that is new to the firm*”. Björkdahl and Holmén further argue that a “*business model describes how the firm creates and captures value*”. According to their definition, business model innovation means a new integrated logic of how a company creates value for its customers and how it captures value.

Established companies often create new products that disrupt competitors without changing their business models radically (Johnson et al., 2008). Sometimes however, companies need to



create new growth opportunities by fundamentally changing their business model. Business model innovation is not about discovering a new product or service, it is rather about redefining an existing product or service for an example by changing how it is delivered to a customer and how a company profits from the customer offering (Björkdahl, 2009). This is in line with Johnson et al. (2008) that state that new business models are needed when companies significantly change elements in their business model.

### 2.7.2 When New Business Models are Needed

According to Johnson et al. (2008), these five strategic circumstances, presented in Figure 7, often require new business models.

#### **1. Disruptive innovations:**

Disruptive innovations enable an opportunity to address needs of large groups of potential customers who are currently shut out of a market since the current solutions are too expensive or complicated (Tata's Nano).

#### **2. Technology:**

Opportunity to capitalize on either new technology (MP3) or to bring technology to a whole new market.

#### **3. Being more efficient:**

Opportunity to bring a job-to-be-done focus where there is a gap in the market. Common in markets where increased commoditization of products occur over time. The opportunity lies in redefining the industry's profitability by being more efficient for an example being much faster and more reliable than existing solutions (FedEx).

#### **4. Threat from low-end disrupters:**

Need to react on threat from low-end disrupters (steel mills, Nano etc.)

#### **5. Need to respond to a shifting basis of competition:**

What customers define as an acceptable solution, change over time. "Good enough" low-end entrants as an example affect high-quality business models (Hilti's tool fleet management service).

*Figure 7. Five strategic circumstances which often requires new business models (Johnson et al., 2008).*

One example that forced competitors to change, adapt and innovate their business models, is when Apple introduced their iPhone (Hacklin et al., 2018). Apple's iPhone fundamentally changed the industry by shifting focus from hardware and technology towards software and content. Business models offered by Nokia etc. were previously based on selling devices, voice minted and text messages. Apple changed this by offering an ecosystem of applications and mobile services.

To make it worth the effort of introducing new business models, the model must not only be new to the company itself, it must also in some way be new or game-changing to the industry or market (Johnson et al., 2008). To succeed, a firm must have a compelling customer value proposition, make the elements value proposition, profit formula, key resources and key processes work together in an efficient way, handle the potentially negative effects it might have on the core business as well as make sure that the business model disrupt competitors.

### 2.7.3 Challenges with Business Model Innovation

It is challenging to design and implement new innovative business models as an established organization (Osterwalder and Pigneur, 2010). Innovative business models might challenge or even compete with the existing models. New organizational culture might further be necessary

to reach new customers. An established organization must therefore, according to Osterwalder and Pigneur (2010) find a way of having parallel business models where it can implement innovative business models at the same time as it maintains the existing models.

Björkdahl and Holmén (2013) present several themes of challenges within business model innovation where one is managing business model innovation in established firms. A current problem identified by the scholars is that most companies do not have someone responsible for business model innovation and that companies do not have any routines for it. Lock-in to existing business models by top managers as well as limited resources are further identified factors. Other themes of challenges, identified by Björkdahl and Holmén (2013), are experimenting, testing and implementing new business models, business model scalability as well as profiting from business model innovation.

According to both Hacklin et al., (2018) and Markides (2013), there are different views of how companies should manage business model innovation. One strategy is to have multiple, parallel and to some extent even conflicting business models. An alternative strategy is to change the primary business model to adapt to changed demands. Scholars highlights the difficulty of running parallel business models and how it often is the leading cause for strategic failure (Hacklin et al., 2018). In the design and development of a business model, factors such as learning and testing are important. It is therefore a risk to plan the design for parallel business models in advance since those two factors will be excluded if doing so. Further, when running a new business model in parallel, one or several of the elements in the business model are fundamentally distinct from the primary model. Hackling et al. (2018) mention one example of how providing a completely different customer value proposition by targeting new customer segments via new distribution channels to illustrate this change. One argument for transforming the primary business model as well when the business environment is changing is that business models must change over time to sustain competitive. Successful companies that do not change their business models in line with their business environment, risk to fail in the long-term.

An important choice for established organizations is therefore whether they choose to spin off innovative business models or to integrate it in the established organization (Osterwalder et al., 2010; Markides, 2013). According to Osterwalder et al. (2010) the conflict between the business models, the strategic similarity and the risk affect this choice. Risk in this case refers to how the new model might affect the established models in form of brand image, earnings and legal liability etc. independent of the choice of integrating or having the new model as a standalone, the implementation will further affect if the organization succeed (Markides, 2013). According to Markides (2013), much focus in business model literature is on the structural choice but organizational context such as culture, values, vision, incentives, and people will determine the success of having dual business models simultaneously.

#### 2.7.4 Business Model Innovation in the Automotive Industry

Product companies within the automotive and transport industries are investing in new service offers through data collection from digital products (Björkdahl et al., 2018). The digitalization trend within the industries increase the need of collaboration between actors in networks and alliances. There are examples of collaborations on the business side that aim to combine different companies' core competences. Example of such collaborations is the partnership between Volvo Cars and Uber. Collaboration is also a result of companies entering new

business fields where they lack technical knowledge. As an example, Volvo Buses is collaborating with ABB and Siemens in their development of electrical buses.

There are several examples of companies within these industries that are moving towards the end-user in their business networks (Björkdahl et al., 2018). One example is Scania which is looking into business models where they would sell transport services. Changing the business model for a company like Scania takes time since the company's model have looked more or less the same for the last 100 years.

Björkdahl et al. (2018) predict that autonomous vehicles will force companies within the automotive and transport industry to reconsider how they create value for its customers. One example of business model innovation within the automotive industry is Daimler's Car2go which is a relatively new business model concept (Osterwalder & Pigneur, 2010). It complements Daimler's core business model of manufacturing, selling and financing vehicles within the segments luxury cars, trucks and buses. Car2go is an on-demand mobility solution with citywide smart car fleets and target city dwellers. The smart car fleet is available throughout cities and can be booked either in advance or on the spot. It is a pure service model with an all-inclusive pay-per-minute or pay-per-hour offer launched to complement Daimler's core business because of the global trend of urbanization.

Osterwalder and Pigneur (2010) present a comparison of how key elements in the Business Model Canvas differ between Car2go and Daimler's more traditional models. This is visualized in Figure 8. Some of the elements that is different is how Daimler's offer a new value proposition through new channels to target a new customer segment.

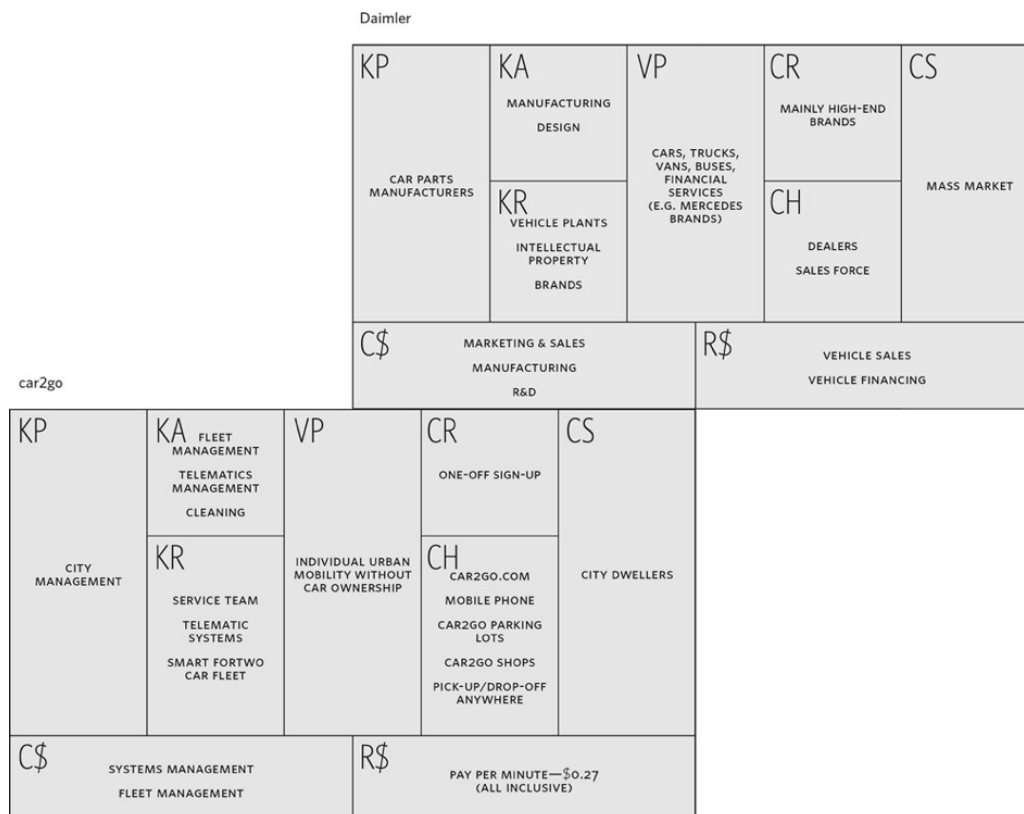


Figure 8. Comparison between Daimler's more traditional business model and Car2go. (Osterwalder & Pigneur, 2010).

## 3. Methodology

This chapter presents the research method used to answer the research questions and to fulfill the purpose of this thesis. Firstly, the research approach is presented and the rationale behind using it. Secondly, a description of the research process as well as how data has been collected and analyzed are described. The last part of this chapter is a discussion about the quality of the research.

### 3.1 Research Approach

There are two main approaches to conduct a research project according to Patel and Davidson (2003), an inductive or a deductive approach. An inductive approach is preferable when there is limited information and investigations available from previous research whereas a deductive approach builds on existing information within an area. Bryman and Bell (2015) further argue that an inductive approach is used to generate theory whereas a deductive orientation is more suitable when testing theory.

This research is primarily build on an inductive approach since there is limited research performed within this field. Also, the research is about predicting the future, it is therefore not possible to test the theory and an inductive orientation is, therefore, most suitable. The research is further explorative and is built on interviews of qualitative nature where the main focus of the interviews was to identify key success factors, based on which roles an OEM in the automotive industry take in the business network, in a future business model with car fleets. This is in line with Bryman and Bell (2015) who argue that a qualitative method is preferred when the study is of inductive nature.

Hennink et al. (2011) summarize the key differences between qualitative and quantitative research as the type of data, sample size, purpose and objective with the data collection as well as the method, analysis and outcome of the data collection. In qualitative research, data is in the form of words and is collected to give a detailed understanding of underlying reasons, beliefs and motivations. The sample size is smaller compared to quantitative research where the data consists of numbers and the objective is to identify patterns in the data.

Besides interviews, other sources of information such as literature study, seminars, events, fairs and a workshop with an OEM in the automotive industry were used to answer the research questions. As mentioned above, this research is mainly based on inductive and qualitative orientation. A general understanding of the automotive industry as well as of the industries chosen for the interviews were necessary to answer the research questions.

The process can be divided into three phases; planning, data collection, and data analysis, which is visualized in Figure 9.

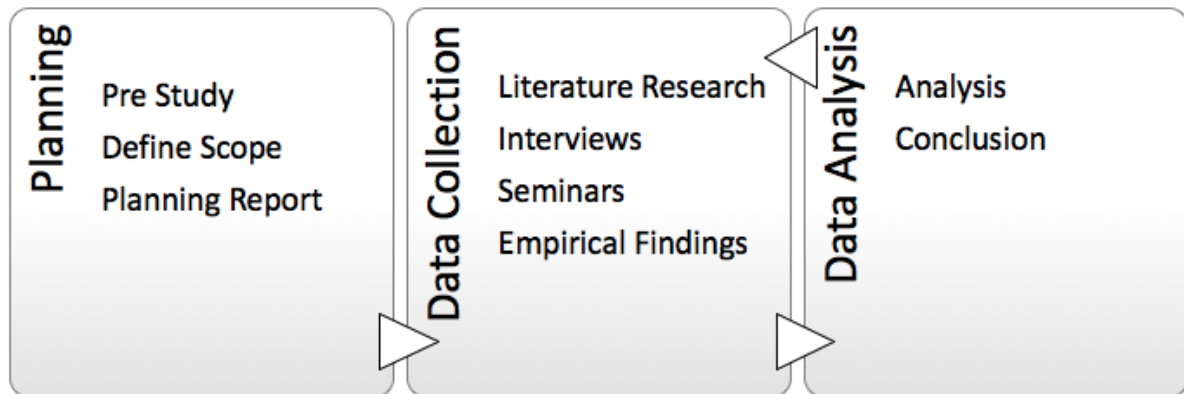


Figure 9. Visualization of the research process.

### 3.2 Planning Phase

In the planning phase, an initial understanding of the automotive industry and its trends was gained through a pre-study. The pre-study included meetings with an OEM in the automotive industry, literature research as well as reading consultancy reports and journals which analyzed how current trends might transform the industry the coming ten to fifteen years.

The research questions and research scope were defined in this phase. These were later updated along the process as new insights emerged. The planning report was the final step of this phase and was used as a plan for how to proceed with the thesis and how to answer the research questions.

### 3.3 Data Collection

Both secondary and primary data were used to answer the research questions. Secondary data was collected from available literature, reports, company websites and annual reports as well as from databases. Primary data was collected in interviews, from attended seminars and events. The interviews were mainly performed with companies within other industries with the goal of gaining important insights and complement the available literature about business models and how to work with service-based business models. The collected data was analyzed throughout the research process.

#### 3.3.1 Get an Initial Understanding of the Automotive Industry

As mentioned, one of the purposes of the planning report was to get a general understanding of the industry and how it is changing. For this purpose, data was collected from consultancy reports about future mobility, focusing on autonomous car fleets and shared economy trends. A seminar about future mobility was also attended which gave a good overview of the largest trends in the automotive industry today. Further, data from journals and literature were collected, focusing on the shift of going from offering just a product to also offering solutions as a combination of product and services.

### 3.3.2 Literature Study

The information presented in the theoretical framework was collected from journal articles, articles, and books at the Chalmers library, mostly online. Since areas such as digitalization, trends and predictions about the future was important for the research. Industry data, such as trend reports, market analyzes, and newspapers were used as a complement. The literature and the theoretical framework was updated along the research process based on insights from the interviews and seminars.

To answer the research questions, an understanding of business models was necessary. Information were collected from journal articles and books. Different models and concepts of how to design business models were used, the two main ones being the Business Model Canvas by Osterwalder (Osterwalder and Pigneur, 2010) and Business Concepts for service-based business models by Lay et al. (2009). The Business Model Canvas was useful to sketch what was probable for a future business model and get a good overview of how one change affects many different elements in the canvas. It was also useful when forming the interview questions. The business concepts framework developed by Lay et al. (2009) was useful to understand which parts that shape the business model and which the main factors to consider in a service-based business model are. These factors were used to map different types of canvases with different scenarios based on the factors mentioned in Lay et al. (2009), for example ownership and payment model.

The Business Model Canvas has been used throughout the research as a way of structuring thoughts and insights and stay on track. Lay et al.'s framework was used as inspiration for the roles in the business network which is reflected in the role "fleet owner" and the role "service and maintenance". The business model literature was complemented with literature about servitization and service-based business models. Available literature mentioned few success factors in their examples but interviews complemented that.

### 3.3.3 Creating a Business Network Model

To understand the role an OEM in the automotive industry has today, and what roles they might take in the future with service-based business models, a business network was constructed in an early phase of the research. This network was inspired by both the four different strategies discussed in Arbib & Seba (2017) as well as of the public transport industry and the freight transport industry. This resulted in Figure 1, presented in the introduction chapter. Both these industries are characterized by fleet sales, fleet operators/carriers as well as platform owners.

Relationships between actors in the business network of these industries as well as different payment models were thereafter analyzed. This led to an understanding of different activities that could be performed by the different roles in the value chain. As more knowledge about the automotive industry was gained, and with inspiration from Lay et al., new roles such as fleet owner and service and maintenance were added to the business network. The network model was also used to identify potential interview companies that could fill the gaps in the available literature. One focus area was to identify what requirements fleet operators and platform owners have on OEMs. In this sense, the business network was valuable in forming interview questions and giving direction in how to answer the research questions.

The initial business network model was later discussed with interviewees from other industries as well as with an OEM in the automotive industry and with an expert within industrial networks

at Chalmers University of Technology. This to validate it and to make sure that the most relevant roles were covered. The model was first called value chain model but both interviewees and literature highlighted the complexity in value chains. The focus thereafter shifted to calling it a business network model rather than a value chain which thereafter was used to describe the model in the thesis. Using the word network to describe the value chain also made it more clear that Figure 10 covers different roles and activities rather than actors. The network has been updated along the research when new knowledge was gained.

Scenarios is a way of exploring different options and is according to Teigland (2018) a way of making strategic decisions about the future. Different scenarios were therefore developed where OEMs took one or several roles in the business network model, these are presented and discussed in chapter 5.3.

### 3.3.4 Attended Seminars and Events

To gain a deeper understanding of what is happening in the automotive industry, a seminar, “Future Mobility”, concerning the mobility sector trends was attended early in the research process. Different trends such as electrification, autonomous vehicles, and shared mobility were covered. Field notes was taken and contact details to interesting speakers were collected. A seminar about Digitalization 4.0 was further attended and finally, two seminars, “Car, bus or in-between?” and “The sharing revolution: what does ownership look like in the future?” were also attended. These events and seminars gave new insights as well as led to interesting discussions about the research.

CHARM, Chalmers University of Technology’s career fair, was also attended in February. Before CHARM a list of potential interview companies was made by first clarify what the objective of having interviews was, and then go through the Charm catalogue. At the fair, questions were asked to the selected companies to verify whether the company was of interest or not. If it was, contact details was collected to help reach the right person within the company that could answer the questions.

### 3.3.5 Sampling of Interviewees

Several areas were identified as important to cover in the interviews because of limited available information in previous research. This way, different industries were interesting for different purposes. The main goal with the interviews was to identify key elements in a business model with fleet sales.

An industry analysis was made early in the research process to identify interesting industries and companies to interview. Data was primarily collected from company websites and annual reports. It was identified which payment models they used (pay-once, leasing or pay-per-use) as well as which roles companies had in their network. This resulted in a list of different industries that could provide insights to the automotive industry based on their business models. This list was later narrowed down based on industry characteristics. These were public transport, airline, taxi, freight transport, construction, outdoor equipment, boat transport, mining and mail. These industries are characterized by both fleet sales and offerings of products and services. Potential interview companies were chosen both based on their business models but also on their location since personal meetings were preferred. The long list of companies was divided into different areas depending on what OEMs in the automotive industry could learn from them. These areas were servitization, requirements on OEMs and business models.

This to ensure that the companies chosen would cover the most important areas. Some companies were relevant for all areas whereas some were interesting to cover just one or two areas. The chosen companies were also mapped into the business network model to ensure that all important roles were covered in the interviews.

Online sources, such as company websites and LinkedIn, were used to identify right persons and to find contact details. Personal networks and contacts provided by supervisors of the thesis were also used to find interviewees.

### 3.3.6 Interviews

Interviews, as stated above, were performed to gain insights about important success factors in a business model with car fleets. The findings from the business network model and the industry analysis as well as the Business Model Canvas and Lay et al.'s business concepts. were used to form the questionnaires. In preparation for the interviews, useful material about the company and industry was also collected and used to form the questionnaires.

In total, 15 interviews were held, most of them with company representatives. Interviews were also performed with experts and professors at Chalmers University of Technology to gain knowledge within integrated solutions and industrial networks. Two of the interviews were held via Skype since the interviewees worked in Belgium and in Germany, the rest of them were held in person at the interviewed company or at the university. A list of the interviewees is presented in Table 3.



Table 3. List of interviews

<b>Role of the Interviewee</b>	<b>Company</b>	<b>Interview Focus</b>	<b>Length of Interview</b>
PhD Student	Chalmers University of Technology	Integrated solutions	60 min
Senior Director Alignment and Business Transformation	Volvo Cars	Aftermarket	30 min
Product Director Services	Volvo Buses	Requirements on OEM, business model, servitization	60 min
Senior Expert Uptime and Maintenance	Volvo Group Trucks Technology	Requirements on OEM, business model, servitization, uptime	80 min
Industrial Doctoral Student	Chalmers University of Technology		
General Manager	Philips Lighting	Servitization, pay-per-lux	60 min
International Business Development	Sunfleet	Requirements on OEM, car fleets	60 min
CEO	Hertz Sweden	Requirements on OEM, car fleets	60 min
Senior Vice President	Västtrafik UITP	Requirements on OEM, role as platform owner	60 min
Vice President and Chairperson of the UITP Organising Authorities Division			
Business Unit Director	SKF	Servitization and deservitization, TCO	60 min
Business Manager	Transdev	Requirements on OEM, uptime, resource utilization	90 min
Strategy Managers Strategy Manager Strategy & Change Manager Enterprise Architect	Ericsson	Servitization and deservitization	2 * 120 min
Vice President Efficiency and Change	SAS	Business network, resource utilization	30 min
Director Business Technology	Volvo Construction Equipment	Uptime, TCO	60 min
International Key Account Manager	UniCarriers	Uptime, business model	120 min

The interviews were semi-structured, and the questionnaires worked as a guide to make sure that all planned areas were covered, but still gave the freedom to adapt the interview during the session in line with Bryman & Bell (2015). Moreover, Bernard and Gravlee (2014) also recommend that structure when only one meeting is possible, which was the case for several of

the interviews. The interviews were recorded to make it possible for the researchers to listen to the interview afterwards. The researchers were always two at the interviews, one that had the responsibility asking questions during the interview and one that was responsible for taking small notes and fill with questions in if needed.

### 3.4 Data Analysis

Data analysis was an iterative process and was performed throughout the research process as data from literature and interviews were collected. Empirical data was analyzed in a structured way where data was clustered into themes and sub-themes. That way the researchers could identify how many of the interviewees that had mentioned a certain topic.

All the interviews were transcribed and summarized to guarantee that nothing important mentioned in the interview was missed. This was also a way of lowering the risk of misunderstanding the interviewee and enabled the researchers to be focused on the interviewee at the interview. The summaries from the interviews were used to divide the empirical findings according to the headlines in the theoretical framework; business model and servitization as well as to the roles in the business network model. This categorization was later used to form clusters of data which were used to present the empirical findings in chapter 4. During the data collection phase, data analysis was made and then more data was collected in shape of more literature research and then more interviews were conducted, explaining the arrows in figure 9.

### 3.5 Quality Assurance and Validity

A risk with interviews of qualitative nature is to miss important factors since the data collection is based on the interviewees' perceptions and knowledge. Triangulation was used to avoid being too biased of an interviewee. Triangulation is according to Yin (2014) to use several sources of information that prove the same point. This has been made through discussing the same topic in many of the interviews which enabled the researchers to identify areas such as modularization which were mentioned by many of the interviewees. Triangulation therefore improves the reliability of the research.

Companies from different industries were interviewed making the sample size of each industry quite small which can be argued to affect the validity of the findings. However, since one focus was to identify common challenges and success factors of companies that have service based business models from different industry the variety of industries was needed and the spread can rather be viewed as an advantage. Another focus area was to collect findings regarding the different roles in the new business network. Here, the interviewed companies are spread across different roles but the sample size is quite small for many of the roles which can affect the validity of those findings.

Three workshops were held, one with an OEM in the automotive industry and two with a networking and telecommunications company who have worked with servitization and service-based business models for more than twenty years. Both the business network as well as the findings from the interviews were discussed and presented during the workshops which helped verify the collected data and strengthen the conclusions made by the researchers. Weekly meetings were also held with internal stakeholders which gave insights and improved the internal validation. A meeting was also held with an expert within industrial network where the

developed business model network was discussed. These meetings and workshops together with the triangularity were used to achieve higher credibility.

Except for credibility, Bryman and Bell (2015) mentions transferability, dependability and confirmability as factors to evaluate a qualitative research method. The research and the business network model aims to provide insights to OEMs in the automotive industry. It is not developed to be used for a specific company or actor and the findings in the research can therefore be used for any OEM in the automotive industry. The findings can further be used for other actors in the business network as well as of other industries that are considering service-based business models. The research method is described in detail in this chapter which enables other researchers to repeat the study which lowers its dependability. The last factor, confirmability is related to how objective the findings are. Documentation have been made throughout the process which enabled the researchers to recheck the data and go back to the interview summaries to lower the risk of biased findings. The objectivity was further strengthened through the workshops, meetings with stakeholders and interviewees who helped the researchers to stay objective.

## 4. Empirical Findings

Findings from the interviews are presented in the following chapter. Fifteen interviews were held with companies from different industries as well as with experts at Chalmers University of Technology. The empirical findings focus on how OEMs in the automotive industry can be inspired from companies that have introduced more service-based business models or have roles that are the same, or similar to, the roles in the business network model presented in this thesis.

Firstly, Table 4 summarizes what roles the interviewed companies have. Following, a table of identified challenges and a table with success factors the interviewed companies have experienced while having, or introducing, a more service-based offer. After that, a table of how OEMs in the automotive industry can be inspired by other industries regarding the elements in the Business Model Canvas is presented. Finally, since uptime has proven to be an important factor in the new value proposition, a separate table is made for that topic. Uptime was identified as a key finding since it will be important in the new way of selling mobility. The term is not used by OEMs in the automotive industry today in contrast to other industries, for example the truck industry, where it is central.

All tables are within different areas and are divided into themes and sub-themes to make it easier to get an overview and go back to find specific findings. Under each sub-theme the findings are either explained or presented in shape of citations followed by which company or companies the finding is from. Generally, if many different interviewees have described an effect an explanation of what they have talked about is made to present the finding.

### 4.1 Current Roles in the Business Network

Table 4 summarize the roles the interviewed companies have in their business networks today. The darker color shows the role they have today. The light blue color shows a role the interviewed company partly have today. Partly in this case means that the company offer it for some of their business models or to some extent. For example, SAS is mainly a platform owner and operator but they own some of the planes, therefore they are marked as “is partly” owners.

Table 4. Summarizing table with the different roles in the business network the interviewed companies have.

	Explanation				
	Is	Is partly			
	OEM	Owner	Service & Maintenance	Operator	Platform Owner
Volvo Cars					
Volvo Buses					
Volvo Trucks					
Philips Lighting					
Hertz Sverige					
Ericsson					
Västrafik / UITP					
SKF					
Sunfleet					
UniCarriers					
Volvo CE					
SAS					
Transdev					

## 4.2 Empirical Findings from the Interview

Abbreviations for the interviewed companies are used in the tables presented in this chapter. Table 5 summarize the abbreviations used for each company.

Table 5. The abbreviations used for the interviewed companies.

VT: Volvo Trucks	V: Västrafik
VB: Volvo Buses	H: Hertz
VC: Volvo Cars	SAS: SAS
U: UniCarriers	S: Sunfleet
E: Ericsson	T: Transdev
P: Philips Lighting	SKF: SKF
VCE: Volvo Construction Equipment	

### 4.2.1 Challenges when having a service-based business model

The following table, Table 6, presents the challenges when having or introducing service-based business models in an organization. The identified challenges are from the different interviewed companies and will be used in the analysis to identify which ones that are applicable on an OEM in the automotive industry and what effects they will have.

Table 6. Summarizing Table of Findings of Challenges when Introducing Service-Based Business Models.

Theme	Sub-Theme	Described in Interviews	Described by
<b>It leads to changes within the organization</b>	Confusion	Introducing more services in the business model brings with it changes in the organization that can create confusion internally in the organizations.	P, E, VB
	Create right incentives	The new payment models change the focus of key account managers and sellers. It is a challenge to change KPIs and measurements to create the right incentives to sell the new offer.	P, E, SKF
	Internal resistance	<i>"We had internal resistance from key account managers when introducing the pay-per-use model pay-per-lux".</i>	P
	Learn to work with shorter projects	<i>"We are used to work with long projects with a long development time. When introducing services, we need to learn how to work with much shorter time spans and be more agile"</i>	VT
<b>It is hard to achieve scalability</b>	Customization	Offer more services and solutions require customization which affects the scalability.	P, E, VB, VT, SKF
	Parallel business models	You need to have parallel business models since customers want different types of solutions. This affects scalability.	VB, VT, P, SKF
<b>The demand for customization makes it harder to scale</b>	Customization	When offering both product- and business-related services it is important to adapt the solution to the customer.	VT, P, SKF, E, VB
	Difficult to consolidate	<i>"The contracts were customized, and we did not organize them on a global platform, we could write contracts with anyone. It got difficult to consolidate and work in the same way everywhere."</i>	E
	Time consuming	To customize solutions is time consuming and can get expensive.	E, SKF, VB
<b>The organization is not adapted for the new way of working</b>	Change the mind-set	In technology companies the engineers are used to working with long projects that are technically advanced. Here it is a challenge to change mind-set and to start working with more customer interaction and services.	VT, P
	Mind-set and culture	The mind-set and culture need to be changed when going from mainly focusing on mechanical engineering and being machine-centric to focus more software engineering and be more customer-centric to deliver value through services	VB, VCE
	It takes time to adapt systems and processes	<i>"There were problems with standardized invoices and that systems were hard to change to be able to handle subscription payments/pay-per-use instead of one-off or monthly payments". "Invoices were sent to customers automatically even though they were not supposed to receive them since they paid a monthly fee instead. It took 5-6 years before the IT systems were adapted to the new business model"</i>	P
<b>The dealer network is affected by the changes</b>	Channel conflicts	When a company has a dealer network and starts taking over work from their dealers there can be conflicts and resistance from the dealers.	VB, VT, P, U
	Can be an advantage or a disadvantage	Dealer networks affect how easy it is to sell solutions directly to customers. <i>"When we launched a new offer in a market, customers expected us to take over their workshops and provide services through them. This because another company, who opposite to us, did not have an established dealer network in that market had made it to a standard"</i> .	VB

<b>The right data needs to be collected</b>	What data to collect	<i>"Data is becoming more important and can be valuable to a company. It is hard to know what type of data to collect and what it is worth".</i>	H
	Expensive to sort data	<i>"Collecting too much data can be costly since it is expensive to sort it. One challenge here is to get the different departments to collaborate to find the answer to what sort of data that is needed and how it can be collected in the best way".</i>	E
	Locked-out	<i>A company can end up being "locked-in". "The customer to an OEM can state requirements on the OEM on delivering vehicle related data, which can end up being used by a 3rd party supplier providing services to the customer. That way a provider can create value from the OEM's data and the OEM gets "locked-out"".</i>	VB
<b>Not all customers have the incentives to change to a service-based offer</b>	Customers do not request the same degree of services	<i>"A common mistake is to view servitization as a linear development and assume that everyone wants more services. It is important to remember that customers have different needs and requirements and do not request the same degree of services".</i>	VT
	Customers do not request the same degree of services	<i>"We have our own workshops where we handle most things apart from guarantee tasks. We found a good workshop manager, despite 29 more busses we have a lower workshop budget today." "We prefer taking care of the repairs and maintenance ourselves".</i>	T
<b>Responsibility conflicts when selling total solutions</b>	Responsibility is challenging	Responsibility is a challenge when OEMs offer full service agreements and total solution service contracts.	U, SKF, VB
	Long discussions	<i>"There have been long discussions about who is responsible for what".</i>	U
	Uptime depends on usage	<i>"Our service contracts have long closures and disclaimers, uptime depends on how customers have used and installed our products".</i>	SKF
	Included in total solutions	<i>"What should be included in a turn-key solution? Should we or the operator be responsible for external vandalism in the buses etc.?"</i>	VB
<b>Owning means becoming asset heavy</b>	Interest rate	Today cash is cheap which makes it easier to push incomes to the future by getting incomes as a monthly fee or pay-per-use instead of getting a one-off payment. If the interest rates go up, how will that affect these revenue models?	H
	Resource utilization	<i>"Resource utilization is important to make the business model profitable, at the same time we need enough cars to cover the peaks during the day".</i>	S

#### 4.2.2 Success Factors in service-based business models

This table presents the factors that the interviewed companies have identified as success factors to overcome the challenges in Table 6 and succeed with a service-based business model. The success factors are general for many different organizations that have service-based business models and will be used to analyze how OEMs in the automotive industry, that are offering a more service-based business model, can be inspired by other industries.

Table 7. Summarizing Table of Findings with Success Factors when Introducing a Service-Based Business Model.

Theme	Sub-Theme	Described in Interviews	Described by
<b>Modularization is key both when it comes to products and services</b>	Scalability	One way of making a service-based business model and an offer easier to scale up is through modularization.	VB, E, VT
	Scalability	There is no one fits all, but parts of solutions can be reused	VB, E, SKF
	Standardization component is key	<i>“Try to capture the same reasoning as when you design modularized cars, making them standardized to make them easy to assemble, when talking about services. It is the standardization component that is key”. ... “Think lego, make standardized building blocks that works together in different combinations and can be used to build different solutions and offers. Reuse the best parts and copy best practice to avoid spending time on creating the same thing twice. Standardization of parts is important”. “Another example is IKEA’s kitchen modules, by using a few standardized components you can build many different kitchens”.</i>	E
	Modularization in three layers	<i>“There are three layers when discussing an offering; product, service and interaction layer. It is important to work with modularization in all three layers. This is a way to balance standardization and customization and make a business model scalable”.</i>	VT
<b>Share information within the organization</b>	Apply best practices	<i>“Overcome the “not invented here”-attitude and apply best practices. To do this it is important to have a good way to share information. When you become good at getting to know customers, you can apply parts of the offerings to multiple customers by using best practices”.</i>	SKF
<b>You need to understand your customers to create an offer that sells</b>	Interaction layer	<i>“Focus is often on the product and the service layers, the interaction layer is often forgotten but still very important”.</i>	VT
	Figure out customers’ needs	<i>“Figure out what the customers’ needs are instead of asking and listening to what they say they want”.</i>	E
	Involve your customers	<i>“Involve the customers in the development of new offerings and make sure they know what direction you are going in”.</i>	P
	Go after the right customers	<i>Go after the right customers. “We were chasing revenues and did not take the time to stop and evaluate which customers that were profitable. We ended up having many spread customers with customized solutions. The costs increased in the same rate as the revenues”.</i>	E
	Customer segmentation	<i>“It is important to segment customers and figure out where the highest ROI is to know what customers to target. Also, we need to think strategically, a customer that results in low ROI today can be strategically important in the future”.</i>	SKF
	Figure out what the end-user wants	<i>“If we had the chance to start over with the development of a tablet we would start in the other end of the business network, figuring out what the end-user wants, instead of being focused on the role as an OEM with great technical skills.”</i>	E



<b>Collect the right data and present it in the right way</b>	Work proactive	<i>“Collecting the right data creates the opportunity to work proactive and understand the customers and their needs better”</i>	VT
	Requirements of different type of data	<i>“Data is becoming valuable and requirements on delivering different type of data is becoming more usual”.</i>	VB
	Make data useful	<i>“To make data useful to customers it is important to firstly collect the right data and secondly present it in a way that the customers can easily understand- The value should be immediate without any additional work / data manipulation from the customers”.</i>	VCE
	Use the collected data internally	<i>“Besides creating value for the customers, the OEMs can use machine data to improve the product quality, improve sales forecast, target the right customers, develop the parts business etc.”</i>	VCE
<b>Have an Enterprise Architect from the beginning</b>	Enterprise architect	<i>“If we would had introduced our services today, we would have had an enterprise architect to ensure that we had an aligned and scalable strategy. It is important to have the right systems already from the beginning”.</i>	E
<b>Find a suitable organizational structure</b>	Different organization structures	There are different ways of changing the organizational structure when adding or increasing services. Three suggestions were discussed.	
	Separate the service and product	<i>“When introducing new offers, start a new small company separate from the big to run the new concepts. We have started Signify as a separate part that takes care of some of the service business” ... “Run the new concepts separately”</i>	P
	Do not separate product and service department	<i>“We had separated products and services units”. “Do not have separate measurements and KPIs for products and services, it increases the risk that the departments will work against each other”.</i>	E
	Integrate department both vertically and horizontally	<i>“Service and solutions” is one out of five business lines with its own profit and loss center.” “This helped in dedicating more focus on this business and integrate it in the other business lines effectively”.</i> <i>“Uptime, productivity, safety, fuel efficiency services are included in the “service and solutions business line but it also includes spare parts and attachments”.</i> <i>“Cross-functional organization helps us to manage services and machines features roadmap in an integrated way.”.</i>	VCE
	The organization can affect the scalability	<i>“Products and services were separated. If we had done a small change in the product is would had become a bit more expensive but the service part had been much more scalable. It is a risk to separate products and services, you get different incentives”.</i>	E
<b>Adapt steering mechanism to suit the new business model</b>	Change measurements	<i>“When new ways of selling are emerging, it is important to adapt the steering mechanisms in the company. Change the measurements for sales, go away from focusing on selling volumes”.</i>	SKF
	Steering mechanisms	<i>“Steering mechanisms are very different for a manufacturer and actors that are closer to end customer today. OEMs have long project for their development of new product models and we change price sometimes several times per day. Steering and corporate governance is therefore very different and a challenge”.</i>	H

	Servitization require changes	<i>“Servitization is challenging, you need to change many steering mechanisms and competences within the company”.</i>	SKF
<b>Overcome channel conflicts and work with dealer network</b>	Involve dealers in the development	<i>“Services Value Propositions target both end-customers and dealers. It needs to be a win-win situation so the dealers are fully engaged in the services and solution business. For example, Uptime services help the customers to have a high machine availability aiming at eliminating the unplanned breakdowns. It helps the customers meet their production schedules and controlled their machine total cost of ownership. At the same time, uptime services help the dealers to plan better the machine maintenance, selling parts and mechanics hours, increasing the relationship with the customers and their satisfaction.”</i>	VCE
	Involve wholesalers in the development	<i>“Our largest customer were wholesalers. We invited them to strategy sessions and told them what direction we were heading towards. This helped a lot. It was still to some extent a constant conflict, but it was the internal conflict that was the largest conflict with people that handles the customers, such as KAMs, in particular “.</i>	P
	Create better plans	<i>“We managed to create a better value proposition roadmap thanks to initiatives (proof of concepts, prototypes) with some key accounts and early adopter customers. Key Account usually set trends for instance in safety domain”</i>	VCE
	Dealers are necessary	<i>“Dealers are necessary to reach out to some of our customers. It is a global company and dealers are good in helping us reach out.”</i>	SKF
	Dealers are necessary	<i>“We prefer direct sales but in some markets, we need dealers to reach the customers”.</i>	U
<b>Create a good interface to be able to collaborate with other actors in the business network</b>	Interface	<i>“To be able to scale up, you need to have a good interface between you and other actors to be able to work with other actors. If you are early you can even set the standards of what the interface should look like.” ... “The fleet owner must handle their information in line with the platform. Information management is important”.</i>	E
	A good structure and foundation enables fast changes	<i>“One good example is Amazon, everything they do and the services they deliver have a public interface, a decided architecture. Today they are huge.” ... “They have the possibility to grow fast since they have a good structure and foundation for everything they do. They know exactly what is happening in the whole chain and can make fast changes”.</i>	E
	Interface important to be visible on platforms	<i>“We do not want our customers to buy our products and services via another actor, we want to keep the contact with the end-users ourselves. However, we want to be visible as an alternative on other actors’ platforms so we need an interface that matches theirs”.</i>	S
<b>Handle parallel business models</b>	No one fits all solutions	<i>It is important to manage parallel business models when introducing more service-based ones, since there is no one fits all solution.</i>	U, VB, P, SKF
	Integrated solutions	<i>“We have managed well with having parallel business models. We at the sale side have always seen product and service as one thing”.</i>	U

<b>Optimize resource utilization</b>	Different customer segments	<i>"We have different types of customers that want to use the cars at different times during the day. That helps us increase the utilization degree".</i>	S
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#### 4.2.3 The Elements from the Business Model Canvas

This table goes through the Business Model Canvas-blocks, one by one, and presents what other companies in other industries say about these factors. In the analysis, this will be used to analyze how an OEM in the automotive industry can be inspired by this and use the knowledge in a future business model.

Table 8. Summarizing Table of Findings of What OEMs in the automotive industry can Learn from Other Industries Regarding Elements in their Business Model

Theme	Sub-Theme	Described in Interviews	Described by
<b>Value proposition</b>			
<b>Mobility</b>	End-user	Easiness and customer experience are important factors when you have a fleet service.	S, VC
	End-user	<i>"Car fleets must be convenient and economically favorable to compete with privately owned cars."</i>	H
	End-user	<i>"Customers to the public transport want punctuality, fast transport, many departures and security".</i>	V
<b>Uptime</b>	Value proposition	Uptime becomes a value proposition when you sell products as services and when you sell functionality. See table 9 for more details.	VB, VT, SKF, U, E, V
	The offer	Uptime becomes a value proposition combining the hard product and the services. The offer can be a customer support agreement with a committed machine availability rate or/and a service to proactively monitor the machine to avoid any unplanned breakdown.	VCE
<b>Product-related services</b>	Lowers TCO	Product-related services that lowers the TCO and improves the customers' operations continue to be an important value proposition.	VB, VT, SKF, VCT, U, P, E
	Bundling	The trend of bundling product and services such as maintenance, fuel coaching, financing and fleet management is continuing.	VT
	Service contracts are more common in some markets	The position an OEM can take depends on how mature the market is. <i>"We have a very strong service provider position in some markets. Some customers take care of the service themselves or use their own service technicians whereas others prefer to focus on their core business and have a full-service contract with the OEM. These differences affect the scalability of the business model".</i>	SKF
<b>Business-related services</b>	Optimize	Business-related services, where you help the customer to optimize their business have become more important.	VB, VT, U
	Utilizing the data	<i>"Business related services is often about understanding your customers better and utilizing the data you have".</i>	VT
	Enter customers processes	<i>"We went towards optimizing customers' operations, meaning that we entered customers' processes. As an example, we offered consultancy services where we helped the customer to operate their workshops and had integrated workshops staffed by our personnel".</i>	VB
	Difficult and risky	<i>"In this segment, we go in and start to make it more efficient and are responsible for the customer's staff</i>	E

		<i>and drives its operations. We must reduce costs between ten to fifteen percent which often is difficult. These contracts are an investment and risky, we will not earn money short-term, but the contracts are often around eight years long”.</i>	
<b>Customization</b>	Service when its best for customer	Today, you do not only want to minimize the time it takes to perform the service, you also want to schedule service when it is best for the customer.	VB, VT
	Responsible for the whole fleet	If you take the role as service provider, customers sometimes want you to be responsible for their whole fleet and therewith also be responsible for products produced by other OEMs.	VB, U
	Understand pains and gains	<i>“You must understand customers’ pains and gains and how you can deliver value to them. This can be both difficult and costly”.</i>	SKF
<b>Risk-taking</b>	Technological development	It is a risk to own products when technology is developing fast, taking the ownership role is therefore a value proposition.	VB, VC
	Customers’ attitude to leasing	<i>“For us, it was an opportunity to take a larger role in the business network when technology was developing rapidly. The uncertainty regarding electro mobility made customers more positive to leasing contract etc.”</i>	VB
<b>Revenue Streams</b>			
<b>Payment model for services</b>	Different payment models	Companies that have introduced a business model where they sell products as services offer many different payment models such as pay once, pay-per-month, pay-per X or Y.	VB, VT, P, E, SKF, U
	Payment models	Pay-per-km, leasing, rent, pay once	VB
	Payment models	Pay-per-lux, pay once	P
	Payment models	Pay per hour (pay per usage), subscription-based (pay per month etc.)	VCE
	New payment models	Pay-per-h, pay-per-pallet, pay-per-month, pay once, the interviewed company has come far with service offerings and is now looking into alternative payment models in the future such as pay-per-assembled-item they have been a part in assembling and pay-per-kWh.	U
	Between service provider and its buyer	The transaction between a service provider and its buyer is often characterized by fixed and variables costs.	V, S, T
	Payment model	Pay-per-month + pay-per-hour and pay-per-km	S
	Payment model	Fixed cost + variable cost based on number of passengers, number of kilometers and number of hours + bonus based on customer satisfaction	V
	Additional services	Additional services such as full insurance is an important additional income for fleet operators and platform owners	S, H
	Differentiate price	In the future, the price will probably reflect how and how much persons use the cars. Factors such as wear and tear and eco-driving will probably be reflected etc.	H
<b>Aftermarket</b>	Different views of aftermarket	<i>“It is important to define what you mean with aftermarket. It is not only spare parts and maintenance, it is about offering the right services during the product life cycle. Aftermarket will become the main market if you sell services instead of products”.</i>	VC

	Spare parts	Spare parts are an important income in today's business models, but a cost when you introduce new business models where you own the products.	VB, VT
	Capture the aftermarket	<i>"Spare parts are an important income in today's business models for both dealers and OEMs. Services business can help OEM/Dealers capture the aftermarket business (parts, attachments, machine maintenance &amp; repair) from customers, especially in the increasing competitive environment (independent repair workshop, original equipment suppliers, pirate parts providers,...)"</i>	VCE
	New payment models	<i>"The revenues from parts will decrease, therefore, we need to find something that can replace it which leads to new business models"</i>	VB
	Capitalize on the brand	<i>"Aftermarket can also be a large revenue stream when selling services. OEMs let go of their customers too early today and let other actors make money on them, they do not fully capitalize on the brand".</i>	VC
	Opportunity to lock in customers	<i>"We have experienced that our aftermarket has been exposed to competition where other actors perform services of our products to a lower price." ... "aftermarket becomes a cost when you own the products but also gives you the opportunity to lock in your customers to use your spare parts etc.".</i>	E
<b>Services</b>	Opportunity to sell extra	<i>"When you perform service that is included in customers' service agreement, it is also an opportunity for extra sales. You might change the product to a newer model or sell some business-related services etc.".</i>	U
<b>Costs</b>			
<b>Customization</b>	Affect scalability	Customized solutions are expensive, and it affects the scalability (See Table 6, challenges with servitization).	E, SKF, VB
	Must consider aftermarket in the development phase	<i>"We are committing on optimized responsible when we sell solutions. Therefore, we needed to rethink and consider how we could make service and maintenance easier already in the development phase of the vehicles".</i>	VB
<b>Aftermarket</b>	Include the cost in the contracts	When you sell solutions, and keep the ownership, spare parts will become a cost. <i>"Service support agreement includes the entire aftermarket cost of the machine for the duration of the contract with the customer including a margin. It helps capturing the aftermarket business for the machine during its first and second life".</i>	VCE
	Reduce amount of service needed	<i>"When you have performance guarantee towards your customers, you want to optimize the product and reduce the amount of service needed. To succeed with that, you need to be willing to let go of the aftermarket which today have high margin".</i>	SKF
	Electrical cars	<i>"Electrical cars have less moving parts which require less service and aftermarket. If you own the cars, this is something you can benefit from".</i>	VC
<b>Fleet operator</b>	Leasing costs	The interviewed company has leasing periods of 18 months with one OEM brand. The length of the leasing period can be optimized based on peaks in demand and need of maintenance.	S
	Service and maintenance	<i>"We negotiate every service and maintenance contract every second year with service providers. We do not buy total solutions that include service and</i>	S

*maintenance since that would add margins, the fewer actors involved, the lower the price. But we should of course focus on what we are good at, which is car pool, if the service would be good enough it might be an option but today it is not an alternative. Optimizing is a very large part of our operations due to low margins in the business, we do not even want to have card payment to avoid paying the banks”.*

	Service and maintenance	<i>“We perform smaller service and maintenance, brand specific dealers perform the rest”.</i>	H
	General maintenance	<i>“It is important to optimize car wash and general maintenance due to low margins, one extra car wash of the fleet per month take away a large share of the profit from that year”.</i>	S
<b>Ownership</b>	Risk premium	<i>“It will be very expensive if one actor owns all cars and items such as racks in the future since you must be able to cover variation in demand. The risk has today been spread on many different actors, but if one would own all product and items, the owner will have to add a risk premium as well as non-utilization and profit which will make cars very expensive”.</i>	H
	Warranty costs	<i>“Costs such as warranty costs can be lowered when you offer a total solution since you can prevent breakdown and improve product quality when you leverage on machine data (predictive maintenance)”.</i>	VCE
	Financing the fleet	<i>“We buy most of our buses and own them ourselves but if it is a short time left on our contracts we often use leasing contracts or buy-back guarantee. The buy-back guarantee means that the next operator will buy your buses. How we choose to finance our buses also depends on the interest rate”.</i>	T

## Customers

<b>Customer segments</b>	Segmentation important when offering services	When offering services, it is important to segment customers both to make sure that you have a high resource utilization but also to make sure that you will get a high return on investment.	S, SKF
	Reach high resource utilization	<i>“One of our success factors is that we have targeted different business areas to reach a high resource utilization. We have company customers, private customers, municipalities as well as construction customers. These customer segments want to use the fleet at different times of the day”.</i>	S
	Key accounts set the trends	<i>“Our key accounts usually set the trends so our new business models, where we charge our customers based on how much they use our products or when we charge based on the outcome. It might spread to other customer segments if it makes sense. We must therefore be ready to expand this type of contracts in the future”.</i>	VCE
<b>Geographical differences</b>	Differences require customization	Customers request different solutions depending on how mature the market is which differ between geographical markets. OEMs that have started to sell products as services therefore need to customize their offers. This is difficult and affects the scalability of the business model.	VB, SKF
	Public procurement	<i>“Many countries do not use public procurement, but it becomes more common. We cannot state that we want to buy a specific brand, it is more about the functionality”.</i>	V

<b>Understand your customer and your end-user</b>	Scalability	<i>“Do not ask what the customers want, ask what they need”.</i>	E
	End-user	You want to come closer to the end-user.	SKF, VT, P, E, H, U
	End-user contact	<i>“We do not want to be fully integrated with platforms since it would make us dependent on them and prevent us from selling additional services in the future, we want to keep the end-customer contact”.</i>	S
<b>Channels</b>			
<b>Business network</b>	Affects roles you can take	The existing business network affects the roles you can take in the network when launching new business models.	VB, VT, VCE, SKF, P, U
	Dealer network	<i>“We had a strong dealer network in Europe which made it more difficult to offer solutions directly to our end-users. It was easier to sell direct customer solutions in markets where the dealer network was less developed”.</i>	VB
	Important relationship between dealers and carriers	<i>“We have some fleet sales but the majority of sold trucks are sold through dealers. The business relation between dealers, workshops and carriers can often be carriers most important business relations. Sometimes, carriers even choose the brand on their next truck because of these relationships”.</i>	VT
	Different channels for different models	<i>“We are always seeking highest return on investment, sometimes we sell direct and sometimes through dealers, but dealers are very important for our product sales”.</i>	SKF
	Resellers add margins	<i>“You need to be careful when adding margins to services. Our standard model is through value-added-resellers and value-added partners, but they add margins and take the revenues generated from the services”.</i>	P
	Important to manage channel conflicts	<i>“We started to sell directly to some customer segments, but it led to constant channel conflicts with wholesalers. In the end business is business and wholesalers were in the end quite accepting when we included them in our strategy sessions and gave them something in return. You must constantly manage these channel conflicts since they are very important for your old business model”.</i>	P
	Distance to end-user	<i>“Dealers can increase the distance between the seller and the end-user”.</i>	U
	Aggregators	<i>“We wanted volume and saw that aggregators had customers. The problem was that they became good enough to take over all the dialog with the customers and we became a simple supplier”.</i>	H
<b>Knowledge and competence</b>	Services require deeper understanding	You need to have a certain level of knowledge and competence when you sell services and solutions instead of products. <i>“Services requires a deeper understanding of your customers’ processes and applications”.</i>	SKF, U, VB
	Services require deeper understanding	<i>“We do not use our distribution network to sell our service solution, we might in the future if they have enough application knowledge”</i>	SKF
	Use the competence in the network	<i>“Use the competence of your distributors and partners to achieve more together and create value for the end-user”.</i>	SKF

	Use the competence in the network	<i>"We do not have any expertise within services, our dealers are performing it, also when we sell solutions where we own the products".</i>	VCE
<b>Key resources</b>			
<b>Dealer network</b>	Dependent on dealers	<i>"We are very dependent on our dealers today to reach our customers since we operate in many different industries and work globally, but a future value chain might look differently". (See channels)</i>	SKF
<b>Enterprise architect</b>		See table 7, enterprise architect	E
<b>Data</b>	Enables predictive maintenance	Data enables you to customize your offerings and to lower the TCO, related to your product through predictive maintenance.	SKF, VB, VT, E, U
	Lower machine TCO	<i>"Data enables you to customize your offerings and to lower the machine TCO (total cost of ownership) for the customers, for instance through predictive maintenance".</i>	VCE
	Dependent on data and information	<i>"The fleet owner has all information about services etc. Everything further ahead in the business network will be dependent on that information".</i>	E
<b>Finance</b>	Direct contact through own bank	<i>"Having your own bank gives you, instead of another bank, the margin from customer's loan. It gives you direct contact with the end-customer and they get more flexibility."</i>	U
<b>Key activities</b>			
<b>Analytical capabilities</b>	Analytical capabilities to optimize the fleet	Analytical capabilities and resource planning are very important in the airline industry. <i>"You want to maximize the resource utilization and be flexible. One way to do that is to use different fleet operators and to use different forms of partnerships with them. It is a balance between having a robust and consistent offer and revenue optimization".</i>	SAS
<b>Training</b>	New competence	You need to shift competence when selling services as an OEM.	SKF, P, VB
	Internal competence	<i>"We have SKF academy where we offer sales training etc. and helps us to shift our internal competence".</i>	SKF
<b>Predictive maintenance</b>	Important for uptime	Predictive maintenance is important to be able to deliver the agreed uptime.	VB, VT, SKF, E
<b>Partnerships</b>			
<b>Partnerships when introducing services</b>	Partners are important	Partnerships becomes more and more important when changing business model and introducing services.	VB, VT, SKF, P
	Need partners when selling services	<i>"We realized that we could not do everything internally and that we needed to find partners that complement our capabilities when introducing more services".</i>	VB
	Partnerships help keeping the cost down	<i>"We need our partners to be able to scale our service business, otherwise it will become too costly. Traditional service settings such as installation and consultancy have to do with people and it becomes almost impossible to hire all the people if you do not have the project, it becomes a chicken and egg situation. To succeed we need to build an ecosystem with partners".</i>	P



<b>Dealers</b>	Important to reach customers	Dealers are both an important resource and partner when having parallel business models. Dealers help OEMs to deliver services and to reach all their customers. (See key resources and channels)	VB, VT, SKF, U
<b>Operators</b>	Help adapting the fleet	Partnerships with operators are very important, you must be able to adapt the fleet depending on demand fluctuation. <i>“A passenger can buy a ticket at our homepage, but the route might be operated by another operator, sometimes the passenger does not even notice this”.</i>	SAS
<b>Platform</b>	Necessary for the quality	<i>“We work closely with our service providers and have common goals. We have realized that it is necessary for the public transport to maintain a high quality.”</i>	V
	Customer interface	<i>“If the service does not live up to the customers’ expectations we as overall responsible for the service has to take responsibility towards the customers”</i>	V
<b>Customers</b>	Transparency is important when selling functionality	<i>“Service agreements where a certain uptime is guaranteed can easily lead to conflict of interests. Transparency and partnerships are important when you sell functionality rather than products. You as an OEM must have insights in how the product is being used and how it has been installed”.</i>	SKF
	Share risk with customer	<i>“Use proof-of-concept, our customers are often interested of our solutions. We often share the risk under a certain introduction phase and we have some other requirements on us under that period”.</i>	SKF
	Service providers’ incentives	<i>“Earlier, price was the most important factor in the procurement which led to that operators bought cheap buses. This resulted in longer requirement lists and a new incentive structure. Today, it is more of a partnership structure where we together develop the public transport and operators want to have as many passengers as possible, as long as there is space in the buses”.</i>	T

#### 4.2.4 Uptime is a Value Proposition

Since uptime has proven to be an important part in a future value proposition and much findings are made within the topic, it has been moved from the value proposition in table 4.2.3 to its own table.

Table 9. Summarizing Table of Findings Regarding Uptime

<b>Theme</b>	<b>Sub-Theme</b>	<b>Described in Interviews</b>	<b>Described by</b>
<b>Uptime</b>	Uptime important for OEMs	All interviewees stress the importance of uptime when discussed in the interviews. Many interviewees, mostly OEMs, also mention that uptime has become more important and that they use the term internally.	VB, VT, E, V, SKF, U, SAS, VCE,
	Availability and utilization	Some of the interviewees do not use the term uptime internally but use terms as availability and measures the degree of utilization of the fleet.	P, H, S, T
	Available vehicle when needed	<i>“Before, uptime was about maximizing the time a vehicle was rolling and minimizing the time in workshops. This is still important but today, a vehicle should also be available when it is needed. It is not only about lowering the need of</i>	VT

		service and the time it takes, it is also important to perform the service when it's best for the customer, availability is an important concept".	
	Definition	<i>"For a user, the right vehicle in the right place at the right time needs to be available"</i> .	VT
<b>KPIs uptime</b>	Km	<i>"Number of rolled km" and "cost per km"</i>	VB
	Service	<i>"Vehicle off road, first time fix rate and response time"</i> .	U
	Stops	<i>"Unexpected stops"</i>	VCE
	Availability	<i>Availability is an important uptime KPI for many of the interviewed OEMs.</i>	U, SKF, VCE
	Availability	<i>"Guarantees 98% uptime based on agreed available time"</i>	U
	Availability	<i>"We have KPIs to measure the availability. We measure time at service, days behind (services), cancelled minutes and cost per km"</i>	T
	Utilization	<i>"Do not use the term uptime but measures utilization: Number of hours a car is booked Non-revenue transactions (booked by staff for service etc.)"</i>	S
<b>Uptime requirements</b>	Uptime is a requirement	The interviewed OEMs consider uptime as a requirement for their service-based business models.	VB, VT, E, P, SKF, U, VCE
	Schedule service	<i>"It is important to schedule service at the right time"</i> .	T
	Resource utilization	A fleet operator must adapt the fleet based on variations in demand as different customer segments uses cars at different hours as well as geographically different areas to guarantee a high resource utilization and to ensure that their vehicles are available at the right place when needed.	SAS, S, H
	Penalties and fees	If the uptime is less than the one agreed in the service contract, service providers must pay fees.	VB, V, SKF
	Discounts	<i>"Discounts if we do not deliver as promised"</i>	SKF
	Fees	<i>"Fee if not delivering what was agreed"</i>	VB
<b>Guarantee uptime</b>	Prevent failures	When you sell services, some availability level is often agreed on in the service agreement. Failure is expensive, and you want to avoid it by react before it happens.	VB, E, V, SKF, U, VCE
	Uptime department	<i>"The whole firm works with uptime" The interviewed company also has an uptime department.</i>	VT
	Uptime centers	<i>"We have two uptime centers that mainly monitors the machines where alarms are triggered based on machine error codes. It helps schedule technicians' intervention proactively before a breakdown occurs"</i> .	VCE
	Service trucks	<i>"We have 85 service trucks in Sweden with spare parts to guarantee uptime and visit customers' sites when needed. It leads to aging parts, but it also generates extra sell and they are very important to increase our first visit fix rate and to guarantee a certain uptime. Our first visit fix rate of 95% gives us a competitive advantage"</i> .	U
	Partnerships with customers	<i>"To know how long a product will last, you must know how it has been used and installed. You must have insights and our service agreements are therefore build on partnerships, but they also have long closures and disclaimers"</i> .	SKF
	Partnership with operators	<i>"We use several operators to maximize the utilization depending on the demand"</i> .	SAS
	Own workshops to save time	<i>"We have two own workshops where we fix everything except guarantees, it has resulted in a lower budget despite a larger fleet. Right now, it is better to perform the service internally since it is cheaper and time saving but we have competitors that have bought turn-key solutions"</i> .	T

Service and maintenance	<i>“General maintenance is performed during nights and we try to fill the service spots in our workshop when the traffic situation allows us”.</i>	T
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## 5 Analysis of the Findings

Since the future mobility solutions are expected to result in more service-based business models, discussions concerning that are relevant. In this chapter, challenges and suggestions of ways to overcome them are discussed and connected to how that applies to an OEM in the automotive industry. This will answer the research question concerning what OEMs can learn from other industries about service-based business models. To understand the context an OEM in the automotive industry will operate in, in the future, the business network has been analyzed and a model has been created. With this understanding, the selection of what role an OEM in the automotive industry can take and what implications it will have is analyzed and will answer how the role an OEM takes will affect the business model. To finish, and answer the overall research question, selected parts from the Business Model Canvas are discussed. Overall, in the discussion and analysis, the literature about the topics mentioned above will be connected to the findings from the interviews.

### 5.1 Succeeding with a Service-based Business Model

It is not only the choice of taking the role as fleet owner or not that will affect the business model. What the OEM does besides offering a product, for example selling service contracts, will also be an important aspect to consider. When services and solutions are included in the OEMs offer, it is relevant to discuss challenges and success factors for service-based business models. When discussing service-based business models, literature about servitization is relevant. In this chapter literature about servitization is compared with the empirical findings from the interviews. Challenges and success factors when introducing service-based business models are presented and discussed. The findings are from interviews from different industries and can be applied in all industries moving toward a service-based business model, including the automotive industry.

#### 5.1.1 The Degree of Servitization is not linear

As presented in the literature review, users and operators are becoming more interested in buying performance and not only products. This can be compared to that the degree of servitization increases and more service-based business models are required to meet the new demand. Baines and Lightfoot (2013) describes three different degrees of servitization depending how integrated the product and service are. However, as stressed by an expert within the area of development and implementation of solutions and services in industrial networks, it is important not to view the increase of the degree of servitization as a linear development that will be applied on all customers. He explained that *“A common mistake is to view servitization as a linear development and assume that everyone wants more services. It is important to remember that customers have different needs and requirements and do not request the same degree of services”*. This is strengthened by another interviewee saying that *“Right now, it is better to perform the service internally since it is cheaper and time saving, but we have competitors that have bought turn-key solutions”*. An OEM that is starting to offer solutions or services need to consider this and find a balance with different offers. The differences in customer maturity and what they want indicates that parallel business models are needed to cater to all customer needs. In Kryvinska et al.’s (2015) framework for successful services integration, step three, *“select business models to support service products”*, recommends applying different models for different products and life cycle stages. That too stresses the need to have parallel business models. However, parallel business models affect scalability which is one of the challenges presented in the coming chapter.

### 5.1.2 Challenges and Success Factors when Introducing a Service-based Business Model

As mentioned, a more service-based business model will be necessary for the new way of selling mobility. Challenges when introducing and having service-based business models have been identified in a variety of different industries. In this chapter, the challenges will be presented with suggested solutions and a discussion around them. A summarizing table is presented below, followed by a discussion around each challenge and suggested solutions.

*Table 10. Summarizing table of challenges with service-based business models and suggested success factors.*

Challenges	Success Factors
<b>1 Customization and scalability</b> Service-based business models requires customization and can be hard to make scalable. Customization can easily become time-consuming and expensive. There is no one size fits all.	Modularization of both products and services Remember the interaction layer Understand your customers' needs Focus on needs rather than wants Segment customers Parallel business models
<b>2 New way of working</b> It requires changes within the organization regarding the mind-set, capabilities, payment models, length of projects etc. The organization is not adapted for the new way of working.	Learn to work with shorter time spans Change culture and mind-set Find the right balance between technically advanced and customer satisfaction Have an enterprise architect Change steering mechanisms Make sure to have the right incentives by changing KPIs and other measurements Make sure that the product and service department are integrated or at least cooperating Adapt the IT systems to fit the new offerings
<b>3 Dealer network</b> The dealer network is affected since service-based business models can result in that OEMs take over their work to some extent.	Build a good relationship with dealers and other actors in the network Build an ecosystem together with partners Have an interface for products and services that is compatible with other actors' interfaces Build a good relationship and communicate early with key account customers as they set trends
<b>4 Data collection</b> Need to know what data to collect, how to collect it and how to use it. To collect and sort data is costly.	Collect the right data to minimize costs for sorting it Figure out what the data is worth Avoid being locked-in Present it to customers in a way that is easy to understand
<b>5 Responsibility question</b> Responsibility conflicts when the offer exceeds a one-off product sale.	Clearly clarify who is responsible for what when writing a contract
<b>6 Asset heavy</b> Service-based business models lead to a company being more asset heavy. A challenge for a fleet owner is to cover peaks when many customers want the same product/ solution at the same time.	Work with maximizing resource utilization Aim for different customer segments that want to use the product at different occasions

## **Challenge 1: Customization and Scalability**

### **Work with modularization in all three layers**

In many of the interviews, the need for customization is mentioned as one of the biggest challenges when introducing service-based business models. Not only does it affect scalability, it is also time consuming and costly. Customization and different solutions for different customers requires parallel business models. There are many ways to work with these challenges. The most frequently mentioned solution during interviews is to work with modularization, both for the products produced and for services provided. Comparisons have been made with lego and IKEA-kitchens. By using the same reasoning of combining standardized components when designing service offers they can become easier to handle and scale. *“To scale the business model, the services also need to be structured as modules”*. In Kryvinska et al.’s (2015) framework for successful services integration, step two is to create a portfolio of service products. They stress that having too few or too many service products affect the quality and profits and that the services should be separated by having different performance levels. That step can be succeeded with by working with modules. It is important to apply the modularity in all three layers, product, service and interaction layer. The last layer, which has to do with the interaction with the customer, is often forgotten but is as important as the other two layers. Modularization of the interactive layer enables OEMs to offer different forms of distribution solutions and to have different relationship involvement with different customers. The interaction with customers can be based on factors mentioned by Osterwalder and Pigneur (2010), such as costs, expectations from customers as well as the strategic importance of the customer. OEMs in the automotive industry are often very good at working with modularization when it comes to their products. This competence need to be transferred to the service part of the offer as well as in the interaction with customers to make the business both customized and scalable.

### **Understand customers and their needs, not wants**

Customization is about understanding the customers which is important to design an offer that sells. In Kryvinska et al.’s (2015) framework for successful services integration, step six, Monitor Performance continuously, stresses the need to really understand customer problems and perceptions. One interviewee said: *“To design a good offer you need to understand your customers and their needs, collect data and be proactive”* and another stressed the importance of figuring out the customers’ needs rather than wants. By figuring out what a customer needs instead of asking what they want, it is up to the seller to solve the problem the customer has. This makes it easier to work with modules and combine them in the best way to solve the problem instead of making a customized offer for each customer. OEMs in the new business network, presented in this thesis, need to clarify who the customer is. Depending on what roles they decide to take they will have different customers. Additionally, they must stay focused on the end-users as well. Involving customers in the design and development of the modules that the new offer will consist of will help create the right modules to build from. Designing the right modules from the beginning will save time further ahead and decrease the number of modules needed. In the segmentation process, an OEM in the automotive industry must identify which customers that will generate the most value. Comments concerning this are *“Figure out where the highest ROI is to know what customers to target, but still think strategically”* and *“We were chasing revenues and did not take the time to stop and evaluate which customers that were profitable. We ended up having many spread customers with customized solutions. The costs increased in the same rate as the revenues”*.

### **Cater for different requirements**

As presented, different customers have different wants, needs and requirements, that is one of the reasons why OEMs in the automotive industry need to have parallel business models. In the case of an OEM in the automotive industry, the traditional model where cars are sold as one-off-sales need to be complemented with leasing solutions and new mobility solutions. Simultaneously, when introducing service-based offers, the product and service departments need to be aligned. One company that has succeeded with this said *“We have managed well with having parallel business models. We at the sale side have always seen product and services as one thing”*.

Handling different customer requirements is another area where data collection is useful. To handle differences between customers, collected data about them is useful. Another way to handle this challenge is to include the customers in the development of offers. Again, focusing on needs rather than wants is important to be able to use fewer modules and keep cost down.

### **Challenge 2: New way of working**

#### **Finding the right new ways of working within the organization**

Implementing service-based business models enables new ways of working within an organization. As stated in one interview *“We are used to work with long, technically advanced projects with a long development time. When introducing services, we needed to learn how to work with much shorter time spans and be more agile”*. Another interviewee talked about needing to change the culture and mind-set within the organization when going from mainly focusing on engineering to start focusing more on services. This will be the case for the OEMs in the automotive industry that have focused on developing and designing cars and now choose to take roles where they will start offering services and solutions as well. It creates a need to be more agile and reconsider their steering mechanisms and the organizational structure.

#### **Optimize the balance between technically advanced and customer satisfaction**

For companies that are used to work with technically advanced projects and developing the best product possible from an engineering perspective it is easy to forget that what is best technically is not always what the end-users are asking for. One example is that Ericsson did not expect Skype to succeed since the quality was far from perfect but that was not what the end-users valued the most and now Skype is well-known and used by many. A company that is very good at developing products with the end-user in focus is Apple. They have succeeded in finding the right balance between technically advanced and making customers satisfied and managed to build a well-known brand without being best from an engineering/ technology perspective. OEMs in the automotive industry that are used to designing and developing technologically advanced cars will need to take a step back and make sure that they are designing cars with that has a balance of customer satisfaction and being technologically advanced.

#### **Hire an enterprise architect**

One advice given is to hire an enterprise architect (see definitions) as early as possible. It is not just a success factor when introducing service-based business models but also a good way to get an overview of an organization and make sure that all departments work together. *“If we would had introduced our services today, we would have had an enterprise architect to ensure that we had an aligned and scalable strategy. It is important to have the right systems already from the beginning”*. For OEMs in the automotive industry that are changing their business

models and want to make sure that the whole organization succeeds, not just specific departments, the earlier they include an enterprise architect the better.

### **Create the right incentives by changing KPIs and other measurements**

As stressed by Oliva and Kallenberg (2003) it is important to create the right incentives internally and have the right measurements adapted to the new way of selling. When service offers were introduced in one of the interviewed companies that enabled new payment models they had internal resistance from KAMs. The measurements and KPIs they had been working with when selling products as a one-off-sale did not apply and had to be changed to keep the sellers motivated. Overall, the steering mechanisms need to be adapted to the new business model. *“It is important to change the steering mechanisms in the organization. Change the measurements for sales, move away from selling volumes”*. When OEMs in the automotive industry start selling products or solutions with subscription models or pay-per-use models, they need to shift focus from selling volumes and make sure that the measurements for selling cars as a one-off-sale are complemented with measurements for the new way of selling mobility.

### **Make sure that the product and service department are integrated or at least cooperating**

When combining products and services the product- and service departments need to be integrated or collaborate and the right organizational structure needs to be applied. One company had separated the two departments which was not beneficial since they did not optimize the offer, instead the two departments were focused on maximizing their own profit. They expressed that *“It is a risk to separate products and services, you get different incentives”* and explained that a small change in the product would make the product a bit more expensive but would make a big difference for the scalability of the services. However, since they were separated the product department had no incentives to do so. In contrast, another company said that what they saw as a success factor was that they had their services separate from their product department. They launched their service offer separate from their traditional business which turned out very good for them. A third suggestion is to have the services separate but also across the other units. *“Service and solutions is one of the five business lines with its own profit and loss center, this helped in dedicating more focus on the topic. The line is also integrated across the other business lines to make sure that the whole organization is working toward the same goals”*. There are spread opinions on which the best way to structure the organization is but what is agreed on is that aligned goals and measurements between the departments are needed. This is important for OEMs in the automotive industry to consider no matter what organizational structure they decide to have.

### **Update IT systems and processes to fit the new way of selling**

Changes in payment models and new ways of selling products and services require updated IT systems and processes which can take time. One interviewee talked about problems they had with invoices for the new payment models, *“it took 5-6 years before the IT systems were adapted to the new business model”*. An OEM in the automotive industry that shifts its way of selling must be prepared that it takes time and require updates in their systems.



## Challenge 3: Dealer Network

### **Build a good relationship with the dealer network to succeed with the introduction of services**

As will be described in chapter 5.3.3, one alternative for an OEM in the automotive industry is to take the role as a provider of service and maintenance in the future business network. A challenge here is that channel conflicts between the OEM and their dealers or other actors in the business network can occur. The current dealer network can feel threatened when the OEM comes in and start taking over parts of their jobs. At the same time, the OEMs are often still dependent on the dealers and must find a way to overcome this conflict. For example, in the truck industry the dealers are sometimes the factor that decides what brand a truck-driver buys and in many industries the dealers are the only, or the easiest, way to some customers. Some are not as positive about dealers, they mean that dealers increase the distance to the end-users and take margins. However, even if an OEM does not take the role as a service and maintenance provider, but offer total solutions, the dealer network will be important according to many interviewees. One company expressed *“We are working with building an ecosystem with partners to manage the scalability”*. Another company is collaborating with their key account customers since they often set trends. They stressed the importance of communicating with key account customers before introducing something new and to create a win-win situation. That way they could create a better plan of how and where to spend their money. On the topic of collaborating, a third interviewee said *“Our largest customers are wholesalers. We invited them to strategy sessions and told them what direction we were heading towards. This helped a lot”*. Collaboration and using the competence and knowledge from other actors in the business network seems to be the way to handle the challenge of channel conflicts and succeed with the introduction of new products or solutions. This knowledge should be used by OEMs in the automotive industry that are developing and introducing new products and solutions in a new business network.

### **Have an interface for products and services that works with other actors’ systems**

The interface between the OEM and other actors must match to make it easier to collaborate. *“You need to have a good interface to be able to work with other actors. If you are early you can even set the standard of what the interface should look like”*. This is described in step one in Kryvinska et al.’s (2015) framework, identify which products to cover, where they describe that a choice concerning what products to support need to be made. For example, whether competing products should be supported. An example of a company that has a successful interface is Amazon. They have a public interface, a decided architecture. *“Amazon has the possibility to grow fast since they have a good structure and foundation for everything they do. They know exactly what is happening in the whole value chain and can make changes fast”*. In contrast, Apple has succeeded with an interface that is not compatible with competitors. OEMs in the automotive industry need to adapt to the new business network and new actors and develop an interface that matches the new organizations they will need to collaborate with.

## Challenge 4: Data Collection

### **Collect the right data and understand its value**

When discussing service-based business models, and changes in business models overall with the interviewees, a commonly mentioned challenge is data collection. *“Requirements on delivering different type of data is becoming more usual. Data is becoming valuable, not least in business-related solutions”*. Knowing what data to collect, figuring out the value of it and to

sort it when too much is collected are the main challenges. When it comes to the opportunity to sell data, a company can end up being locked-in. *“If provider A is analyzing data for all vehicles in a system and sells business related services to a platform owner, the platform owner can require getting data from provider B and then gives that data to provider A. That way provider A can create value from provider B’s data and provider B gets locked-out”*. In that sense, it is good to be early out with offering business-related services that use data from different providers. Since it is expensive to sort data it is a good idea to make clear from the beginning what data will be useful for the collector or is valuable to someone else. To figure out what the data is worth, the company can compare with similar data collections and investigate their customers’ willingness to pay for it. When doing this and selling data it is important to present it in a way that is easy for the customers to understand. *“To make data useful to customers it is important to firstly collect the right data and secondly present it in a way that is easy to understand”*. It is not only data that is hard to set a value of, in step 3 in Kryvinska’s framework, the challenge of deciding the value of a service is described.

The advantages of collecting data are many. It creates the opportunity to work proactive and to understand customers’ needs. This is useful for OEMs in the automotive industry working with predictive maintenance and during the development of new solutions. Additionally, it creates value for customers, helps forecast sales, makes it easier to target the right customers, sell more etc.

## **Challenge 5: Responsibility Question**

### **Make it clear who is responsible for what**

The challenge of conflicts about who is responsible for what occurs when the selling company is taking the responsibility for the product in some way. To mention two examples, it can be when total solutions/ different types of service agreements are offered or when the ownership is kept by the seller in general. Here, it must be made clear who is responsible for what. One interviewee has experienced long discussions about this and another has had discussions of what is included in a total solution. To solve similar challenges a third interviewee explained *“Our service contracts have long closures and disclaimers, agreed uptime depends on how the customers have used and installed our products”*. OEMs in the automotive industry that are starting to offer service-based solutions, full service agreements, total solutions etc. must create standardized agreements that clearly state who is responsible for what.

## **Challenge 6: Being Asset heavy**

### **Handle the challenge of being asset heavy**

When going from selling a product as a one-off sale to different models where the seller keeps the ownership, for example subscription models, the seller become more asset heavy. For that reason, it is important to maximize the resource utilization. As one interviewed fleet operator expressed *“Resource utilization is important to make the business model profitable, at the same time we need enough cars to cover the peaks during the day”*. There are different ways of maximizing resource utilization, also known as uptime. Predictive maintenance is one way and having spread customer segments that want to use the product or solution at different times is another. Working with maximizing uptime is a must for OEMs in the automotive industry in the future.

## 5.2 A Business Network for Future Mobility Solutions

The value chain introduced by Porter in 1985 was meant to be a tool for analyzing a company's competitive advantage. Porter further stressed the importance of understanding the value system, shown in Figure 2, to sustain competitive. Now when mega trends such as electro mobility, connectivity, autonomous drive and shared mobility are transforming the automotive industry, OEMs in the automotive industry must reconsider their strategies and their current business networks to sustain competitive. These changes in the business environment requires business model innovation where OEMs reconsider how they create and capture value as discussed in Björkdahl and Holmén (2013).

To understand how the role an OEM in the automotive industry take in the business network affects the business model, one must first understand how a future business network might look like. Reports and consultancy firms predict a totally new business network where OEMs in the automotive industry can position themselves by taking different strategies. OEMs must adapt by offering new mobility solutions which leads to new value chains with new actors and roles. Example of solutions already launched, where OEMs in the automotive industry have taken new roles, are Volvo Cars' Care by Volvo and Ford's Canvas subscription models. Lay et al. (2009) highlights factors such as ownership and personnel as important factors in new business concepts which are more service-based. This can also be seen in the interviews with companies that have introduced subscription- and pay-per-use payment models. Some of the interviewed OEMs such as Volvo Buses, Volvo Construction Equipment, SKF, Ericsson and UniCarriers all have a range of offerings where they offer their products as services meaning that they keep the ownership and are the ones that are responsible for the service and maintenance, either internally or through partners. This shows how value chains are transforming and how complex they have become. Due to this complexity, the term business network used in Ford et al. (2003) was identified to better describe a future business environment with fleet sales. This term was further used to describe the business network model presented in chapter 5.3.

Arbib's and Seba's (2017) four different actions visualized in Figure 1 were used to get a general understanding for how a future business network in the automotive industry might look like in the future. They argue that OEMs in the automotive industry can take four different strategies, mentioned in the background, these strategies together with Lay et al. (2009) were used to develop a model with roles in a future business network in the automotive industry. The model, seen in Figure 10, is based on different roles in the network and depending on a company's strategy, an organization can choose to take one or several of these roles. Interviewees stressed the importance of understanding the whole business network no matter what role a firm take in the network which is in line with Porter (1985).

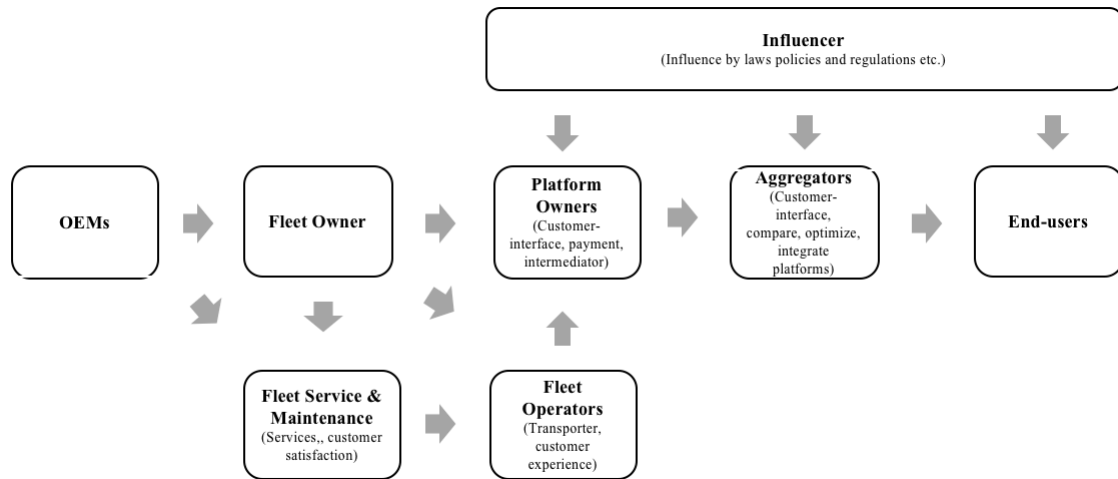


Figure 10. Different roles in a future business network.

As Lay et al. (2009) argues, business models will be very different depending on if OEMs in the automotive industry keep the ownership or if they sell their cars to other actors, a role called “fleet owner” was therefore added to the model. Many of the interviewed companies had chosen to focus on their core business and had therefore partly or fully outsourced some of the service and maintenance activities. Some bought it from a third party whereas other bought it from partners to OEMs. Some of the OEMs offer total solutions where they sell per-consumed-unit such as km or hour and are responsible for more or less all service and maintenance. The role “fleet service & maintenance” was therefore added to the model after interviews. “Influencer” was finally added because of the impact policy makers and laws have on the industry. Finally, this network only represents the network for fleet sales, other parallel business models, where OEMs have other roles can therefore exist in parallel. The model is developed for the automotive industry but can be used as inspiration for other industries with fleet sales.

### 5.3 Roles in a Future Business Network

In this chapter, different combinations of roles in the business network model are presented. Choosing which role to take in the network is of high strategic importance since it has a large impact on the business model. Each role further has its opportunities and challenges which is important to consider before choosing role/roles. As stated in the introduction chapter, the focus in this thesis is on taking the OEM role as well as the combination of the OEM and the fleet owner role. A presentation of the other roles will be included to give a general understanding of the business network and to understand the requirements on OEMs. The model is mainly based on insights from interviews and industry reports. It is a part of the scientific contribution of this thesis since limited similar models are presented in journal articles and books.

### 5.3.1 Taking the Role as OEM

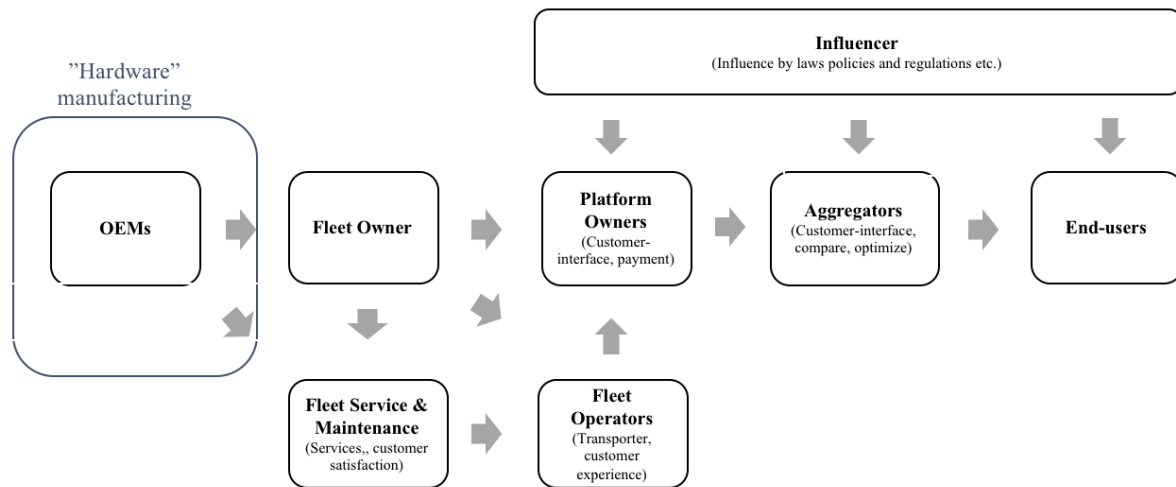


Figure 11. Taking only the OEM role in the new business network.

Taking the role as OEM in the business network model means that the OEM continues being a hardware manufacturer. OEMs choosing this strategy will earn money by selling the car fleets with potential service agreement to a fleet owner. This role means that the OEM does not perform the fleet service and maintenance nor operates the fleet or the platform, which is represented in Figure 11. Those roles are taken care of by other actors in the network.

This role is not very different from how OEMs in the automotive industry operates today. The core business for this role is still to produce cars. OEMs can sell service contracts, but they do not perform the service and maintenance. Since other actor owns the fleets, the OEM can still earn money on the traditional aftermarket such as spare parts by selling it to the owner or the service and maintenance provider. Spare parts, which in today's business models is an important revenue stream will therefore continue to generate revenues. This role is further characterized by less risk than if the OEM takes more of the roles in the business network. This role means less risk in two senses, both less risk in form of less change of the business strategy but also less risk in form of not taking the ownership of the fleets. An OEM that introduce this business model will probably experience less of the challenges of managing parallel business as an established firm, presented in Björkdahl and Holmén (2013), compared to one that also takes the ownership role.

It is important though to consider that OEMs might experience, similar as for other industries, that the aftermarket becomes exposed to competition by other actors. *"We have experienced that our aftermarket has been exposed to competition where other actors perform service of our products and sell spare parts to a lower price"*. It is further important to consider how megatrends might change the industry and thereby also influence the products, the cars. Electrical cars have less moving parts and are predicted to require less service and spare parts. This would affect the revenue streams and profit margins from the traditional aftermarket must be considered when taking this role. OEMs that choose this role must therefore identify new revenue streams and identify how they can fill gap on today's market. This has been identified by some of the interviewees. *"Revenues from parts will decrease, therefore, we need to find something that can replace it which leads to new payment models"*.

Since the new business network contains new roles in between the OEM and the end-user, it is important that the OEM does not lose track of what the end-user want. This is particularly true for OEMs with a very technical background, as cars. Fleet sales leads to new customer segments, fleet owners, these customers will have other requirements and needs then what OEMs in the automotive industry are used to today. When selling to fleet owners, OEMs must be able to develop products that have a low TCO by making them easy to maintain and to perform service on. Uptime will be an important value proposition to fleet operators and platform owners and OEMs must consider these needs in their design. They must also allow interfaces which make their products easy to integrate with solutions provided by other actors.

A risk for OEMs that continue to focus on the OEM role is that they might develop too technical products which the end-users in the network are not willing to pay for. One of the interviewed companies stressed the importance of focusing on the end-user when designing new business models in a new network. *“If we had the chance to start over with the development of a tablet we would start in the other end of the business network, figuring out what the end-customer wants, instead of being focused on the role as an OEM with great technical skills”*. As an OEM taking this role, it is important to have processes for information sharing since they are dependent on information from the rest of the business network. OEMs with parallel business models can utilize their position in other networks to get information and to avoid losing track of what end-users want.

For OEMs taking this role the largest challenges are to manage the balance of satisfying both their customers, the fleet owners, as well as the end-users. It is further important to find a way of differentiating their brand from competitors. This role suits OEMs that do not have the capabilities to take other roles the business network and who sees the manufacturing process as their core business.

### 5.3.2 Taking the Roles as OEM and Fleet Owner

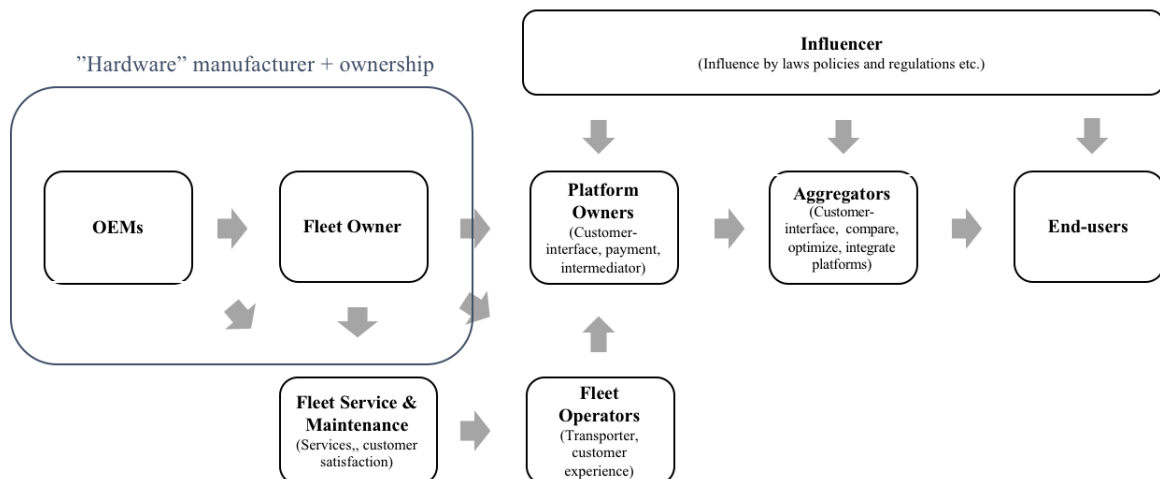


Figure 12. Taking the role as OEM and fleet owner

As illustrated in Figure 12, this strategy means that the OEM keeps the ownership of the fleets. This enables them to use different payment models, both leasing contracts as well as using more subscription-based payment models with both fixed and variable costs.

There are plenty of different business models within this field, the OEM can choose to use leasing contracts without service agreements or they can sell with their fleets with full-service contracts similar to Volvo Cars' Care-by-Volvo. Another payment solution is to use pay-per-use solutions similar to car rental or carpools, also this can be combined with service contracts, but the OEM is not the one who performs the service and maintenance.

The position an OEM can take depends on how mature the market is. As was shown in the interviews, buying total solutions from OEMs are more common in some markets than in others. This was also shown in Kumar and Kumar (2004). Some users choose to outsource part of their operations when it is not part of their core business whereas others only want after-sales services. This shows the variety of offers needed when offering services. This range of differentiated offerings was also shown in the interviews. *"Some customers take care of the service themselves or use their own service technicians whereas others prefer to focus on their core business and have a full-service contract with the OEM"*. Two of the interviewed OEMs, that have started to sell full-service contracts, mentioned that this maturity of the market differs between geographical markets. Some markets are more willing to purchase full-service agreements than others. This was shown in one of the interviews which mentioned that a competing OEM made it a standard in one market to take over the customers' workshops. The interviewed company already had an existing dealer network in that area. That made it more difficult for them to take over workshops from their customers, which the other company had made a standard. This example therefore also shows how the existing business network influence how easy it is for an OEM to total solution in the new business network and how it might lead to channel conflicts.

Selling total solutions and full-service agreements can have a positive effect of the costs if lowering the rate of failures with predictive maintenance. This can lower the TCO for the customer as well as lower costs for the OEM. One example of the latter one is an OEM who has introduced pay-per-use solutions, where service and maintenance is included but performed by their dealers. The OEM has seen that some of their costs such as warranty costs have been lowered when they offered total solutions. This because they could prevent failures when they had full insight and could perform predictive maintenance.

Several of the interviewees mentioned responsibility conflicts when selling total solutions. It is therefore important to clearly state what is included in the service agreements when selling total solutions. One of the interviewees also mentioned partnerships as an important factor when they sold full service agreements with their products since they needed to have insight in how the product was being used and had been installed to be able to guarantee uptime.

When you own the fleet, spare parts go from generating revenues to become a cost but there are also other dimensions to consider regarding spare parts. When keeping the ownership, one can guarantee that your spare parts are being used *"spare parts become a cost when you own the products, but it also gives you the opportunity to lock in your customers to use your spare parts etc."*. Owning the fleets also enables the OEM to collect more data and to *"work more proactive and understand the customers and their needs better"*. The role as OEM and fleet owner enable the OEM to come closer to the end-user which many of the interviews stressed the importance of. One of the interviewed companies highlighted their own bank which enable

them to offer both leasing contracts as well as charge per hour contracts. This increased their customer-interaction and enabled them to come closer to the user.

It is important to have a good interface, both when selling services to a fleet operator but also to make it easy to perform service and maintenance. The interface will affect the scalability of the business model and can be a first-mover-advantage if being early and therewith make your interface to an industry standard.

Owning the fleet requires financial capabilities which was mentioned as a large challenge in many of the interviews. One interviewee, who today operates a large fleet, stressed that it will be difficult to keep the costs down if the OEM would own the fleets and all the equipment necessary, *“The risk has today been spread on many different actors, but if one would own all product and items, the owner will have to add a risk premium which will make cars very expensive”*. The interviewee stated that private persons have carried the risk in today's business models and that transferring that risk to one actor would be very costly. However, taking this role gives OEMs the opportunity to bypass actors such as dealers which add margins in today's business models. An opportunity is therefore to lower customers' TCO. Owning the fleets will particularly be challenging if interest rates rise which will make it very expensive. When taking the ownership role, it is therefore important that the actor spread the risk by having a partner network and to use parallel business models. Partnerships with dealers and operators help spreading the risks as well as maintaining parallel business models.

Even if interviewees did not use the term uptime internally, they all stressed the importance of it and resource availability when it was discussed during the interviews. No matter if OEMs take the fleet operator role themselves or if they will sell their fleet to other actors, guaranteeing uptime will be of importance and might become an order winner in the automotive industry in the near future. Construction industry and transport industries, which have used fleet sales for a long time, have already come far with guaranteeing uptime through predictive maintenance and uptime centers. Fleet optimization is central for businesses where a high resource utilization is necessary. Some of the interviewed OEMs have already adapted to these needs by offering service and maintenance when it is best for the user which in many cases would be the fleet operator in this model. *“Uptime is not only about lowering the need of service and the time it takes, it is also important to perform the service when it is best for the customer, availability is an important concept”*.

A risk with the ownership strategy, which was identified by many of the interviewed OEMs, is to make the solutions too customized. To succeed, it is important to segment customers based on importance of the customer as well as find a way of making the service offer modular, see chapter 5.1.2 for further discussion. To succeed, it is further important to remember to differentiate the interaction with customers. The interactive layer mentioned by the interviewed expert within development and implementation of solutions and services in industrial networks, described it as a way of *“balancing standardization and customization and make a business model scalable”*. Lastly it is important that OEMs have the right organizational structure to manage these parallel business models (Markides, 2013; Hacklin et al., 2018) as well as having enough resources and support from top management (Björkdahl & Holmén, 2013).



### 5.3.3 Other Roles in the Network

Other roles in the business network model are important to understand both how to create value to new customers but also if taking these roles in the future. OEMs in the automotive industry must understand the roles fleet operators and platform owners to understand how they should develop competitive solutions. One key finding is further the importance of the role service and maintenance since this role helps OEMs to offer cost-efficient total solutions. An analysis of the empirical findings concerning the roles service and maintenance, fleet operator and platform owner is therefore presented below.

Taking any of the following three roles would mean that OEMs come closer to the end-user, but the roles also brings with it challenges regarding need of new capabilities and competences. These roles differ a lot from the traditional OEM role and comes with large organizational changes as well as need of changed steering mechanisms.

#### 5.3.3.1 The Role Service and Maintenance

Service and maintenance will become more important when selling fleets due to the high resource utilization and due to low margins for fleet operators. Selling total solution, either by taking this role as an OEM or through partners, is an opportunity for OEMs to come closer to their customers. It is further an opportunity to enter new markets, but total solutions require much customization which make it less scalable in today's business environment.

The interviews show that services and maintenance is a way of customizing the offer by making the fleet available when it is needed by the operator. *"Before, uptime was about maximizing the time a vehicle was rolling and minimizing the time in workshops. This is still important but today, a vehicle should also be available when it is needed"*. The relationship with the service and maintenance provider is very important in the business models with fleet sales. This because OEMs will be dependent on the service and maintenance provider when they sell total solutions where they are responsible for a certain uptime and service level. If these relationships do not work, OEMs will not be able to offer cost-efficient solutions. Interviews also shows how important this relationship is for an operator since it helps the operator to maximize the uptime.

If an OEM in the automotive industry is going to succeed with offering service and maintenance, either by taking this role or through partners, it must be able to offer it to a lower cost than if the customer would do it themselves or purchase it from a third party. One interviewed operator in the public transport industry, an industry where uptime is very important, perform the service and maintenance internally since the operator has a good workshop manager who has lowered their costs. *"Right now, it is better to perform the service internally since it is cheaper and time saving but we have competitors that have bought turn-key solutions"*. One interviewed carpool company neither wants to buy a total solution today since they thought it would add margins. At the same time, it mentioned that *"optimizing is a very large part of our operations due to low margins in the business"*, which indicates that there is a business opportunity as long as the OEM or a third party make the offer cost efficient. The opportunity therefore lies in understanding the customers' pains and gains and optimizing the service and maintenance based on that.

#### 5.3.3.2 Taking the Role as Fleet Operator

The fleet operator role is responsible for a large part of the customer experience since it is the one operating the fleet. Until the fleets are autonomous, this role often includes staffing of

drivers/operators. This role further includes to ensure the right vehicle is available at the right place, activities similar as for carpool operators. Very few of the interviewed companies had taken this role in combination with other roles than the platform owner. Some had combined the fleet owner, the fleet service & maintenance role and the fleet operator but there were very few OEMs that had taken the fleet operator role. One OEM, not in the transport or automotive industry, has a business model where they are responsible for the staff of the customer and have contracts of around eight years where they are responsible for the performance and of making their business more efficient. Contracts like this might become more common also in the automotive industry, especially if cars become autonomous, since the OEMs have knowledge about how to make their products better and more efficient. OEMs further often have analytical capabilities which they can use to optimize the fleets.

The operator must adapt the fleet based on variations in demand to guarantee a high resource utilization. This can be achieved through different strategies. One interviewee mentioned a partnership with an OEM that allowed them to change their leasing agreements depending on the demand. It also allowed them to push forward service and maintenance and perform it at the same time as they return the vehicle to the owner etc. Another operator, who is also a platform owner, mentioned partnerships with other operators as very important to achieve high resource utilization.

The interviewed operators either buy their vehicles directly from OEMs, dealers or lease them from a bank. None of the interviewed fleet operators buys pay-per-use solutions today but the carpool company use pay-per-use payment solutions towards its customers. Several of the interviewed operators mentioned low margins and stressed the need of resource optimization and activities to minimize the downtime as well as optimizing service and maintenance activities. Helping the fleet operator to become more cost-efficient is therefore identified as a market gap which OEMs can fill.

#### *5.3.3.3 Taking the Role as Platform Owner*

The role as platform owner is characterized by the end-user interface and is the one that gets the requirements from the end-users. These requirements are spread to other actors in the business network which is shown in the contracts between platform owners and fleet operators. Service providers must often pay fees if they cannot deliver the uptime and resource availability as was agreed in the service agreements.

Partnerships with other actors in the business network is important for the platform owner. This because of the need of adapting the fleet to demand fluctuations as well as resource availability. These requirements are similar to the ones of the fleet operator. Some of the interviewed companies had both these roles. Others had a partnership where they had common goals which they had identified as necessary to deliver a service of high quality. The platform owner role and the fleet operator role can in some cases preferably be taken by one actor, this might particularly be true if car fleets become autonomous. Despite the similarities, there are some differences such as that platforms often are adapted to different markets which affects the scalability and these roles can therefore in some cases preferably be separated.

Since high resource utilization is a prerequisite for this role, a success factor, identified in the interviews with platform owners who offer mobility solutions, is to target different customer

segments. This also generates a complexity since it requires different payment solutions and differentiated offers.

The aggregator can generate new customers to the platform owner, but it is also a risk that it takes the end-user contact from the platform owner. One of the interviewed companies mentioned how they do not want to be fully integrated with other platforms or aggregators since it would prevent them from selling additional services in the future and take the end-user contact away from them. They saw an opportunity to be integrated with other platforms to be able to offer integrated mobility solutions. However, they did not want to lose the interface towards the customers in this case meaning that they wanted customers to be transferred to their platform and make the payments through them as an example.

#### 5.3.4 Comparison of the Different Roles in the Business Network

Each of the roles described above has its pros and cons which are summarized in below table. Which role/roles an OEM should take in the business network depends on what capabilities and competences they have as well as how it fits the overall business strategy.

*Table 11. Summarizing table with opportunities and challenges for each of the roles discussed above from an OEM's perspective.*

Role	Opportunities	Challenges
<b>OEM</b>	Less risk since it requires less change of competence and is less asset heavy than when having the owner role	The OEM need to find new revenue streams in the future
	The OEM can focus on core competence and become a well-known fleet manufacturer	Risk to become a “simple” hardware manufacturer and lose contact with end-user as well as becoming too dependent on other actors
	Can offer different service solutions	Need to adapt to all other actors in the business network
	Recurrent income from subscription models	The fleet owner is asset heavy
<b>Fleet owner</b>	Opportunity to offer a total solution and come closer to customers	Keeping the cost down if interest rates rise can be tough
	Opportunity to lock-in the usage of your spare parts	Risk of making the solutions too advanced and hence too expensive
	The fleet owner owns the data	
	Can have its own bank and get the margins the banks get today by offering financial solutions	
<b>Fleet service and maintenance</b>	Larger share of the business network makes it easier to offer total solutions	Need for investments in new capabilities and resources
	The intermediate can be removed and the OEM can come closer to end-users	Keeping the cost of service and maintenance down
	Taking this role makes it easier to guarantee uptime by having more flexible solutions	Geographical differences affect the scalability
		Convince customers to buy total solutions

<b>Fleet operator</b>	Opportunity for additional sales during the meeting with the customer and to lock-in the usage of their spare parts	Channel conflicts can occur when taking over old workshops' and dealers' job
	End-user contact	Manage new steering mechanisms and becoming more agile
	New business areas which enable OEMs to use their knowledge to design better products and services	Becoming profitable due to low margins when being operator
	Use analytical capabilities to optimize the fleet through predictive maintenance and design	Keeping the service contract in new procurement periods when platform owners easily can replace the fleet with another fleet
<b>Platform owner</b>		Adapting to platform owners' requirements since many platforms today are local
	Become the interface for the end-user	Competition from aggregators and other platforms
	Large influence on the business network	
	New business areas characterized by high margins	Manage the change since it is very different from core business for traditional OEMs
	Find a scalable platform which can be used globally	

OEMs have offered different forms of service contracts together with their products for a long time (Björkdahl et al., 2018). This was also shown in the interviews. Some OEMs in the automotive industry are already testing the fleet owner role with new business models but there are less examples of OEMs that have taken the fleet operator role or the platform owner role. One reason might be that these roles are quite different from the traditional view of activities performed by an OEM in the automotive industry. Taking these roles requires a larger change of the business strategy compared with taking the fleet service & maintenance role or the fleet owner role. *“Steering mechanisms are very different for a manufacturer and actors that are closer to end-customer today. OEMs have long project for product models and we change price sometimes several times pay day”.*

Based on the interviews, there are mainly three factors that affect what role an OEM can take: the maturity of the market, the existing business network and the costs of performing the service and maintenance which is transferred as a cost for the operator. The maturity of the market refers to whether customers want to buy a total solution or products as one off etc. The second factor, the existing business network, affects the choice in two dimensions. It refers to potential channel conflicts since OEMs are dependent on their dealers today and must therefore be able to manage potential channel conflicts. It also refers to OEM's capabilities since they need a network to support them if they do not have the capabilities to offer total solutions internally. The third factor is about the cost of OEMs' offers and the value it generates for the customers. If OEMs cannot provide cost-efficient solutions, themselves or through partners, operators will prefer to buy the fleets as one-off sale.

## 5.4 Key Elements in a Business Model with New Mobility Solutions

Market pull as well as a technological push drives the development of new business models. End-users request mobility solutions such as carpools and seamless transports. At the same time, the technological development enables new transport solutions which leads to new business models. In this chapter, an analysis of how key elements in the business model for an OEM in the automotive industry will differ from today is presented. The discussion is based on the different strategies an OEM in the automotive industry can take, presented in chapter 5.3.

Björkdahl et al. (2008) argue that autonomous vehicles will change the way companies create value. The key elements presented in this chapter are applicable for OEMs in a short- to midterm perspective when the fleets are still driven by a person, but also in a mid- to long-term perspective when the fleets become autonomous.

The automotive industry today can be compared to the first three offers mentioned in Kumar and Kumar (2004), after-sales-service, partial outsourcing and full-service contracts. All these are characterized by that the customer owns the product and that much focus is on the product's profit maximization potential through service and maintenance contracts. As Johnson et al. (2008) as well as Björkdahl (2009) describe, new business models are needed when companies significant change elements in their business model. When OEMs sell fleet sales to operators, they target a whole new customer segment with a new value proposition. Further, elements such as ownership and personnel as well as payment model are all factors mentioned in the framework in Lay et al. (2009) which enable different business models and business concepts. Some OEMs, such as Volvo Cars and BMW, have introduced new subscription-based business models where they keep ownership as well as are responsible for maintenance and service, but few OEMs have gone all the way to selling performance. Selling performance in this sense refers to the solution selling and total care solutions mentioned in Kumar and Kumar (2004) which focus more on functionality and performance. Some of the interviewed companies, especially in asset heavy industries with expensive equipment and products, have started to offer more performance-based offers where they guarantee a certain availability and uptime. This analysis is mainly based on the insights from those interviews since there will be a lot of similarities when OEMs either sell their fleets or own them themselves.

### 5.4.1 Value Proposition

A large adaption from today's business models and business network is that OEMs, except the ones taking a platform role, will sell their offerings to other companies instead of to end-users. This requires a new focus in how they choose to frame and communicate their value proposition.

Osterwalder and Pigneur (2010) stresses the importance of a good value proposition to stay competitive. Elements that creates value are according to them convenience/usability, cost, customization etc. In line with this, findings show that to compete with privately owned cars, car fleets must be "*convenient and economically favorable*", which means that much focus lies in the customer experience and the cost of the service. Either if OEMs sell their fleets as a one-off or sell their fleet as a service to an operator, they will require that the fleet is available and running when it is needed. This means that OEMs in the automotive industry will require new competence and capabilities to cover both the needs of the end-users as well as the ones of the

fleet operators and platform owner. Many of the interviewed operators mentioned low margins and need for optimized processes and services. An important value proposition in a business model for an OEM in the automotive industry must therefore contain an offer which help the operator to become more efficient. This can be achieved through offering total solutions where they guarantee a certain availability and uptime, by lowering customers' TCO or helping them to become more productive.

Total care solutions that enable customers to focus on their core competencies were discussed both in interviews as well as in Kumar and Kumar (2004). This is particularly valuable when new technologies are introduced as electro mobility and autonomous cars since new and better products might be introduced shortly after customers have bought the product. Taking the ownership role and therewith the risk is therefore a value proposition. *"The uncertainty regarding electro mobility made customers more positive to leasing contracts"*. Taking the ownership role and/or being responsible for service and maintenance can further reduce the cost of operating the fleet. Except for making cars cheaper, this can be achieved through lowering the need of service and maintenance and by lowering the cost of it. This is closely related to TCO and thereby uptime and availability of the fleet.

One of the companies, that have come far with offering availability and full-service agreements, defines uptime as *"For a user, the right vehicle in the right place at the right time needs to be available"*. Many of the interviewed companies measured uptime and availability because of its importance and several of the interviewed service providers mentioned fees if not delivering the agreed uptime. Some KPIs mentioned in the interviews were, cost per km, time at service, availability, vehicle of road, first time fix rate and number of rolled km. Because of its importance, OEMs in the automotive industry must secure that they have resources to guarantee uptime. Means discussed in the interviews were uptime centers, service trucks, predictive maintenance and partnerships with customers to get insights in how they use the product.

The automotive industry is known for its module-thinking in the production. Even though components and items are standardized, buyers can combine them and customize them based on their needs. Customization will continue to be an important value proposition with fleet sales, but OEMs in the automotive industry must not only offer customization of products, they must also be able to customize services since this will become more important for customers in the new business network. Since end-users and customers have different needs and requirements, this requires a new understanding of the business network where OEMs is required to understand not only their customers' but also other actors' pains and gains. This can be both costly and difficult and affects the scalability. OEMs in the automotive industry must therefore, as discussed in chapter 5.2, use their knowledge within modularization to succeed with this new business model.

OEMs in the automotive industry can help their customers become more productive through business- and product-related services. Examples of product-related services which were mentioned as important in fleet sales are maintenance, fuel coaching, financing and fleet management. Business-related services are about understanding customers better and to utilize the data available and thereby helping them to become more efficient. It is also about optimizing customers' operations such as taking over customers' operations.

#### 5.4.2 Revenue Streams

Which and how many revenue streams an OEM in the automotive industry will have depends on the roles they decide to take and the level of services they will offer. For example, as discussed in chapter 5.3, spare parts and other parts of the aftermarket will go from being a revenue stream to becoming a cost if the OEM decide to sell total solutions or full-service agreements. Since spare parts and aftermarket have high margins for OEMs today, this becomes an important question to discuss. An OEM in the automotive industry must therefore evaluate if it can succeed with finding new scalable ways of capitalizing on the aftermarket or if it instead should focus on generating revenues from this part of the aftermarket as it does today. It is important though to consider how electro mobility and changed customer requirements as well as how competition might affect the margins of the spare parts in the future.

Taking the owner role in the network means that the OEMs in the automotive industry will go from a transaction-based payment model to recurring revenues as discussed in Osterwalder and Pigneur (2010). The OEM role today is characterized by pay once solutions with potential monthly incomes from service contracts whereas the fleet owner role will be more characterized by monthly payments or pay-per-use solutions. This indicates that it can be financially challenging to take the ownership role since revenues are pushed forward. An alternative is to have your own bank who can own the fleets and instead lease the fleets as both the interviewed car rental company as well as the carpool company do.

Interviewed OEMs from different industries who have introduced service-based business models are characterized by having several different payment models. This is also in line with the framework for service-based business concepts presented in Lay et al. (2009) which includes models such as pay for availability, pay-per-unit, pay-per-equipment and fixed rate. The transaction between a service provider and its buyer is often characterized by a fixed and a variable cost based on either consumed units or based on the performance of the service provider. An example of these is monthly costs plus cost per kilometer and hour and another example is a fixed cost plus a variable cost based on number of passengers, kilometers and hours plus a potential bonus based on customer satisfaction.

Additional services offered to end-users and platform owners generates important additional incomes for fleet operators and platform owners. Additional services in this sense are services related to the end-user's customer experience. Services can also be offered to customers in the business network but to distinguish these from the ones offered to end-users these goes under the category of business- and product-related services. Interviewees who offer mobility solutions also mentioned these additional services as a large revenue stream in the future. OEMs must therefore either enable other actors to integrate additional services to their products or develop and integrate them themselves. Also, since customization is important for end-users, additional services create opportunities for new revenue streams. One example can be offering solutions that automatically change the settings in a shared vehicle so that it feels like an own car from the second it gets unlocked.

Product- and business-related services will be important revenue streams no matter if the OEMs in the automotive industry choose to take the OEM role or the OEM and owner roles. Operators will have uptime requirements which OEMs in the automotive industry must be able to guarantee through different forms of service- and maintenance contracts. Business-related services is an opportunity to come closer to customers as well as the partner network. It is

further an opportunity to lock-in customers as well as position oneself on the market and differentiate the offer from competing OEM's.

### 5.4.3 Cost Structure

The cost structure is very dependent on which role a firm take in the business network. As discussed under revenue streams the view of aftermarket differs depending on which role a firm take. If a firm chooses to focus on the OEM role and the car manufacturing, their cost structure will be similar to the business models used today. OEMs in the automotive industry must of course adapt to fleet sales since it means that they will have fewer but larger customers with other needs and requirements. The interviews show that the requirements of end-users go back to the operator via the platform owner. Interviewed operators are focused on end-users' experience and satisfaction but to be able to satisfy these needs, operators put requirements on OEMs in terms of uptime and costs. When taking the OEM role in the model, OEMs must, therefore, focus on lowering the costs for their customers through design and partnerships with actors who can offer service and maintenance solutions. A potential strategy for an OEM in the automotive industry is to focus on becoming the market leader in fleet sales and focusing on making its processes more efficient. Some of the competing OEMs will try to take larger share of the business network through new business models which will be costly and take resources from the manufacturing process.

If OEMs in the automotive industry keep ownership of the fleets, spare parts will become a cost *"we do not earn money from spare parts which previously has been a good business for us"*. It therefore becomes important to think carefully about how OEMs can price services to cover these costs. This is challenging and a require a new mindset for OEMs in the automotive industry who are used to pay once models. It is difficult to know how the user will use and wear and tear the fleet which further makes it difficult to set a price when OEMs keep the ownership and sell as a service. OEMs in the automotive industry must therefore prevent that the cost of owning the fleets will exceed the revenues from it by having the right incentive structures as well as having ways of tracking how the user use the fleet. Subscription models already available on the market, helps OEMs to prepare for this role.

Customization can easily be costly and since both end-users as well as operators and platforms will request customization, OEMs in the automotive industry must ensure that they already from the beginning make the business model scalable. This by having their systems and processes in place before scaling it. A risk is otherwise that the costs will increase at the same rate as the revenues as for one of the interviewed OEMs from other industries. It is further important that OEMs in the automotive industry find an organizational structure which encourage that R&D and service-providers communicate with each other to keep the cost down and to make the business model scalable. One of the interviewed companies, who earlier had very separated service and product organizations, mentioned that they had experienced that they had no incentive structure to improve the products to make the services offered to the product easier and more efficient. They later realized that they had been too separated which made services costly and made it difficult to scale.

Taking the ownership role generates new opportunities for OEMs in the automotive industry by offering new business models and finding new ways of interacting with customers, but it also comes with challenges. None of the interviewed OEMs from other industries have managed to scale their service-based business models where they keep the ownership because



of the challenge of keeping the cost and risks down. At this state, OEMs in the automotive industry are recommended to segment their customers into different customer segments where they take different roles. This both because of that customers want to have different solutions depending on what they see as their core business but also because of owning all fleets would be too costly and risky for an OEM in the automotive industry today.

## 6. Discussion of the Implication of the Two Strategies

In this chapter, the implications of having a service-based business model are discussed and partly answers the research question concerning what OEMs in the automotive industry can learn from other industries. Following are discussions concerning the implications of taking the role as OEM and taking the role as OEM and fleet owner in the business network model. That answers the research question *"How does the role an OEM takes in the future business network affect its business model?"* and finalizes the answer to what OEMs in the automotive industry can learn from others. Lastly, the key elements in a future business model are discussed and answers the third research question. All these areas combined help answer the main research question *"What are success factors in a future business model for OEMs in the automotive industry when introducing new mobility solutions?"*.

### 6.1 Succeeding with a Service-based Business Model

Many other industries and companies have also gone towards a more service-based business model. The learnings from the interviewed companies and the implications for OEMs in the automotive industry are analyzed in this thesis to answer the research question *"What can OEMs in the automotive industry learn from other industries regarding their transition from a product focused to a service-based business model?"*. Because of the challenges related to more service-based business models, OEMs in the automotive industry need to modularize their offers in all three layers, product, service and interaction. By doing so, they can take different roles in the business network and offer different solutions in parallel, which will be a competitive advantage for them. When designing and using modules OEMs in the automotive industry must understand customers' needs rather than wants. Further, a balance between technically advanced and customer satisfaction needs to be achieved.

OEMs in the automotive industry have been very product focused and must evaluate their organizational structure and make sure that products and services are aligned when they are implementing service-based business models. Additionally, they need to create the right incentives adapted to the new way of selling by changing KPIs and other measurements. Many of the interviewees as well as scholars stress the importance of making sure that the whole organization aligned when established organizations goes from selling products to also selling their products as service. One of the interviewed companies mentioned how the product business had no incentive to improve the products to make the service business more scalable since they were measured individually. Product failures therefore made the service business very costly which affects the scalability. This an important learning for OEMs in the automotive industry which today have very product focused business models and will need to adapt to service offerings.

Whether OEMs in the automotive industry should separate the new business model or integrate it in the established organization depends on the overall strategy and on what roles the OEM takes in the network. Interviewees as well as scholars as Hacklin et al. (2018) have different views of this question. Some think it is a risk to become too separated if they do not integrate the service offerings with the established organization. Others think separating the old and new

business model is the only way forward to succeed. The factors that affects this choice, according to Osterwalder and Pigneur (2010) are risks, potential conflicts with parallel business models and strategic similarity. These factors are important and what both interviewees and Markides (2013) highlight as success factors when having parallel business models is the importance of the organizational context. Culture, values, vision, incentives and people are the factors which will affect whether an OEM will succeed or not. These factors should therefore influence how an OEM in the automotive industry organizes around the new business model.

If the automotive industry will transform in the same rate as consultancy firms and analysts such as PwC (2017) and Arbib and Seba (2017) predict, OEMs in the automotive industry must already now decide how they should position themselves in the business network model for the next coming ten to fifteen years. Following is therefore a discussion of the implications of the two different strategies, the OEM role or the OEM plus the fleet owner role.

## 6.2 Taking the OEM Role in the New Context

Continuing with just the OEM role means that the OEMs in the automotive industry can continue to focus on their core competences and business models. Similar to OEMs' more product focused business models today, it will make it easier to scale and this strategy is characterized by less risk and less need of change. When taking this role, the integration of service and products will be more of a marketing-oriented focus described by Park et al. (2012). This means that services are mainly a mean to differentiate the product offering from competitors. This role further means that OEMs in the automotive industry can continue to earn money on the traditional aftermarket such as spare parts, but it also means that OEMs will risk giving away parts of the aftermarket to other actors.

When taking this role, OEMs in the automotive industry must identify new revenue streams in form of service agreements through partners and/or develop hardware and solutions that create value for other actors in the network. This both because OEMs in the automotive industry will target new customers with new needs, but also because of the risk of the aftermarket becoming exposed to competition as in other industries. Identifying new revenue streams is one of the largest challenges for an OEM taking this role. Customers will have other requirements in terms of TCO and uptime which force OEMs in the automotive industry to identify new ways of creating value. Value could be created by guaranteeing uptime through uptime centers or by making predictive maintenance easier etc. It could also be achieved through product design which makes service and maintenance easier. Operators, which in many cases will be the customer in these business models, are characterized by low margins which make TCO and uptime to potential order winners in the future. This further indicates that OEMs in the automotive industry must develop new strategies where they earn money through lowering customers TCO, otherwise they might be replaced by other actors in the future.

Other risks related to the OEM role is to become too separated from the end-users. The distance increases the risk of developing other solutions than what the end-users want but also means that OEMs in the automotive industry get a smaller share of the margins. The third large risk with this strategy is to lack behind competitors that will take other roles in the network.

## 6.3 Taking the Fleet Owner Role in the New Context

Taking the ownership role enables OEMs in the automotive industry to develop a closer relationship with its customers. When keeping the ownership, OEMs can capitalize on all available fleet data and use it to further improve its products and to offer additional services. The new payment models might according to Martinez and Walsworth, (2018) be challenging for OEMs to adapt to but will according to the findings in this thesis be needed in a mid-long perspective. OEMs in other industries such as construction equipment and buses have already seen a market need of total solution and turn-key solutions. They further expect these to grow in the future. Geographical differences and customization affect the scalability of this business model and OEMs in the automotive industry must therefore find ways of building their offers in modules. They must also identify processes for sharing information and use existing knowledge and competence to make the service and maintenance element profitable.

The challenge is to scale this strategy without making the solution too customized or too costly when the OEM in the automotive industry carries the risk of owning the fleets. To succeed with this strategy, OEMs must work closely with its partners to keep the cost and risks down. This business model generates most value to customers when the market is uncertain and when interest rates are high. This is also the most challenging situation for the OEMs in the automotive industry which further indicates that they must have parallel business models also for future mobility solutions.

Other risks with this strategy are responsibility conflicts which was identified in several of the interviews. The need of service and maintenance is very dependent on how a customer use the product which can lead to potential conflicts of who is responsible for what. Another risk is channel conflict since this role means that OEMs in the automotive industry bypass actors such as dealers in the network. Finally, a risk, especially for OEMs in the automotive industry that target a premium segment, is to make their solutions too costly which the interviews showed often is related to too customized solutions or too technical advanced products. Operators must find these solutions cost-efficient otherwise they will prefer to own the fleet themselves instead of buying total solutions from OEMs.

## 6.4 Key Elements in a Future Business Model

A challenge for established OEMs in the automotive industry is to adapt to the new business network with new actors. To succeed, the OEMs must be able to manage to satisfy both customers' as well as end-user needs. This can easily lead to parallel business models within each customer segment. A challenge, but also an opportunity is therefore to become a solution provider, focusing on solving customer problems through pre-defined modules rather than making customized solutions for each customer.

Continuing using partners for service agreements makes OEMs in the automotive industry quite dependent on other actors since their performance will determine whether customers will be satisfied or not. This was discussed in one of the interviews where the truck manufacturing company mentioned that carriers might even choose brand based of their relationships with dealers and workshops. OEMs in the automotive industry must therefore, in both strategies, manage potential channel conflicts by involving their dealers and make use of their competence

and knowledge. Dealers and workshops will be important for the more traditional business models also in the future and OEMs must therefore make sure that they do not damage these relationships by offering direct sell to some customer segments. OEMs in the automotive industry are further dependent on their network to be able to offer service and maintenance in a cost-efficient way.

Traditionally, OEMs in the automotive industry have earned money on selling spare parts and service contracts, when selling car as services, many of these revenue streams will become costs which shows the difficulty of introducing new business models which are more service-based, this could also be seen in the Scania example in Björkdahl et al. (2018). Scania have worked for many years with adapting their business model to be more service-based but such adaption takes time.

This thesis shows that OEMs in the automotive industry must already now start to consider their strategy onward to cope with the changing business environment and to be able to position themselves in a future business network. Scholars as well as interviewees highlight the challenges related to implementing new innovative business models in parallel in an established organization (Osterwalder and Pigneur, 2010; Markides, 2013; Hacklin et al., 2018). OEMs in the automotive industry must therefore decide what strategy they will have onward. In line with Osterwalder and Pigneur (2010), this thesis shows that OEMs in the automotive industry must find a way of maintaining the existing business models at the same time as they implement new innovative more service-based business models in the short- to middle-long perspective. This to not lack behind competitors.

Since it is challenging to manage parallel business models, OEMs in the automotive industry must decide whether they should take one or several roles in the network model. Keeping the ownership comes with new challenges but if not taking this role, OEMs will be limited to a smaller share of the market and be limited to some customer segments. OEMs in the automotive industry are therefore recommended to offer parallel business models where they for some customer segments only take the OEM role but for others also keep the ownership. Aiming for only one of the strategies would either limiting the OEM or make the business model difficult to scale.

All above adds up to answer the overall research question, *“What are success factors in a future business model for OEMs in the automotive industry when introducing new mobility solutions?”*. As shown in this chapter, key elements in the business model varies depending on which role a firm take as an OEM. OEMs in the automotive industry must therefore constantly challenge their current business models as well as reconsider the roles they have in the business network. In a short- to midterm perspective, OEMs in the automotive industry are recommended to mainly target the OEM and the OEM and owner roles. However, roles as service and maintenance, fleet operator as well as platform owner should be considered in a middle to long-term perspective, especially when the fleets are autonomous.

## 7. Conclusion

OEMs in the automotive industry have many challenges ahead of them but also many opportunities. The whole industry is changing fast and a new business network is expected to emerge with new roles. OEMs in the automotive industry need to adapt to the new way of selling mobility as well as to the new business network and decide what role or roles to take. They also need to adapt to a more service-based business model since the indications of the future way of selling mobility points in that direction. Simultaneously, the old business model will continue to be relevant and parallel business models will be necessary.

To handle more service-based business models, much can be learnt from other industries and success factors have been identified to handle the challenges that comes with it (summarized in Table 10). OEMs in the automotive industry should build their offers in modules to avoid too much customization and hence make the business model more scalable. Many OEMs in the automotive industry are already good at designing their products as modules and this way of thinking must be transferred to services and the interaction with customers. To make it easier to work with modularized offers focus should be on the customers' needs rather than wants. By doing so, they can combine their modules and solve the customers' problems their way. This will help OEMs to keep cost down and as well as make the business model more scalable. OEMs in the automotive industry must not only segment customers, but also choose which ones to aim for to ensure that they are profitable, instead of just chasing revenues. Further, OEMs in the automotive industry must handle parallel business models since new value propositions and a new business network will enable different ways of selling products, services and mobility solutions that will be used at the same time. KPIs and other measurements need to be adapted to the new business models to create the right incentives within the organization. The organizational structure also needs to be adapted to selling more service-based offers. Regarding this question, the interviewed companies, as well as scholars, prefer different ways of structuring the organization, but all agree that departments for products and services need to be integrated or at least cooperating so that the whole organization are working towards the same goals when having parallel business models.

A model of a potential future business network for the automotive industry has been developed. The new network will have a large impact on the future business models. The roles in the model are OEM, fleet owner, service and maintenance, fleet operator, platform owner, aggregator, influencer and end-user. This thesis focuses on two strategies including the OEM and the owner-role. However, it is important to understand all roles in the network to be a successful actor in it and perhaps in the future take more roles. Independent of which role OEMs in the automotive industry take in the business network model, they must identify new revenue streams related to uptime and performance since resource utilization will be central in fleet sales. Both strategies described in the thesis, keeping the role as just OEM or OEM plus fleet owner, has its opportunities and challenges. Continuing with just the OEM role requires less change and risk. The traditional aftermarket continues to be a revenue stream but at the same time parts of the aftermarket risk being taken over by competitors. It is further a risk to lose market shares in the future when other actors might be able to offer more attractive solutions which lowers customers' TCO. In comparison, adding the fleet owner role means that OEMs must change their steering mechanisms and way of selling. This is challenging and changing processes and systems takes time.

Today, fleet operators in other industries spend much time on optimizing their fleets to reach a high resource utilization. By succeeding with offering cost efficient total solutions OEMs can fill a market gap in the automotive industry. Factors as maturity of the market and customer attitudes will affect which role OEMs can take on different markets. Other factors affecting which role an OEM can take is maturity of the business network as well as the OEM's ability to offer cost-efficient solutions. A strategic choice is whether OEMs should take different roles for different customer segments or if they should focus on one of the strategies and target a smaller share of the market.

Today, OEMs in the automotive industry are investing in subscription models and new competence as a response to new needs and business opportunities. In a mid-term perspective, the OEM or the OEM and fleet owner role will be most relevant due to the similarities and the current trend of offering subscription models. Taking the service and maintenance-role can also be relevant here but requires large investments and is complex on a global market. In a long-term perspective, when the mobility solutions will be autonomous, OEMs might take roles as fleet owner and platform owner to come closer to end-users. It is important to constantly reconsider role/roles in the business network as well as evaluate the current business models.

To sum up and answer the main question of what success factors for a future business model are, key elements in a future business model for OEMs in the automotive industry will depend much on what role in the business network they decide to take. However, the success factors of a service-based business model can be applied independent of choice of role as long as the OEM is moving from offering products towards a service-based offer. This thesis builds on predictions of future mobility solutions and so does the conclusions concerning what role to take and the implications it will have on the business model. Success factors for an OEM in the automotive industry when offering service-based business models have been identified as well as key elements in a future business model. A suggestion for further research is to complement the findings presented in this thesis by quantifying the economic impact different roles in the network have as well as to update the suggested recommendations based on future development of the industry. Additionally, a deeper analysis of each role and what would be required to take the roles should be investigated.

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