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Business model innovation in the Swedish carsharing market

Master's Thesis in the Master's Program Management and Economics of Innovation

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Abstract

The concept of mobility is entering a new era. This is exemplified by changing customer preferences, new modes of mobility and new business models. This paradigmatic shift has forced OEMs to transform beyond car manufacturers into the role of mobility providers where carsharing is a concept with high predicted future growth. Therefore, this thesis aims to answer how an OEM can innovate its station-based carsharing business model in order to improve its business-to-consumer offering in the Swedish carsharing market.

The theoretical framework focuses on literature covering the concept of business models as well as business model innovation. More specifically, the concept of how business model innovation is defined, how it is conducted and why it is relevant is described and elaborated on from the perspective of multiple scholars. The study has applied a qualitative research strategy with the use of both primary and secondary data. The primary data consisted of semi-structured interviews where customers, non-customers, researchers and market players were interviewed. The interviews were coded and clustered into distinct themes which served as the main categories in the empirical findings. Moreover, the main secondary data consisted of information from website in order to map the current market players and their business model characteristics.

The empirical findings highlighted four categories of customer pains in relation to the current offerings, namely lack of flexibility, trips resulting in paying for non-usage, poor fit for multi-modality and a market structured in silos. In combination with the mapping of the market player, it could be determined that these pains constituted a void area in the market where no current market player offered a high pick-up and drop-off flexibility. Moreover, seeing as the majority of pains were related to station-based carsharing, a potential for addressing these pains were found to be to offer one-way trips within such a concept. Furthermore, four main areas of challenges that might arise if these customer pains were to be addressed were found. These were associated with the risk of asymmetric flows, the increased cost with car relocation, critical mass of customers, and sustainability aspects.

By using the insights gathered from the empirical finds in conjunction with theory on business model innovation, several business model patterns suited to address both the customer pains and the challenges that might arise from addressing those pains were found. More specifically, by employing the *do more to address the job* and the *solution provider* pattern, a basis for a new value proposition for was created characterized by extending station-based carsharing to include one-way trips. Moreover, by employing the *self-service* and the *freemium* pattern, the challenges of such a value proposition could be addressed. Thus, this study finds that if an OEM with a station-based carsharing offering would adopt these four business model patterns, this has the possibility to improve its business-to-consumer carsharing offering as well as constitute business model innovation as described in theory.

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1

Introduction

In this chapter, an introduction to the thesis is provided. The chapter starts with a background in order to provide a context for the chosen study. Thereafter, the aim of thesis, the corresponding research question and its three sub-questions are presented. Lastly, the delimitations and limitations of the study are shortly elaborated on.

1.1 Background

The concept of transportation is on the verge of a new era. The way people travel from one location to another, in urban areas in particular, is currently changing and reshaping the way we define transportation and mobility (Corwin & Pankratz, 2017). Over the last years, there has been a start of a paradigmatic shift from vehicle ownership to vehicle usage, implying that transport is separated from private vehicle ownership and rather seen as a means, or a service, that enables movement from location A to location B (Shankar, 2017).

This paradigmatic change is partly a result of a convergence in demographic changes, altering customer preferences, climate issues, urbanization and technological change (Koster *et al.*, 2018; Shankar, 2017). The emerging mobility preferences of young adults such as convenience, connectivity and the ability to choose among a range of transportation (Pottebaum *et al.*, 2017) coupled with the rise of the collaborative economy (EY, 2015), are some aspects of this change. Together with the emergence, advancement and adoption of new technologies such as autonomous driving and electrification, these factors together define the characteristics of the mobility industry, as of today and in the future (Amelsfort *et al.*, 2017). As a consequence, a variety of mobility alternatives spanning various transportation and mobility modes have emerged and currently complements and coexists with the traditional transportation modes in urban areas. Furthermore, the concept of mobility-as-a-service (MaaS), which essentially aims to offer travelers mobility solutions based on their own needs (Frost & Sullivan, 2018), has gained momentum.

In the automotive industry, this paradigmatic change has had significant implications. According to some predictions, original equipment manufacturers (OEMs) need to focus their efforts on service-based strategies and offerings rather than product offerings to stay competitive in the future when urban mobility will be redefined (EY, 2015). Moreover, Koster *et al.* (2018) predict that 22% of the automotive industry revenues will be deriving from

shared on-demand vehicles, accounting for 30% of the industry profits in 2030, while 38% of the revenue and 26% of profits will be attributed to car sales. In addition, the industry revenue distribution is predicted to shift from new vehicle sales and aftermarket and instead the mobility platform providers, i.e., MaaS fleet operators, are believed to capture the most value (Koster *et al*, 2018).

The shifting views on vehicle ownership, together with an increased demand for MaaS and the accelerating growth trend for shared on-demand vehicles has essentially created a new segment of transportation that allows for customers to access a car on-demand. The interest from global OEMs has manifested itself with the introduction of their own mobility sub-brands or subsidiaries, offering mobility solutions such as carsharing, ridesharing and eHailing that further allows for separation of vehicle usage and vehicle ownership (Shankar, 2017). While ridesharing and eHailing implies a peer-to-peer (P2P) transactions, carsharing represents a way for OEMs to offer mobility through continuous business-to-consumers (B2C) transactions and thus ensuring revenue generation from their cars as a service (Koster *et al.*, 2018).

Over the past years, the Swedish market has seen the introduction of carsharing offerings from large premium actors such as Volvo, Daimler and BMW, alongside platform providers like Zipcar and Aimo (Shankar, 2017; Darijan, 2018). Although Daimler's and BMW's free-floating services struggled to reach success on the Swedish market (Darijan, 2018), the recent $1 billion joint venture between the two illustrate the investments currently being made to create strong portfolios of mobility offerings on a global scale through initiatives in carsharing, ride-hailing, multimodal services, parking and charging (Daimler, 2019).

Meanwhile, innovation has come to concern more than just products and services. Multiple scholars argue that business model innovation has risen to become a key formula for achieving sustainable competitive advantage (Teece, 2010; Zott & Amit, 2011). Moreover, business model innovation based in the understanding of the customers allows for a customer-centric approach (Teece, 2010). One way to reach such an understanding is by understanding the customer pains where these insights can serve as indication of what needs are not currently fulfilled and hence represent opportunities for improvement (Osterwalder *et al.*, 2014).

Thus, the changing customer preferences, intensifying competition and shifting revenue pools need to be captured in the carsharing business models of OEMs. By identifying ways of improvement based in the understanding of customer pains and the challenges that might arise from addressing those pains, OEMs with a carsharing business model are provided with insights of how to be competitive in the future world of mobility.

1.2 Aim

The perception of mobility is changing. This is exemplified by the emergence of new modes of mobility, the concept of MaaS and the fact that automotive OEMs are transforming themselves from car manufacturers to mobility providers. As of today, major automotive industry players have developed a range of offerings where the concept of mobility are in focus rather the vehicles as such, where carsharing is such a concept with high predicted future growth. In the meantime, innovation is no longer only applicable to products and services. Business model innovation has grown to become a key formula to gain a sustainable competitive advantage in a rapidly changing environment. Therefore, the aim of this thesis is to identify and specify how an OEM, with a station-based carsharing concept, through business model innovation can further improve their mobility offerings. Hence, the thesis aims to propose a suggestion of how the business model of station-based carsharing potentially can be innovated.

1.3 Research question

Based in the aim of the thesis, the thesis wants to answer to the following research question:

- How can an OEM innovate its station-based carsharing business model in order to improve its business-to-consumer mobility offer?

To tackle the research question, sub-questions were identified enabling for a breakup of the research problem in three separated, yet linked, questions. The sub-questions are a re-interpretation of the main research question and delimit the scope of the research. They are also interrelated, i.e., each sub-question is connected to the following one through an input-output relationship (answering the first question furnishes inputs for the second one). Especially, to understand how an OEM can innovate its station-based carsharing business model, it is first needed to understand the current offerings available in the market, compare them against customer needs, and finally to identify a possible solution and related consequences.

The three sub-questions are articulated as follows:

- What are the current offerings and the associated business model characteristics in the carsharing market?
- What are the customer pains in relation to the current offerings and how could those be addressed?
- What business challenges will potentially arise if station-based offerings are modified to address those pains and how could those be resolved?

1.4 Delimitations

Although there are multiple subsegments of carsharing, this thesis will focus on the B2C type of carsharing. Hence, the closely related concepts of corporate carsharing and P2P carsharing will not be studied within the scope of this thesis. Furthermore, this thesis will delimit the scope to the Swedish market and will therefore not consider other international markets.

This thesis will focus on the business model implication from the perspective of a carsharing service provider and will therefore not describe one company in specific. This thesis will consequently not deal with prerequisites in terms of resources and capabilities of one carsharing service provider in particular, but rather on a general level.

1.5 Limitations

A number of factors exist that will limit the scope of this thesis. First, the availability and access to data necessary to create a holistic view of the companies might be limited and those limitations might only present themselves once that phase of the thesis has been initiated. Moreover, the companies currently active in the Swedish carsharing market might evolve over time. Therefore, the companies studied can be seen as a representation of those active during the initiation of this thesis.

2

Theoretical framework

This chapter constitutes the theoretical foundation for the thesis and is built on literature covering the concept of business models as such, but also the process of business model innovation. The chapter starts with a brief description of the current state of the business model research, which then is followed by some conceptualizations and interpretations of the business model concept. Thereafter, the process of business model innovation is described, highlighting what is it, why it is important and how it is conducted. The last part of the chapter brings up some examples of business model innovation in the automotive industry before addressing some barriers to business model innovation processes.

2.1 The current state of the business model research

Since the mid 1990s, the concept of business models has gained momentum in academic literature (Zott *et al.,* 2011), and Teece (2010) highlight the emerging knowledge economy, the growth of Internet and the increased prevalence of outsourcing and offshoring of business activities as driving factors. However, despite the surge in the business model literature, scholars have not managed to gather around a clear definition of the concept of business models which effectively have hindered the progress of research in a unified way (Zott *et al.*, 2011). Scholars from different academic "silos", spanning various disciplines, seem to partly disagree on what a business model is, what it entails and what not, since "idiosyncratic definitions" are adopted by scholars in their strive to fit the definition to the purpose of their studies (Zott *et al.*, 2011). However, regardless of those conceptual differences, there are also some emerging themes suggesting that the field is moving towards "conceptual consolidation" according to Zott *et al.* (2011). First, it is acknowledged that the business model "is a new unit of analysis" centered on a focal firm but with boundaries wider than the firm and hence, being distinct from the industry, firms or products as such. Second, business models are used to explain how firms "do business" by adopting a holistic system-level approach. Third, the various conceptualizations of business models agree that the firm's, its partners and their interlinked activities plays an important role. Fourth and last, explaining that the creation and capture of value is at the core of any business model (Zott *et al.*, 2011).

The trend with a continuous increase in the number of publications on the subject of business models, originally explored by Zott *et al.* (2011), is also observed by and is said to be continued by Massa, Tucci and Afuah (2017). Furthermore, in line with the reasoning by

Zott *et al.* (2011), Massa *et al.* (2017) argue that "there is a lack of agreement among scholars on more operational definitions of a business model" reinforcing the fact that there is no unified perception about the business model as a concept. As a possible explanation to the lack of definitional convergence, Massa *et al.* (2017) argue that the terminology has not developed as fast as the ways to conduct business which has resulted in researchers going in slightly different directions and splitting the field into "different camps". In addition, Massa *et al.* (2017) finds the morph in meaning of the term "business models" and the closely related terms "value creation" and "value capture" as another source of confusion, and potentially even disagreements, in the business model literature.

2.2 The business model as a theoretical concept

On an abstract level, Zott and Amit (2010) emphasizes the activity system-view as a key to understand any firm's business model. They argue that to reach the overall objective of any business model, which is to "exploit a business opportunity by creating value for the parties involved, i.e., to fulfill customers' needs and create customer surplus while generating a profit for the focal firm and its partners", different activities need to be performed (Zott & Amit, 2010). The engagement of physical, capital or human resources of any business model participant, e.g. customers or suppliers, to serve a certain purpose is to be viewed as such activities according to Zott and Amit (2010). Furthermore, they define an activity system as a set of "interdependent organizational activities centered on a focal firm, including those conducted by the focal firm, its partners, vendors or customers etc." where links weave activities together to a system.

Zott and Amit (2010) argue that a purposeful design is the essence of any business model and divides the design parameters into two distinct sets; *design elements* and *design themes* (figure 2.1).

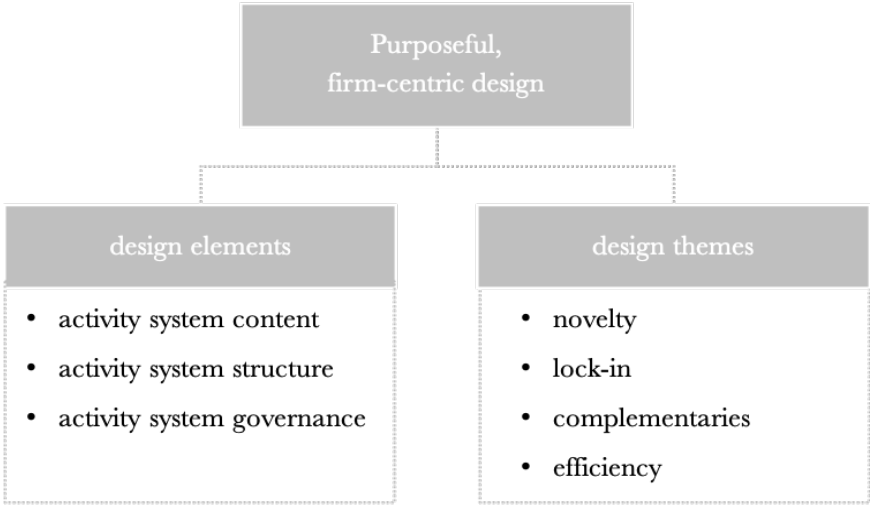

Figure 2.1: Design parameters of a purposeful design. Adopted from Zott and Amit (2010).

Looking at the design elements, *activity system content* refers to the actual activities that are being performed, *activity system structure* describes how the activities are linked while *activity system governance* refers to who performs the different activities within the system. Moreover, an activity system can be described by distinct design themes which highlight the system's prominent value creation drivers (Zott & Amit, 2010). The notion of *novelty* in the context of activity system design refers to adoption of new activities, new ways of linking activities, new way of governing activities or a combination thereof. The *lock-in* design theme refers to an activity system's potential to keep third parties attracted as business model participants and can be embodied as switching costs or network externalities. Furthermore, *complementaries* is referred to the bundling of activities within an activity system that enables for value creation beyond what is possible when running the activities separately. Finally, *efficiency* as a design theme refers to an activity system design that enables for higher efficiency by reducing costs, e.g. transaction costs (Zott & Amit, 2010).

Yet another conceptualization is provided by Gassmann *et al.* (2014) who conceptualizes a business model using four distinct dimensions; the customer (who?), the value proposition (what?), the value chain (how?) and the profit mechanism (why?), as illustrated in figure 2.2.

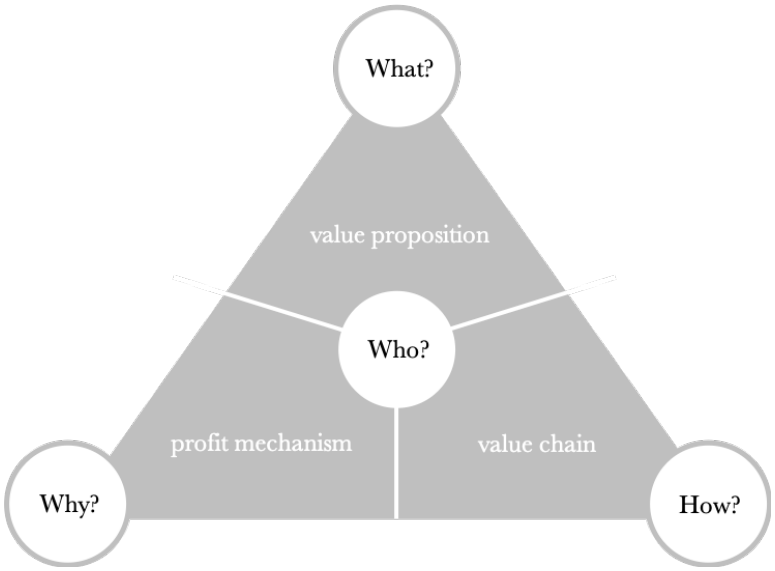

Figure 2.2: The 'magic triangle' as proposed by Gassmann *et al.* (2014).

The customer dimension, 'who?', is focused on understanding the customer segments in order to evaluate what segments which are, and which are not, relevant to serve using a particular business model. Hence, in this dimension the goal is to target specific customer segments. The value proposition dimension, 'what?', is concerned with the question of what to offer to customers, that is, what products and/or services are offered to the customers and how do those products and services cater to target customers' needs. The third dimension, 'how?', is concerned with the value chain configuration associated with the specific business model. That is, what processes and activities are performed and how should they be coordinated in order to realize the value proposition. Moreover, this dimension is concerned with what

resources and capabilities that are needed in order to perform the processes and activities required. Finally, the last dimension, 'why?', aims to answer the question of whether the business model will work commercially, that is, is the business model financially viable? Hence, this dimension includes the aspects of revenue generating mechanisms and cost structures (Gassmann *et al.*, 2014).

Despite that Zott and Amit (2010) and Gassmann *et al.* (2014) provides completely different descriptions and conceptualizations of the business model, there are also some common denominators. For example, the value chain dimension in the model proposed by Gassmann *et al.* (2014) encompasses the design elements described by Zott and Amit (2010) to some extent. For example, what set of activities to perform, how those activities are linked and sequenced, as well who is performing them, could all be considered as value chain decisions. Hence, despite the overlapping content, the different conceptualizations provided by Zott and Amit (2010) and Gassmann *et al.* (2014), complement each other and provide different analytical lenses since the unit of analysis differs between the two. Looking at the differences instead, Gassmann *et al.* (2014) puts more emphasis on the customers, what customer segments to target and what value proposition to deliver to them in order to fulfil their needs in their model. Zott and Amit (2010) on the other hand, highlight the prime value drivers of the activity system as such but with emphasis on internal factors e.g. activities rather than external factors e.g. customer needs. Thus, this fact further highlights the complementarity of the two descriptions.

Arguably, many scholars have made their contribution to business model theory. However, what has arguably received the most widespread attention is the Business Model Canvas by Osterwalder and Pigneur (2010). With a holistic and simplistic view of the ingoing aspects, it provides a basis for describing a current business model in an organized way as well as providing means for successful business model innovation (Osterwalder & Pigneur, 2010). Furthermore, The Value Proposition Canvas looks deeper at the value proposition and the customer segment in order to clarify customer understanding, how to create value for that specific customer and subsequently the fit between the two (Osterwalder *et al.*, 2014). Both of these concepts will be described in the following sub-chapters.

2.3 Business model canvas

Osterwalder and Pigneur (2010) define their business model canvas as a common language for describing, visualizing, evaluating and change business models. By using a common language firms will more easily question assumption about their own business models which in return will provide a more systematic approach when innovating the business model. The authors argue that the best way to describe a business model is in the form of nine central cornerstones. These are customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partnerships and cost structure. The business model canvas also constitutes a visual representation where each cornerstone has been assigned a section of the canvas for their respective field (Osterwalder &

Pigneur, 2010). In the following section, the contents of the nine cornerstones will be presented. Figure 2.3 shows the graphic illustration of the business model canvas.

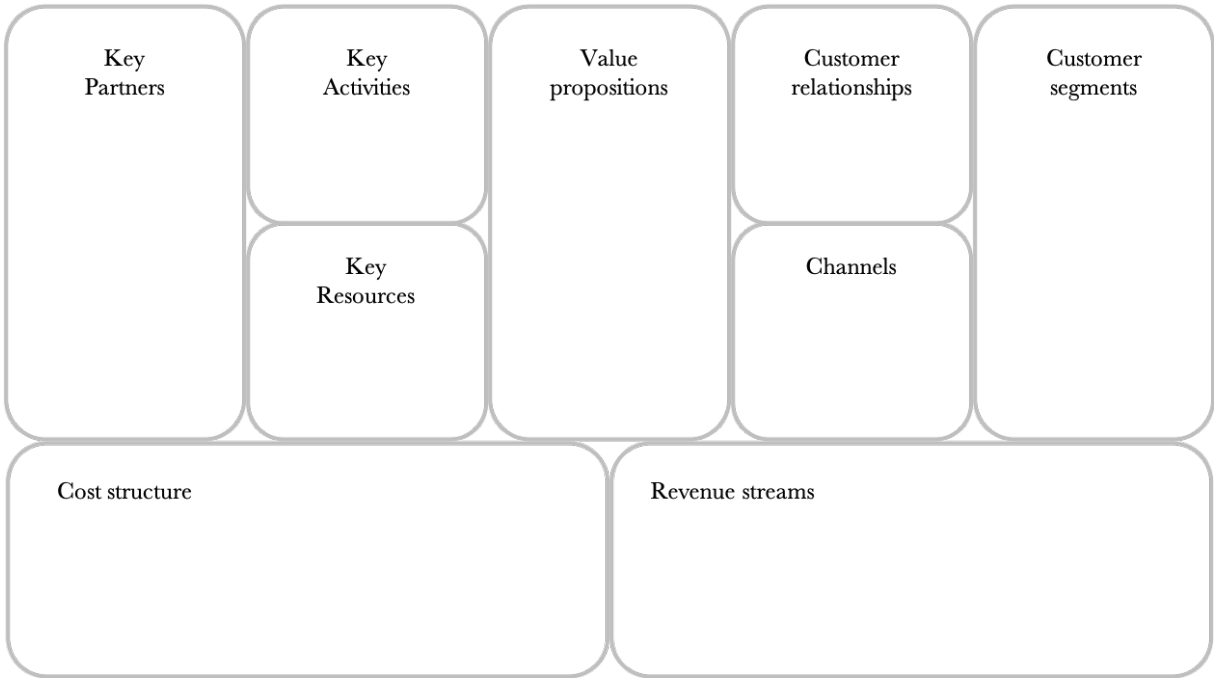

Figure 2.3: The nine building blocks of the business model canvas. Adapted from Osterwalder and Pigneur (2010).

Customer segments

The customer always represents the core in all business models (Osterwalder & Pigneur, 2010). Magretta (2002) argues that a good business model begins with an insight into human motivations and ends in a rich stream of profits. By identifying and segmenting its customers a firm can identify common needs, behaviors and other denominators. Since a firm cannot serve all potential customers there has to be a conscious decision about who to target and who not to. With this as a basis, a more customer specific business model can be detailed (Osterwalder & Pigneur, 2010).

Value proposition

A firm's value proposition describes that a specific combination of product and/or services that create value for a specific customer segment. It also represents the reason for why customers should choose a specific firm above another. By addressing the needs or problems of the specified customer segments the company delivers value. There exist various variations of what that value can be. Osterwalder & Pigneur argue that the value can be of both a quantitative nature, e.g. price, and qualitative nature, e.g. customer experience. Thus, a value proposition can be in the form of both as design, price, risk reduction, cost reduction, availability, and usability (Osterwalder & Pigneur, 2010).

Channels

The channels represent the way in which the firm communicates its value proposition with its customer segments and subsequently through which channels they are active in. Channels can be both direct and indirect, as well as self-owned, partner-owned and a combination of the two. It's important to identify the right mix of channels in order to reach the most customers in order to market the value proposition in a cost-effective way (Osterwalder & Pigneur, 2010).

Customer relationships

A firm needs to the describe the nature of the relationship it intends to have with its identified customer segment. Traditionally, it can range all the way from arms-length distance on one side of the continuum to a personal relation on the other side. The intended customer relationship also needs to match the rest of the aspects in the business model in order to create a coherent image of the firm. This is especially important since customer relationships have a direct and strong impact on the customer's perception of the firm (Osterwalder & Pigneur, 2010).

Revenue streams

Osterwalder and Pigneur (2010) draws the parable of the customers as the heart of the business model and the revenue streams as the arteries. A firm needs to assess the customer segment's willingness-to-pay for the proposed value in order determine what type of revenue of that can be extracted. A firm can have one or multiple revenue streams from one customers segment by the use of both transactional revenues, e.g. those occurring as a result of a one-time payment, and recurring revenues as a result of ongoing payments through subscription, leasing or licensees. The revenue streams also relate to different pricing mechanisms, which can be fixed or dynamic. Fixed uses predetermined prices based in static variables, and dynamic adopts variable prices in conjunction with market conditions (Osterwalder & Pigneur, 2010).

Key resources

In order to have a functioning business model a firm is dependent on certain resources that are essential in order to make the business model work, labeled as key resources by Osterwalder & Pigneur (2010). In turn, these resources enable the firm to create and offer a value propositions, reach their intended customer segments, maintain customer relations and generate revenues. Key resources can differ depending on the chosen business model and can be either physical, economical, intellectual or human. The key resources can either be owned by the firm, be acquired through leasing or procured through key partnerships (Osterwalder & Pigneur, 2010).

Key activities

Another important aspect of the business model are the key activities a firm need to carry out in order to deliver on their value proposition. In line with previous reasoning, key activities are unique for the type of business model. The key resources can be categorized into three separate activities; production, problem solving, and platform/network which highlights that

the key activities have differed significantly between, for instance, an automotive manufacturer and platform developer (Osterwalder & Pigneur, 2010).

Key partnerships
The network of suppliers and partners that enables the business model to function constitutes the key partnerships. Firms seek these partnerships in order to reduce risk, to optimize various aspects of their business and to reduce risk. The business model canvas highlights three different reasons for entering partnerships. These are to optimize and gain economies of scale, to minimize risk and mitigate uncertainties, and to acquire resources and capabilities necessary to conduct the activities described in the business model (Osterwalder & Pigneur, 2010).

Cost structure
The creation of value, maintenance of customer relationships and the generation of profits are all associated with costs. Therefore, describing the cost structure of the business model is essential in order to ensure that the proposed business will be profitable. Although most firms strive towards minimizing cost, the cost structure can be both cost-driven and value-driven. A cost-driven approach encompasses a focus on cost minimization whenever and wherever possible, whereas as a value-driven approach has a stronger focus on creating strong value for the customer instead of focusing on costs associated with it. The cost structure further compromises fixed costs, variable costs, economies of scale and economies of scope (Osterwalder & Pigneur, 2010).

2.4 The value proposition canvas

With an increased focus and importance on understanding the customers (Magretta, 2002), the value proposition canvas acts as a tool to ensure that the developed value proposition matches the customer needs. It zooms in on two of the business model canvas nine cornerstones, namely customer segments and value proposition as represented in figure 2.4 (Osterwalder *et al.*, 2014).

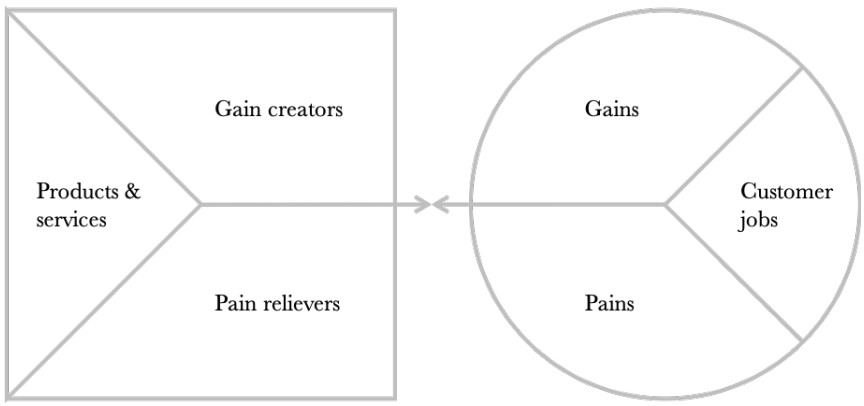

Figure 2.4: The value proposition canvas. Adapted from Osterwalder *et al.* (2014).

From each customer segment, a customer profile is created in which *pains*, *gains* and the *customer jobs* are identified. *The pains* describe anything that negatively affect the customer, is an obstacle or represents a risk. *The gains* can be either required, desired, expected or unexpected and can be between essential and nice to have. *The customer jobs,* refers to things that customer want to do during their day, needs they want to fulfill and problems they want to solve. The customer jobs need to be actionable and can be either functional, societal, emotional or of a supporting character.

From the value proposition, a value map is created where the features are described in more detail. It breaks down the value proposition into *product and services, gain creators* and *pain relievers.* The *products and services* is list of all the products and services that support the creation of value for the customer. The *gain creators* and the *pain relievers* are descriptions of exactly how the products and services will relieve pain and create gain.

When the customer profile and the value map has been filled out, they are ranked according to importance in order to achieve the optimal fit. An optimal fit is achieved when the most essential products and services of the value proposition solves the most critical gains and pains of customers. However, additional steps are needed in order to assess that the value proposition is unique, differentiable and represents a competitive advantage in the intended market (Osterwalder *et al.*, 2014).

2.5 Business model innovation

In this subsection the process of business model innovation (BMI) is described. More specifically, it is elaborated upon what business model innovation is, why it is relevant and how it is done. Moreover, the concept of business model patterns is introduced and some applications in the automotive industry are being put forward. The subchapter ends with a brief section on barriers to business model innovation.

2.5.1 What it is

To start with, Björkdahl and Holmén (2013) argue that a BMI include new ways for a firm to create and capture value by applying "a new integrated logic". Thereby, a BMI as such is not equivalent to product, service or process innovation, Hence, a BMI can comprise a variety of changes or alterations of new or existing products, services, process or any combination thereof (Björkdahl and Holmén, 2013).

Furthermore, in the business model design components, or activity system, as proposed by Zott and Amit (2010), business model innovation can occur in various ways. First, novel activities can be added. Backward or forward integration is such an example, where new "content", that is activities to be performed, are added or removed from the initial activity system. Second, activities within the system could be linked in novel ways by relinking and/or resequencing activities affecting the system "structure". And third, Amit and Zott (2010)

points out the role of changing the party performing any of the business activities within the activity system, referred to as "governance", as a way to innovate ones' business model.

Returning to the "magic triangle" as proposed by Gassman *et al.* (2014), business model innovation occurs when two or more out of the four dimensions are modified. To exemplify this, Gassman *et al.* (2014) uses the case of the aircraft engine manufacturer Rolls-Royce that innovated the what and why dimensions when introducing a new value proposition offering airlines to purchase flying hours rather than airplane engines allowing for a constant revenue stream. Furthermore, in order to be able to deliver and realize the new value proposition, even the how dimension was modified (Gassman *et al.*, 2014). More specifically, Rolls-Royce integrated downstream activities such as maintenance and reparation, activities that were previously performed outside the boundaries of the firm. Thus, without introductions of new products, Rolls-Royce managed to innovate their business model with respect to the dominant industry logic or their former business model (Gassman e*t al.*, 2014).

Thus, fundamentally, the concept of business model innovation could be described as a novel way to either create or capture value by modifying one or more components (Chesbrough, 2010; Teece, 2010; Frankenberger *et al.*, 2013) where value creation is a process involving both suppliers, customers and other members of the value-creation ecosystem rather than by producers exclusively (Massa *et al.*, 2017).

2.5.2 Why it is relevant

Innovation has always played a vital role in driving growth and business competitiveness (Gassmann *et al.*, 2014) and in the past, new technology, products and processes was the main focus for innovation (Gassmann *et al*. 2014; Amit & Zott, 2010). However, due to increasing competitive pressure, rapid commoditization of products, blurred industry boundaries, changing regulation and globalization etc., product and/or process innovation is not sufficient for success in most industries (Gassmann *et al.* 2014). This fact is also reflected in the mindset of senior managers globally who favors new business models over new products and services in the quest for future competitive advantage (Amit & Zott, 2010).

Hence, since a business model articulates how a business creates and delivers value as well as describing the architecture of revenues and costs associated with delivering that value - that is profits – business model design is closely related to competitive advantage (Zott & Amit, 2010; Teece, 2010). More specifically, Teece (2010) argues that business model innovation, or business model design, can in itself be used as a means to achieve sustainable competitive advantage if the new design fulfills the requirements of being sufficiently differentiated and hard to replicate for potential competitors. Moreover, Zott and Amit (2010) argue that it is relatively easy for competitors to erode a firm's returns stemming from product or process innovation while business model innovations may transform into a sustainable competitive advantage. In addition, Sund *et al.* (2016) points out exploring new business models as a way for mature companies to renew their competitive advantage. Furthermore, Gassmann *et al.* (2014) argue that some influential companies such as Grundig, Nokia and Kodak among

others, lost their competitive advantage due to failure in adjusting their business models to the changing environment surrounding them.

2.5.3 How it is done

Having clarified what business model innovation is and why it is relevant, an approach for initiating and carrying through a business model innovation process is hereafter presented. In fact, despite the rising attention of business model innovation, Frankenberger *et al.* (2013) argue that the research field lacks frameworks supporting the actual business model innovation processes. Therefore, they developed a framework (figure 2.5), called the 4I-framework, which describes the business model innovation process by dividing it into the four distinct phases; initiation, ideation, integration and implementation, highlighting the key challenges associated with each phase (Frankenberger *et al.*, 2013).

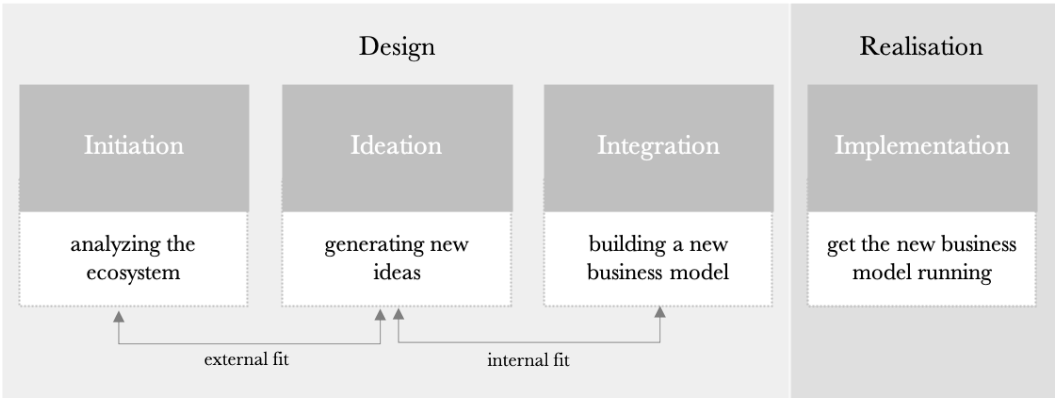

Figure 2.5: The four phases of the 4I-framework. Adapted from Frankenberger *et al.* (2013).

The initiation phase
In this first phase, the surrounding ecosystem from the innovating firms' perspective is analyzed. More specifically, ecosystem entities such as competitors, customers and suppliers, but also governments and universities, need to be understood and put in relation to the focal firm. In this phase, there are two significant challenges. First, there is a challenge associated with understanding the needs of the ecosystem entities since changing customer needs or competitor moves often is the triggering point business innovation initiatives. Therefore, contacts with suppliers and/or customers is a necessity in order to unveil customer needs and pain points as well as identifying business opportunities. Second, the other challenge is associated with identification of change drivers such as technological or regulatory in order to respond to those with adequate actions (Frankenberger *et al.*, 2013).

The ideation phase
This second phase is primarily concerned with generation of new ideas with the ambition to come up with new business models. In this phase, market analysis and value chain analysis take place which happens to be complemented with workshops, brainstorming sessions and external experts' interviews. But in general, however, there exist no common methodology to generate business model ideas (Frankenberger *et al.*, 2013). The purpose with those activities is

to transform opportunities identified in the initiation phase into concrete business model innovation input. Challenges arising in the ideation phase, according to (Frankenberger *et al.*, 2013), are the difficulties associated with "overcoming the current business logic", and the "out-of-the-box"-thinking which may be necessary to challenge the current "industry laws". Another challenge is the ability to "think in new business models" since product innovation and development traditionally has been used as primary means to solve problems. Furthermore, there is a challenge related to the perceived absence of "systematic tools" with respect to business model innovation (Frankenberger *et al.*, 2013).

The integration phase

In this third phase, further development and transformation of the ideas that were generated during the previous stages are further developed and turned into a complete business model design (Frankenberger *et al.*, 2013). To facilitate for this, Frankenberger *et al. (*2013) suggest the use of the four dimensions "What', "Who", "Why" and "How" which are also proposed by Gassmann e*t al.* (2014). Challenges in this phase are perceived difficulties with integrating all pieces in new proposed business model. Changing one part is necessarily not a major problem but aligning and implementing changes in multiple dimensions are usually cumbersome (Frankenberger *et al.*, 2013). Another challenge is related to partner management and integration. Business models may need be aligned to partners' business models creating complex interdependencies resulting in demanding and time-consuming agreement discussions etc. (Frankenberger *et al.*, 2013).

The implementation phase

Once a new business model has successfully been designed and integrated, the next step is the implementation phase. This phase usually implies substantial investments and risks. Compared to product innovations Frankenberger *et al.*, 2013 argue that business models need to be fully implemented in order to be successfully tested and validated while products can be evaluated using prototyping. Apart from those risks, a challenge in this phase is the internal resistance which is present in most cases according to Frankenberger *et al.* (2013) especially when multiple areas within the company are involved. Furthermore, another challenge is related to the choice of implementation approach, and to make use of the learnings from the actions taken if a pilot, trial-and-error or experimentation approach is used in favor for a 'Big bang' approach. However, Frankenberger *et al.*, (2013) points out that the approach of trial-and-error usually works well with respect to materialize learnings from previous iterations.

Even though the process as described above is linear, Frankenberger *et al.* (2013) points out that iterations between phases are very common, especially between the integration and implementation phases. However, there are three main types iterations taking place within the framework. The first iteration is related to the alignment of constantly changing ecosystem and the generated business model innovation ideas. According to Frankenberger *et al.*, (2013) this type of iteration is necessary to ensure the external fit of the proposed business model. The second main type of iteration are concerned with achieving internal fit, that is, alignment between the business model dimensions and the generated ideas and components. The last type of main iteration occurs when the design phase as a whole, that is the initiation, ideation

and integration phase, is aligned to the realization phase, that is, the implementation phase. More specifically, insights and learnings during the realization phase may incur adjustments of the business model in order to make it work in real life (Frankenberger *et al.* (2013).

2.5.4 Business model patterns

In the 4I-framework presented by Frankenberger *et al.* (2013), a number of challenges usually emerges during the business model innovation process. For example, in the ideation phase, the challenge of "out-of-the-box"-thinking is prominent, hindering the business model innovators to overcome the current business or the dominant industry logic. However, as a way to overcome such challenges, Gassmann *et al.* (2014) suggest seeking inspiration beyond one's own industry boundaries. In fact, Gassmann *et al.* (2014) argue that nine out of ten successful business model innovations are recombinations of existing business model elements and that the innovation lies in "the understanding, translation, recombination and transfer of the successful patterns to one's own industry".

This approach is also brought up by Abdelkafi *et al.* (2013), arguing that looking outside industry boundaries for concepts that could be adapted and fitted into a new context may enable more effective business model innovations. Hence, instead of being new to the world, most business model innovations could be referred to as new to the firm or new to the industry highlighting the fact that business model patterns "describe proven solutions to recurring problems during business model design" (Abdelkafi *et al.,* 2013; Remane *et al.,* 2017). Worth noticing, however, is that application of business model patterns primarily is used as a means to spur creativity, to provide a way to overcome cognitive barriers and to increase the efficiency in the business model innovation process, rather than focus on imitation (Remane *et al.,* 2017).

Since the approach of applying business model patterns has proven to itself to be a powerful tool (Remane *et al.,* 2017) in the business model innovation process, multiple collections of business model have been compiled by various scholars, e.g. Gassmann *et al.* (2014), Johnson (2010) and Weill *et al.* (2005). Due to those various understandings of the business model pattern concept, and the fact that the existing collections are incomplete, overlapping and poor structured, the concept often is a source for confusion and therefore, Remane *et al.* (2017) structured patterns into a business model pattern database. The database is structured along several dimensions and could be used as a means for systematic business model innovation (Remane *et al.,* 2017).

Moreover, in the business model pattern database by Remane *et al.* (2017) a link between business model patterns and the business model canvas components as described by Osterwalder and Pigneur (2010) is established. More specifically, based in the work of Günzel and Holm (2013), Remane *et al.* (2017) developed four 'meta-components' that relate to different subsets of the business model canvas. The meta-components and their relation to the business model canvas components are illustrated in table 2.1.

Table 2.1 : The relation business model canvas components and meta-components. Adopted from Remane et al. (2017).

Meta-component	Business model component	Description
Value proposition	Value propositions	Gives an overall view of a company's bundle of products and services.
Value delivery	Customer segments	An organization serves one or several customer segments.
	Channels	Value propositions are delivered to customers through communication, distribution, and sales channels.
	Customer relationships	Customer relationships are established and maintained with each customer segment.
Value creation	Key resources	Key resources are the assets required to offer and deliver the previously described elements.
	Key activities	Number of key activities performed by key resources.
	Key partnerships	Some activities are outsourced and some resources are acquired outside the enterprise.
Value capture	Revenue streams	Revenue streams result from value propositions successfully offered to customers.
	Cost structure	The business model elements result in the cost structure.

2.5.5 Business model innovation in the automotive industry

By using business model patterns as an analytical lens, Abdelkafi *et al.* (2013) have analyzed the automotive industry with focus on electric cars and provides multiple examples of how different business model patterns have been successfully transferred and applied to the automotive industry context. For instance, *the bricks and clicks* model which allows the customers to order their cars using an online channel in favor for a physical channel, has been around for a quiet long time in the automotive industry (Abdelkafi *et al.*, 2013). In combination with the bricks and clicks model, the *disintermediation* model, which was successfully deployed by Dell in the computer industry, has also been widely adopted by car manufacturers as a means to sell mass customized cars online (Abdelkafi *et al.*, 2013). In addition to the bricks and clicks and the disintermediation model, which are focused distribution network reconfiguration, other business model patterns focusing on the value proposition have also been practiced. For example, carsharing actors such as ZipCar and Car2Go have successfully implemented the *product-to-service* pattern, deriving from the servitization concept, in the automotive industry when offering a mobility service rather than

a physical product to their customers. Furthermore, the related but yet different business model pattern of *leasing,* where customers pay monthly fees for a fixed duration instead of paying the entire price upfront, has also been successfully implemented in the automotive industry and is widely practiced as of today (Abdelkafi *et al.*, 2013).

Furthermore, Abdelkafi et al. (2013) discusses how some other business model patterns, not yet deployed in the automotive industry, which potentially could be transferred and used as a means to create value beyond what is offered today. One such example is the *affinity club* business model pattern which should focus on services around the car and enlarging the role of the customer as a part of an exclusive club (Abdelkafi *et al.*, 2013). Using that model, multiple affinity groups could engage in partnerships creating additional offerings only available to club members and partners. In addition, such a model could potentially work as a basis for a different customer reward system as a way to create different incentives (Abdelkafi *et al.*, 2013).

2.5.6 Challenges associated with business model innovation

One major challenge related to business model innovation that was highlighted by Frankenberger *et al.* (2013) refers to the internal resistance that in many cases takes place within a firm in which a business model innovation process is in progress. Furthermore, Frankenberger *et al.* (2013) stresses that this is particularly true when multiple areas within the company are involved. This fact is also being put forward by Chesbrough (2010) arguing that managers may resist firm actions such as asset reconfiguration since a new asset configuration may render the manager's and his or her subordinates work obsolete or even unnecessary. Furthermore, Gassmann *et al.* (2014) emphasizes the "employees' attitudes and non-supportive behavior by management" as the biggest obstacles in the business model innovation process and stresses the importance of change management in order to succeed. Chesbrough (2010) points out a similar solution, when concluding that "organizations will need to identify internal leaders for business model change, in order to manage the results of these processes and deliver a new, better business model for the company".

2.6 Customer needs as a trigger for business model innovation

With the business model canvas as a foundation, arguably nine different areas could serve as stepping stone for business model innovation. It is therefore essential to understand where to place initial efforts when trying to innovate. Teece (2010) argues that the rapid development of new communication and technology, together with a higher transparency of existing alternatives, have given the customers a greater amount of choice. In addition, technological change also gives rise to new and improved ways of fulfilling customer needs. This in turn pushes companies to increase their understanding of the customers, what they desire and think, and exactly how to fulfill those customer needs now that the underlying logic might have changed (Teece, 2010). E.g. for a car manufacture to transition into a mobility provider, an understanding of what drives value from a mobility perspective is needed in order to create a strong value proposition. Effectively, this forces the companies to be more customer-centric

in their business models in order to remain relevant. As a consequence, companies have to move away from the traditional supply-sided approach in order to reconfigure their value propositions to better suit the needs of customer (Teece, 2010).

This is also highlighted in the rapidly increasing research into demand-side strategy which during last years has seen an ample growth within the fields of entrepreneurship, innovation and strategy (Priem *et al.*, 2018). The linkage between demand-side strategy and business models, where value creations for customers is put at center stage, acknowledges that the source of competitive advantage may stem from the demand of the customers and that value has to be created, rather than simply just captured (Priem *et al.*, 2018). Therefore, the above reasoning serves as rationale as to why the customer's needs and the value proposition are a good starting point when working with business model innovation.

2.7 Overview of carsharing and car-rental

When looking at the car based B2C mobility offerings, three main types are available, i.e., free-floating carsharing, station-based carsharing and car-rental (Pottebaum *et al.*, 2017). However, while car-rental can be considered to be the traditional model, carsharing and its associated business models have seen a rapid growth during the last years (Frost & Sullivan, 2018). Thus, in order to grasp the competitive landscape, the different concepts are outlined to provide a foundation for the upcoming empirical section.

2.7.1 Carsharing

Carsharing as a concept has long lacked a standardized definition. This has led to confusion amongst both scholars, professionals and end users when discussing the topic (Le Vine *et al.*, 2014). In its most basic form, carsharing is referred to as offering the user access to a car on demand without the requirement of ownership, maintenance, insurance and other aspects normally associated with owning a car of your own (Frost & Sullivan, 2018). However, in order to create a clear view in this thesis, the definition by Le Vine *et al.* (2014) in order to establish that carsharing services heron refers to the formal variant where transactions occur between a business and a consumer. Le Vine *et al.* (2014) highlight a set of common characteristics that is applicable for the carsharing concept where the following key points represents a non-exhaustive list:

- In order to use the service, the user has to register to ensure the operator of the qualifying age, to register payment method, and to enable user direct communication. This is usually associated with a subscription or a membership which could be free or against a monthly cost.
- The user is granted access to the car usually through a keyless system.
- A mobile application is used to create an overview of availability, reservation and user information.
- The car is at all time operated by the user. Hence, all the driving is performed by the user unlike e-haling concept that utilize a chauffeur.

- The pricing model is usage-based and can be billed in increments of minutes, hours and days. This can also be combined with the distance traveled.
- The cars can be reserved before and/or spontaneously depending on availability and rules of the car fleet operator.
- Cleaning and maintenance are performed by the car fleet operator and is usually done at predetermined intervals, although not after each use.
- The user is responsible for ensuring that the car is in the correct condition before starting their journey.
- The fleet is owned or leased by the carsharing fleet operator.

Moreover, carsharing can be further defined in two concepts, namely round-trip and one-way concepts. By definition, round-trip requires the user to return the car to the same location where it was originally picked up from, as represented by the station-based business model (Shaheen *et al.*, 2015). Due to round-trip carsharing being an established concept, there exists numerous studies where the environmental benefits associated with this form of carsharing have been documented (Shaheen *et al.*, 2015). More specifically, it has been found that carsharing vehicles reduce the need for privately owned cars as well as that customers who engage in round-trip carsharing reduce carbon dioxide emissions (Rydén & Morin, 2005; Martin & Shaheen, 2011; Martin *et al.*, 2010).

In contrast, the one-way concept does not require the user to return the car to its original location. Thus, one-way can theoretically be offered both in free-floating and station-based where the former allows for drop-off at any location within a geographically defined zoned and the latter allows for drop-off at any station within the station-based network. Although research into one-way carsharing has increased, i.e., logistics, modeling and price models, Shaheen *et al.* (2015) argue that the environmental impacts remains to be further determined.

Free-floating carsharing

With the free-floating concept, cars are available within a geographically restricted zone. Within that zone, users can make one-way trips, that is, picking it up at location A and dropping it off at any preferred location B. From within an app, the user can locate available cars and consequently determine where the nearest car is located. This allows for spontaneous usage on-demand where the vehicle is not reserved beforehand or only reserved a few minutes ahead of time. (Le Vine *et al.*, 2014).

Free floating utilizes small and compact city cars suited for the city areas which also simplifies parking for the users. Additionally, during the period of use, the user is free to move around both inside and outside the zone as long as the car is return back within the zone. However, the user's ability to park freely emphasizes the need for the operator to have close cooperation with cities and parking authorities. Furthermore, due to the size of the cars and the nature of the concept, it has proven suitable for the shorter and more spontaneous trips that originates within the city, as an alternative to taxi, public transport and other micro-mobility offerings (Pottebaum *et al.*, 2017; Le Vine *et al.*, 2014).

Station-based carsharing

The station-based carsharing concepts utilizes variety of stations where the cars can be accessed. Through station-based carsharing, users are normally not restricted to a certain location, nor a specific city and can therefore access the cars as long as there exists a station at their wanted location (Pottebaum *et al.*, 2017). In comparison with free-floating, station-based carsharing deploys a larger variety of cars, meaning that users can access both small and compact cars as well as larger vans and SUVs (Pottebaum *et al.*, 2017). In addition, each car has its own dedicated parking spaces, guaranteeing for both the operator and user that the car is return to the correct location and that parking always will be available. In further contrast to free floating, the cars need to be booked in advance, with the user stating the time of pick up and return. Station based services are accessed through monthly membership fees in combination with billing by the hour/day/weekend. While free floating allows for more spontaneity and shorter-range trips, station-based car sharing requires some more planning. In return, station-based can offer a greater choice of cars that can accommodate the medium to long distance trips (Pottebaum *et al.*, 2017; Le Vine *et al.*, 2014).

2.7.2 Car-rental

Although car-rental shares some attributes with carsharing, it is classified as a separate form of mobility offering (Le Vine *et al.*, 2014). More specifically, the inability to use it for shorter durations than by the day, alongside not being able to access the cars without a key or interaction with station-staff, represents a distinct difference in relation to carsharing. However, it shares some commonalities with station-based carsharing where the car-rental too is based on a network of stations.

Car-rental normally span strategic locations throughout the whole country with cars primarily available at stations in close proximity to important transportation hubs, such as airports, train stations, city centers etc. Apart from having a guaranteed parking spot, the rental stations also function as the hub where maintenance and cleaning is carried out within the same location (Hertz, 2019). Furthermore, the users can also choose between either doing 1) a round-trip or 2) a one-way trip between stations against a premium. Moreover, rental traditionally offers the largest selection of cars, with all purpose vehicles ranging from smaller city vehicles, to larger sedans, vans and SUVs. In contrast to carsharing, there exist no memberships and bookings are handled as one-time transactions where a more manual process by the use of staffed rental offices are needed to access the cars (Le Vine *et al.* 2014). Moreover, and in contrast with free floating and station based, the customers have to pay for the fuel used. Lastly, since car-rental offers mobility by the day, this service caters to users with longer time and distance mobility needs (Hertz, 2019).

2.8 Research learnings about customer mobility needs

Even though customer needs, pains and behavior in relation to carsharing services have not been extensively studied, a number of studies on carsharing as a stand-alone mobility solution as well as carsharing as a part of a broader mobility concept such as MaaS, have been studied

by different scholars from various perspectives. In this subsection, some of the very latest research on the topic is presented, focusing on the needs of the customers.

2.8.1 Learnings from the UbiGo field trial

In an evaluation of a MaaS project in Gothenburg, Sweden, called UbiGo, Karlsson, Sochor and Strömberg (2016) observed that carsharing as a mode for transport experienced a significant increase in terms of use. According to their study, 57% of the project participants was reported to use carsharing services more often than they did before, while 37% was reported to use them to the same extent as before and only 6% was reported to use carsharing services more seldom than before (Karlsson *et al.*, 2016).

Table 2.1: Reported changes in choice of transport mode, adapted from Karlsson *et al.* (2016).

	more seldom	as before	more often
Private car	48%	48%	4%
Bicycle sharing	16%	61%	23%
Bus/tram	4%	46%	50%
Local train	7%	75%	18%
Carsharing	6%	37%	57%
Taxi	12%	68%	20%
Walk	6%	73%	21%

In addition, the study also highlights that participants' attitudes in relation to different transport modes changed during the project and that carsharing was subject to a major, yet positive, attitude shift where 61% of the participants were more positive to the concept of carsharing than before (Karlsson *et al.*, 2016).

Table 2.2: Reported changes in attitude toward different modes of transport, adapted from Karlsson *et al.* (2016).

	more negative	as before	more positive
Private car	23%	74%	3%
Bicycle sharing	1%	57%	42%
Bus/tram	2%	46%	52%
Local train	3%	71%	26%
Carsharing	3%	36%	61%
Taxi	6%	76%	18%
Walk	2%	82%	16%

However, Karlsson *et al.* (2016) highlight the importance of closeness to carsharing sites or systems, and in the study the participants were targeted and subsequently selected based on distance to such services.

Furthermore, Sochor *et al.* (2014) points out some interesting learnings from the UbiGo project with respect to carsharing services as a part of a MaaS solution. For example, even though curiosity was the dominant motive for participants to join the project, increased convenience and flexibility, to gain access to cars and to test living without a privately-owned car and economic factors motivated participants to join. In general, participants were very positive about the UbiGo service but also pinpointed some requirements for future use. More specifically, they called for an expansion of transport alternatives including the possibility to travel longer distances such as to other major towns by including more carsharing, taxi and train companies in the service. This is also in line with the findings by Karlsson *et al.* (2016) where participants wanted UbiGo to cover all their travel needs such as traveling to and in other cities and countries.

In addition, participants wanted an increased number of carsharing sites and in more geographical areas within towns. In the conclusion, Sochor *et al.* (2014) points out that, in order to be successful, new mobility services cannot be more expensive than the user's existing solution as long as additional value from the service does not offset the higher price. Furthermore, the service cannot be perceived as less flexible or convenient in relation to the user's existing solution (Sochor *et al.*, 2014). In addition, the authors highlight the examination of the carsharing networks and business models as a way to facilitate "*a move away from privately owned vehicles in urban areas*" (Sochor *et al.* 2014).

Other carsharing related learnings from the UbiGo project is presented by Strömberg *et al.* (2018) where it was discovered that the use of private cars was lower than expected due to the fact that the participants' perceived need for a car decreased when other mobility options were available. That trend was observed despite the fact that some mobility needs could not be fulfilled in a satisfying way given the current carsharing and rental car offerings. For example, such needs could include trips to more or less remote locations where plenty of luggage may be needed. One participant exemplified where carsharing could not offer a satisfying solution:

> "*I need [the] car only in the morning, but then it will just sit there for 8 hours costing more and more every hour. Like, it is not going to work, so that stopped me.*"
>
> Strömberg *et al.* (2018)

The statement exposes that carsharing services in its current form are unable to fulfill certain trip types, creating a misalignment between payment and usage. This is due to the fact that carsharing caters to the needs of shorter trips in terms of time and distance traveled while rental services are suitable for longer trips in terms of time and distance traveled (Strömberg *et al.*, 2018).

2.8.2 Different travel needs call for different vehicle attributes

By putting the physical vehicle as such as the unit of analysis, Sprei and Ginnebaugh (2018) explores the idea of carsharing as a means to change car purchasing behavior. In their work, they consider the vehicle as a bundle of physical attributes that enables for fulfillment of different mobility needs categorized as either "daily" or "infrequent" use cases. More specifically, they define the daily use cases as commuting, grocery shopping etc. while infrequent use cases are defined as occasional activities such as ski vacations, transporting bulky goods or items as well as towing travel trailers etc., and hence, the vehicle characteristics and attributes needed for different use cases varies (Sprei & Ginnebaugh, 2018). Moreover, they argue that customers as of today often purchasing vehicles with attributes covering all their needs, i.e., covering the daily as well as the infrequent use cases.

However, dimensioning the vehicle attributes for all use cases also implies a higher total cost of ownership deriving from higher initial capital costs and operating costs compared to a vehicle with limited to the features needed to solve the daily use cases. Hence, by "unbundling" vehicle attributes by using carsharing services, Sprei and Ginnebaugh (2018) argue that customer welfare might be increased. However, they conclude that the offerings of today need to be extended in order to successfully serve infrequent needs (Sprei & Ginnebaugh, 2018). With respect to the rapid changes in the mobility space though, they highlight development of new business models as a potential way moving forward fulfilling such needs (Sprei & Ginnebaugh, 2018).

3

Methodology

In this chapter, an outline of how the study has been conducted is provided. The section starts with a description of the research process as such, followed by a section where the underlying rationale for the chosen research strategy and design and the associated data collection methods is motivated. Lastly, the data analysis process is described followed by a section covering research quality.

3.1 Research process description

In order to answer the overall research question and thereby fulfill the aim of the thesis, a fictitious BMI process was conducted following the framework by Frankenberger *et al.* (2013) as a guiding principle where three out of four phases were focused on. Since the fourth phase, i.e. implementation, is related to company specific details, this phase is not focused on within the scope of this thesis. Furthermore, in order to generate the necessary BMI process input, and to address the challenges associated with the different phases of the framework, sub-research questions were formulated related to distinct parts of the framework. That way, the overall research question could be answered by first answering the sub-questions.

In this section, the sub-research questions are returned to in order to describe and outline the research process as such. As a start however, a brief description of the pre-study is provided, followed by the sub-research questions.

Understanding the domain of the study
With the ambition to gain an overall understanding of the domain of study and to put it in a context, a pre-study was conducted. In that study, meetings and interviews with three representatives from Volvo Car Group (VCG), the Swedish automotive OEM, were conducted to get insights about their role in the future of mobility. In addition, a seminar hosted by Drive Sweden, KOMPIS 5th Meetup: Sustainable Mobility Challenge which covered the concept of MaaS was attended. As a complement to those activities, secondary data sources describing the carsharing concept as such was studied. Additionally, as a part of the pre-study, a literature review of theory covering the concepts of business models in general, business model patterns, business model innovation and business model innovation in the context of the automotive industry was initiated.

What are the current offerings in the carsharing market and the associated business model characteristics?
To gain insights about the current value propositions on the market, both primary and secondary data was collected. Primary data derived from interviews with VCG representatives, where initial insights about the carsharing market and the players active on that market, were extracted. Subsequently, those insights were complemented with secondary data such as consultancy reports and market players' websites. The data collection process is further explained in chapter 2.3. In this process, the different market players were identified and, thereafter, their value propositions were mapped and assessed. The benefits from the mapping process were twofold. First, the understanding of the market was increased, and second, it served as a means to prepare for the succeeding data collection activities.

Moreover, the different market players were assessed from a business model perspective. When doing so, the collected data were linked to theory by applying a theoretical lens of business model patterns. Thereby, some characteristics of the different market players business models were identified.

What are the customer pains in relation to the current offerings and how could those be addressed?
In parallel with the value proposition mapping process, a process of exploring unmet customer needs was conducted. Although recent research (Karlsson *et al.*, 2016; Sochor *et al.*, 2014; Strömberg *et al.*, 2018; Sprei & Ginnebaugh, 2018) indicates that there exists a number of customer pains in relation to the current carsharing offerings, there was a need to complement and to continue to build upon their findings. Therefore, additional interviews were conducted. Interview respondents were represented by nine customers or non-customers, four researchers and four market players. This way, multiple perspectives on the issue of unmet customer needs was gathered allowing for 1) validation of the findings of previous research and 2) triangulation of new empirical findings. Thereafter, once a range of unmet customer pains had been identified through interviews, an assessment of how well those customer pains could potentially be fulfilled given the current offerings on the market were conducted. Thereby, a basis for a new value proposition was discovered. Thereafter, business model patterns with the potential to address the customer pains were identified.

What business challenges will potentially arise if offerings are modified to address those pains and how could those be resolved?
If any company would aim to address the customer pains, new business-related challenges are likely to arise which need to be handled in order to create a commercially viable business. To get an understanding of such potential challenges, primary data were gathered by interviewing four market players in the carsharing market as well as four researchers. That way, insights regarding the major potential challenges associated with fulfilling customer pains was identified and elaborated upon from a researcher and market player perspective. Once an understanding of challenges associated with resolving customer pains was gained, business model patterns with the potential to address some of the potential challenges was identified.

3.2 Research strategy

The research process described above is consistent with a *qualitative* research strategy. In essence, the aim of the thesis is about exploring and understanding rather than describing and explaining, and since the research questions is to be considered as an open-ended inquiry rather than a focused hypothesis, qualitative data is preferred over quantitative (Edmondson & McManus, 2007).

Furthermore, the research builds on an *inductive* approach which aligns with Bryman and Bell (2011) who argue that an inductive approach is used when new insights is the outcome of the research. Moreover, Bryman and Bell (2011) argue that an inductive approach is to be considered most suitable when employing a *qualitative* research strategy, which is the case for this study. Also strengthening this stance is the fact that this research is not about testing theory, that is, using a deductive approach, which further underlines the study being of an inductive nature (Bryman & Bell, 2011). Lastly, the research is to be considered *exploratory* since it through interviews with customers, researcher and market players aims at both creating an overview of the problem as well as identifying emerging patterns, as argued by Fallahi (2018).

3.2 Literature study

To create a theoretical foundation with depth, both books, academic journals and articles as well as previous research was researched continuously throughout the research. The data collected was in the form of physical books and online articles which mainly were accessed through the Chalmers library and Google Scholar. The research material was accessed by using chain search and systematic search were used to search for the literature that underlies the theoretical framework. Chain search means that new literature is found by following references in the found literature and systematic search means that literature is obtained by searching for, for example, search engines (Rienecker & Stray Jörgensen, 2014). The keywords that were used topics such as the current state of the business model research, business models, business model innovation and learnings from previous research on customer needs.

3.4 Data collection

In this study, multiple methods for data collection have been applied. By applying multiple data collection methods and techniques, diverging or converging patterns in the data could be identified in a process which in essence is to be described as a triangulation process. In the subsequent subsections, the rationale for the different data collection methods used are presented together with a more detailed description of how the actual data collection activities were conducted.

In order to delimit the potential sources for data collection as well as for practical reasons, only the Swedish carsharing market was used for the purpose of primary data collection. More specifically, only market players with either ongoing or recent operational activities in Sweden were subject to data collection activities. However, presence in Sweden does not mutually exclude presence in other geographical markets, and hence, some of the actors that were subject to data collection activities indeed have operations in multiple geographical markets.

3.4.1 Primary data

Throughout the study, semi-structured interviews were used as the main method for collecting primary data. By using the semi-structured approach to interviews, questionnaires were developed prior to the interviews and thereafter used as general guideline during the interviews. That way, it was ensured that the topics and issues of interest were covered while simultaneously allowing for flexibility and freedom (Bryman & Bell, 2011). Furthermore, all interviews were audio recorded with both members of the research team present. That way, the research team could stay focused on the interaction with the interviewee rather than being occupied with taking notes etc. Out of 20 interviews, 9 were held in person and 11 where held using Skype or FaceTime.

A comprehensive list of all the interviewees can be found in the following tables where the interviewed customers/non-customers are presented in table 3.1., researchers in table 3.2 and market players in 3.3.

Table 3.1 : Interviewed customers and non-customers.

Number	Age	Residential area	Duration
Customer 1	32	Göteborg	35 min
Customer 2	26	Stockholm	25 min
Customer 3	32	Göteborg	25 min
Customer 4	31	Mölnlycke	30 min
Customer 5	29	Partille	25 min
Non-customer 1	33	Göteborg	20 min
Non-customer 2	53	Mölnlycke	30 min
Non-customer 3	30	Göteborg	20 min
Non-customer 4	34	Göteborg	20 min

Table 2.2: Interviewed researchers and other roles.

Name	Role	Research institute/employer	Focus area/task	Duration
Researcher 1	Associate Professor	Chalmers University of Technology	Sustainable mobility	60 min
Researcher 2	Senior researcher	RISE Viktoria	Mobility-as-a-Service	70 min
Researcher 3	Senior lecturer and programme director	Chalmers University of Technology	Sustainable mobility	60 min
Project Manager	Senior project manager	Lindholmen Science Park AB	Project manager for Drive Swedens LiMA project	60 min

Table 2.3 : Interviewed market players.

Number	Company	Interviewee role	Interview focus	Duration
Market player 1	Sunfleet	CFO	customer needs, value proposition, business operations and challenges	60 min
Market player 2	Aimo	General Manager, Marketing IR and PR	customer needs, value proposition, business operations and challenges	60 min
Market player 3	DriveNow	Former CEO DriveNow Sweden	customer needs, value proposition, business operations and challenges	90 min
Market player 4	Hertz	Former CEO Hertz Sweden	customer needs, value proposition, business operations and challenges	50 min
Market player 5	Volvo Cars	Head of strategy and transformation	mobility trends and OEM role	60 min
Market player 6	Volvo Cars	Market intelligence	mobility trends and OEM role	60 min
Market player 7	Volvo Cars	Strategy and business development director	carsharing and carsharing market characteristics	60 min

The rationale for using semi-structured interviews as a data collection method was twofold. First, since pains in relation to the current offerings wanted to be understood, semi-structured interviews offered a superior way to understand customers/non-customers point-of-view by allowing for both exploration and explanation (Bryman & Bell, 2011). Secondly, the flexible nature of the semi-structured interviews allowed the research team to be iterative and

improving the interview questions continuously in order to create a better foundation to discover customer pains and potential business challenges that might arise from addressing those (Bryman & Bell, 2011).

The rationale for interviewing customers, i.e. people currently using carsharing services, and non-customers, i.e. people currently not using carsharing services but who lives in the proximity of such services, was to understand how the current carsharing offering fulfilled their mobility needs in order to understand their pains. Therefore, interview respondents were asked and encouraged to elaborate on their own usage of the services, especially focusing on specific occasions when they were displeased with the service. Such questions are to be considered as "experience questions" as a part of *ethnographic interviewing* as described by Spradley (1979). Moreover, the interview respondents were asked to elaborate upon potential ideas for improvement based in their own perception of the existing pains. Customer/non-customer interview protocols are presented in appendix A.

Additionally, the rationale for interviewing researchers was to provide an additional perspective on both customer pains and potential business challenges. By including researchers who previously had conducted research within the field and possesses the knowledge of carsharing as a concept or the carsharing business in general such insight could be gathered. Furthermore, by including the view of researchers, the perspectives of customer/non-customers and market player could be complemented. Researcher interview protocols are presented in appendix B.

Finally, the rationale for interviewing market players was to create an understanding, from a business perspective, of the challenges that might arise from addressing the customer pains discovered throughout interviews with customers/non-customers and researchers. Therefore, to some extent, interviews with market players also acted as complementary perspective on customer pains. Market player interview protocols are presented in appendix C.

Interviewee sampling

As previously mentioned, the interviewees could be categorized into three distinct categories: customer/non-customer interviews, researchers and market players, where sampling differed between the different categories.

In order to find customers, the research team visited two different Sunfleet locations, one in the central parts of Gothenburg, and one in Mölnlycke, where customers pick up and subsequently leaves the cars. The rationale for the choice of locations were that customers in those two geographical areas partly have different mobility needs. Thereby, an initial contact was established with customers, and thereafter, longer interviews could be conducted using Skype or FaceTime. Customer interviews were conducted until indications of saturation occurred. To find non-customers, the snowballing technique was applied. More specifically, the interviewed customers were asked if they knew anybody within close range of a carsharing service but who still do not use them. For this category, however, saturation indications did

not occur since almost each and every interview respondent expressed different reasons for not using carsharing services.

Continuing with researchers, they were identified through a combination of studying previous research as well as by recommendations from previous interviewed researchers. Moreover, the researchers were chosen based on their field of study and expertise in the area of mobility and carsharing as such, but also customer behaviors and preferences in relation to MaaS-services. Finally, market players were chosen and selected based on the rationale that the entire spectrum of B2C carsharing providers would be represented in the sample. More specifically, representatives from free-floating carsharing services, station-based carsharing services and rental services should be present. With that as a basis, potential interviewees with suitable positions were identified by contacting each company that was included in the mapping of market players. This was done by either phone or e-mail.

3.4.2 Secondary data

Secondary data was collected to create an initial understanding of the current state of mobility in general and the state of B2C carsharing in particular. More specifically, academic literature and theory was examined and complemented with news and magazine articles as well as with 14 consultancy reports to create an understanding of available actors in the B2C carsharing landscape.

In order to lay a foundation for the mapping of market players and their associated business model characteristics, the market players respective website was researched. From the websites, data regarding what service they offer, i.e., free-floating, station-based or rental was gathered. Moreover, data on their geographical coverage, variety of cars and pricing model was collected.

3.5 Data analysis

Since different types of data, i.e., primary and secondary data has been collected as described above, different methods for data analysis have been applied depending the type. In this subsection, the different methods for data analysis are described.

3.5.1 Primary data

As soon as interview data was collected, the data analysis process was initiated and ran in parallel with further data collection activities. The data analysis process as such started with extraction of subsets of the interviews which had an unambiguous connection to the research questions. Those subsets were represented as interview quotes. Once the entire data set was gone through, the research team started a thematization process in order to organize and structure the data. To do so, a thematic analysis was conducted as described by Cassell, Cunliffe and Grandy (2018). More specifically, thematic analysis refers to "qualitative data analysis that principally focus on identifying, organizing and interpreting themes in textual data" according to Cassell *et al.* (2018).

In practice, the research team reviewed all of the extracted quotes individually and linked them to the matching research question. Thereafter, each and every extracted interview quote was conceptualized and themed based in the subjective interpretation of the research team. After that, the quotes were organized into distinct clusters representing different themes. Here, a theme was represented by "recurrent and distinctive features of participants' accounts, characterizing particular perceptions and/or experiences, which the researcher sees as relevant to the research question" as described by King and Horrocks (2010). Thereafter, the data clusters were linked to the different sub research questions, providing a holistic understanding of the areas of investigation. The benefits of this approach were twofold. First, by adopting this approach the empirical findings could be linked, and subsequently used as input, in the different phases in the BMI process as described by Frankenberger *et al.* (2013) and second, a clear and transparent link between the primary data gathered, the findings and subsequently the conclusions were created.

3.5.2 Secondary data

Once an initial understanding of who the current market players were gained, a list of the market players available within the distinct carsharing concepts, i.e., free-floating, station-based and rental was created. This resulted in a list of one free-floating and three station-based players and a and a non-exhaustive list of one rental player. The reasoning for having a non-exhaustive list for rental players, i.e., not mapping all existing players, was based in that this segment was the most saturated in terms of number of actors and where the value propositions were assessed to have largely converged. Therefore, the largest market player in the Swedish car-rental market, Hertz, served as a proxy for the larger group.

With all the market players identified, their respective value proposition and attributes were analyzed. More specifically, based on their type of service and pricing model, suitable travel distance and duration was assessed for each market player. Moreover, based on what service they offer a number of customer jobs that are reasonable to do using the particular service were listed. Additionally, the degree of flexibility in terms of pick-up and drop-off possibilities was assessed and. That way, the market players could be compared to each other based on six categories, namely; trip duration, trip distance, geographical coverage, variety of cars offered, pick-up and drop-off flexibility and customers jobs. By adopting this approach, a comprehensive understanding of the current offerings and their characteristics was developed.

3.6 Research quality

The choice of research strategy and design ultimately comes down to arranging research activities in such way that the chances of achieving the research aim are the highest. However, achieving the research aim per se is not enough, but ideally, achieving the research aim should not come at the cost of research quality. In qualitative research, that means that achieving the research aim should not come at the cost of poor credibility, transferability, dependability or confirmability.

Starting with credibility, the question is whether the chosen research activities are suitable and whether appropriate research methods have been used with respect to answer the research question at hand, or more specifically, is it measured what is intended to be measured? Arguably, by choosing research strategy and design using the nature and character of the research question as a guideline, is a good starting point to ensure "methodological fit", that is, "internal consistency among elements of a research project" according to Edmondson and McManus (2007) which affects the credibility positively. Moreover, the combination of different research and data collection methods, that is triangulation, further increases the credibility of the study, something that also increases the confirmability aspect of the study (Guba, 1981).

Regarding the transferability dimension of research quality, the research team aimed to gather "thick" data as described by Guba (1981) in order to enable for comparisons with other contexts to which the study results might be transferred. Thereby, the transferability of the study is increased. Furthermore, in order to increase the level of dependability of the study, a transparency with respect to the linkage and interpretation of collected data has been presented. That way, an "audit trail" as described by Guba (1981) is established allowing an external auditor to inspect the data analysis processes.

4

Empirical findings

In this chapter, the empirical findings of the study are presented. The chapter as a whole comprises four subchapters where each subchapter has a distinct area of focus. In the first subchapter, findings related the different market players on the Swedish carsharing market, and the characteristics of their value proposition is presented, compared, and subsequently mapped. The second subchapter contains interview findings unveiling existing customer pains in relation to the current value propositions. Thereafter, in the third subchapter, findings associated with potential ways to reduce those customer pains are presented, which ultimately results in a potential basis for a new value proposition. Finally, in the last subsection, findings concerning presumptive business challenges that may arise as a consequence of reducing the previously unveiled customer pains are presented.

4.1 Market players and their value propositions

With an understanding of the different B2C carsharing concepts and its associated business models, each player's value proposition and unique characteristics is hereby presented. In addition, during customer interviews it became apparent the flexibility aspect is an important part of the value proposition. Therefore, the flexibility with respect to pick-up and drop-off, the variety of cars offered, as well as the geographical coverage has been assessed as separate dimensions. That way, a multidimensional assessment of the existing market players is hereby performed.

4.1.1 Aimo

Aimo is currently the only actor on the Swedish market offering a free-floating concept. They entered the market shortly after both BMW's DriveNow and Daimler's Car2Go had entered and shut down successively (Arvidsson, 2018). With funding by the Japanese investment firm Sumitomo, Aimo offers a fully electric carsharing for inhabitants of Stockholm. Since the launch in October 2018, they offer 300 electrified small city vehicles (Renualt Zoe) within the Stockholm city center. Within this restricted geographical area, referred to as the homezone, users can pick-up and return the cars at most street addresses where parking is allowed. In addition, Aimo offers Hotspots which are reserved parking spots for Aimo vehicles (Aimo, 2019).

Aimo has no subscription fee or start fee. Instead, the billing is initially by the minute before switching to an hourly rate and finally progressing to a capped daily price. Along this continuum, there exists a price per minute of 6 SEK, a price per hour of 200 SEK and finally a price per day of 995 SEK. Aimo automatically adapts the best rate depending on the length of the trip. All the rates include 300 free kilometers, parking and congestion taxes (Aimo, 2019).

The value proposition is to offer flexible and spontaneous access to electrical mobility, available within the city center, for short distance travel. The mobility needs addressed are primarily the shorter distance and time errands and shorter intra-city mobility, from minutes long to hours long (Aimo, 2019). Furthermore, as Aimo focuses on shorter, spontaneous trips, i.e. taking a car back from work or using it to go shopping, they are in direct competition with both taxis, public transport and other micro-mobility offerings such as rental bikes and electrical scooters.

In total, the characteristics Aimo is summarized below:

- Type of service: Free-floating carsharing.
- Type of trip: One-way.
- Trip duration: Minutes to hours.
- Trip distance: Short to medium.
- Geographical coverage: Low, only in the city center of Stockholm
- Variety of cars offered: Low, only one type of small car is available.
- Pick-up and drop-off flexibility: High, anywhere within the zone.
- Customer jobs: One-way trips in form of spontaneous trips and smaller errands.

4.1.2 Sunfleet

Sunfleet is currently the oldest station-based carsharing alternative in Sweden, dating back to 1999 (Allabolag, 2019). Initially, Sunfleet was started as a collaboration between Volvo and Hertz but is now fully owned by Volvo Cars. As of today, Sunfleet offers around 1400 cars, with 22 different models. ranging from compact cars to large SUV and moving vans and fully electric cars - with the majority of the cars being Volvos. This is offered at 710 distinct locations in over 50 cities, from Umeå in the north to Malmö in the south, where users can make two-way trips which, along with being station-based, guarantees that each car has its own reserved parking spot (Sunfleet, 2019).

The billing starts at hourly rates but also covers day and weekend rates. In addition to the time used, the distance traveled, and the type of car also affects the final price. Included in these rates are maintenance and fuel. In order to fit different demands and purposes, Sunfleet offer four different levels of subscription where a higher monthly fee results in a lower usage fee and vice versa. By example, the cheapest subscription of 0 SEK a month comes with an hourly rate of 80 SEK and daily rate of 589 for a smaller vehicle. Furthermore, and as the only station-based actor, Sunfleet also offers weekly rates (Sunfleet, 2019).

The value proposition is to have various types of cars at easily accessible locations and thus being able to offer the right car at the right time. Because Sunfleet's offering encompasses rates from hourly to weekly, the mobility needs addressed are covers the short, medium and long-distance trips, ranging from both intra- and inter-city trips to weekends and getaways. It also addresses the users that require different type of vehicles depending on the type of customer jobs, that is, a long trip might require a large and load-friendly car while another shorter trip only demands the convenience of a smaller car. Due to its nationwide coverage, Sunfleet cater to a larger number of potential customers than its station-based rivals.

In total, the characteristics of Sunfleet is summarized below:

- Type of service: Station-based carsharing.
- Type of trip: Round-trip.
- Trip duration: Hours to days and weeks.
- Trip distance: Short, medium and long.
- Geographical coverage: High, 710 locations available in 50 cities throughout the whole country.
- Variety of cars offered: High, cars for different purposes.
- Pick-up and drop-off flexibility: Low, have to be returned to same location.
- Customer jobs: Two-way trips in form of errands, leisure and shorter vacations.

4.1.3 Move About

With a focus on sustainability, Move About offers two-way trips through a fleet of 100 fully electric cars. With a limited selection of vehicles, two out of the three available models are small and compact cars while one is a larger moving van. Multiple stations with cars, parking spots and charging stations are available throughout the larger cities in the southern half of Sweden, where the highest density of stations are to be found in e.g. Helsingborg, Kalmar, Gothenburg and Stockholm. Apart from offering B2C carsharing, Move About also offers B2B fleet optimization aimed at strengthening the utilization rate of existing car fleets (Move About, 2019).

Move About utilizes a flat price model, based in a monthly subscription cost of 124 SEK together with either an hourly rate of 79 SEK or a daily rate of 595 SEK. No additional cost associated with booking or kilometers driven are added. As with the other station-based offerings, booking must be carried out in advance in order to secure a car. (Move About, 2019).

The value proposition is to offer green, two-way mobility throughout accessible locations in popular cities for users who value a focus on sustainability and fully electric mobility. The mobility needs addressed are primarily the short to medium distance trips, ranging from both intra- and inter-city trips to weekends. Since the fleet is fully electric, the range of the cars are currently lower than its fuel powered alternatives. This requires the user to either plan for trips that are within the range of the vehicle or allow for time during the trip to find location to charge up at. Therefore, Move About can be said to caters to the trip types where the

customer jobs done primarily require a small and compact car and where one charge is enough to fulfill the mobility need.

In total, the characteristics of Move About is summarized below:

- Type of service: Station-based carsharing.
- Type of trip: Round-trip.
- Trip duration: Hours to days.
- Trip distance: Short to medium.
- Geographical coverage: Medium, some locations throughout the southern half of the country.
- Variety of cars offered: Medium, small and compact as primary vehicles.
- Pick-up and drop-off flexibility: Low, have to be returned to same location.
- Customer jobs: Two-way trips in form of errands, leisure and shorter day travels.

4.1.4 Zipcar

With more than 1 million users internationally, Zipcar is seen as one of the largest international actors. However, Zipcar is currently only available in Sweden for tenants of the housing company Wallenstam. For those tenants, Zipcar offers access to round-trip car sharing in selected locations in Gothenburg and Stockholm. These locations are within suitable proximity of the Wallenstam buildings. Zipcar currently only offers only one model of car, that is a small and compact model, and can be booked hourly, by the day or over a weekend.

As an effect of the partnership with Wallenstam, Zipcar can offer competitive pricing when compared with Sunfleet and Move About. The membership with Zipcar here is not associated with a monthly subscription fee and the rates are 40 SEK by the hour, 379 SEK by the day and 659 SEK for a weekend. As with Sunfleet, an additional price per kilometer is added (Zipcar, 2019).

The value proposition is to offer a community of tenants, based in Gothenburg or Stockholm, access to two-way, on demand mobility. By creating a pool of cars available near the buildings, Zipcar addresses the mobility needs addressed of short to medium distance trips, covering both intra- and inter-city trips to weekends. The small and compact cars pose a limitation as to what customer jobs can be fulfilled. E.g. they are not suitable for errands associated with transporting larger portions of gear or items and subsequently does not lend itself when a larger amount of people is to be combined with loading capacity.

In total, the characteristics of Zipcar is summarized below:

- Type of service: Station-based carsharing.
- Type of trip: Round-trip.
- Trip duration: Hours to days.
- Trip distance: Short, medium and long.
- Geographical coverage: Low, 15 selected locations in Stockholm and Gothenburg.

- Variety of cars offered: Low, one compact car.
- Pick-up and drop-off flexibility: Low, have to be returned to same location.
- Customer jobs: Two-way trips in form of lighter errands, leisure and day and weekend travel.

4.1.5 Hertz

As the representative market player for car-rental, Hertz offers the ability to perform both one-way and round-trips between its rental stations. In contrast carsharing, Hertz's offer starts with mobility by the day, extending up to multiple weeks if wanted by the customer. Furthermore, as the largest rental actors in Sweden, Hertz offers 240 stations in 125 cities (Hertz, 2019).

The locations are physical rental offices where booking is handled, keys are transferred, and cars are stationed and maintained. Due these locations taking up more space than just the parking spot, this requires the rental stations to be located at less central city areas. Another important distinction is, since these rental stations are manned, customers are limited to picking up cars during the actual office hours of the stations (Hertz, 2019).

The cars available span a large continuum of different use-cases, where small and compact, estates, sport cars and vans can be chosen from. In contrast with the station based carsharing, i.e. Sunfleet, Move About and Zipcar, rental allows the customer to choose between using the same station for pick-up and drop-off, as well as utilizing another station to perform the drop-off. In essence, the rental allows for both one-way trips and two-way trips. However, a higher rate if the customer chooses to return the car to a different station (Hertz, 2019).

In addition to the regular one-way trips available, Hertz offers one-way trips for free through their secondary platform called "Hertz freerider". The concept is sprung out of the need for the rental companies to re-distribute cars as a consequence of offering one-way trips. By essentially alleviating the rental companies of the cost to redistribute the cars, users are allowed to take the specific car directly from A to B, while simultaneously having a free ride (Hertzfreerider, 2019). Prices are not predetermined but are rather a consequence of the current supply and demand balance. Normally however, the daily rates start at around 600-1000 SEK, depending on what type of vehicles and how far in advance the booking is performed. Moreover, adding to the daily rates are the cost of fuel that the customer itself have to pay for.

The value proposition is thus to offer a large variety of vehicles at near strategic transportation hubs with the flexibility to choose between one-way and two-way trips. The trip lengths covered are thus the long durations and/or distance. Hertz offers a large selection of different vehicles suitable for getaways, vacations, longer business trips and similar customer jobs that might require anything from a small and compact car to a large SUV during a longer period of time.

In total, the characteristics of Hertz is summarized below:

- Type of service: Station-based car-rental.
- Type of trip: Round-trip and one-way.
- Trip duration: Days and weeks.
- Trip distance: Long.
- Geographical coverage: High, 250 locations ins 125 cities.
- Variety of cars offered: High, cars for different purposes.
- Pick-up and drop-off flexibility: Medium high, drop-off available at for all stations.
- Customer jobs: Vacations, business trips and longer one-way transportations.

4.2 Customer pains in relation to the current offerings

In this subchapter, interview findings with respect to customer pains in relation to the current offerings are presented. The findings are structured in four distinct areas or sub themes that emerged during the data analysis process. More specifically, the sub themes are the following, lack of flexibility, trips resulting in paying for non-usage, poor fit for multi-modality and a silo structured market, as represented in figure 4.1.

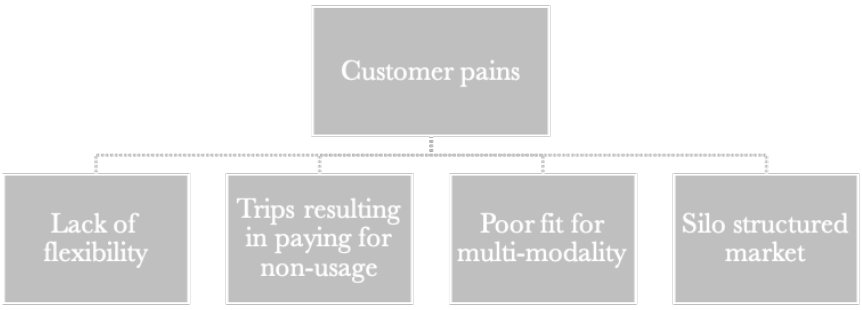

Figure 4.1: Customer pains in relation to the current carsharing offerings.

4.2.1 Lack of flexibility

An issue raised by multiple interview respondents and was perceived as a significant pain is related to the flexibility aspect of the current value propositions. More specifically, the lack of flexibility was experienced in station-based primarily and rental secondarily. The interview respondents covering all interview categories, that is, customers, non-customers, researchers and market players, expressed that the lack of flexibility may actually impact the usage of the service negatively.

To start with, the concept of flexibility has different meanings. As one researcher highlighted, flexibility may have different implications in different cases and contexts:

> *"Flexibility as a concept is a bit diverse. Sometimes you only need a transport solution from A to B which is punctual and affordable. Sometimes you want to travel on another premise. A commuting trip*

is different from a weekend trip, where you want to go door to door but with some detours. Other times you need to move an object, then you need something bigger. So, flexibility encompasses all that, having different needs at different times."

(Researcher 2)

Furthermore, the same researcher puts emphasis on flexibility as an important feature for carsharing services in order to be adopted by younger generations of customers:

> *"The younger generations, generation Y, who are living in an urban city do not buy a car straight after their examination or whatever. Instead, they a more flexible and servitized solution."*

(Researcher 2)

However, a prominent pain among customers seem to be related to the inflexibility of the current offerings with respect to pick-up and drop-off flexibility. In multiple interviews, customers highlighted how improved flexibility would allow them to solve a wider array of their mobility needs, which serves as an indication that they could use such carsharing services to a greater extent than what they do today. For example, one customer said the following, implying that other modes of transport are chosen over carsharing in some situations due to flexibility pains in relation to a specific carsharing service:

> *"When I'm going to visit mum and dad in Malmö, it would have been very convenient to use the Sunfleet car that is parked just outside here, and then just leave it at a station in Malmö. Then I might use the same approach for the trip home, but I might instead go together with mum and dad in their car back to Göteborg. Today, I'm choosing another alternative instead, most often buss, because I cannot do that trip with Sunfleet."*

(Customer 1)

Similarly, as shown by the following statement, another customer emphasized that he certainly would use the carsharing services more extensively if a greater degree of flexibility was offered:

> *"Regarding this part of the service that forces me to return the car the very same station again. I'm absolutely certain about that I would use it more if I was not forced to return it. Like for example going from here to Arlanda. If we were able to leave the car at Arlanda we would most likely used the car for all those trips."*

(Customer 2)

Although trips to the airport may not be a distance most people travel frequently, multiple customers described other use cases that come about more often, but where the current services are not flexible enough to handle that particular mobility need. For example, one customer voiced that she would like to use carsharing services for occasional commuting to work from Mölnlycke:

> *"Normally, I always go by buss to work, but if I had the option to use a car I would definitely do so occasionally. Not every day, that would probably be too expensive, but as I said, occasionally, like one time a week or every second week or so."*

(Customer 4)

A similar statement on the same topic was provided by another customer, highlighting that he would prefer to use a carsharing service to solve his morning commutation routine:

> *"The best solution for me would be if I could use the car in the morning and the buss in the afternoon. That way, I'm not going be stuck in traffic jams in the afternoon."*

(Non-customer 4)

Besides commuting, customers have brought up other use cases which occurs on a quite frequent basis which could potentially be solved by a carsharing service with a higher degree of flexibility. For example, one interview respondent stated that he would make use of a carsharing service late during weekday evenings when the public transport is not satisfying his mobility needs in a satisfying way:

> *"If you are visiting someone and you suddenly realize that, ops the time just flew away, I would have been great if you just could pick a Sunfleet car instead of using the public transport which usually sucks late weekday evenings."*

(Customer 2)

Another customer pain with respect to the lack of flexibility of the services is brought up by a customer that would like to use carsharing services in order to travel to a party or any other activity involving alcohol consumption:

> *"For example, when we are going to a party. You have dressed up and maybe you are carrying a present and something to drink with you. Then it would be great to use a car for that trip, leave it there, and then take taxi or Uber or anything on the way home since we drank alcohol."*

(Customer 2)

The fact that the inflexibility of the current carsharing services constitutes a barrier for increased usage is also brought up by the interviewed researchers. For example, multiple researchers stated that carsharing services in their current configuration only has the capability to cover a small subset of people's everyday mobility needs, something that is illustrated in the following statement:

> *"Those services [i.e., carsharing services] do not cover everyday trips. If private car ownership is removed, your fundamental everyday trips need to be solved using other modes of transport such as public transport or something else."*
>
> (Researcher 1)

On the same topic, another researcher shares a similar view:

> *"Today, carsharing works for people who are able to cover the biggest part of their mobility needs by using public transport or bicycling, but when you need to go somewhere to buy something big and bulky, or to transport yourself to some kind of activity somewhere, a shared car could be used. That is how carsharing works today. But not as a major part of your everyday transport."*
>
> (Researcher 3)

One significant part of the everyday transport is commuting back and forth to daily activities such as work for example. However, as indicated by customers, carsharing services do not solve such trips given their current configuration, which is also confirmed by a researcher who argued the following:

> *"Commuting trips using carpooling services do not work at all. With station-based, it's pretty crappy since they only offer A to B trips."*
>
> (Researcher 2)

However, even though commuting would be possible to do using carsharing services, researchers predicts that customers would only use such services occasionally rather on a daily basis, which is illustrated by the following statement:

> *"The reasoning would be that if you commute every day to work, you are not going to choose a shared car because it will not pay off. But it pays for occasional use, like twice a week. But the basic commutation need will have to be covered by something else."*
>
> (Researcher 1)

In summary, the degree of flexibility offered by the current carsharing services seem to negatively affect the actual usage of the service. Although flexibility have different meanings for different situations, the findings indicates that the main customer pain with respect to flexibility is the pick-up and drop-of flexibility which currently hinders them to solve some of their mobility needs. Therefore, it is reasonable to assume that if the flexibility of carsharing services were to be increased, the services would have potential to solve a wider array of mobility needs, and hence, the need for a privately-owned car may be reduced. This is also brought by a market player, arguing the following:

> *"The more use cases that are solved* [using carsharing services], *the more obvious it becomes that you don't need your own car."*
>
> (Market player 3)

4.2.2 Trips resulting in paying for non-usage

Another commonly expressed theme throughout the interviews with customers and researchers was that longer trips, normally outside of the city center, often resulted in having to pay for non-usage. In addition to that, the commuting trip was often raised as a scenario where current offerings did not offer a sustainable solution, nor an attractive price point.

On that topic, customers voiced that several of their longer trips only resulted in the car being used to transport them to location A, while remaining parked during the activity only to be brought back home once the activity was finished. This resulted in the feeling of paying for access rather than usage, as exemplified by the following quote:

> *"The disadvantage of Sunfleet is that, when taking it to the waterpark in Borås over the day, then it will be that I leave there in Borås while still paying for it to have it standing there. On top of that I have to pay for parking sometimes. So, to some extent I think it is poor economical solution."*
>
> (Non-customer 1)

Adding to the same reasoning was another customer who, when planning for a skiing trip, opted to not chose a carsharing service due that the car would be parked during the majority of trip:

> *"We went to Lindvallen for a week last winter, then we looked into what Sunfleet would cost. But since we would only have it when we went up and down it feels strange. It feels like you are wasting money. It stands still during the week when we are there. So therefore, we took the bus instead, even though we had a lot of stuff to lug on."*
>
> (Customer 1)

Another customer argued that it used carsharing for a longer trip to another town. However, in hindsight, the customer realized that it did not feel economically sustainable to continue to do so:

> *"When I and my sister visited some friends in Växjö over the weekend, we took Sunfleet there. It was smooth but afterwards it felt a bit expensive since it was really little of the time, we actually drove the car. It would not have been so economically viable to do so often."*

(Customer 3)

Further adding to that reasoning was another customer who noted that even though she preferred using car as her mode of transport she was reluctant to do so since it would incur a lot of cost when standing still:

> *"I'm pretty comfortable person so I would really like to use a car more than I actually do today. But often it only becomes standing and costs money and then I think it is too expensive actually. So, then you will find other solutions instead."*

(Customer 4)

Similarly, customers also highlighted the inability to use it as a mean for commuting, pointing towards carsharing in its current form being both inflexible and expensive since it forces you to pay for the time while at work and not using. The following quote exemplifies the non-feasibility of using carsharing, outside of Aimo's offer in the inner city-regions of Stockholm, to solve occasional commuting needs:

> *"If I'm going to work then there is a station near me, but I have to rent the car all day because I can't leave it at work at IKEA."*

(Non-customer 3)

In relation to this, another customer highlighted the possibility to allow for another customer to use it during the time the car is standing still. This would according to the interviewee also encourage him to consider stations that were located slightly further away:

> *"I could imagine taking it to work sometimes, but then it would be good if someone else could use it in the meantime, so I didn't have to pay for it when it was only when I was going to work for eight hours. Then I actually could Imagine going a bit further to get it too."*

(Non-customer 4)

In relation to the feeling of paying for non-usage, customers also highlighted some pains with the pricing model of the station-based carsharing in particular. As a consequence of having to

state the estimated trip duration when booking the vehicle, customers could end up in situation where they were left with the feeling of having to pay even after returning the car:

> *"I thought that I needed the car for three hours, but my plans changed so I ended up only needing it for an hour. And it would have been nice to get away with paying for those extra hours that I didn't use it. Well, it's not a lot of money, but all these "lost" hours eventually becomes a lot of money."*
>
> (Customer 1)

Another customer saw it as a barrier to using carsharing services since the majority of his trips where the shorter ones. By having to in advance decide how long the trips were going to take would, according to him, result in a lot of non-usage for the time paid:

> *"In theory, I could do a lot of trips with station-based carsharing. But all shorter trips when you need to pick-up some additional groceries or similar would quickly become quite expensive. Especially since I would have to state the time each errand would take and then I might pay for an hour even though I only used it for 30 minutes."*
>
> (Non-customer 2)

The researchers raised similar points as the customers when they pointed towards the notion of usage versus cost. One researcher spoke about how station-based carsharing in its current form made customers feel like they were paying for something that they were not actively using and that the service therefore was perceived as being expensive. Not because of the actual price, but rather the misalignment between price and usage:

> *"What is perceived from the customer's side is that sometimes, because one pays by the hour, one goes away with the intention to have it during the day only to park the car once you have arrived where it remains standing during three-four hours before going back. And the some think that: it is expensive, I continue to pay for a car I actually do not use."*
>
> (Researcher 1)

Another researcher voiced that it existed a mismatch between customer needs and what was offered, in this case by station-based carsharing:

> *"I think that station-based, if you think a little what their service is and what the customers' needs are, is most popular in city centers and cities. But since it is station-based means it is only a certain kind of trip you can do with it - without wasting a lot of money. So, it is not good for e.g. a commuting trip."*
>
> (Researcher 2)

Furthermore, it was highlighted that the current offerings didn't match what the customer needed and that it, as a consequence, hindered some trips where they felt that neither of the available B2C carsharing options were an optimal fit:

> *"What I have seen in my research is that the trips customers have the most difficulty with are when they are going somewhere, stays there for a long period of time and then goes home. Often remote places such as a golf course, a stall or friends in more rural areas. It was difficult, they did not think that either rental cars or car sharing had a good fit."*
>
> (Researcher 3)

The same researcher, who also was a part in evaluating carsharing as a part of a MaaS offering, pointed towards that it is not necessarily the price per se, but rather the notion of paying for something you don't use that is the hardest thing for customers:

> *"Having to pay for something you do not actively use. That was tough for people."*
>
> (Researcher 3)

Adding to this, the researcher also highlighted the difference between services who only charge by the hour in comparison with the market players who charge a subscription fee on top of it. Her quote underlined the psychological aspect of pricing where customers have a tough time with understanding the alternative cost:

> *"Some people feel that they would rather not pay this subscription fee. You would rather only pay by the hour. Because otherwise people felt like they were wasting money. It is a lot of loss aversion in that, you do not want to lose money even though you might lose money elsewhere. But that can be hard for people to see."*
>
> (Researcher 3)

As a consequence, to how the carsharing services (except from free-floating services) currently are configured, one interpretation could be that non-customers perceive that paying for non-usage constitutes a barrier for usage. This is also reflected in the following researcher statement:

> *"If you can solve this gap, that you feel you don't pay for it, then I think you can attract more."*
>
> (Researcher 3)

In summary, customers and researchers highlight that the station-based carsharing in particular leaves you with the feeling of paying for access rather than usage. Since all station-based actors currently requires the car to be return to the same location, several types of trips

results in the car standing for an extended amount of time and accumulating cost. To mitigate the feeling of paying for something you don't actively use, the opportunity to take the car one way is seen as a possible solution to that problem.

4.2.3 Poor fit for multi-modality

Another theme that emerged as a customer pain in relation to the current carsharing offerings is related to multi-modal trips. More specifically, given the current configuration of the carsharing services, such services do not work as a part of multi-modal trips. This is illustrated by the following customer statement, highlighting that she would like to use carsharing services to solve one part of a longer trip, if that was an option:

> *"Like when we are going to visit my sister and her family in Växjö, then we usually take the train from Göteborg early in the morning. In that case, it would have been very handy to go by car to the train station and not to have rely on public transport, but today that's not even an option."*
>
> (Customer 4)

Like this quote exposes, customers sometimes want to combine different modes of transport in order to match their specific mobility needs in relation to a specific trip or situation. However, at the same time, transportation punctuality becomes more crucial in multi-modal trips to ensure the transfers between the different modes of transport. As reflected by this quote, the customer was not assured that public transport was going meet her punctuality criterion, and hence, a shared car would be favored instead.

Another but yet similar case is illustrated by a customer living outside of the geographical coverage of Aimo. The customer expresses the need for a carsharing service to solve the last part of his trip during weekday evenings when the public transport options are not as extensive as during day time:

> *"Sometimes when I have arrived late at the central station with the train and the public transport system is not that good, I would like the possibility to pick a car to get home."*
>
> (Customer 2)

Similarly, the same customer illustrates another case where a car-train combination would be ideal to solve a certain trip:

> *"Like this wedding in Örebro that I spoke about earlier. Then you could go there by train, but then you need to go to that particular destination just outside of the city, and that's a hustle to familiarize with a new public transport system especially when you are carrying luggage, a suit, and all that. In that case I would prefer to use a car instead."*
>
> (Customer 2)

As the above statements indicates, carsharing services are wanted in some multi-modal traveling scenarios. However, since the configuration of the current services do not allow for that, apart from Aimo in the inner city of Stockholm, this is a customer pain in relation to the current offerings. In line with the reasoning of the customers, researchers also identify carsharing as a part of multi-modal traveling:

> *"Often times, multi-modal traveling is what you want. Use train for the longer part of the trip, from a CO_2 perspective, and then use a car for the shorter distances that are difficult to solve with public transport. But then it has to work smoothly."*

(Researcher 1)

Furthermore, another researcher highlights that the combination of different modes of transport is a potential move forward with respect to mobility and MaaS, and that cars will be a part in such solutions:

> *"I think you can accomplish a lot by realizing that some parts of a trip could be solved by car travel and another part with public transport. I believe that you will accomplish more by cooperating."*

(Researcher 2)

Another interesting insight is brought up by the LIMA project leader, exemplifying how shared cars potentially could be used as to be a cornerstone in a multi-modal infrastructure.

> *"If you could view the car in the same view as you view bus or train, it would be advantageous. Because if you decide to use the car, you can go anywhere. If I would go to Örebro and then to Stockholm and then back to Göteborg, then maybe I want to use the car to drive to Örebro, use it while I'm there, leave it there and continue to Stockholm where I don't want any car. So, if one could solve one part of the trip with the car, and then get rid of that thought, that would be good."*

(Project manager)

In total, those statements indicate that there are exists some unfulfilled mobility needs with respect to multi-modal traveling that could potentially be addressed by carsharing services if they were differently configured. Nevertheless, the findings also indicate that carsharing would be a complement in the mobility-mix rather than playing a major role in such ecosystems.

4.2.4 Market structured in silos

A final pain that became evident was that no market player alone could fulfill one customer's mobility needs. Today, each B2C offering is constructed with the ambition to fit a niched mobility need, i.e. cover a certain geographical area and cater to certain customer jobs. As a

consequence, each market player operates distinct silos which results in that customers can only use a certain market player for a certain subset of their mobility needs. Therefore, in order to cover a wider array of mobility needs, a user without a privately-owned car has to be a member in a variety of different solutions and services, as initially noted by a customer:

> *"There have been times that I've found that a can only do this with one service and only that with another. Like I can do an errand that only requires car during one way in the inner city of Stockholm but not outside. I can unlock the car with an app with one but have to go to a physical office with another."*
>
> (Customer 3)

Another customer highlighted that the increase in mobility actors as something positive, although it was seen as a source of confusion since each one served a specific need:

> *"I mean it is good with the increase in mobility actors - with everything from scooters, bikes, cars and so on. But at the same time, it is frustrating for me because each one is for a specific thing. Sometimes, I really have to think about what actor I chose depending on my trip type which sometime can be a bit frustrating. And that can even be the case in the car segment sometimes."*
>
> (Customer 5)

Continuing, a researcher voiced similar thoughts:

> *"It becomes a hassle for me as a customer if I have to be a member i several different carpools, free-floating, station-based and rental."*
>
> (Researcher 1)

The same researcher continued with saying that previous studies has pointed towards customers having to become members with multiple players in order to fill their mobility need:

> *"What is interesting is that you can see, in a Swiss study on free-floating and station-based, that there are customers that are members in both. Just because they cover different scenarios and that they are complementary and therefore cover different kind of mobility needs"*
>
> (Researcher 1)

Similarly, while later interviewing market players, this was also seen happening on the Swedish market where customers had to become members in three different services in order to fit their mobility needs in the absence of a privately-owned car:

> *"I know several people living in Stockholm city who after they sold their car became a customer of both DriveNow, Sunfleet and Hertz."*
>
> (Market player 4)

However, the silo structure was not only present between different market player- but also within some actors' own offerings. One market player highlighted that this created further complexity and contributed to customer confusion:

> *"When I entered Hertz, we had something called 'Roadmate' for carpooling. We had 'Hertz short time'. We had 'Flexifleet' as our long time offer. We had 'Freerider' to move cars. The problem here was, the customer did not know who he or she was a customer to."*
>
> (Market player 4)

Another market player highlighted that the silo structure forced customers to constantly make informed decisions for each trip since each market player catered to a specific mobility need. As a natural consequence of this, each actor had its own platform or app which represented an added layer of complexity in comparison with the freedom and flexibility of owning your own car:

> *"The customer will always want it extremely simple and competition will push us in that direction. But today, you have to jump between apps. You have to make a conscious decision whether you jump in an Aimo and ride for 15 minutes or if you go over to Mabi [a rental company] and rent a car over the weekend."*
>
> (Market player 3)

However, while one market player spoke about the current need for different market players, he hinted that change, sooner or later, would transform the silo-oriented market:

> *"I have no ambition to fully cover all mobility needs as a free-floating actor. Because you will need Sunfleet some days since you can have it for a couple of days. But you might rather grab a traditional rental car if you are going on a skiing vacation or on a weekend. However, what is interesting, is which of these actors that will start slide between offers first. "*
>
> (Market player 3)

Lastly, it is evident that a clear silo structure creates distinct mobility needs for each market player to focus on. However, from a customer viewpoint, the exact same structure is also a source of confusion where no single actor can offer a flexible enough solution to solve a larger array of the customer's total mobility needs. Therefore, users are required to be aware of multiple market players and to constantly make informed decisions based on the type of trip.

4.3 The relation between the existing value propositions and customer pains

In this subsection, the different value propositions that were assessed in 4.1, are compared and mapped using tables and figures, in order to create a better understanding of how they relate to one another. Thereafter, the value propositions are related to the needs and unveiled pains of the customers with the ambition to identify areas for potential improvements.

Table 4.1 shows that different segments cater to different types of trip distances and durations. E.g. Aimo, the free-floating player, offers its service all the way down to by the minute which allows for shorter to medium trips. In contrast, rental actors only offer mobility by the day which therefore makes it ideal for longer trips during one or several days. In between are the station-based players who offer mobility by the hour, day and sometimes week. This allows for a broader span of trips to be covered using such services, essentially meaning you could perform both short, medium and long trips with those market players. However, the longer distances are more difficult to cover using Move About's fully electric cars due both range limitations and charging infrastructure that allows for quick enough charging while on the move.

The highest geographical coverage is present within rental and the station-based player Sunfleet. They also offer the largest variety of cars. In contrast, while having a limited geographical coverage, Aimo instead offers the highest flexibility when considering pick-up and drop-off. However, since Aimo only operates in the inner city of Stockholm, the geographical coverage of their service is very low and therefore only shorter distances can be traveled. The station-based services on the other hand, and Sunfleet especially, has an extensive geographical coverage with 710 distinct stations distributed over large parts of the country. However, the station-based services have a low pick-up and drop-off flexibility since the service only offer round-trips, that is, A-to-A trips. Somewhere in between Aimo and the station-based alternatives, the rental actors are found. Rental companies have combined a medium pick-up and drop-off flexibility with an extensive geographical coverage. However, flexibility beyond round-trips comes to an extra cost and is to be considered as an additional feature or an add on the basic offering. In essence, this feature gives customers the option to do one-way trips, rather than only round-trips, if a premium is paid.

Table 4.1 : Summarization of the value propositions.

Market player	Type of service	Type of trips	Trip duration	Trip distance	Geographical coverage	Variety of cars offered	Pick-up and drop-off flexibility	Customer jobs
Aimo	Free-floating carsharing	One-way	Minutes to hours	Short to medium	Low, only in Stockholm city center	Low, only one type of car	High, anywhere in the zone	Spontaneous trips and smaller errands.
Sunfleet	Station-based carsharing	Round-trip	Hours, days and weeks	Short, medium and long	High, 710 locations available in 50 cities throughout the whole country	High, cars for different purposes	Low, have to be returned to same location	Errands, leisure, shorter day and weekend travels
Move About	Station-based carsharing	Round-trip	Hours to days	Short and medium	Medium, some locations throughout the southern half of the country	Medium, small and compact as primary vehicles	Low, have to be returned to same location	Errands, leisure, shorter day and weekend travels
Zipcar	Station-based carsharing	Round-trip	Hours to days	Short, medium and long	Low, 15 selected locations in Stockholm and Gothenburg	Low, one compact car.	Low, have to be returned to same location	Errands, leisure, shorter day and weekend travels
Hertz	Station-based car-rental	Round-trip and one-way	Days and weeks	Long	High, 240 locations in 125 citites	High, cars for different purposes	Medium drop-off available at for all stations	Vacations, business trips as well as direct one-way trips

The market players were further assessed based on the variety of cars offered and pick-up and drop-off flexibility, see figure 4.2. From there, it can be noted that the strongest combination of the two parameters exists within rental. However, Aimo is assessed to have the highest degree of pick-up and drop-off flexibility with its free-floating concept in comparison with the medium flexibility of rental in which users are allowed to return it to any preferred station within the rental network at a premium charge. Aimo's concept allows for the car to be picked-up and dropped-off anywhere within the zone, allowing for the highest flexibility within their geographical coverage. Furthermore, Aimo has a low variety of cars offered since they only offer one type of car to their customers. In comparison, the rental actors' medium pick-up and drop-off flexibility is instead coupled with a high variety of cars offered.

In contrast, Zipcar, Move About and Sunfleet are represented on the lower side of the pick-up and drop-off flexibility-axis, since only offering round-trips. Instead, the main differentiator is the variety of cars offered. With the lowest variety of cars offered is Zipcar who currently only

offers one type of car. This is followed by Move About who offers three types of electrical models in their main range coupled with high-end Tesla at selected locations. The highest variety of cars offered is found in Sunfleet who outperforms any player except the rental actors in this area.

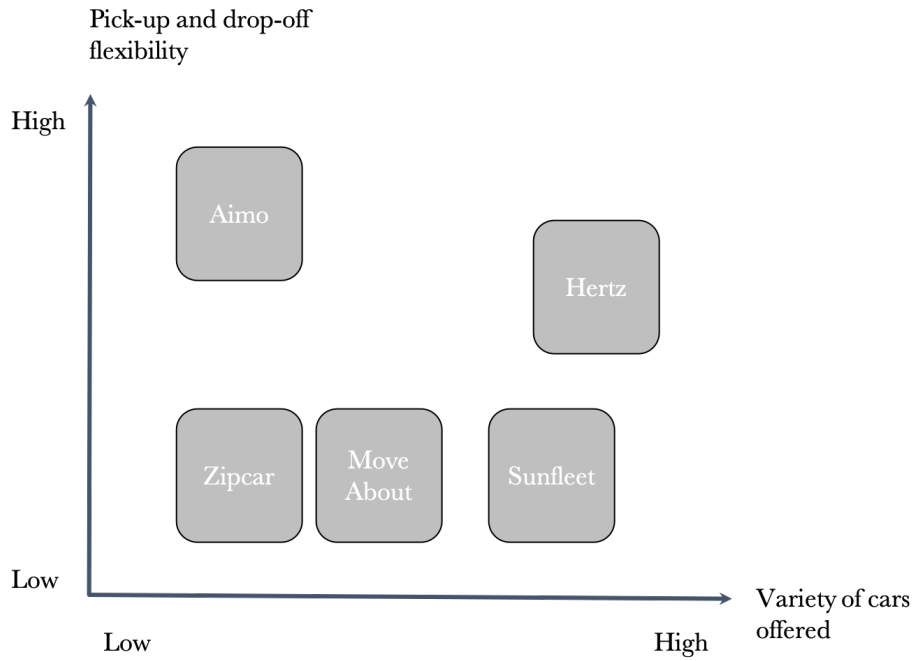

Figure 4.2. A matrix illustrating how different market players relate to each other with respect to pick-up and drop-off flexibility and variety of cars offered.

Furthermore, the different value propositions and their pick-up and drop-off flexibility in relation to the trip distance were assessed. As visualized in figure 4.3, Aimo combines a service suitable for shorter distance trips with a high pick-up and drop-off flexibility. The high flexibility is attributed to its free-floating concept which allows for one-way trips all throughout their homezone. Representing a medium pick-up and drop-off flexibility in combination with a suitable for the longer trip distances is Hertz. Although offering the ability to perform one-way trips, this is limited to between the rental stations and hence results in a medium flexibility, positing the rental player between free-floating carsharing and station-based carsharing on the flexibility continuum. Representing a low pick-up and drop-off flexibility are the station-based actors that due their concept of round-trip carsharing only allow for pick-up and drop-off to be from the same station. Move About and Zipcar combines this with service suitable for the medium distance trips whereas Sunfleet also cover the longer distance trips due to ability to access the cars with weekly rates.

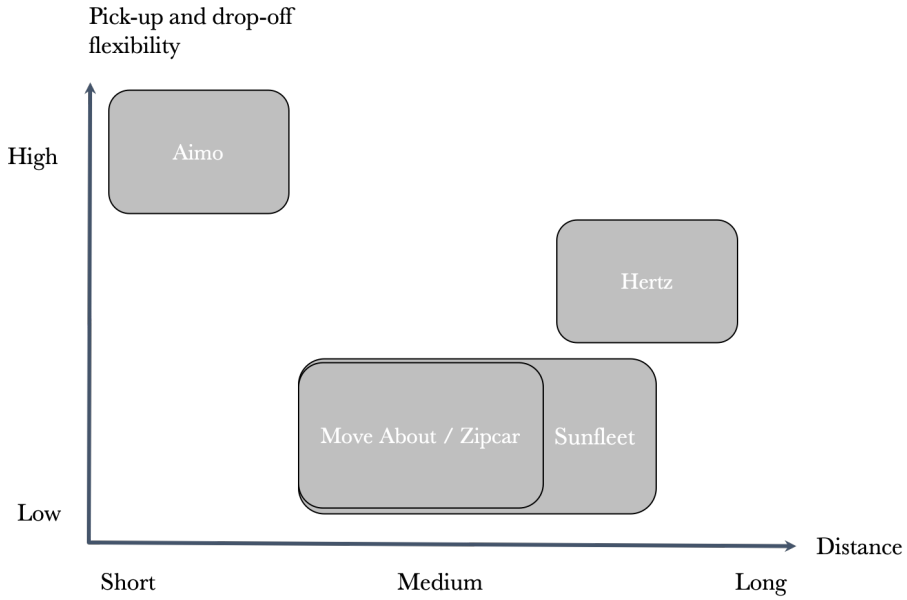

Figure 4.3. A matrix illustrating how different market players relate to each other with respect to pick-up and drop-off flexibility and trip distance.

In addition to this, interview findings unveiled some customer pains in relation to the current offerings. More specifically, pains related to a perception of low flexibility, paying for trips which results in non-usage, a silo structured carsharing market, and that carsharing services have a poor fit for multi-modality have emerged. Furthermore, the findings indicate that most pains are primarily related to the station-based alternatives in which a low degree of pick-up and drop-off flexibility are offered. As a consequence, customers are unable to perform certain customer jobs such as occasional commuting, one-way inter-city trips as well as other shorter one-way trips due to how carsharing currently is structured. Furthermore, the customer pains relating to lack of flexibility, trips resulting in paying for non-usage and poor fit for multi-modality implies that a higher degree of pick-up and drop-off flexibility is wanted by customers to cover trips that occurs outside of the geographical coverage of Aimo, as further exemplified by the following quote:

> "*The goal would obviously to be able to return the car wherever I want - that is the ultimate flexibility. However, I understand that it is not feasible. But to be able to do it to a larger extent is something I find an important thing for me to be able to do the trips I want.*"
>
> (Customer 2)

In addition, even though longer distance trips to some extent are covered by Hertz with their medium pick-up and drop-off flexibility together with an extensive geographical coverage, such an offering is currently unable to fully address the pains of low flexibility, paying for non-usage and poor fit for multi-modality since their offering starts at car by the day and thereby is

misaligned to address the shorter and medium distance trips. This is further highlighted by a customer who argued that even they haven't bother researching rental-actors since they are aware that they only offer mobility by the day:

> *"I have never looked into detail what Avis or Hertz cost since I know I have to rent it for a whole day. And also, since there is a Sunfleet station outside my door basically, I don't want the hassle of going to a rental station somewhere else."*
>
> (Customer 2)

Thus, the customer pains in relation to the current station-based offerings indicate that customers are unable to fulfill their mobility needs using the current carsharing offerings. More specifically, a higher degree of pick-up and drop-off flexibility is wanted for trip distances that currently are not covered by Aimo. Moreover, the pain associated with the silo structured highlight that even though a medium pick-up and drop-off flexibility can be found within Hertz, customers also want to have that flexibility for shorter duration and distance trips. Thus, by combining these insights together with the mapping of market players illustrated in figure 4.3, one major observation emerges. More precisely, the disclosed pains relating to the lack of flexibility for station-based carsharing emphasizes that a higher degree of flexibility is wanted outside of the scope of Aimo and Hertz. This is further reinforced by the market player mapping which highlights that no market player currently has an offer which covers medium or high pick-up and drop-off flexibility for medium distance trips. Therefore, this is to be regarded as a void area among the offerings, as illustrated in figure 4.4.

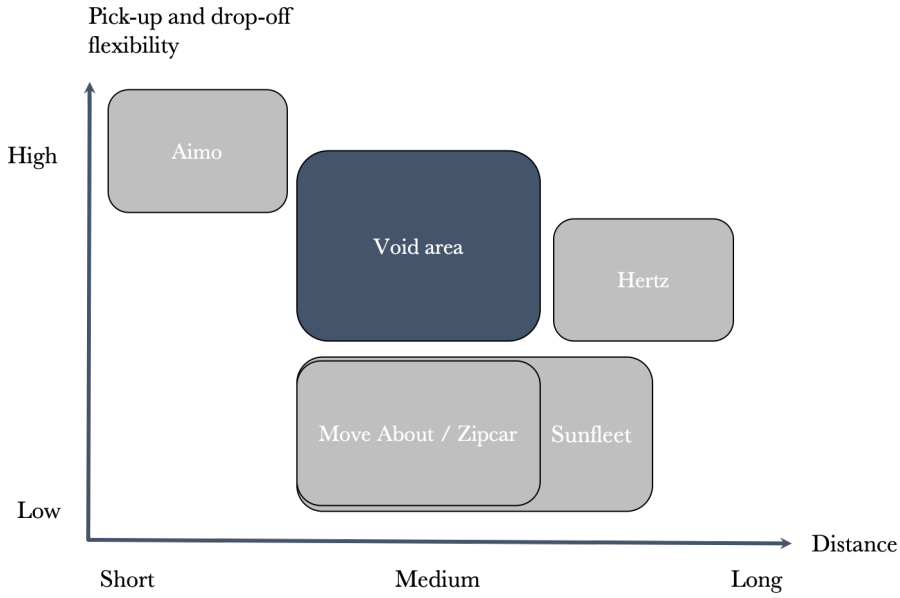

Figure 4.4. A matrix illustrating an identified void amongst market players with respect to pick-up and drop-off flexibility and trip distance.

Since an offering capturing the established void area is currently non-existent, such a service implies convergence into some sort of hybrid offering between the free-floating carsharing and car-rental. Such a reasoning is explicitly brought up by a market player, indicating a gap by highlighting the following:

> *"When I talked to someone I know in Stockholm, they want a complement between carsharing and car rental."*

(Market player 4)

The statement hints that there exists a gap between the different offerings and that customers currently lacks solutions that bridges that gap. In line with the reasoning above, a potential way to do so is to combine the high flexibility of the free-floating services and rental services, a pattern that already has been observed in the marketplace according to one market actor, hinting that convergence in the marketplace already occurs to some extent:

> *"But one could see that Avis and Hertz are starting to ponder about short-time rentals. The reason for that, is that one has observed the growing trend. In practice, the service is the same, it's just the time period that differs."*

(Market player 3)

The same respondent also indicates that even though that a convergence may take place at the moment, it is currently unclear exactly how a future model may look like and that it is likely that new models and/or solutions emerge out of the existing ones is to be expected:

> *"Then, if it is exactly the free-floating model that DriveNow uses, or the that model Sunfleet uses, no it is going to be modifications of them. The most important thing is the combination of the different solutions because it is all about replacing the private car in the daily use."*

(Market player 3)

On the same topic, the same interview respondent continues:

> *"Going forward, I believe that the business model won't be as distinct as they are today. Sunfleet is fixed and DriveNow is free-floating. But why shouldn't the rental cars be free-floating etc.?"*

(Market player 3)

A convergence of different carsharing concepts as described above may potentially address the customer pains in relation to the silo structured market, enabling customers to access a wider

set of mobility solutions within the the same offering. Something that may be wanted by customers according to a market player:

> *"The customers want to come to one company and say "Hi! Can I share a ride with somebody? Can I get a car for an hour some time? Can I get a car for a month some time? Can I use the car to go to Sälen for a week some time? Can I get a car that I could use during my project employment over the next couple of years? Regardless of what happens in life, there is a solution for you."*

(Market player 4)

In summary, by opening up for one-way trips in the station-based alternatives and thereby allowing a substantially higher pick-up and drop-off flexibility, multiple customer pains could potentially be addressed. First, the pains related to the currently perceived low degree of flexibility would be reduced for obvious reasons. Second, the number of trips that results in paying for non-usage as of today could be reduced significantly if customers are not obliged to bring the car back to the pick-up location in order to end the trip. Third, opening up for one-way trips in the station-based alternatives would imply convergence between the concepts of station-based carsharing and car rental which may in turn reduce the silo structure of the market. Hence, by addressing the void area presented in figure 4.4, interview findings indicate that some customer pains with respect to the current carsharing solutions may be resolved as well. In other words, the void area could be turned into an opportunity space, potentially forming a basis for a new value proposition.

4.4 Resolving customer pains imposes new business challenges

Opening up for one-way trips within the station-based alternatives in order to reduce customer pains will inevitably cause new business-related challenges. During the interviews with market players and researchers, they were asked to elaborate on such potential challenges. And according to interview findings, four prime challenges emerged. As figure 4.4 illustrates, those challenges are the importance of symmetric flows, the increased costs with car re-localization, the need for a critical mass of customers and sustainability aspects.

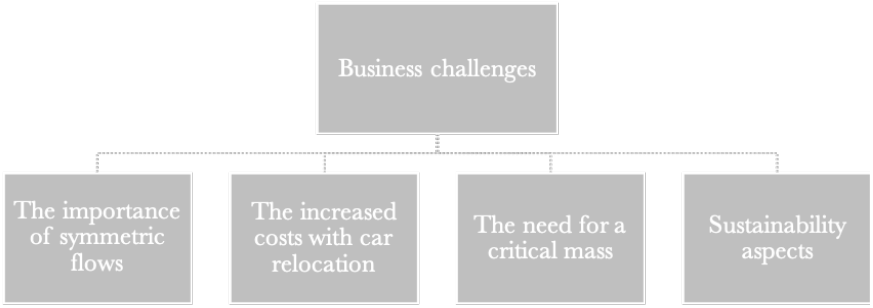

Figure 4.4: Potential business challenges associated with reducing customer the identified customer pains.

4.4.1 The risk of asymmetric flows

One prominent challenge that were mentioned by multiple interview respondents, both market players and researchers, is the issue of travel flows. More specifically, imbalances in travel flows may cause asymmetric localization of cars, causing cars to gravitate to certain locations. This is brought up by a researcher by relating to the bike sharing service Styr & Ställ in Göteborg:

> *"It would be the same as with the Styr & Ställ stations, that it [the traffic] goes in certain directions. People go downhill from Chalmers, but not uphill to Chalmers using Styr & Ställ. That particular effort won't be a problem if going by car, but I still believe that there will be certain flows at certain points in time. So, the question is if you need somebody to move the cars around or if that will just resolve itself. That you could deploy them* [the cars] *so that there actually are cars evenly spread out in the system."*
>
> (Researcher 3)

On the same topic a market player provides a concrete example of this issue highlighting how asymmetric flow may come as a consequence of certain events or occasions:

> *"The commercial challenge will be to balance the flows. One example was Arlanda, where the flows are pretty equal in both directions. You work with both business travelers and private travelers and they match each other fairly good. Except for Christmas, Easter etc. At those times, it becomes very clear how skewed it could be. At Easter, we had more than 100 cars standing at Arlanda, that is more than a third of the entire fleet."*
>
> (Market player 3)

Another but yet similar issue is brought up by a free-floating player when speculating about setting up detached stations outside of the geographical boundaries of the free-floating zone, allowing customers to travel one-way trips even outside of the zone.

> *"There will always be a risk that too many cars arrive, getting stuck there, or that there will be no cars there at all. One need to manage them."*
>
> (Market player 3)

On the same topic, the interview respondent continues:

> *"It's all about spreading the cars in a way that ensures a favorable supply everywhere."*
>
> (Market player 2)

Hence, asymmetric travel flows are predicted impose substantial challenges as a consequence of cars gravitating to certain locations on the one hand while simultaneously causing insufficient supply at other locations on the other hand. This challenge implies that considerable efforts in fleet management related to deployment and relocation of cars are needed due to asymmetric travel flows.

4.4.2 The increased costs with car relocation

Another prominent challenge was that one-way trips would increase the need to re-localize cars in order to meet the shifts and imbalances in demand. This in turn drives cost since the relocation of cars is a labor-intensive task and therefore risks affecting the profitability of the business. A market player highlighted this reasoning by saying:

> *"Carsharing today is not a high marginal industry. So, you have to do this in a way that is not so labor-intensive so that you don't hire away the whole profit."*
>
> (Market player 1)

The same market player voiced that they had investigated this before but had concluded it to be expensive:

> *"We have looked a bit at orchestrating cars, that is, to actually move the cars yourself. And this is something that is very expensive and very heavy on labor."*
>
> (Market player 1)

Similarly, another market player pointed towards that there exists a common misconception of where the cost lies for a carsharing operator. He said that the politicians favored electrical cars, but he argued that the fuel consumption represented in minor part in relation to the other cost of operating carsharing. According to him, activities that required a lot of personnel symbolized far higher costs from an operating perspective, as symbolized by the following quote:

> *"In the car sharing context, it is the need of human involvement, i.e. moving the cars, that represents costs. And that is staffing costs."*
>
> (Market player 3)

On the same topic, the need for multiple personnel to collect a single car was voiced by another market player. He referred to it as a back-up function to handle the need for relocation when asked about the what actually drives costs in a one-way scenario:

> *"The back-up function to be able to collect the cars.* [...] *Somebody has to go there and collect it. And this someone, have to transported there by somebody, and that you suddenly require two people to move cars."*
>
> (Market player 4)

Another market player acknowledged similar problems and highlighted its similarities with the challenges one would face if introducing new hubs outside the city center in free-floating. More specifically, she pointed towards the increased variable cost for moving the cars when the distances increased.

> *"We have to move the cars to ensure that it exists enough spots for people who want to return their car at that spot. And that represents an even higher cost when you have to move it the longer distances."*
>
> (Market player 2)

In response to this, a market player representing Hertz spoke about their way of reducing the cost associated with moving cars between locations. With the introduction of a separate website called "hertfreerider", customers could free of charge drive rental cars that were in need of relocation directly from point A to point B. The market player highlighted two main advantages with this:

> *"Freerider exists for us to reduce the cost of moving cars. And to build customer relationships."*
>
> (Market player 4)

Furthermore, he argued that the concept also expanded beyond cost reduction:

> *"So, the need for transport, yes that was a key issue for us. Saving money on transportation, key issue for us. But it became something more. It became about branding and customer relationships. Because we noticed that the freerider customers also booked cars through Hertz quite a lot."*
>
> (Market player 4)

In summation, market players voice that one challenge is how to handle the costs that arise from having to re-localize the cars. According to them, this is an activity requiring a lot of manual labor and thus inquires a lot of personnel costs. Although being existing as a sub-part of the Hertz-offering, the Freerider concept highlights ways to mitigate these costs. However, it remains clear that that new or more effective actions are needed to address the relocation challenge in a broader way.

4.4.3 Critical mass of customers is essential

Yet another challenge is related to the size of the customer base. According to multiple market players, a critical mass of customers is essential in order to make the business commercially viable. In essence, a critical mass of customers is needed in order to reduce the issues of asymmetric travel flows that may occur in a one-way scenario. This is explicitly brought up by a market player who argues that a certain number of customers with different travel patterns is pivotal in order to reduce potential flow imbalances:

> *"It is about acquiring a sufficient number of customers in the system to make sure that you have a sufficiently large demand for different routes or trips. If you're able to do that, well then you can get the processes and the flows going."*
>
> (Market player 4)

Moreover, a similar reasoning is brought up by another market player when speculating about a one-way solution outside of free-floating concept would need a critical mass of customers:

> *"If one opens up for one on those alternatives, additional problems related to the flows will arise. But the solution would be volume. The bigger volume of customers we have, statistically, they would level each other out."*
>
> (Market player 3)

Similarly, another market player highlights the importance of a critical mass of customers in order to create symmetric flows when a higher degree of pick-up and drop-of flexibility is

> *"You need a certain volume of customers and cars in order to get those movements and flows. To get the flexibility… a critical mass is required."*
>
> (Market player 1)

The challenge of critical mass is also brought up when free-floating actors are speculating about the scenario in which they would establish detached locations, that is, stand-alone stations outside of the geographical boundaries of the free-floating area:

> *"Then we're back to the importance of a critical mass. If there are sufficiently many of the one million people that live in Stockholm that would use it, it would statistically work at some other locations as well such as Barkarby, IKEA other locations."*
>
> (Market player 3)

Another free-floating market player is also pinpointing the enlargement of the customer base as a main challenge if stand-alone stations were to be established:

> *"Then it will be crucial to raise the number of customers even though we're only have one location in that area. That will be the biggest challenge."*
>
> (Market player 2)

In total, the findings indicate that creating a critical mass of customers is a prime challenge that follows from a higher pick-up and drop-off flexibility. Indeed, to reach a critical mass of customers may be a crucial challenge in many businesses for various reasons. In this particular case, however, a critical mass of customers is clearly related to another prominent challenge, namely the issue of symmetric travel flows.

4.4.4 Sustainability aspects

In addition to the practical, operational and financial challenges mentioned above, another challenge has emerged even though it has not been explicitly mentioned as a challenge by the interview respondents. More specifically, multiple respondents have raised concerns regarding sustainability aspects which may follow when carsharing solutions would be upgraded in terms of pick-up and drop-off flexibility. In essence, opening up for one-way trips in the station-based carsharing alternatives and thereby allowing fulfillment of a wider range of customers' mobility needs, will make the car a more viable substitute for trips that are currently dominated by train, buss or public transport modes in general. Thus, if such carsharing solutions would exist, there is a risk of moving travelers from trains and busses to cars - an outcome that is not desirable from a societal perspective. To illustrate this, on interview respondent voiced the following:

> *"But in the LIMA project we will also evaluate how the users change their behavior, and therefore one does not want a total or perfect availability of cars if the bus could be used for the same trip. Like Uber has developed, that if everyone should go by taxi instead of public transport, it will not be better from a societal point of view. It may favorable for the car retailers, but for the climate and congestion, it will be a problem."*
>
> (Project manager)

On the same topic, a market player elaborated on the issue by taking on a city perspective:

> *"From a city perspective, I don't want people to use a shared car and be a part of the traffic jams going into the city center. That's not a desired development because then it becomes as just as any privately-owned car."*
>
> (Market player 3)

Apart from the congestion and traffic jam aspects, a researcher mentioned the following, indicating that the car should not ideally substitute the train as the preferred mode of transport for longer trips due to climate reasons:

> *"But at the same time, the question is whether one want to change the mode of transport from train to car for those trips. Rather, one would use public transport and train for long trips and then use cars for the shorter trips that are hard to solve using public transport."*

(Researcher 1)

However, the sustainability aspects are not in any way overseen by the market players themselves even though they may have economic incentives to increase the usage of cars. Rather, their perception is that carsharing services have the potential to lower the climate impact of cars, something that is also their explicit ambition as illustrated by one market actor:

> *"We don't want people to travel by car. We want people to travel by train or bicycles. We don't want people to travel to Stockholm from Göteborg by car. Well, is good for us because we get revenues, but we think it is better that people use the train for the long trip and then rent a car while in Stockholm. We think that we have a civic responsibility. We know that a shared car removes five cars from the streets. We know that if you are a Sunfleet member you do less car trips because every trip is always more expensive than using your privately-owned car standing on your driveway."*

(Market player 1)

A similar reasoning brought up by another market player, arguing that carsharing services, due to up-front costs, may increase the cost awareness of car usage and transport and hence reduce the total usage of it in some cases:

> *"In order to succeed in reducing the car traffic into the cities, there is a substantial amount of people using the car to commute forth and back to the city center. And if we're able to make them use a shared car to commute, we know that they will not use it every day because once you've started to pay per use, you get pretty thrifty because the costs become very obvious. If you own your own car, you pay like once a month and the other 29 days of the month you don't think about it. But if you use a shared car, one becomes more aware. If you've spent 600 crowns already in this week, then I can use the train instead. So, from that perspective, we see that we could help reducing congestion associated with commuting."*

(Market player 2)

Furthermore, another interview respondent, representing a market player as an OEM, shared her view on the immense sustainability related challenges that lies ahead for the automotive industry in general with respect carbon dioxide emissions:

> *"The carbon dioxide emissions per capita needs to be reduced so immensely. Either, one has cars with less exhaustions, or one has more people per car, or one has fewer cars."*

(Market player 5)

Continuing on the very same topic, she speculates that increasing the people per car may be the only way forward since more sustainable products themselves will not be enough:

> *"We invited a number of experts from different academical, government, and expert positions to talk about sustainability. If we have a closer look at the requirements of the Paris agreement, and not exceed an increase of 1.5 degrees, then the emissions per person needs to be so radically reduced, that the only way over and above electrical cars and more sustainable products is to fill the cars with more people."*

(Market player 5)

Hence, the findings indicate that sustainability challenges on a broader scale is a major challenge in general, which ultimately affects the entire society. However, besides that, the findings highlight some unique implications for the automotive industry and unveils a set of industry specific challenges related to those. More specifically, increasing the pick-up and drop-off flexibility for the station-based carsharing alternatives may potentially move travelers from public transport to cars in some cases, which is not a desired outcome according to some interview respondents. On the other hand, some interview respondents argue that the total car usage may be reduced as a result of improved carsharing services.

4.4.5 Other aspects

Apart from the challenges raised in the previous sub-chapters, two additional aspects were also mentioned. First, the need to increase the number of parking spaces in order to accommodate more cars was raised. Secondly, the need of supporting IT systems that supports one-way concepts was also discussed as a potential challenge.

A researcher initially mentioned parking spots when asked about potential challenges:

> *"Parking spots will become a problem. To get places allowed to them. This is something that already today is difficult."*

(Researcher 3)

This was also voiced by another researcher, pointing towards the need to have more parking spaces than cars in order to offer the needed flexibility of one-way trips:

> *"With station-based carsharing you know that you have a guaranteed parking spot. But with this, then you have to have enough parking spots so that they aren't occupied by others. So, you will need more parking spots than cars."*

(Researcher 1)

Similarly, a market player highlighted the cost aspect of adding more parking spots. Using the situation in Stockholm as an example, he said:

> *"In an A to B scenario, there is mainly parking and personal cost as the large cost items. Let's say in the city center of Stockholm, there you could pay 4-5 thousand a month for a parking spot. That is more than what the car costs. So, if you are to have 25% more parking spots than cars - well yes, then it's going to be expensive."*
>
> (Market player 1)

He further added that there was no interest, as a station-based car sharing service, in having bulks of parking spots. It was rather fewer and more strategically located spots that were of interest; something that could pose a challenge if one-way was to be introduced:

> *"We can get 100 parking spots in the Nordstan garage, but we don't want that. We want them here, here and here."*
>
> (Market player 1)

On the topic of supporting IT systems, a market player highlighted that the lack of those currently represented a challenge:

> *"We don't have system support in our application to do free trips that Hertz are doing in their Freerider concept by example."*
>
> (Market player 3)

Adding to this was another market player who stated that even though many players probably have given it considerable thought on how to improve business, many stops when they realize that their current system represents a barrier:

> *"All carsharing firms have probably thought like crazy on how to grow their business and how to get customers to choose them for more trips. And often it ends with it being too expensive. But it is with the supporting systems it stops first - because the system can't handle it. Then you have to first program that functionality and then you have to find customers who are interested in that."*
>
> (Market player 1)

In conclusion, the findings point towards that extending station-based carsharing to include one-way trips will give rise to parking spot challenges. Seeing as attractive locations are preferred, the need of more parking spots than cars will prove an important challenge to address in order to guarantee that the one-way trips actually can be performed. Building on

this is also the need to have supporting IT systems. Here, they need to be a foundational step towards a new value proposition.

5

Discussion

With the ambition to answer the overall research question, and thereby fulfilling the aim of the thesis, this chapter links the empirical findings with the theory of business model innovation in general and the process of BMI in particular. The chapter starts with section in which the BMI process is outlined where the sub research questions are returned to and answered in conformity with theory. Thereafter, the chapter ends with a review of the main research question which is answered using learnings from the BMI process as input.

5.1 BMI process outline

When conducting the BMI process as such, a reduced version of the 4I-framework as presented by Frankenberger *et al.* (2013) is adopted and used as a foundation. In addition, the 4I-framework is complemented with the work by Remane *et al.* (2017) when applying their business model pattern database throughout the entire BMI process. Without being performed nor exhaustively or completely, the first three phases of the 4I-framework, i.e., initiation, ideation and integration will be in focus. The fourth and last phase, i.e., the implementation phase, is left out since it is concerned with practical changes of the business model including piloting and experimenting rather than theoretical conceptualization. Furthermore, in the second phase, i.e., ideation, a list of several business model patterns for transfer is not presented, but rather a subset of business model patterns with the potential to address either customer pains, the predicted business-related challenges associated with addressing customer pains or a combination thereof. Moreover, the third phase, i.e. integration, will not result in a complete business model as proposed by Frankenberger *et al.* (2013) covering all nine aspects of the business model canvas. Rather, the output of the integration phase is a specification of a bundle of business model patterns with the potential to affect a subset of a business model. The BMI process as such is represented in table 5.1.

Table 5.1: The conducted BMI process is based on the 4I-framework and complemented with the business model pattern database. Adapted from Remane *et al.* (2016).

	1. Initiation	2. Ideation	3. Integration	4. Implementation
Objective of the phase	Understand own business model and its surrounding ecosystem.	Identify new ideas for business model innovation.	Integrate ideas into a complete business model.	Pilot and commercialize the designed business model.
Role of the business model pattern database	Identification of currently implemented patterns in the focal firm's ecosystem.	Iterative cycle of structure (select dimension for innovation) and creativity (transfer patterns to own business model).	Systematic generation of opportunities to specify the missing business model dimensions through additional patterns.	Glossary for relevant background information and cases for implementation of involved patterns.
Results from application of the database	Overview of patterns employed in own business model and differences compared to competitiors.	List of several business model ideas (i.e., patterns and a description of how to transfer them).	Specified business model by combining several patterns.	Success factors from prior implementation of the patterns.

When conducting BMI, Abdelkafi *et al.* (2013) and Gassmann *et al.* (2014) highlight that there is no need to 'reinvent the wheel' by arguing that inspiration for new ideas is to be found by reviewing business model patterns that are currently used, or have been used, in other industries. In fact, Gassmann *et al.* (2014) state that as many as ninety percent of all new business models are not new *per se*, but rather a recombination of existing business model components. Applying this thinking, Abdelkafi *et al.* (2013) brings up three options when searching for existing business model patterns. First, companies should start to look within their industry for patterns to be adapted to their own preconditions. Second, companies should look beyond their own industry boundaries to identify potential patterns for transfer, and third, a more comprehensive approach is proposed including combination of more than one pattern in order to address different value dimensions.

Hence, by applying this logic, and through the use of the business model pattern database by Remane *et al.* (2017), business model patterns with the potential to address both customer pains and business challenges that are predicted to rise as a consequence of addressing those pains may be identified.

5.1.1 What are the current offerings and the associated business model characteristics in the carsharing market?

The answer to this question plays an important role in understanding the ecosystem surrounding any firm that is undergoing a BMI process - which should be a part of, or even the ultimate objective of, the initiation phase of any business model innovation process according to Frankenberger *et al.* (2013). Without taking any particular company's perspective, the benefits of the mapping process of the existing value propositions, their characteristics, and how they relate to each other were twofold. First, an overview of the

market players was obtained, increasing the overall understanding of the Swedish carsharing ecosystem as such. Second, the mapping process disclosed an area of void among the existing value propositions. More specifically, the findings reveal that no market player, as of today, offers high pick-up and drop-off flexibility in combination with an extensive geographical coverage allowing customers to travel short, medium and long distances. Those insights are both important input in the initiation phase of the BMI process in order to address the challenges related to understanding the competitors, their moves or offerings (Frankenberger *et al.,* 2013).

The connection between current offerings and business model patterns

In addition to creating an understanding of the ecosystem as such, the output of the market player mapping process may also serve as foundation to analyze their characteristics from a business model pattern perspective. According to Remane *et al.* (2017), the business model pattern database could be used for those purposes as a part of the initiation phase as described by Frankenberger *et al.* (2013). Moreover, Remane *et al.* (2017) illustrates a link between different business model patterns and the business model canvas components described by Osterwalder and Pigneur (2010). More specifically, Remane *et al.* (2017) use a 'meta-perspective' to illustrate when different business model patterns may be applicable. These four 'meta-components' are represented by value proposition, value delivery, value creation and value capture. Thus, by using the business model pattern database by Remane *et al.* (2017), the different market players and their corresponding business model characteristics are hereafter matched with business model patterns, meta-components and business model building blocks, presented in table 5.2.

Since all the market players under investigation essentially are offering the customers a service, in this case a mobility service, rather than a physical product as such, they are all applying the *servitization of products* pattern, affecting the value proposition meta-component (Remane *et al.*, 2017), as their core and most dominant pattern in line with the reasoning by Johnson (2010). This observation is also in line with the findings of Remane *et al.* (2017) who uses Zipcar to exemplify the use of that particular pattern. Moreover, even Abdelkafi *et al.* (2013) refers to the pattern as one of the 'existing car-focused business models' even though they refer to it as *products-to-service.*

Besides the commonality of employing the dominant pattern of *servitization of products,* the different actors also employ different patterns that are unique to their specific service or offering. To start with, Aimo employs the *do more to address the job* pattern which affects the value proposition meta-component (Remane *et al.*, 2017). In essence, the core characteristic of that pattern is to fulfill customer needs that are currently not being fulfilled by the current offerings (Johnson, 2010). More specifically, by offering their customers pick-up and drop-off way beyond the other players, the empirical findings indicate that Aimo (or free-floating services in general) enables customers to solve the pains related to lack of flexibility, trips resulting in paying for non-usage and poor fit for multi-modality in a way that no other player does. However, although Aimo's current offer addresses multiple customer pains as of today, the limited geographical coverage of their service has two major implications. First, it only

serves a modest number of people, in practice those who live within the Aimo homezone. Second, the number of customer jobs are reduced as a consequence of the limited geographical coverage since the travel destination in practice needs to be within the homezone as well. Nevertheless, the *do more to address to job* pattern is effectively employed as long as the customers travel within the geographically restricted Aimo homezone.

Table 5.2 : Representation of the different business model patterns that are employed by the market players under investigation.

Concept	Player	Unique pattern	Business model connection
Free-floating	Aimo	Do more to address the job	Value proposition
		Pay per use	Value capture
Station-based	Sunfleet	Brand integrated content	Value proposition
			Value capture
Station-based	Move About	Premium	Value proposition
			Value capture
Station-based	Zipcar	Unique partnerships	Value creation
Rental	Hertz	Self-service	Value creation
			Value capture
		Freemium	Value proposition
			Value capture

Moving on to the station-based actors and starting with Sunfleet, they uniquely employ the *brand integrated content* pattern as described by Rappa (2001) and thereby affecting the value proposition and value capture meta-components (Remane *et al.*, 2017). By the use of the *brand integrated content* pattern, the Volvo Car affiliate Sunfleet are able the use their service as a basis for product placement of Volvo cars. Another station-based player, Move About, are employing the *premium* business model pattern affecting the value proposition and value capture meta-components. In essence, the characteristics of the premium pattern is to price higher than competitors based on a superior offering (Tuff and Wunker, 2010). In the case of Move About, they are currently the only station-based player in Sweden that uses only electric cars in their fleet, positioning themselves as the most sustainable player and thereby motivating a higher price. Moreover, Move About are the only station-based player that offer their customers premium electric cars such as Tesla Model S. Finally, the last station-based player under investigation, Zipcar, are currently offering their service solely to tenants of the housing company Wallenstam. Through an exclusive collaboration agreement, Zipcar effectively solve the issues related to finding and signing up for parking spots to use in their service. Hence, by employing the *unique partnerships* business model pattern as described by Johnson (2009) and thereby affecting the value creation meta-component (Remane *et al.* (2017), Zipcar currently enjoys the exclusive right to the extensive number of parking spots being owned by Wallenstam.

Finally, looking at Hertz, they uniquely make use of a combination of the *self-service* and the *freemium* business model patterns and thereby affecting the value proposition, value creation and value capture meta-components (Remane *et al.,* 2017). According to Gassmann *et al.* (2014), the *self-service* pattern is about passing over some parts of the value creation to the customer who is then rewarded with a lower price as a form av compensation. In the case of Hertz, they employ this pattern within their freerider service when making use of customers to relocate cars from location A to location B when there exists a mismatch of supply and demand, i.e., too few cars at location A while there is an excess number of cars at location B. In practice, customers are offered free trips between location A and B, and thus eliminates some of the labour intensive work associated with the manual relocation of cars which essentially is a no value adding process from a customer perspective. Moreover, the Hertz freerider concept could also be linked to the *freemium* business model pattern. The *freemium* pattern is characterized by offering customers a basic version of the offering for free while a premium version is accessed when payed for (Gassmann *et al.*, 2014; Johnson, 2010). In the case of Hertz freerider again and based on the empirical findings, the analogy would be that customers are offered a basic service, i.e., driving a predetermined route from A to B, for free while driving to any other preferred location would be made possible only against payment, i.e., a premium. In addition, the empirical findings also indicate that Hertz's customer base was grown due to the uniqueness of offering free trips, something that the freemium business model pattern is intended to do (Gassmann *et al.*, 2014; Clinton and Whisnant, 2014; Seufert, 2014).

In summary, by comparing and mapping the different offerings in the carsharing market, an increased understanding of the surrounding ecosystem has been gained, which is an essential part of the initiation phase of any BMI process (Frankenberger *et al.,* 2013). Moreover, the output of the mapping process also served as a stepping stone when identifying the business model characteristics associated with the different market players, something that also should be conducted as a part of the initiation phase of any BMI process when using the business model pattern database as a guideline (Remane *et al.,* 2017). Thus, the question of what the current offerings and the associated business model characteristics are in the carsharing market is hereby answered in conformity with theory.

5.1.2 What are the customer pains in relation to the current offerings and how could those be addressed?

In order to further increase the understanding of the surrounding ecosystem beyond the different market players and their business model characteristics, and as an even more prominent part of the initiation phase of the BMI process, the customer needs have to be properly understood (Frankenberger *et al.*, 2013). The importance of customer understanding in the BMI process should not be underemphasized which is highlighted by Baden-Fuller and Haefliger (2013) when pointing out the importance of 'engaging with their needs' 'and 'delivering satisfaction'. Similarly, Teece (2010) emphasizes that unveiling of some 'deep truth' about the customers and their needs constitutes an essential steppingstone in the process of developing new business models. Furthermore, Frankenberger *et al.* (2013) even stress that the

discovering of customer needs makes up to one out of two major challenges while in the initiation phase of the BMI process. Moreover, such insights enable business model innovators in the area to be 'customer-centric' as described by Teece (2010), which in turn may constitute a foundation or a starting-point for the process of generating new ideas, by identification of business model patterns suitable to address the customer pains, which is significant for the ideation phase (Frankenberger *et al.*, 2013).

Unveiled customer pains

In this study, the customer pains are used to increase the understanding of customer needs. More specifically, by understanding the customer pains, i.e., anything that displeases the customer when they are trying to get a job done (Osterwalder *et al.*, 2014), an indication of customer jobs that cannot be performed and unsatisfied customer needs can be discovered and subsequently used as input when understanding the ecosystem. Osterwalder *et al.* (2014) define customer jobs as tasks that customers are trying to get done. Hence, essentially a customer job represents a customer need. Customer jobs could be categorized as either functional, social, personal/emotional or supporting Osterwalder *et al.* (2014). From interviews with customers and non-customers it was learnt that a number of pains are experienced in relation to the station-based carsharing offerings.

More specifically, customers and non-customers stated that they could not properly perform a number of jobs due to the current configuration of the services in terms of a limited pick-up and drop-off flexibility. Such jobs include trips to other cities, occasional commuting trips to work or other one-way trips which all could be categorized as functional jobs as described by Osterwalder *et al.* (2014). For example, one interview respondent voiced that she wanted to use a Sunfleet car to go to Malmö but ended up choosing another mode of transport since the Sunfleet service was not able to do the job. Moreover, a couple of interview respondents highlighted that they wanted to use a carsharing service occasionally to commute to work, but due to the current service configuration that particular customer job cannot be done in a satisfying way. Additionally, multiple interview respondents pointed out how they were unable to use station-based carsharing services as a part of multimodal traveling. For example, one interview respondent talked about arriving late at the central station when highlighting his need to use a shared car instead of public transport to get to his home location. Similarly, multiple interview respondents talked about their inability to combine train trips between cities and carsharing as a part of such trips, indicating poor fit for multimodality. Those findings are consistent with another study by Colom and Desel (2013) where it is argued that station-based carsharing 'strictly binds the conformation of users' travels' since the car needs to be returned to the same location as it was picked up on.

Similar findings were discovered by Strömberg *et al.* (2018) in their work of evaluating the MaaS project called UbiGo. In addition, given the current configuration of the station-based carsharing services where customers are not able to travel one-way trips, customer perceive pains in relation to multimodality. For example, multiple customers expressed difficulties with combining train trips with station-based carsharing. However, even this pain could be attributed to the low degree of pick-up and drop-off flexibility since multimodal travel as

defined by (Nobis, 2010), i.e. 'a flexible use of various modes of transport', requires one-way travel modes.

Moreover, another pain in relation to station-based services according to the findings is related to paying for non-usage. For example, findings indicate that when a station-based car is used for customers jobs such as for daily or even weekly long trips, the car is left idle the majority of the time causing the customer to feel that money is wasted. This is exemplified by a non-customer who was considering using Sunfleet to go for a trip to a waterpark but did not because he realized that he had to pay for it while remained standing parked. Moreover, a customer described how she considered to use Sunfleet to go to Sälen for a week but chose the bus instead because she otherwise would have had to pay for a car standing still in Sälen for several days. Similarly, a non-customer contemplated on using carsharing to commute to work but did not since he had to rent the car a whole day.

The last theme of pains is related to the silo structured market. More specifically, this pain highlights the fact that not a single actor can fulfill all of one customer's mobility needs. For example, one customer felt frustrated about having to navigate between multiple mobility actors to fulfill a certain job. Moreover, this also means that customers have to manage multiple memberships since distinct market player are suitable for distinct customer jobs, which is line with the statement from a researcher when mentioning that it is a hustle for the customers to have multiple memberships in different carsharing services to get their jobs done. Gassmann *et al.* (2014) argue that this can be an effect of industry players having a preconceived logic about how the industry should be structured. One example of this is that managers do not see reason to abandon what they originally built their business upon (Gassmann *et al.*, 2014). In relation to this, Prahalad (2004) argues that a dominant logic limits the ability of organizations to see new opportunities and threats. As an example of this, this customer pain illustrate that customers want to be able to perform more customer jobs with one market player while some market players might be geared towards upholding the silo structure due to the dominant industry logic.

Potential ways to address customer pains

During the interviews a number of ideas for improvement emerged. Customers and non-customers respondents elaborated upon potential ideas for improvement based in their own perception of the existing pains. Market players and researchers on the other hand, provided ideas based on their knowledge about the carsharing concept as such or carsharing businesses in general. Thereby, empirically grounded ideas for improvement, in line with the objective of the ideation phase (Frankenberger *et al.*, 2013), were collected which hereafter are related to theoretical concepts.

More specifically, empirical findings indicate that by allowing for one-way trips in the station-based services, customers would be able to complete a wider array of jobs than they are able to do as of today. This is consistent with other findings in previously conducted studies on one-way carsharing (Boyaci *et al.*, 2015; Shaheen *et al.*, 2015; Chen *et al.*, 2018) who argue that one-way services allow for greater flexibility than the station-based alternatives, while Bruglieri

et al. (2017) argue that 'flexibility offered by a one-way system makes it more attractive to users'.

Furthermore, as a part of the initiation phase of the BMI process, it was learnt that Aimo is offering a high degree of drop-off and pick-up flexibility by allowing for one-way trips. Thereby, the free-floating actor is able to reduce the pains related to lack of flexibility, trips resulting in paying for non-usage and poor fit for multimodality which is consistent with previous studies on free-floating carsharing such as the work from Kopp *et al.* (2015). Furthermore, by applying the theoretical lens of business model patterns, it was learnt that Aimo employs the *do more to address the job* pattern affecting the value proposition meta-component (Remane *et al.* 2017) in order to solve a wider range of customer jobs (Johnson, 2010) than station-based services are able to. Hence, by the employment of that business model pattern, some of the pains related to station-based carsharing could be addressed, as illustrated in table 5.3. Thus, relating this to the work by Osterwalder *et al.* (2014), the introduction of one-way trips in station-based carsharing may potentially work as a pain reliever.

In order to address the pain of the silo structured market and thereby allow for more customer jobs to be performed with one market player, a suitable business model pattern is needed. Moreover, the analysis of business model patterns currently employed in the carsharing market showed that no market player currently has a pattern that addresses this pain. Since customer pains could be linked to the value proposition component of the business model (Osterwalder *et al.,* 2014), business model patterns that affect the value proposition meta-component as described by Remane *et al.* (2017) were reviewed to identify a pattern with the potential to address the pain. Based on the characteristics of the pain as described by interview respondents, the solution provider pattern would work as a potential pain reliever since the pattern is used to add value to customers by integrating multiple services in a one-stop shop allowing for 'a total coverage of products and services in a particular domain' (Gassmann *et al.*, 2014).

Table 5.3: The connection between customer pains and business model patterns.

Customer pains	BMC component	Meta-component	Business model pattern
Lack of flexibility			
Trips resulting in paying for non-usage	Value proposition	Value proposition	Do more to address the job
Poor fit for multimodality			
Silo structured market	Value proposition	Value proposition	Solution provider

To summarize, as a part of the initiation phase as described by Frankenberger *et al.* (2013) it was learnt from interviews that there exist four prominent customer pains in relation to station-based carsharing services which either restricts or even hinders the customers do certain jobs. More specifically, pains related to the lack of flexibility, paying for non-usage,

poor fit for multimodality and a silo structured market were unveiled. Moreover, empirically grounded ideas for improvement indicate that an introduction of one-way trips within the station-based services and thereby employing the *do more to address to job* business model pattern would act as a pain reliever (Johnson 2010; Osterwalder *et al.* 2014) - affecting the value proposition meta-component (Remane *et al.* (2017). In addition, it was learnt from theory that application of the solution provider business model pattern where one actor offers a total coverage of services in a certain domain (Gassmann *et al.,* 2014) has the potential to relieve customer pains in relation the silo structured market. The combination of the two business model patterns is illustrated in table 5.3, aligning with the stated output of the ideation phase as described by Remane *et al.* (2017). Moreover, since customer pains and potential pain relievers are both important input in the development of new value propositions according to Osterwalder *et al.* (2014), those findings may represent a basis for a future, currently non-existing, value proposition in order to address the identified customer pains.

5.1.3 What business challenges will potentially arise if station-based offerings are modified to address those pains and how could those be resolved?

In order to develop a commercially viable business model, some level of internal fit needs to be reached (Frankenberger *et al.,* 2013). More specifically, the ideation phase partly concerns the generated ideas of how to fulfill customer needs and thereby reduce their pains in relation to the current offerings (Frankenberger *et al.,* 2013). A similar reasoning is brought up by Teece (2010), although without linking it to any specific part of the business model development, when arguing that besides an understanding of customer desires, a sense about the 'future behavior of costs', analogous to the cost structure part of the business model canvas (Osterwalder & Pigneur, 2010), is needed in order to arrive at a viable business model design. With this is mind, it is therefore feasible to address the business-related challenges that are predicted to arise if station-based carsharing services are to be opened up for one-way in order to address the customer pains. Put differently, in order to reach internal fit, the predicted business challenges associated with addressing customer pains need to be addressed with business model patterns. According to the empirical findings, there are four major challenges they may appear if the identified customer pains are to be resolved, namely; the risk of asymmetric flows, the increased costs with car relocation, the need for a critical mass and sustainability.

Predicted challenges and their connection to business model patterns

When asked about potential business challenges that may arise if customer pains are to be addressed by introducing one-way trips, multiple interview respondents mentioned the risk of asymmetric flows and the increased costs for car relocation as separate challenges. However, those challenges are closely linked to each other as shown in multiple previously conducted studies on one-way carsharing (Huang *et al.* 2018; Jorge *et al.*, 2012; Jorge *et al.*, 2015) where operational issues related to one-way carsharing are in focus. For example, Huang *et al.* (2018) links the prevalence of asymmetric flows or 'non-linear demand' to vehicle relocation operations and the associated costs. In addition, Jorge *et al.* (2012) present an approach for handling 'vehicle stock imbalance issues' while avoiding vehicle relocation operations.

Moreover, Shaheen *et al.* (2015) refers to 'system rebalancing' as a way to describe the process of balancing supply and demand when arguing that relocation strategies are divided into two general approaches being operator-based strategies or user-based strategies. The user-based strategies are based on creating incentives for users to either share rides from 'low-vehicle-quantity stations' to 'high-vehicle-quantity stations' or to incentivize groups of people to split trips when going from 'low-vehicle-quantity stations' to 'high-vehicle-quantity stations' (Shaheen *et al.,* 2015). On the same topic, Correia *et al.* (2014) and Pfrommer *et al.* (2013) argue that by exploiting the flexibility of the users, i.e., a user may be willing to use his or her second or third preferred (closest) station, more profit can be made by the operating company.

However, although a considerable amount of studies have focused on the operational aspects of one-way carsharing, studies focusing on explicit business models connections seem more or less absent. Nonetheless, the related challenges of asymmetric flows and the increased costs for car relocation will ultimately affect the cost structure of the business model (Osterwalder & Pigneur, 2010; Abdelkafi *et al.*, 2013). During the initiation phase of the conducted BMI process, it was learnt that Hertz make use of their customers in order to reduce the costs of car relocation within their freerider service. Hence, Herz are affecting, i.e. lowering, their cost structure by exploiting users as a part of their operations and thereby reducing the need of labor through the employment of the *self-service* business model pattern, as illustrated in table 5.2. Thus, by applying the logic by Gassmann *et al.* (2014), Abdelkafi *et al.* (2013) and Remane *et al.* (2017) the very same business model patterns could be transferred and subsequently adapted to the station-based carsharing concept if widened to include one-way trips, as a means to minimize increasing costs following from asymmetrical flows as illustrated in table 5.4.

Table 5.4: Illustrating implications of challenges on business model canvas components and their connec to business model patterns.

Challenges	BMC component	Meta-component	Business model pattern
Risk of asymmetric flows Increased cost for relocation	Cost structure	Value capture	Self-service
Critical mass	Value proposition	Value proposition	Freemium

Moreover, during the market player interviews it was learnt that another predicted business-related challenge was closely related to the prevalence of asymmetric flows, namely the size of the customer base. More specifically, it was learnt that a critical mass of customers is needed in order to create sufficiently large demand for different trips and to get the desired flows et cetera. However, from the findings it is learnt that Hertz were able to acquire more customers through their freemium service, freerider. This observation is in line with theory since acquisitions of a large customer base is one characteristic of the freemium business model pattern (Gassmann *et al.,* 2014, Clinton & Whisnant, 2014; Seufert 2014). Thus, by the employment of the freemium business model pattern, through which Hertz offer their

customers free trips, the attractiveness of the value proposition is increased, resulting in an enlargement of their customer base according to findings. Thus, by applying the logic by Gassmann *et al.* (2014), Abdelkafi *et al.* (2013), the *freemium* business model patterns could be transferred and used in one-way carsharing services with the purpose to acquire a critical mass of customers by exploiting an attractive value proposition.

Another challenge that was unveiled during interview relates to the sustainability aspect of offering one-way trips where the risk of moving travelers from public transport to carsharing cars was emphasised as one concern. Here, multiple market players and researchers argued that offering one-way to a larger extent risks counteracting the ambition of carsharing, that is, to reduce the usage of cars in total. This aligns with the findings of Lempert *et al.* (2019) who, based in a recent survey of Canadian carsharing customers, found that customers of two-way carsharing adhere to a more sustainable lifestyles than customers of one-way carsharing. In contrast, customers of one-way carsharing was found to use it more for convenience and, as a consequence, used shared vehicles two times more often as two-way customers. Moreover, customers of one-way carsharing were also observed using private cars more frequently than customers of two-way carsharing (Lempert *et al.*, 2019). However, one market player argued that total car usage might be reduced as a result of carsharing customers performing less trips than those with privately owned cars. This topic was investigated by Nijland and van Meerkerk (2017) who assessed the effect carsharing had on privately-owned cars. The study concluded that people who started using carsharing both owned 30% less cars and drove 15% to 20% fewer kilometers than prior to carsharing which emphasizes that carsharing could help reduce total car usage (Nijland & van Meerkerk, 2017).

Furthermore, while carsharing is argued to be a more sustainable mode of transport than a privately-owned car (Briceno *et al.*, 2004; Kent & Dowling, 2013; Nijland & van Meerkerk, 2017), using carsharing per se might not represent the only way forward towards more sustainable mobility. In relation to this, one market player highlighted that increasing the number of people per car, i.e. ridesharing, might be a way forward. This is consistent with findings from Yu *et al.* (2017) who argue that the advantages with ridesharing from a sustainability perspective are multifold. More specifically, ridesharing is found to contribute to substantial energy savings, reduction in emissions and contribute towards weakening the willingness to purchase new cars.

Although ridesharing may be a way forward, a number of barriers are associated with the concept such as safety concerns and social discomfort (Li *et al.*, 2017). Moreover, proper connections between ridesharing and B2C business model implications appear to be absent in theory and therefore no suitable business model patterns have been identified in either theory or practice with the capability to address the existing challenges associated with the concept of ridesharing. Thus, more research is needed to create viable connections between the ridesharing concept and B2C business models in general.

In summary, the findings revealed four distinct challenges that are predicted to arise if the discovered customer pains are to be addressed. More specifically, challenges associated with

asymmetrical flows, increased costs for car relocation, the need for critical mass and sustainability were predicted to arise. However, by studying business model patterns currently employed by different market players, it was learnt that Hertz, as a part of their freerider service, employ two business model patterns, namely *freemium* and *self-service* in order to address the challenges related to asymmetric flows, increased costs for relocation and the need for critical mass. However, regarding the sustainability aspects, this challenge remains unpaired with a business model pattern since theory, as of today, offers no connection between ridesharing and business model patterns.

5.2 How can an OEM innovate its station-based carsharing business model in order to improve its business-to-consumer mobility offer?

BMI can be conducted in multiple ways (Amit & Zott, 2012; Gassmann *et al.*, 2013; Björkdahl and Holmén, 2013). With the starting point in the business model conceptualization by Zott and Amit (2010), the business model as such could be represented by an activity system that include different activities which are linked in particular ways and performed by different parties (Zott & Amit, 2010). From such an activity system perspective, BMI occurs when novel activities are added, when activities are linked in new and novel ways, when activities are performed by another party than originally or any combination thereof (Amit & Zott, 2012). Moreover, Gassmann *et al.* (2014) refer to the four dimensions of the 'magic triangle' which conceptually describes a business model, arguing that two or more out of the four dimensions what, who, how or why need to be modified in order to innovate the business model.

Moreover, as guidelines in any BMI process, Amit and Zott (2012) highlight the customer needs as a starting point in any BMI process in order to arrive at a business model that fulfills the needs of the customers and thereby creates customer surplus (Zott & Amit, 2010). Similarly, Teece (2010) argues that companies need to put the customer in focus when developing new businesses, i.e. being 'customer-centric' since products or services as such is not necessarily what customers want, but rather they 'want solutions to their perceived needs'. Moreover, Frankenberger *et al.* (2013) argue that an understanding of customer needs constitutes an essential subset of the initiation phase, i.e. the first phase, of any BMI process as a way to understand the ecosystem surrounding a firm.

From a business model perspective, customer jobs and needs and the fulfillment of those are commonly related to the value proposition, that is a part of the business model (Osterwalder & Pigneur, 2010; Gassmann *et al.*, 2014). For example, Osterwalder and Pigneur (2010) define the value proposition as a description of how a company creates customer value by combining products and services in a way that addresses the needs or problems of customers. A similar definition is provided by Gassmann *et al.* (2014) who argue that the value proposition represents one out of four dimensions of any business model. More specifically, Gassmann *et al.* (2014) argue that the value proposition is concerned with the question of what is offered to

customers in terms of products or services in order to fulfill customer needs. Zooming in even further on the value proposition, Osterwalder *et al.* (2014) creates a link between customers jobs, pains and gains coupled with what is offered to them in their value proposition canvas. Thereby a link is created between customer jobs, the associated pains and the value proposition as such, which in itself is a subset of any business model (Osterwalder & Pigneur, 2010; Gassmann *et al.*, 2014; Remane *et al.*, 2017*;* Abdelkafi *et al.*, 2013).

As a part of the conducted BMI process, and more specifically the initiation phase of that process, it was learnt through interviews that there exist a number of customer pains in relation to station-based carsharing services. The prevalence of pains indicates that customer needs in relation to the existing station-based carsharing services are not properly satisfied which in turn either restricts or hinders customers to perform certain jobs (Osterwalder *et al.,* 2014). Thus, the prevalence of pains as such constitutes a basis for development of new value propositions since customer currently are displeased in some regards with the current ones (Osterwalder *et al.,* 2014). Hence, in order to deliver solutions that fulfill the perceived needs of the customers as recommended by Teece (2010), the empirical findings indicate that new value propositions need to be developed in order to address the pains that were discovered as a part of this study. Thus, the substantial customer pains in relation to the current offerings provides an OEM with the opportunity to be 'customer centric' (Teece, 2010), when developing new value propositions in the carsharing domain and thereby increasing the likelihood of achieving external fit (Frankenberger *et al.*, 2013).

Once an understanding of customer needs and pains has been established, Amit and Zott (2012) propose business model innovators to consider what novel activities that could help to reduce customer pains in order to satisfy the needs. With respect to this, it was learnt from interviews that introduction of one-way trips within the station-based services may work as a pain reliever to a majority of the unveiled pains. Hence, introduction of one-way in the station-based services could be considered as a novel activity as described by Amit and Zott (2012). More specifically, the perceived pains related to the lack of flexibility, paying for non-usage and poor fit for multimodality are likely be reduced or eliminated since one-way trips allows for a higher degree of pick-up and drop-off flexibility (Shaheen *et al.*, 2015; Kopp *et al.*, 2015). In addition, by studying the free-floating actor Aimo who uniquely employs the *do more to address the jobb* when offering one-way trips, it was learnt that the service is alleviating those pains as long as customers travel within the Aimo homezone. Hence, by transferring and thereafter adapting the *do more to address the job* business model pattern in line with Gassmann *et al.* (2014), Remane *et al.* (2017) and Abdelkafi *et al.* (2013), an OEM would be able to incorporate pain relievers that have been proven in other carsharing services as a subset in the development of new value propositions. Furthermore, to address the last customer pain that was unveiled as a part of this study, i.e. the silo structured market, the *solution provider* business model pattern may be applicable. More specifically, Gassmann *et al.* (2014) argue that the *solution provider* pattern is used to add value to customers by integrating multiple services in a one-stop shop allowing for 'a total coverage of products and services in a particular domain'. Thus, the *solution provider* business model pattern has the potential to act as a pain reliever addressing the pains related to the silo structured market. Therefore, following the reasoning

above, the *solution provider* could be transferred and adapted (Gassmann *et al.,* 2014; Remane *et al.,* 2017; Abdelkafi *et al.* 2013) to function as another pain reliever as a part of a new value proposition (Osterwalder *et al.*, 2014).

Once a better understanding of customer needs and pains is gained, followed by an identification of novel activities to help customers to fulfill their needs, Amit and Zott (2012) propose an investigation of how activities could be linked in novel ways followed by identification of whom to perform the activities. Similarly, Frankenberger *et al.* (2013) refer to the notion of internal fit when describing the alignment between generated ideas and other business model components. In relation to this, interviews unveiled that a number of challenges are expected to arise if station-based services are opened up for one-way trips. More specifically, challenges related to asymmetric flows, increased costs for relocation, the need for a critical mass of customers and sustainability aspects were mentioned. However, it was also learnt that most of those challenges could be addressed by employment of a combination of the *self-service* and *freemium* business model patterns that is currently in place at Hertz freerider service. Through the employment of those patterns, Hertz is exploiting customers as a means to reduce the operational costs attributed to the relocation of cars that occurs when one-way trips are allowed by compensating them with free trips. Moreover, according to the findings, the Hertz freerider service also attracted more customers to the company, helping them to build a larger customer base. Hence, by transferring and adapting the *self-service* and *freemium* business model patterns as described by Gassmann *et al.* (2014), Remane *et al.* (2017) and Abdelkafi *et al.* (2013), an OEM would be able address the challenges related to asymmetric flows, increased costs for relocation and the need for a critical mass that are coupled with one-way trips by assigning customers to perform some of the needed operational activities. However, with respect to the sustainability related challenges, ridesharing was pointed out as a potential way forward even though there, as of today, there exists a number of challenges in relation to the concept (Li *et al.*, 2017). However, to the extent of the knowledge gained through this thesis, no empirical study has extensively explored how sustainability issues can be mitigated through business model in the carsharing market. Consequently, sustainability related challenges remain unsolved and need to be further explored.

Based on the findings of this study, an OEM is provided with an opportunity to innovate its station-based carsharing business model in order to improve its B2C offering, starting with the development of a new value proposition based in the business model patterns found to address the customer pains namely, the *do more to address the job* and the *solution provider* patterns. Thus, if a value proposition is to be developed based on those findings, BMI occurs since new content is added to the activity system (Zott & Amit, 2010) affecting the 'what?' dimension described by Gassmann *et al.* (2014) which is equivalent to the value proposition component in the business model canvas (Osterwalder & Pigneur, 2010). Moreover, such a value proposition holds the potential to seize the void area in the market since no value proposition as of today combines a high degree of pick-up and drop-off flexibility with the possibility to travel short, medium and long trips as proven by the findings of this study.

Moreover, as a response to the challenges that can arise from such a value proposition, the *self-service* pattern could be employed to reduce costs associated with relocation of cars due to asymmetrical flows. Thereby, the cost structure component of the business model canvas (Osterwalder & Pigneur, 2010), the activity system efficiency as described by Zott and Amit (2010), and the 'why?' dimension as described by Gassmann *et al.* (2014) could be updated. Furthermore, the findings also show how the *self-service* pattern could be employed to assigning customers to perform certain operational activities, i.e., relocating cars. Thereby, the key partnerships component of the business model canvas (Osterwalder & Pigneur, 2010), the activity system governance as described by Zott and Amit (2010) and the 'how?' dimension described by Gassmann *et al.* (2014) could be modified. Lastly, the *freemium* pattern could be employed to increase the size of the customer base by offering an attractive value proposition where free trips are offered in exchange for car relocation. Thereby, new content is added to the activity system (Zott & Amit, 2010) affecting the 'what?' dimension described by Gassmann *et al.* (2014) which is equivalent to the value proposition component in the business model canvas (Osterwalder & Pigneur, 2010).

In summary, by applying a set of business model patterns illustrated in table 5.5, an OEM can innovate its station-based carsharing business model, in order to improve their offer. More specifically, an OEM is able to innovate its business model by changing the activity system content, efficiency and governance as described by Zott and Amit (2010), equivalent to the 'what?', 'why?' and 'how?' dimension as described by Gassmann *et al.* (2014) and the value proposition, cost structure and key partnerships components of the business model canvas (Osterwalder & Pigneur, 2010).

Table 5.5: Bundle of business model patterns with the potential to address customer pains and business associated challenges.

Business model pattern	BMC component (Osterwalder and Pigneur, 2010)	BM dimension (Gassmann *et al.*, 2014)	Activity system (Zott and Amit, 2010)
Do more to address the job Solution provider Freemium	Value proposition	What?	Design element: content
Self-service	Cost structure	Why?	Design theme: efficiency
	Key partnerships	How?	Design element: governance

6

Conclusion

The aim of this thesis was to identify potential ways for an OEM to innovate its station-based carsharing business model in order to further improve its mobility offerings. To do so, a qualitative research strategy was adopted when conducting a business model innovation process, using a station-based carsharing offering as the baseline.

In order to structure the business model innovation process, the framework by Frankenberger *et al.* (2013) was adopted and adhered to throughout the study. By doing so, the research team was provided with the necessary guidelines to conduct the business model innovation process in a structured way. However, the business model innovation process has not been either completely or exhaustively conducted in relation to the framework. More specifically, merely three out of the four generic phases of the framework have been in focus within the study, namely the initiation phase, the ideation phase and the integration phase. The fourth and last phase, i.e. the implementation phase, was left out since it is primarily concerned with practical aspects such as experimenting, testing and validating the proposed business model. Moreover, the three phases that were in focus within this study were not exhaustively completed, i.e., all the activities that are suggested in the framework have not been conducted, but rather a subset of them. Nevertheless, the activities performed have been sufficient to answer the research question at hand, allowing for fulfilment of the aim of the thesis.

To start with, and as a part of the initiation phase of the business model innovation process, the research team gained an increased understanding of the ecosystem surrounding station-based carsharing. By drawing upon primary data from interviews with customers, non-customer, researchers in the area, and the carsharing market players themselves, the research team got a comprehensive understanding of existing customer pains that currently either restricts or hinders customer to fulfill some of their mobility needs when using station-based carsharing services. Moreover, as another part of the initiation phase, the research team learnt about the different market players currently present in the Swedish carsharing market. By drawing on secondary data retrieved from the market players' websites, it was learnt how their different value propositions are composed, how those relate to each other, and how they make unique use of different business model patterns. When comparing this with interview findings on customer pains, it was learnt that there exists a void area among the offerings present in the Swedish carsharing market, where no market player currently combines a high degree of pick-up and drop-off flexibility with a high geographical coverage that enables customers to travel short, medium and long trips.

Moreover, as a part of the ideation phase of the business model innovation process, it was learnt that customer pains may be reduced by the introduction of one-way trips in the station-based carsharing services. More precisely, study findings indicate that a higher degree of pick-up and drop-off flexibility in the station-based carsharing services comes with the potential to reduce the customer pains related to lack of flexibility, paying for non-usage and poor fit for multimodality by the employment of the *do more to address the job* business model pattern currently employed by the free-floating actor Aimo. Likewise, it was learnt from theory that the *solution provider* business model pattern has the potential to reduce customer pains attributed to the silo structure of the market, a pattern not currently employed by any market player in the Swedish carsharing market. Thus, based on learnings from the initiation phase, the ideation phase resulted in a list of two business model patterns with the inherent potential to address the unveiled customer pains, and thereby representing a potential basis for development of new value propositions.

Finally, as a part of the integration phase, it was learnt through interviews with market players primarily, that if customer pains are to be reduced by introduction of one-way trips within the station-based concept, a number of challenges are likely to arise. However, by utilizing learnings from the initiation phase, two business model patterns were identified with the potential to reduce the negative effects following from those challenges. More specifically, study findings indicate that the *self-service* and the *freemium* business model patterns, which currently are employed by Hertz, may be transferred to one-way station-based carsharing services in order to mitigate challenges associated with asymmetric flows, increased costs for car relocation and to build a critical mass of customers. Moreover, regarding the sustainability related challenges that emerged during this study, findings indicate that ridesharing may be a potential way forward. However, due to the lack of empirical studies assessing the relation between ridesharing and B2C business models, no suitable business model pattern has been identified within this study to address the sustainability aspects.

Thus, based on the learnings from this study, the following conclusions can be made:

- In order to improve the station-based business-to-consumer carsharing offer, an OEM should develop a new value proposition to include one-way trips by the employment of the *do more to address the job business* model pattern.

- As a part of such a value proposition, an OEM should employ the *solution provider* business model pattern by integrating a wider array of carsharing services into a one-stop shop for mobility services.

- To reduce the business challenges associated with such a value proposition, an OEM should employ the *self-service* and *freemium* business model patterns which have proven to be successful in other, but yet similar, businesses.

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Appendix A

Customer/non-customer interview protocol

- Do you, or anyone in your household, own a car?
- Are you familiar with carsharing services such as Aimo, Sunfleet and Hertz?
- Do you live "close" to a carsharing station/service?
    - Have you ever tried any of them?
        - **If yes:**
            - Why?
            - What do like about them?
            - Do you regularly use any of them?y
                - Why?
                - Why not?
        - Tell us about the last time you used such a service.
            - What was good?
            - What did you miss?
        - Could you give me an example of a case when the current carsharing services did not match your mobility need?
            - Why?
            - What did you do instead?
        - **If no**:
            - Could you describe why you do not use them?
            - What are the major drawbacks with the concept according to you?
- Do you think that the options that are available today can replace all the travel you make by car?
    - If not, what aspects had to be strengthened?
- In what ways should carsharing offerings be modified in order to cover a larger array of your mobility needs?
    - Why?
- Could you describe a case that you consider to be better suited with the existing carsharing options than the modes of transportation that you currently use?
- Could you describe the trips that you consider to be better suited with your current mode of transportation than the existing carsharing options?
    - Why?

Appendix B

Researcher interview protocol

- What do you see for overall trends in mobility?
    - What role will Carsharing services play in the future? o Will it be a part of future MaaS solution?
- What strengths and weaknesses do you see with the B2C carsharing alternatives that exist today?
- What do you think are hindering customer (barriers) from adopting carsharing in its form current form?
    - from a customer perspective?
    - from a business (commercial) perspective?
- What does a carsharing service need to meet beyond what is offered today to attract more customers / customer segments / customer groups?
- What are key determinants/reasons/motivators for customers to make carsharing services attractive in all scenarios?
- Given the current carsharing offerings and services, do you see any customer needs that are not effectively fulfilled?
- If carsharing service were to be modified in order to address a wider range customer needs, in what ways should they be modified?

Appendix C

Market player interview protocol

- What overall trends do you see in mobility?
    - What role do you think carsharing services will play in the future?
    - Will it be a part of future MaaS solutions?
- What customer jobs do you think your service resolves?
- What is your view of the range of existing carsharing offers? Do they cover all mobility needs/customer jobs?
    - If not, what needs, or jobs are not covered?
        - Why?
- In relation to other services, how do view other carsharing services?
    - Do you consider them complementary or as competitors?
    - Could they solve other customer jobs than you can?
- Could your offering be tweaked to address those mobility needs?
    - What would be the challenges from a business model perspective?
    - Do you believe that there are other market players better suited to address those [unfulfilled] customer jobs?
    - If so, what do you believe their business model challenges might be?