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**STRATEGIC BUSINESS MODELS:
OPPORTUNITIES FOR BUSINESS MODEL INNOVATION
IN THE AUTOMOTIVE INDUSTRY**

EVALUATION OF CAR SUBSCRIPTIONS MODELS
AND DEVELOPMENT OF RECOMMENDATIONS

MAXIMILIAN JOSHUA SCHMIDT

Work project carried out under the supervision of:

Prof. Ilya Okhmatovskiy, PhD

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Abstract

Digitization and changing customer preferences have an impact on the determinants of sales and ownership in the automotive industry. In this context it is crucial to understand the new, disruptive business models and their potential for market players.

The purpose of this report is to evaluate different business models that exist in the automotive industry in Germany and develop recommendations for improving key components of the recently emerged business model of car subscriptions, wherein a customer gains access to a car in return for a flat rate in the medium-term without the transfer of legal ownership.

Key Words: Strategy, Business Model Innovation, Mobility, Automotive Industry, Automotive Retail, Car Subscription

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1. Introduction

The automotive industry is undergoing a massive transformation, driven by developments in the business environment including digitization and servitization (Voigt et al. 2021). At the same time, the shifting customer preferences, what Bardhi and Eckhardt (2012) describe as “ownership is no longer the ultimate expression of consumer desire”, have major implications for the business model of original equipment manufacturers (OEMs) and car-based mobility providers. While the traditional and profitable business model of OEMs of developing, producing and selling or leasing vehicles is still dominant, service-oriented mobility offerings are predicted to grow as the line between automotive and mobility industry becomes blurred (Ackermann 2021). Already established in 1500 by European map publishers, subscriptions have shown in other sectors such as in the digital entertainment or music industry to be a popular business model for companies to provide temporary access to their services as an alternative to an outright purchase. Recently, the business model of subscriptions has also gained traction for physical goods. As an addition to ownership-based products, companies apply models to generate recurring revenue streams and attract new customer groups – customers who value flexibility and low commitment over ownership (Rudolph et al. 2017). For individual, medium to long-term vehicular mobility, alternatives to vehicle purchasing were limited to car rental or leasing. However, industry experts expect car subscriptions to establish as such an option and represent “a significant share of car sales in the future”, likely becoming a 30 to 40 billion US-Dollar billion market (BCG 2021).

Even though large-scale car subscriptions are a relatively novel concept first introduced in 2017, there are already several automotive manufacturers, mobility providers and start-ups active in the German market (Oliver Wyman 2019). Car subscriptions are an alternative to leasing and comparable to a long-term rental of about one to twelve months, whereby a subscription fee

covers all costs except fuel. Ackermann describes it as the “notion of temporary ownership [of a vehicle] with increased flexibility for customers” (2021).

German legacy automotive manufacturers like Volkswagen and BMW also explore new business models to diversify their portfolio with services instead of being a mere hardware producer. Volkswagen might generate 20% of its revenue with its flexible “business model 2.0”, i.e., car subscriptions and other mobility solutions (Volkswagen 2021; Sueddeutsche Zeitung 2021). Stephan Unger, CFO of Daimler Mobility AG, for instance, states that for the Mercedes-Benz Group, the sale of cars and private use will remain the main business model but the company’s engagement in usage-based mobility services will grow (Rainer 2021).

In this context, the subscription is to be separated from other car-based sharing mobility modes. “Shared mobility (...) enables users to gain short-term access to transportation modes” (Cohen and Shaheen 2016). Further, shared mobility focuses on the sequential (e.g., car sharing) or concurrent models (e.g., carpooling) of vehicle usage. Subscription plans, in contrast, are concepts of use which go beyond the sequential ownership (Transportation Research Board 2015; Enkel et al. 2017). Despite some overlaps in the value proposition, shared mobility along with micro-mobility solutions are an alternative or addition to public transportation but no real substitutes for a personal vehicle and car ownership and therefore not subject of this report (Deloitte 2021).

Further, there is an emphasis on the German market, specifically for the in-depth business model analysis. This is because a focus on one geographic market allows a more comprehensive analysis of the market players. Besides, Germany is an interesting use case to analyze: it is the largest automotive market in Europe and is considered a saturated market (Enkel et al. 2021) with a total of 48,5 million registered cars, which means on average 569 cars per 1,000 inhabitants, clearly above China which is at 110 (Destatis 2020; Frese and Mortsiefer 2020). A survey in 2019 has shown that 26% of Germans are “interested in the idea of car subscriptions”

(Oliver Wyman 2019). Apart from the focus on the German market, externalities of the different business models, such as environmental implications, congestion or dependence on resources, are not within the scope of the report.

The authors' motivation for a business model analysis in the automotive industry stems from two major aspects. First, mobility itself is a basic human need and the "lifeline of our modern civilization" – and companies of the automotive industry play an important role in that regard (Ackermann 2021). Business model innovation will be crucial to find answers to changing customer demands. Second, the authors have a strong personal interest in the topic of car-based mobility and will likely pursue a career in this field. Since the automotive industry is a critical driver for the German gross domestic product, car subscriptions will be of high relevance for the management of mobility providers, so it is advantageous to work intensely on the characteristics of this business to become experts through this project.

Finally, given the lack of empirical analyses on car subscriptions, this report contributes to the understanding of the business models applied, and is intended to encourage a more scientific examination of the subject.

Structure

The general objective of the present report is to analyse the different business models in the automotive industry. In particular, a practice oriented in-depth analysis of the business model components, followed by an evaluation of the business model of car subscriptions in Germany is carried out. Then, recommendations on how to enhance the advantages and to mitigate vulnerabilities of the underlying business model are developed. The following research questions are to be answered:

1. Which business models are included in the automotive industry?

2. What are the characteristics and associated advantages and vulnerabilities of car subscription models in Germany, and how can they be optimized?

In the following two sections, the literature review with academic concepts on business model analysis, and the underlying methodology with the qualitative data collection are outlined. Thereafter, the thesis is composed of four main chapters. Initially, the development in the automotive industry with the variation of existing business models is presented in chapter 4. Chapter 5 is dedicated to an in-depth analysis of car subscription business models in Germany, enriched by examples from providers, to create the basis for the evaluation of these models. As part of the evaluation in the sixth chapter, advantages and vulnerabilities associated with the business model of car subscriptions are presented, followed by recommendations for improvement in chapter 7. In the last chapter, the main ideas of the report are summarised, and an outlook and the outline of possible research extensions are provided.

2. Literature review

As foundation for the present work, a thorough literature review on business model analysis and business model innovation was conducted. As stated in the Journal of Business Models edition from 2013, business models can be defined as “the value logic of an organization in terms of how it creates and captures customer value and can be concisely represented by an interrelated set of elements that address the customer, value proposition, organizational architecture and economic dimensions” (Fielt 2013). According to Aapaoja et al. (2017), a successful business model answers fundamental questions such as “Who are the customers and what do they value?”, “How is money generated in this business?”, and “How can the value be delivered to customers at an appropriate cost?”.

The work of leading academics and business theorists, as well as their frameworks and templates have been analysed and used as foundation for the in-depth analysis of business

models in the automotive sector. A well-established and relevant analysis tool is the business model canvas from Osterwalder and Pigneur (2010) which describes the logic of a business in nine steps. The authors summarize a business model as “*the rationale of how an organization creates, delivers and captures value*” (Osterwalder and Pigneur 2010). The main pillar, however, is provided by Gassmann et. al ‘s (2014) “*Business Model Navigator*” for the analysis of car subscription models. In particular, the “*Magic Triangle*” framework was used to better understand key drivers of business model success and how to facilitate lasting competitive advantage, further presented in chapter 5.3 ‘*Subscription business model analysis*’.

The concept of business model innovation can help companies to capitalize on new opportunities. In this context, companies can develop a new value proposition that meets unsatisfied needs of existing customers, conquer new customer segments or enter entirely new markets with the help of business model innovation (Johnson 2010).

3. Methodology

This report is based on a qualitative primary and secondary data analysis. For the business model analysis, qualitative data is used from primary and secondary sources, whereby market reports, investor presentations and other secondary data were used as a source of data. An in-depth analysis of current subscription providers was performed to identify the distinct business model characteristics. To complement the analysis, expert interviews were conducted with practitioners and representatives from subscription providers and management consultancies. The findings from the in-depth market analysis were used to evaluate the applied subscription business model and to derive recommendations on how to make them more effective.

Data collection and analysis - qualitative research

Due to the novelty of car subscription models, there is still very limited academic work on this topic. However, the relevance and dynamism of the automotive industry has resulted in the publication of various market reports, C-level interviews and newspaper articles. For this reason, a major pillar of qualitative research is formed by the analysis of research material by top-tier consulting firms, including Boston Consulting Group (BCG) and the automotive-specialized consultancy Berylls Strategy Advisors (Berylls), reports from economic institutions, papers, and newspaper articles. To complement the findings with current examples, the websites of relevant automotive companies and car subscription providers were researched, and relevant information from a business model perspective extracted (Appendix 1). For the qualitative research, only reputable and renowned sources were used.

Expert interviews

The second pillar is formed by expert interviews, which are a typical research method for qualitative studies and are “designed to explore expert knowledge” (Meuser and Nagel 2009). Experts were chosen based on their specific expertise in car subscription products, mobility- and automotive-related topics. In addition, the purpose of expert interviews was to receive a comprehensive and practical understanding of the development in the automotive mobility industry from different perspectives, which is why experts were selected knowledgeable in the business perspective of OEMs, mobility start-ups and management consultancies. The experts were interviewed in a semi-structured format, in which the dialogue between the expert and interviewer is “guided by a flexible interview protocol and supplemented by follow-up questions, probes and comments” (DeJonckheere and Vaughn 2019). This approach enables the interviewers to prepare a line of questions but still allows for the flexibility that participants refer to issues they consider vital which was important due to the different professional

background and experience of the participants (Adams 2015). The interviews lasted for approximately thirty minutes and were conducted online through the internet. With the consent of all participants, the interviews were voice recorded. In total, five experts were interviewed. Information on their professional background, the interview guide and a summary of the key statements are provided in Appendix 6. The interview was composed of the four categories of questions, which were also used to analyse and structure the findings: i) development and components of the business model of car subscriptions in the automotive industry; ii) evaluation; iii) market dynamics and assessment of competitors; iv) outlook for the industry.

Qualitative data analysis

For the analysis and interpretation of the gathered data, relevant information from the qualitative research and expert interviews was extracted, critically discussed and evaluated. Thereafter, the findings were structured and put into the context of the business model analysis mainly using the magic triangle framework.

4. Business model variation and evolution

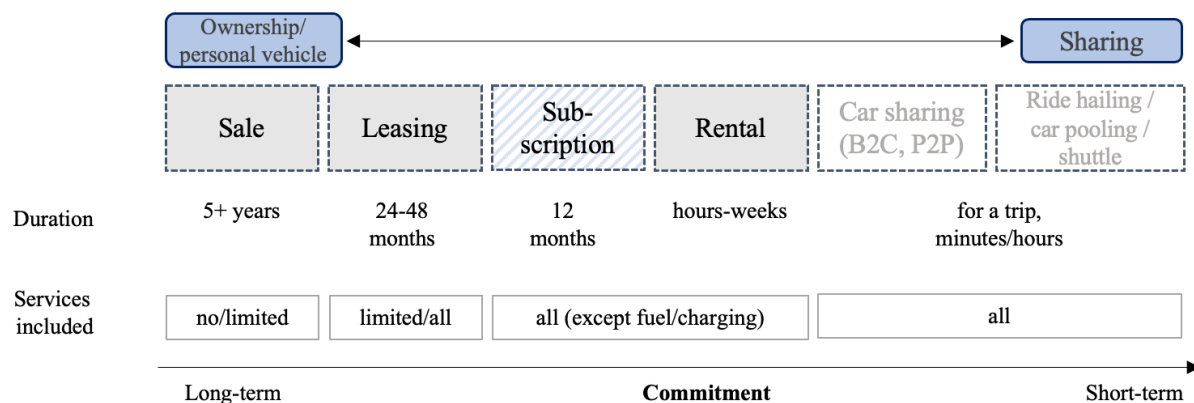
4.1 The emergence of new business models

Nowadays, a shift toward subscription and pay-per-use models is clearly observable in many industries. Companies across all sectors are increasingly providing “products-as-a-service” and jumping on the subscription trend, including the music business with Spotify, the digital entertainment sector with Netflix or the cloud computing sector with Amazon EC2. The automotive industry has adopted this new model away from ownership and toward shared mobility early on by offering leasing options on both an individual and fleet basis since the late 1940s (OSV 2022). Today, new business models are emerging on a continuous basis aiming to respond to ever changing customer preferences including a longing for more convenience and

flexibility. Also access-based consumption is an important development that emerged in the last decade in consumer markets, after ownership “has been the dominant mode of consumption examined in consumer research” (Bardhi and Eckhardt 2012).

The following parts explore the current forms of automotive mobility and the evolution of those business models within the industry.

4.2 Different business models in the automotive industry



Source: own illustration; based on Berylls (2021b); BCG (2021); further details in Appendix 4

Figure 1: Car-based mobility portfolio

Vehicle- versus mobility-as-a-service

Apart from selling cars, there are a variety of established and emerging business models in the wider, car-based mobility portfolio that can be summarized into two separate categories: Vehicle-as-a-Service (VaaS), which includes leasing and subscription as well as rental, corporate fleet management and car sharing. The provider remains owner of the vehicle, but customers have access to a personal vehicle and drive themselves.

Alternatively, mobility-as-a-service encompasses three distinct modes, which are ride-sharing, ride-hailing, and bus/shuttle services, whereby customers are driven (Ackermann 2021). For the scope of this report the focus lies on the traditional sale and VaaS business models.

Traditional transaction models

The current transaction business model in the automotive industry is the car sale, either by one single payment or by financing and leasing (Ackermann 2021). In Europe's largest economies Germany, UK, France, Spain and Italy in 2019, 82% of all new car sales were financed, of which 59% were leased (Deloitte 2021).

In the case of a car sale, the selling price is paid in full, and the customer takes legal possession of the car. If a vehicle is sold through financing, a contract over an instalment loan is concluded with the manufacturer's captive bank or an independent one over a certain period. Apart from the instalment payments, the customer typically makes an upfront and final payment, leading to car ownership eventually. Alternatively, leasing provides the customer with a vehicle for a specified period, usually on a longer-term of 24 to 48 months, in exchange for regular lease payments. Customers are typically given the option to purchase the vehicle for its residual market value or return it to the lessor once the leasing contract has expired (Arthur D. Little 2021; Diez 2012).

Over the past two decades, financing and leasing have become the main source of acquiring vehicles. Europe is the largest and most mature market in the world, with a high penetration of operating leases, making it the most appealing for the development of service-oriented solutions (Roland Berger 2018). In Germany, the share of leased vehicles has been on a steady increase from 60.1% in 2010 to 70% in 2019 (Statista 2019).

In essence, finance and leasing solutions have evolved to become a key factor in OEM's profitability today, as most OEMs own banking or leasing licenses through their financial institutions. A study by Strategy& in 2019 shows that the profitability of selling vehicles is around 5-7%, whereas finance and leasing are more profitable at around 10-15% (Strategy& 2019).

Automotive retail

The retail model is an important part in car makers' business model. In fact, the retail model that has largely been applied globally in the automotive industry for over a century is that car makers sell most new vehicles to dealerships. Contract or independent dealers then sell them to business and private customers, often supported by the OEM's captive with financial solutions. Even though there were some changes in dealership structures, the underlying business model stayed the same (Berylls 2021a).

Apart from indirect sales, OEMs are typically engaged in direct sales with its own employees or key accounts such as rental companies or governments. In the case of direct sales, the manufacturer sells its products without an intermediary. A direct channel for German OEMs, especially for BMW and Mercedes-Benz, are own retail outlets called *Niederlassung* (Diez 2012).

E-commerce is still an exception in automotive retail, but the share of online purchases is increasing. While most customers already do their research and car configuration online, the final purchase usually needs to be made at the dealership (Berylls 2021a). For instance, Tesla started selling directly to consumers from the beginning, and Volkswagen establishes a direct and digital sales channel in Germany for the leasing of its electric *ID* models. Both companies use their retail, respectively dealership network for services and thus combine a seamless online-offline experience (Berylls 2021a; Striftler and Meunzel 2021). Since automotive captives hold a vast majority of customer data, they are well positioned to establish trust, improve the customer experience, and forge new business models such as direct-to-consumer (DTC). Digital and direct sales consequently affect the business model dealerships, as certain steps in the conventional customer journey move into the digital world. The information, advisory and decision phase, as well as the purchase contract conclusion take place online. Only a test drive and the vehicle handover take place physically (Salesforce 2020).

A mixed model of direct and indirect sales are agency models, in which agents sell the car on behalf of the manufacturer who concludes the contract directly with the customer. The agent, in contrast to a dealer, is not an own entity and does not own the car at any stage but receives a compensation for the service (Diez 2012).

Car subscription

Subscription models have only been introduced in 2017 on a large scale but they have already become quite popular (Oliver Wyman 2019). An automotive subscription model can be defined as a temporary ownership of a vehicle with increased flexibility for customers as it allows for switching of cars according and shorter contract terms (Ackermann 2021). Car subscriptions are all-inclusive plans where consumers and businesses pay a fixed monthly fee that covers all the associated costs including maintenance, repair, insurance, servicing and taxes, with gas or electricity being the only variable consumer expense. In essence, subscription models with their value proposition are designed to be an alternative to leasing or rental (see *Figure 1*). Subscription users often benefit from flexible contract terms as well as the rapid availability of vehicles (Enkel et al. 2021). The flexibility is also mirrored by a price difference to leasing. Subscriptions are be more expensive than a leasing contract or other type of finance agreements, but they also appeal to consumers that value convenience and tailored services over price alone (Harrison 2021). This new business model in the industry is populated by upcoming start-ups (e.g., ViveLaCar and FINN), rental-car companies (e.g., Hertz and Sixt), and OEMs (e.g., Volvo and VW). In the fifth chapter of this report, the subscription business model will further be analysed in depth, and business model components will be addressed in detail.

Car rental

Another car-based mobility business model within the automotive industry is car rental which has gone through a century of development since its inception in 1904. In the early 1960s, airport car rental expanded fast to become a major use case as the airline industry flourished. By the 1990s, airport rentals accounted for 70% of the market, and in the early 2000s the car rental industry experienced a number of consolidations, with major player such as Avis, Enterprise, Hertz, Sixt and Europcar prevailing (BCG 2022). Customers benefit from their geographical coverage, extensive branch network and flexible, short to medium-term access to a personal vehicle with all car-related services included except fuel (Appendix 4; Arthur D. Little 2021).

Rental companies operate in different market segments, but most providers' business can be divided into tourism, private, and corporate and fleet management business. Revenue is generated from rental fees from the various customer groups and from the sale of the vehicles after their tenure at the rental company (Gross and Stengel 2011). In the at-risk model, the rental company buys cars in bulk from OEMs and typically receives large discount rates. As an approximation, large fleet management companies demand discounts between 15 and 25% (Deloitte 2017). After the rental tenure, the vehicles are re-marketed, e.g., sold to dealerships or directly to consumers at their residual value. (Campbell 2020; Sixt 2022). On the other hand, in the buyback model, rental companies agree to a contract to purchase a certain number of cars from an OEM, whereby the OEM will buy them back at a predetermined price, making this model less risky (Ackermann 2021). Rental companies benefit from each part of the revenue on the car, which is higher than the depreciation. Key activities to be performed are high initial capital expenditures, operational fleet management and partnerships with different OEMs (Ackermann 2021). Apart from the procurement, the profitability of the rental business model,

which is at about 10 to 15%, is largely dependent on the key metrics utilization and fleet size (Lazov 2017; Strategy& 2019).

Fleet management

Corporate fleet management is another well-established, automotive business model: it was first introduced in the 1970s and features the handling of corporate vehicles for companies. So-called fleet management companies (FMC) are selected corporate car sharing providers that take upon the execution part and typically offer services over the entire life cycle of a vehicle, such as contracting, financing, registration, insurance, and maintenance (Ackermann 2021). The increasing importance of this mode is shown in Europe, where nearly two out of three new cars are sold via the corporate channel. This is also the reason why fleet management in Europe is by far the largest market and is also the most advanced in many ways (Deloitte 2017).

Car sharing

While car sharing, or other MaaS solutions, is not perceived as a true alternative to car subscriptions or ownership, it is an established business model in the automotive industry and therefore briefly presented in this part. Car sharing is a broad term that covers several modes of sharing a vehicle. In general, it is a short-term rental allowing users a choice of vehicle and pick-up/drop-off locations (Ackermann 2021). Car sharing has grown steadily over the previous decade, particularly in urban regions where consumers no longer see the need for a private car anymore. The major value drivers for customers in this business model is the high flexibility to access and pay for a car only when needed, typically for an intra-city trip. In contrast to car ownership, which includes additional expenses such as depreciation, fuel, maintenance, and insurance, car sharing users only pay a one-time usage fee. Since the cost per kilometre in car

sharing is substantially higher than in car ownership, a direct replacement is only feasible for individuals who drive a car infrequently (Nourinejad and Roorda 2015).

There are major distinctions in car sharing modes, including peer-to-peer (P2P), free-floating and stationary car sharing. Free-floating is the most recent and prominent car sharing model and offers flexible one-way trips that allow customers to pick up and return the car anywhere within a designated area. Many free-floating providers are owned by OEMs who see car sharing as a strategic venture rather than a financial one. This allows them to promote their cars through this new channel while also having direct access to customer data and insights. In general, car sharing may reduce car ownership in the short term but expanding car sharing fleets and vehicle replacements will create new opportunities for OEMs. A study by Kearney from 2019 shows that the share of private car use is unaffected by an increasing frequency of car-sharing use. Thus, it can be assumed that the substitution effect between car sharing and private car use is rather limited (Kearney 2019). Consumers mainly regard car sharing as a complementary service, as it remains a very regional subject and highly dependent on local particularities. It remains to be seen the true impact that these alternative mobility modes will have on the automotive industry in the coming years. The following section will provide an in-depth analysis of the car subscription business model and its advantages and vulnerabilities compared to other business models in the automotive industry.

5. In-depth analysis: the business model of car subscriptions in Germany

5.1 The shift in the automotive industry towards customer centricity

The automotive industry traditionally operates with the underlying business model of pushing new vehicles onto the market, which triggers further upstream and downstream activities along the value chain. Almost all car makers, depending on the degree of vertical integration, are responsible for the development, procurement of parts and components from suppliers, and for

around one fourth of the production. More downstream activities that follow include the sale of the car to the customer and financing and insurance solutions. It can be observed that the added value in the automotive industry is shifting downstream (Diez 2006; Appendix 2). After the car is produced, the touch point to the end customer is mostly cut off through the dealership network. Also, the important and profitable aftermarket business is in the hands of dealers and does not allow for a data exchange and systematic learning loops for the manufacturer.

In this context, the traditional business models undergo a paradigm shift away from the physical assets as the mere source of value creation towards value adding concepts in the information economy, in which customer data is the basis for new business models (Boes and Ziegler 2021).

In this context, digitization is the enabler for business model innovation by optimizing customer orientation of existing business models, using data and information technologies (Heinrich 2020). And with digitization, the market logic has shifted towards a demand orientation that is driven by customer needs (Komor 2019). Over the past decade there were many new types of business models designed to keep customers consistently engaged over the entire lifecycle of a product and engaged in long-term relationships with providers. According to Zuora, a leading subscription management company, subscription experiences built around services meet consumers' needs better than the static offerings or a single product (Zuora 2022). Car subscriptions are in harmony with this broader trend of consumers subscribing to a service rather than purchasing a product, similar to trends observed in other industries, such as the digital entertainment and music industry. OEMs had a dominant market position for a long time, but recently many new players and mobility providers started to enter the industry (Ferràs-Hernández et al. 2017). Both incumbents and challengers come up with business models such as car subscriptions that innovate the offering around the customer and the sales model along the value chain (Appendix 2). Such plans feature flat-rate agreements that offer a high degree of flexibility and give customers access to a vehicle and the freedom to use it for a certain period

while the provider remains the legal owner (Schaefers et al. 2016; Wittkowski et al. 2013). For this fractional ownership, customers pay a share in the operating and maintenance expenses (Shaheen et al. 2017). Providers benefit from recurring revenue streams and more customer interaction but also need to manage more complex operations. BCG estimates that the subscription market in Europe and the U.S. reaches up to US 40 billion US-Dollars by 2030, or up to 15 % of new car sales (BCG 2021).

5.2 German automotive market overview and the role of subscriptions

The German automotive market is the largest in Europe with as many as 48.5 million passenger cars. After a decrease in mobility caused by the Covid pandemic, people's demand for comfort and safety in their private vehicles was strengthened (Deloitte 2021). To date, the passenger car is the most prevalent mode of transportation in Germany and a critical vector of the traffic infrastructure (Destatis 2020). A report by *Deutsche Automobil Treuhand* highlights the importance of cars for Germans: for 79% of car holders the car is indispensable (DAT 2022). Even though the German car market is considered saturated (Enkel et al. 2021), the number of new registrations has been slowly increasing (up 1.3%) between 2010 and 2021 (Statista 2020). In total, there were around 70,000 concluded subscription contracts in 2021 which is an 87% increase from 2020 (Autoflotte 2022). For 2030, it is expected that one million subscription plans are reached in Germany, which would mean a compound annual growth rate of 38% in terms of number of contracts (Statista 2020). Assuming that one subscription lasts for one year, around 0.1% of cars in Germany are used for subscription today. Even with little market share, the strong expected growth and absolute size can become a promising market for providers.

5.3 Subscription business model analysis

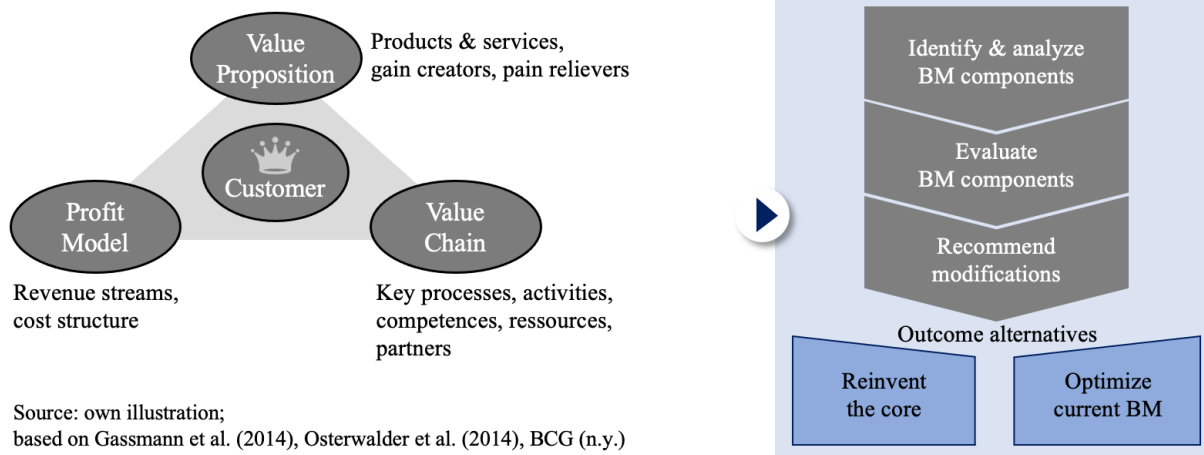


Figure 2: Business model analysis and evaluation approach

In order to analyze a company's underlying business model in a mutually exclusive and collectively exhaustive way, a framework based on the University of St Gallen's 'Magic Triangle' (Gassmann et al. 2014) in combination with the value proposition canvas (Osterwalder et al. 2014) is used. Both frameworks are practical oriented and cover all relevant components to describe and analyze a business model in detail. The magic triangle describes the logic of a business model through the interaction of four dimensions where the customer is put at the heart of the framework (see Figure 2). This dimension answers who the target customer to be served by the business model is. The customer value proposition is the offer provided by the company to the customer, that is the set of products or services that the customer values (Gassmann et al. 2014). The value proposition canvas that Osterwalder et al. (2014) developed in addition to the business model canvas, is divided into a customer and company perspective to ensure a product-market fit of the company's value proposition. A fit is achieved if the value proposition entails products and services that generate gain and alleviate pain, thus providing benefit and extra value to the customer while eliminating pain points. As for the value chain, the key processes, resources and activities along the value chain and their coordination are analyzed, which are necessary to provide the value proposition to the customer (Hedman

and Kalling 2003). The profit model describes cash flowing in (revenue streams) and out (cost structure) of the company and thus explains the financial viability of a given business model (Gassmann et al. 2014).

The analysis of the business model is the foundation of identifying advantages and vulnerabilities of the respective business model. There are two important approaches how companies can drive business model innovation, which are the basis for the development of recommendations. By reinventing the business model, substantial components of the business model are modified, and the associated operations aligned. As part of the optimization approach, the current business model is made more effective by adjusting its implementation or single characteristics (BCG n.d.). Latter approach is the underlying concept for the recommendations in chapter 7.

5.4 Provider overview

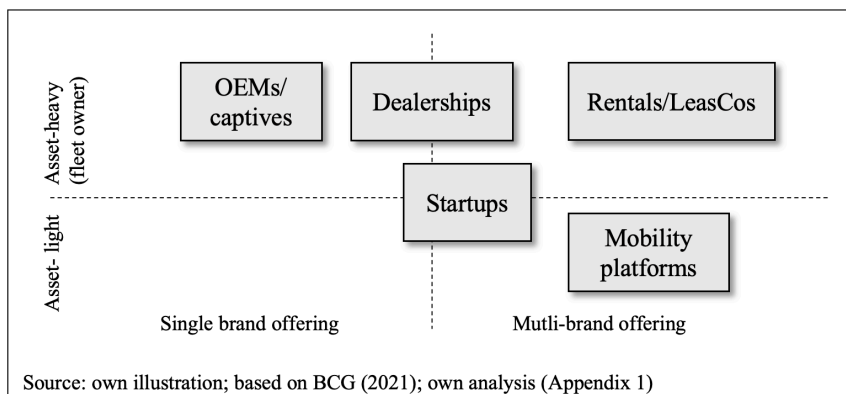


Figure 3: Provider mapping

On the German market, there are more than 40 car subscription providers, including traditional automotive players and new challengers (Siebert 2022). These can be grouped into four segments based on their characteristics described in the following.

OEMs have entered the German subscription market as one of the first providers, often in collaboration with their captive bank, such as Volvo (*Care by Volvo*), Volkswagen (*AutoAbo*),

Audi (*Audi on demand*) or Stellantis (*Stellantis & you*). Typically, OEMs only offer their own brand or Group brands and are asset-heavy, i.e., the group legally owns and operates the fleet (BCG 2021). While Volvo offers new cars that are tailor-made to the customer's preferences on its own website, BMW only offers subscriptions through ViveLaCar, after BMW's own subscription plan in the U.S. *Access by BMW* was abandoned in 2021. Mercedes-Benz, on the other hand, pursues a hybrid strategy, and offers its electric *EQ* vehicles through its dealership network. Other vehicles are offered in subscription as the *Junge Sterne Abo* via ViveLaCar, which also collaborates with dealers (BCG 2021; Appendix 1).

Apart from OEMs, automotive downstream entities including dealerships (e.g., Beresa, a large Mercedes-Benz dealership), rentals (e.g., Sixt), leasing and fleet management companies (e.g., ALD Automotive) are providers of a multi-brand subscription offering. With *SIXT+*, for example, the German rental company Sixt makes use of its existing fleet and branches to offer a variety of cars in subscription.

Start-ups are also entering the market and act as mostly pure-play subscription providers and new mobility platforms. Major segment players include FINN, Faaren, ViveLaCar, Cluno and AutoScout24, whereby the providers apply different business models. ViveLaCar offers a marketplace to enable car dealers of different brands to offer subscriptions under its own name, and white label solutions to customers such as BMW in Germany. This makes ViveLaCar an asset-light provider because the vehicles are not owned and therefore are not on the start-ups' balance sheet.

The last group of providers are non-automotive companies such as HUK Coburg, which is a major German car insurer and which possesses its own fleet; or Shell, which collaborates with the fleet management company Fleetpool to offer EVs in subscription to boost Shell's *Recharge* charging infrastructure (Berylls 2021b; Appendix 1; Interview B).

Finally, it can be concluded the various players follow different strategies regarding brand offering and fleet ownership. Players can choose whether they purchase cars to operate an own fleet or if they orchestrate a fleet managed and owned by a third party. For instance, OEMs and contract dealerships which are exclusive distributors for a brand typically offer their own brand and own the car, while some start-ups offer a variety of brands they do not own (see *Figure 3*). The business models chosen by companies offering car subscriptions do not vary substantially but there are certain differences in the value creation chain by which four basic business models can be identified (BCG 2021). They are presented in sub-chapter 5.3.4 '*Value chain*'. The following analysis of the business model components, however, is applicable to all sub-models.

6. Evaluation of car subscription business models

6.1 Advantages

There are several strategic advantages associated with car subscriptions for a provider in contrast to other business models used by automotive companies. “The major value added of subscriptions is that companies stay in touch with their customers” (Interview E 2022). The subscriber enters and stays in a business relationship with the providing company instead of being lost to the dealership after a car sale. This allows for more touchpoints with customers and enables companies to engage with them and retain them. Moreover, collecting data directly from customers helps to understand and learn from them, e.g., preferences and trends like new ownership models. A direct relationship with the end consumer is the basis for a permanent learning and optimization process, which will have positive implications for the business model, specifically on the value chain and revenue side. In the case of indirect sales, the data stream from end users is limited. This is particularly important for automakers – they can optimize the development and supply of future car models based on the data results, and use car subscriptions as a test field for new technologies (Boes and Ziegler 2021). For instance,

Mercedes-Benz and Volkswagen offer only their battery electric vehicles for subscription to promote them (Interview A 2022; Appendix 1). Since the perceived risks, such as the battery life, charging and value depreciation, are reduced significantly, subscriptions can increase the popularity of electric vehicles (Dudenhöffer et al. 2022).

For the subscription cycle, which on average lasts for a year, recurring and predictable revenues are generated which makes the provider's budgeting more feasible. Apart from the binding to the provider, the subscription keeps customers in the aftersales and service network. On the one hand, the VaaS concept of subscriptions for the provider means that aftersales, e.g., parts and maintenance, shift from being a profit center to a cost center, because the providing company remains the legal owner and is responsible for repairs (Berylls 2022). On the other hand, the subscription fee already includes a calculated aftermarket sales share for maintenance and wearing parts, so the OEM benefits from that model because in the case of leasing or a purchase, the customer may choose not to have the vehicle repaired by the OEM's dealership (Interview C 2022). The associated optimization in customer lifetime profitability is one of the most important values added for the provider, especially compared to the one-time, outright purchase (HSBC Global Research 2021).

Since most players on the market offer their subscriptions digitally, administrative processes for the provider along the value creation chain are simplified, faster and require less human capital (Interview B 2022). The subscription offering with its customer-centric value proposition can attract new groups and non-car customers, which is particularly important in maturing markets and with changes in ownership patterns (Berylls 2022). Additionally, as most subscriptions are offered online, the digital customer journey is future-oriented and attracts a younger customer group. According to Volvo Cars, this business model is "an effective way of winning over customers from other brands" (Volvo Car Group 2021). A major advantage of subscriptions plans for fleet owners that use car subscriptions as an additional distribution

channel is the cross-selling opportunity and the optimization of the asset utilization and thus an increase in vehicle lifetime value. With their traditional business model, OEMs lose control over the vehicles and customers after the sale or a leasing cycle (Boes and Ziegler 2021). However, remaining in “control of the second lifetime of a vehicle can increase profits by 20 to 30% per vehicle” (Berylls 2019). The verticalization along the value chain increases knowledge transfer within the organization and makes a company less dependent from downstream partners, including price autonomy and a seamless communication towards the customer, online and offline. The example of Volvo (asset-heavy) shows that car subscriptions that are offered through a direct channel without dealerships full control over the sales process bears advantages. The control is not only limited to the second vehicle cycle, but also includes pricing and communication. Volvo saves a margin of around 5-10% of the vehicle price, that otherwise would go to dealers, and cancels rebates which dealerships offered and thus steered the transaction price and indirectly the residual value of a car. Both the direct sales and subscriptions (no disaggregated value was published) positively affected Volvo’s gross margin by 2% (HSBC Global Research 2021).

Since the residual value of a car decreases when parked or used e.g., at the dealership, subscriptions are a novel way to increase the asset turnover. The revenues from this business model overcompensate the depreciation (Wutzer 2021). If offered directly to the customer without an intermediary, providers have direct access to their customers and generate new sources of income.

Due to the extensive usage of the car, which allows customers “to intimately know an object, control it” (Belk 1988; Pierce et al. 2001), even without legally owning it, “consumers may develop a perceived sense of ownership” (Strahilevitz and Loewenstein 1998) to the car they subscribe to. In consequence, subscription plans have the ability to increase car sales (BCG 2021) which would represent a major advantage for car selling players.

The advantage of an asset-light platform business model, like the one of ViveLaCar, is the lack of high capital expenditures and the associated lower capital tie-up for the fleet. Also, physical assets are associated with high fixed costs (Heise 2020). What can be learnt from other industries that use subscriptions for digital products, in contrast, is that they have very little marginal costs which makes it easier to scale up the business and cater to a larger audience without accumulating many assets. In essence, ViveLaCar can onboard new dealerships onto its existing tech platform at marginal costs close to zero (Sacolick 2017). Since the vehicle-related costs are mostly variable, the asset-light model can react more agile and flexibly and thus is less jeopardized by economic downturns. On the other side, the value of fleet owners is based on the hardware that they have full control over. The higher their vertical integration, the less they are dependent on third party suppliers. For instance, fleet owners fully control their assets and *integrators* have control over the whole customer experience and sales (BCG 2021).

6.2 Vulnerabilities

In the business model analysis, some vulnerabilities were identified that providers should be aware of. One of the most decisive aspects to this emerging business model is its uncertainty on profitability. As reported by the 2019 Strategy& Digital Auto Report there is yet no available data on the profitability of subscription models (Strategy& 2019). This was also confirmed by several of the interviewed experts, working first-hand on car subscriptions. The profitability of subscriptions depends largely on the pricing package offered to customers, as providers need to target a sweet spot that attracts new customers but also covers all costs involved to offer the full service. Subscription plans are still perceived as rather expensive by consumers, also because *“customers tend to make untrue comparisons as they generally underestimate the total cost of ownership by over fifty percent”* (Interview C 2022). In addition, the limited vehicle choice of some providers in terms of brand or model choice might drive some customers away.

Both aspects have direct implications on the business model because the subscription plans are consequently not appealing to this customer segment, affecting the profit model.

For an asset-heavy provider like FINN, favourable purchasing conditions when acquiring new cars are vital as it could make or break the business. In any case, this business model requires a high upfront investment and includes the vulnerability of quickly depreciating assets. Since the cars remain on the balance sheet of the provider's organization, it carries the residual value risk and the depreciation expenses are on its profit and loss statement. Unless the assets are utilized efficiently, the provider has a large amount of excessive capital tied up. Together with other aftersales and maintenance expenses, the cost structure puts enormous pressure on the bottom-line of the business (BCG 2021; Heise 2020). Especially for smaller providers it is difficult to offer a large choice of different models and secure bulk discounts from car suppliers, insurers and workshops because of lacking bargaining power.

Additional services in the price bundle, such as extra range or insurance packages, enable subscription providers to exploit additional willingness to pay from some customers, but the underlying uniform price logic for each subscriber does not allow to fully exploit the customer surplus, hence, some additional profits are not realized (Roth 2006; Krämer and Kalka 2017).

When looking at one individual cycle of service, the fact that subscription services are much shorter in duration than leasing contracts makes it vulnerable to having a high churn rate and losing customers more quickly after the contract ends. The business model only generates a small profit contribution from the subscription contract itself, the additional services offered and the insurance contract. That is why break-even is not easily achieved as it is with a car sale (full margin from sales and financing). Moreover, providers that outsource activities from the value chain can no longer steer the process from end-to-end and lose control over the customer experience. In addition, they are dependent on third parties, e.g., on the supply and pricing of vehicles, and the handling of delivery and service of cars to customers. ViveLaCar and

Volkswagen experienced problems with their delivery service which did not match both providers' quality standards. Some customers still demanded an introduction to the new vehicle and overall, a higher level of customer service (Interview B 2022).

7. Recommendations for subscription providers

The previous analysis of the subscription business model, as well as the conducted expert interviews conclude that rental companies are best positioned to provide car subscriptions and to dominate the market, given that the car rental business model would not have to be adapted substantially. Rental companies have a strong reach with their branches and can leverage their experience and processes of renting. Many of the needed key competencies, operational capabilities and resources are similar, making it the perfect starting conditions for this new business model. Since only minor modifications are necessary, there is no need for recommendations for car rental companies.

As the young subscription market is coined by different business models and many providers, which in part are still experimenting (Interview C 2022), general recommendations that can be prioritized to secure quick-win results are presented first. In the following, concrete recommendations are provided for both pure-play subscription providers and OEMs. What needs to be taken into account overall when recommending modifications is that a provider can only provide flexibility and convenience to a degree which is still economically viable for the provider. Each value proposition has a value and a cost, and both must be balanced by the providers' management, otherwise the business model merely destroys value (Heise 2020).

General recommendations

An essential aspect for efficient and profitable operations is effective fleet management. Providers are recommended to keep asset-related costs and idle times of the fleet as low as

possible and make use of a fleet management intelligence solution to best schedule the fleet they either own or they operate through a platform. Such solution takes into consideration the residual value and depreciation curve. Especially in the first years of its lifetime, a parked car strongly loses value so if the car is in subscription, the respective rate overcompensates the depreciation and generates a small profit contribution. In the time of a rather flat depreciation, a price plateau, the fleet profit is higher from subscriptions (Interview B 2022). All in all, the vehicle lifetime value is increased by an efficient utilization.

Moreover, a distinct value proposition to differentiate from competition on the market must be created. For instance, a provider can decide to focus on values such as availability and flexibility by having next-day delivery ready or allowing users to return vehicles earlier than previously agreed on. A premium price could be charged for these improved services. Otherwise, a provider could focus its efforts on providing the cheapest subscription service on the market by establishing effective partnerships and creating favourable vehicle sourcing conditions.

Altogether, it seems evident that providers must build their offer from a customer-centric perspective with the provision of excellent customer relationship management and service from end-to-end, including key account management for corporate customers. Krämer and Kalka (2017), who compare the subscription of digital and physical goods from other industries, argue that customer loyalty in subscriptions is largely on a contractual basis, so “elements of emotional and non-rational customer loyalty” need to be created (2017). A targeted marketing strategy to communicate the key value propositions of an individual provider is a key success driver. Therefore, the provider’s management must be aware of the strategic objective (Interview E 2022; Rudolph et al. 2017). Higher marketing costs will likely increase the customer acquisition cost in the short term but will increase loyalty and revenues long term. This optimizes the relationship towards the customer and increases customer touchpoints. Providers are recommended to invest into online marketing and build an easy-to-use sales

funnel. In consequence, recognition of the product and customer loyalty towards the provider are expected to grow and ultimately will drive the top line.

In order to reduce complexity and internal process costs, car swaps within a subscription plan are recommended to be discontinued. This product feature is not a key priority for customers, so the impact on revenue is expected to be marginal. Even though the value proposition gets slightly downgraded, the costs, including the delivery, the inspection and preparation of the car, are massively reduced, which is why this modification is proposed.

Recommendation for pure subscription providers

New mobility players that only offer subscriptions have the structural disadvantage not to source vehicles at the same rate as captives or rentals. To keep asset-related costs rather low but still combine the strengths of fleet owner and orchestrator, pure subscription providers are recommended to pursue a hybrid fleet model. Since a vehicle's value depreciates the most in the first year, the management is recommended to purchase young, used cars e.g., from rental companies instead of new cars from OEMs. According to Bain's consumer survey, most consumers are open to driving a used vehicle as part of a subscription service. In fact, 90% of respondents in Germany would accept a well-maintained, young (up to three years old), used car as part of the subscription service (Bain 2021). This approach means that there is less capital tied-up and a large part of the depreciation is already off. Additionally, after the initial drop in residual value the rate slows down and a decent salvage value can still be achieved when re-marketing the vehicle. Integrating used cars in the fleet can also decrease monthly rate prices, therefore making it more attractive for consumers and making it easier to acquire new customer groups.

When buying the fleet, it is crucial for the bottom-line of asset-heavy companies to negotiate favourable purchasing discounts with suppliers by acquiring larger quantities from car

suppliers, as a 20% discount could improve gross margin by 10%. Vehicle costs account for about half of a subscription provider's revenue, thus smart purchasing contributes significantly to revenues (BCG 2021). Apart from volume discounts, further downstream the value chain, attractive conditions for insurance and maintenance services for the same car model can be achieved. These can both significantly reduce the fixed costs and move the unit break-even point forward. It is important to learn from customers and preference patterns and optimize the fleet offering accordingly. Offering less choice but rather the right kind of cars for the target market (which can be bought in bulk) reduces complexity and encourages economies of scope. For instance, Faaren has revealed that most of its customers subscribe to compact cars averaging EUR 530 per month (Appendix 3). Overall, this makes start-ups become less dependent on suppliers' availability and pricing of certain car models.

On the other spectrum of thy hybrid model, start-ups are recommended to partner up with players that are familiar with the operational handling in the automotive world. A partnership between a start-up and a dealer or a rental company can help create synergies between them and produce more value for both parties. A start-up can help fleet owners utilize their assets more efficiently by providing them an additional distribution channel. Subscription providers benefit from an expansion of vehicles for subscription and from a greater variety of vehicles for their audience without the need to perform any car service-related activities on their end. It is not only favourable in terms of cost structure as it involves many of the same resources and processes that a car dealership is already familiar with, but it allows for a better overall capacity utilization of vehicles that are not in use. It is recommended that subscription providers establish partnerships at attractive terms with dealers that have integrated workshops. All vehicle-related activities, also for the owned cars, as well as the re-marketing can be in the dealer's hand, reducing internal complexities and costs for the provider. Apart from a procurement and partnership department, providers are recommended to build a comprehensive digital sales and

IT platform to integrate the cars from both sources seamlessly. The provider handles the marketing and sales and concludes the contract with the customer, regardless of which party owns the specific car. Services like home delivery and insurance should be outsourced.

The risk of a hybrid fleet model is the complexity to manage both an own fleet and the partnerships with dealers. Although the capital requirements are lower than in case of a fully asset-heavy model, a part of the fleet still has to be financed and held on the balance sheet. The benefits of the recommendations, however, outweigh the risks. Providers can combine the advantages of the availability through a basic stock of vehicles and leverage on strong automotive partners for the fleet management and operations.

Recommendation for OEMs

OEMs are recommended to fully integrate the activities along the value chain. Based on their own capabilities, they may still outsource certain steps to partners but coordinate them internally. In this context, OEMs are recommended to leverage their dense dealership network to handle customer-facing activities. Customer reviews and examples in Germany have revealed that there is still demand for customers support and explanation, e.g., with new electric vehicles. So, OEMs should capitalize on their competitive advantage of a dealership network. Contract dealers are ideally positioned to provide customer-facing activities as they already have the infrastructure and experience from other business models such as leasing, and they typically carry the brand name so the customer experience will be seamless from the online world of the OEM's platform to the physical branch visit.

Dealers in this concept are recommended to be treated as agents which enable a direct sales and direct end consumer contact. That means that the subscription contract is made between the end consumer and the OEM which allows to build a relationship with the customer, increase touchpoints and gather customer data which is important to optimize the offering. In return, the

dealership is compensated for the provided service such as vehicle handover or maintenance works, which are purely variable costs and reduces the fixed cost block. Furthermore, the relationship between OEM and dealer is reinforced with the portfolio extension which has positive strategically implications. Importantly, the DTC model enables full control over the customer journey, marketing and pricing and makes the provider less dependent and exposed to third parties, which otherwise is a major vulnerability.

For the implementation on an organizational level, it is recommended that OEMs create an affiliate company to encourage specialization and learning effects. That way the affiliate and employees might also be more agile, since major hurdles for OEMs to overcome are the traditional structures and mindset designed to sell or lease cars but not to operate them. New cars can be provided at cost and young used cars can be used from a former leasing contract by the organization's producing business unit or the captive bank.

Apart from direct implications for the value chain and profit model, the recommendation has indirect implications on revenue streams. The excellent customer service in combination with a seamless online and offline customer journey will lead to high customer satisfaction, which in turn leads to higher retention rates and a higher market share. This has a positive top-line impact in the future. Regarding the cost structure, there are potentially lower cost in the future with vertical integration. High initial investments are necessary, but the cost to provide one subscription cycle will decrease with a growing number of customers. Since (most) value adding activities are performed in-house and not procured, the marginal costs will also decrease. The higher the unit sales, the lower the marginal cost due to economies of scale benefits. The profit margin and bottom-line are expected to increase accordingly. Depending on the individual case, however, the make-or-buy decision may vary from this recommendation. For example, if an OEM already has an established partnership with a tech company to build and maintain the platform, it might be worthwhile to remain in that partnership. Additionally, the

home delivery and logistics of vehicles is a major cost bucket, which requires human capital and fuel expenses, so it is recommended to increase the fee for the home delivery to turn it into a profit centre. Customers who are not able to pick up the car at one of the OEM's dealerships in Germany presumably are convenience-seekers who are more willing to pay a premium for the service.

On the value chain, the dependency on key partners will be significantly reduced. Nevertheless, partnerships may be entered for less success-critical activities or for activities that cannot be performed internally. For instance, unless the OEM's captive can provide an insurance solution, the provider may choose to outsource this service. New resources and activities are required to compensate for what is not produced in-house. Instead of selling and leasing cars through dealerships, vehicles will remain on the company's balance sheet, so the OEM becomes a fleet operator. In this regard, the paradigm shift among employees in a traditional environment and new skillset is important to implement. The creation of automated processes, billing and a platform with an attractive user interface for a cost-efficient and user-friendly service will be challenging but crucial.

All in all, the recommendations make the business model more effective for OEMs and mitigate some of the previously identified vulnerabilities: OEMs have full control, they optimize their value proposition and profit margins are expected to increase in the medium to long-term. BMW, for instance, has a limited subscription offer through ViveLaCar in Germany. To reveal the full potential of subscriptions, management should pave the way to offer subscriptions in an *integrator* approach. First, managers need to define the strategic objective for their subscription product, which goes hand in hand with the definition of a value proposition and the target customer group. To measure success as a fleet operator with customer relationships, a set of key performance indicators, such as ARR and retention and churn rate needs to be tracked. It can be recommended that BMW creates an affiliate dedicated to subscription which

collaborates with BMW Group company Alphabet to leverage its extensive experience in full-service leasing models (Alphabet 2022). BMW could sell cars to Alphabet at cost which then provides the fleet with insurance contracts for the subscription service. New skills and operational capabilities, such as fleet or direct customer management should be built internally. Then, with a digital platform and associated processes in place, BMW can distribute in a DTC approach and conclude agency contracts with BMW dealers across Germany for vehicle-related services, to keep the costs variably. For a multi-business company like BMW, this business model innovation allows for knowledge transfer and scope effects, e.g., from the joint use of a digital sale platform, and has strategic advantages and eventually implications on the company's bottom line.

Multi-cycle sale

Apart from the business model in isolation, the whole company can benefit from the new business model in a holistic view if it is combined with the other distribution models of OEMs. This is also applicable for other automotive players. If embedded into a car-based mobility portfolio, the provider can benefit from cross-selling initiatives and move the cars between the offering according to demand. With various plans, customers can be retained in the company's ecosystem and use cycles per vehicle increased. For instance, companies should offer customers a new subscription or leasing plan, or offer the subscribed car for sale, after the subscription cycles ends. The vulnerability of losing customers after the relatively short subscription cycle can thus be mitigated. This is beneficial for the customer and the vehicle lifetime profitability, since the provider can decide which distribution model to use for a given car based on its previous lifecycles. To move the break-even threshold of a given vehicle forward, the provider may move the car into a leasing contract or a sale, rather than into multiple subscription cycles.

8. Conclusion and outlook

Changes in ownership patterns and consumers' preferences put pressure on traditional business models in the automotive industry such as one-off sales or leasing models. In the car market but also in other markets, digital and access-based models have emerged that no longer require the customer to become the legal owner. Car subscriptions are business models that allow car companies to establish relationships with their customers and provide access to vehicles in return for recurring revenues. Since their introduction they have gained a strong momentum in Germany with around 70,000 contracts in 2021.

The analysis of the German market revealed that there are different groups of providers that vary in brand offering and vertical integration which includes the different ownership models. Four sub-models were identified: integrators, service providers, orchestrators, and layer players. The management of a company has to make strategic make-or-buy decision in order to decide which particular business model to follow. Asset-light models, where offered cars are not in the provider's inventory, provide more room for flexibility and are less capital-intensive, which is why they are often applied by new industry players. Such marketplaces provide the platform and the marketing and sales for partner companies like car dealers and enable them to become subscription providers. Dealers benefit from an additional distribution channel and providers can easily scale their business at a very low marginal cost. The downside, however, is a high dependence and loss of control to partners and suppliers.

OEMs, downstream automotive entities like rental companies and some mobility start-ups are asset heavy. Since vehicles are purchased and part of the balance sheet, this model requires high capital expenditures and bears the risk of quickly depreciating assets. OEMs and rental companies can use subscriptions as a product extension. They remain in full control of the assets and can increase the vehicle lifetime value through the combination of the different business models. If sold directly to the consumer, car subscriptions bind customers to the provider for

the contract duration and allows for customer touchpoints. It generates recurring and predictable revenues and has the potential to attract also former non-automotive customers. In this context, the business model with its value proposition can become an alternative transaction model to a car sale, leasing or rental, and thus partly monetize maturing markets like Germany.

In contrast to leasing or car sales, however, the revenue from one subscription cycle (six to twelve months) contains a rather smaller profit contribution. Therefore, providers must focus on more than one car lifecycles to achieve break-even. OEMs are recommended to integrate all value chain steps of subscriptions to expand their existing service portfolio and their DTC capabilities. Start-ups are recommended to follow a hybrid fleet approach to boost advantages of the asset-heavy and -light model. That way, liquidity can be preserved with an easily scalable marketplace and at the same time, a uniform fleet of popular vehicles reduces dependency on suppliers.

Car subscription is a rather novel concept and its future impact on automotive retail is difficult to determine. There is not enough conclusive data to estimate its impact on traditional modes such as car purchases and financing. However, it can be expected that the car subscription has the potential to grow and to cannibalize leasing, since subscription offers more flexibility with its contract terms, and is a worry-free and all-inclusive service way to access an automobile. Already today, major automotive markets show strong interest in subscriptions: in the U.S., 15% of Strategy&'s (2021) survey respondents would consider subscription in a year, and in China even 44%. The strong momentum of subscription models can be seen in the U.K. where Onto, an electric vehicle subscription provider, recently raised 175 million US-Dollars of funding (Onto 2021). Furthermore, it can be expected that competition increases and that the price gap between a subscription and a leasing rate shrinks. In the competitive war for market share in the multibillion Euro market, the provider that serves the customer's needs best will outcompete others without a clear value proposition and attractive offering. Subscription

models will still be subject to change, but they will be most successful if providers embed them in an ecosystem with the other car-based offerings. To conclude, there is a consensus among market reports and interviewed experts that subscriptions are a business model innovation that came to stay.

9. Limitations and extensions

First, the scope of this report was limited to the topic of business models of car subscriptions in Germany due to time and space restrictions set by Nova School of Business and Economics. Second, the lack of available data was a limiting factor. Subscriptions of cars are a relatively new and still emerging business model. As a consequence, the business model designs are subject to constant change and new players are expected to enter the market in the aftermath. There are also limited scientific publications on the topic (Scopus, Springer) and most new industry entrants such as mobility providers or start-ups are not publicly listed which limits access to financial or operational information. Listed companies such as rentals or OEMs, that are obliged to publish annual reports, do not provide a granular break down of their financial information to derive relevant information for their subscription products. Another identified limitation was that the experts who were interviewed could not reveal sensitive information that could be relevant and were not knowledgeable in all topics. Several interviews with experts from different companies and with different backgrounds were conducted to counteract potential biases, as an interview is naturally subject to an opinion and bias. Due to current challenges and market disruptions caused by the Covid pandemic or the war in Ukraine, the automotive industry in Germany and worldwide is hit. Therefore, it is difficult to make predictions for this industry, especially for a new model like subscription plans. In future it would be interesting for researchers to analyze which kind of business model designs are applied by providers in other markets with different preferences, such as China or the U.S., and

how the respective automotive market is affected by business model innovation. When more financial data and industry experience is available, it would be interesting to what extent car subscriptions cannibalize other forms of car mobility or different distribution channels of providers. Having analyzed the company's perspective, research could assess the commercial appeal from the customers' perspective.

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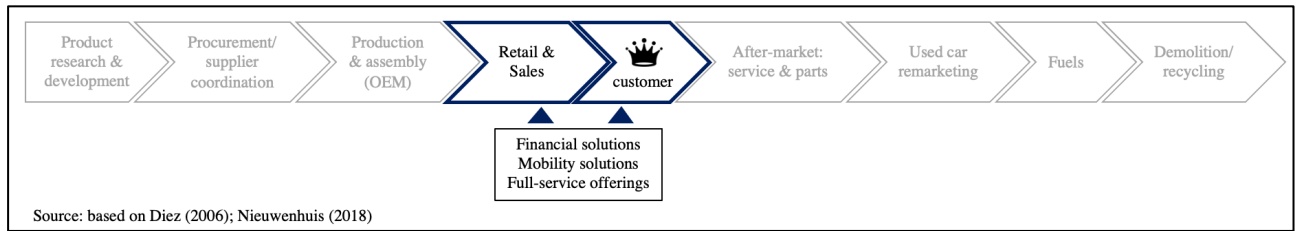
Appendices

Appendix 1: Own analysis of car subscription providers in Germany

(Analysis of exemplary and assorted car subscription providers in Germany; not exhaustive, last checked 31-04-2022; BM and providers exist)

Category	Subscription	Company	Vehicle offering	Fleet owner = company	Asset-light	Target customer	Product features / miscellaneous	Source
OEM	Volkswagen AutoAbo	Volkswagen Financial Services (Volkswagen Group)	VW BEVs only (2 models), young used cars	x		Private only	Objective to support VW's EV sales; offering fully done by VW Group companies (VWFS, EURO-Leasing) except delivery; predefined contract period (>3 or >6 months); home delivery against fee or station pick up (not all VW dealers)	Volkswagen Financial Services (2022); Interview E
OEM	Lynk & Co. Membership	Geely Group	Lynk & Co. BEV only (1 model), young used cars	x		private & business	2021 market entrant in Germany without dealership network so always home delivery against fee; vehicle in subscription can be shared in the "club"; flexible duration (>1 month) and notice period	Lynk & Co (2022); Autohaus (2020)
OEM	Mercedes-EQ Abo	Mercedes-Benz Group	Mercedes-Benz BEVs only		x (dealer's property)	private & business	Offering via captive bank MB Mobility; objective to support EV strategy; some new, some young used cars; minimum length of 6 months and 1 month notice period; handled through dealer	Mercedes-Benz (2022)
OEM	Care by Volvo	Volvo Cars (Geely Group)	Volvo only (new cars only)	x		private (60%), business (40%)	100% own configuration possible	Volvo Cars (2022); Autohaus (2021)
OEM	Audi on Demand	AUDI (Volkswagen Group)	Audi only (young used cars)	x		n/a	To date, only rent option available in Germany; <i>Audi on demand subscribe</i> to follow	Interview A; Autohaus (2021)
OEM	Stellantis &You Auto-Abo	Stellantis Group	Group brands (new and young used cars)		x (dealer's property)	private & business	pick-up at branch or home delivery against fee; flexible duration (>1 month) and notice period	Stellantis (2022)
Rental	Sixt+	Sixt Group	multi-brand & categories (only category bookable)	x		private & business	extensive offering of 42 models, many premium vehicles; pick-up at Sixt station or delivery against fee; flexible contract duration but max. 12 months	Sixt (2022)
Rental	myEuropcar	Europcar Mobility Group	multi-brand & categories	x		private & business	extensive offering of 20 models; pick-up at Europcar station or delivery against fee; predefined contract durations	Europcar (2022)
Dealer	Beresa Auto Abo	Beresa	Mercedes-Benz focus, also also other brands available	x	x	private & business	Beresa fleet and cooperation with other dealers; offering via the platform "Carve8" (previous Daimler innovation unit 1886 Ventures); predefined contract length	Beresa (2022); Autohaus (2021)
LeasCo	ALD Flex	ALD Automotive (Société Générale Group)	multi-brand & categories	x		business (focus) & private	Acquisition of car subscription provider Fleetpool Group (Germany) boosted subscription offering; minimum contract duration of 6 months	ALD Automotive (2022); BSA (2021)
Startup	FINN Auto Abo	FINN	multi-brand & categories (new or young used cars)	x		private & business	free home delivery; either flexible contract package or predefined contract duration	FINN (2022); Interview D
Startup	Cluno	Cazoo	multi-brand & categories (new or young used cars)	x		private & business	free home delivery; predefined contract durations	Cluno (n.d.)
Startup	ViveLaCar	ViveLaCar	multi-brand & categories (new or young used cars)		x (dealer's property)	private (focus), ~20% business	A) white label solution for i.a. BMW, Renault, Hyundai, Mercedes dealers in DE; pick-up at station or home delivery against fee; B) platform cooperation with car dealerships; flexible contract duration with 3 month notice period; growth of 20% per month; 1300 locations in 2021	Interview B
Startup	Faaren AutoAbo	Faaren	multi-brand & categories (new or young used cars)		x (dealer's property)	private & business	similar to VLC; operation of own branded subscription platform and white label solution; pickup at branch or home delivery against fee; predefined and flexible contract duration	Faaren (2022); Nextg Mobility (2021)
Non-auto	smive	Bank11	multi-brand & categories		x (dealer's property)	private & business	subscription service as a non-captive bank; cooperation with dealers; pick up at dealer; flexible contract duration (>6 months)	Smive (2022); BSA (2021)
Non-auto	HUK-AutoAbo	HUK Autowelt (HUK-COBURG Insurance Group)	3 brands of different categories, new or young used cars	x		n/a	redefined contract duration of 6 or 12 months; pick-up or home delivery	HUK Coburg (2022); BSA (2021)
Non-auto	Shell Recharge	Shell	multi-brand BEVs		x (Fleetpool's property)	n/a	in cooperation with Fleetpool; pick up at fleetpool station or home delivery against fee; predefined contract duration	Shell (2022); BSA (2021)

Appendix 2: Value Chain in the Automotive Mobility



Appendix 3: Insights into customer patterns at Faaren

Feature	Average value
Contract duration	13 months (shorter durations only to bridge waiting time for car delivery or seasonal models like convertibles)
Milage package	>2000km / month for most customers (business customers tend to have higher milage packages)
Most popular car / segment	VW Golf / compact segment
Subscription of BEVs	Every fifth car is a BEV
Subscription rate	530 Euro (the gross list price of average car is 37,000 Euro)
Customer	Men (76%), 35 years old

Source: Seyerlein (2021)

Appendix 4: Characteristics of car-based mobility portfolio

Business model portfolio with typical characteristics, exceptions exist

	Car sale	Finance/Leasing	Subscription	Rental
Typical persona	control and autonomy seeking, all distances	avoids high upfront payments, all distances, business customer	experience driven, risk-averse, independence and flexibility seeking	ultra flexibility seeking, medium distances; holiday or business travel
Profitability	medium (5-7%)	high (10-15%)	not available; estimated: medium	high (10-15%)
Customer touch points	limited, after purchase “loss” of customer	high, during entire cycle	high, during entire cycle	high, during entire cycle
Payment	one-time upfront payment	per month, optional one-time payment	per month	per day
Ownership transfer to customer	immediate	at contract end/none	none (asset remains on provider’s balance sheet)	none (asset remains on provider’s balance sheet)
Termination options	anytime (sale of car)	tied to agreement	flexible, dependent on contract terms	flexible/daily
Vehicle selection/customization	unlimited, dependent on manufacturer	unlimited, dependent on manufacturer	limited, depending on provider (brands, category)	limited to category

Source: based on Arthur D. Little (2021); BCG (2021); own analysis (Appendix 1)

Appendix 5: Expert Interviews

Appendix 5.1: Interview guide for a semi-structured expert interview

Kindly note that for this semi-structured interview approach, the following set of questions were prepared, but further questions may arise during the interview. Depending on the background of the expert, the thematic focus of the interview may vary, i.e., some questions are asked differently/customized to the specific company. Out of the ten experts that were contacted, the authors were able to interview five. No expert from a fleet management or rental company could be attracted.

Question block #	Questions
(1) BM development and components	<ul style="list-style-type: none"> - Which role does the car subscription (CS) play in the automotive industry? - Why did your company decide to offer CS? - What is the target group of your offering? - What are (the most difficult) key competences for the CS? - How vertically integrated is your offering and which partners do you need then? - Apart from the economics, are there strategic benefits in offering CS? - What are the major revenue and cost positions? - Is CS already profitable? How can it become profitable?
(2) BM evaluation	<ul style="list-style-type: none"> - What do you think are advantages and vulnerabilities of the BM of your company and how can they be overcome?
(3) Market dynamics and competition	<ul style="list-style-type: none"> - Which provider on the market do you consider a strong competitor? - Are there advantages of the BM of the competitor over yours? - Can start-ups survive when OEMs expand their CS offering?
(4) Outro and future outlook	<ul style="list-style-type: none"> - Which provider or BM is best positioned to win in the world of CS? - Where do you see CS in 5 years from now?

Appendix 5.2 Key statements and information from expert interviews

Interview A 22-04-2022	Senior Expert New Mobility at Porsche Consulting
Relevant perspective for report:	Consulting & OEM
Role and company:	Senior Expert for New Mobility at Porsche Consulting GmbH (male); previously, different roles at Audi AG and responsible for the implementation of Audi's subscription and rental product <i>Audi on demand</i>
(1)	<ul style="list-style-type: none"> - Audi has started with rental and subscription services, as an alternative to car purchase, leasing and financing, through a pilot project <i>Audi select</i> which became <i>Audi on demand</i> today - Audi in 2016 wanted to enter the sharing economy market and offer a premium but flexible automotive mobility product (all-inclusive except fuel) in which customers can change cars within the subscription cycle (e.g., convertible in summer and SUV in winter) - Audi select was discontinued in 2017 and replaced by <i>Audi on demand</i> but without the possibility to change cars within the plan - Audi developed the online platform and digital infrastructure, but makes use of other entities (e.g., dealerships, concierge services) to handle customer-facing activities - licensed Audi dealers across Germany are used because they already have the infrastructure and processes (repair shop, optical treatments, wheel change) in place to provide the service (trade-off between conventional dealer agreement or to pay dealers as agents) - the offering addresses customers in the premium segment with an according willingness to pay; often the use case was a customer who subscribed to a car until the ordered car (purchase or leasing) gets delivered - the vehicles used for the offering are young Audi factory cars (<i>Werkswagenrückläufer</i>) with a maximum of 20,000km; these are available immediately and have lower depreciation costs (otherwise, these specific cars would go into re-marketing) - vehicles remain on the balance sheet of Audi AG; that way the cars have only one holder, which is beneficial for the residual value - the profitability of the business model depends on the pricing package the customer is offered; providers have to target a sweet spot to not drive away customers but cover all costs - Audi as a premium brand is in the position to charge higher prices relative to volume producers - major cost positions are the depreciation (becomes less over the lifetime of a car), the delivery, car services - in the case of very short subscription cycles, the high costs must be allocated to a rather low revenue

(2)	<ul style="list-style-type: none"> - Managing a large fleet with the accompanying operations is very difficult without partners - In the case of a short subscription cycle, an initial fee should be implemented
(3)	<ul style="list-style-type: none"> - Tech companies have an advantage over legacy car makers because of their programming, digital and automation skills; they are usually very agile it took Audi a long time to develop the digital infrastructure - OEMs have an advantage because they can access the existing rolling stock and can influence the market price and positioning; it can be difficult for new market entrants to get assets and to compensate the high depreciation of new cars
(4)	<ul style="list-style-type: none"> - subscriptions will be successful if their pricing is attractive to users - Mobility-as-a-service solutions might be a threat to car subscriptions as the ownership of things becomes less important (even though a subscribed car is not owned legally, the individual and exclusive access to the car has the characteristic of ownership)

Interview B 27-04-2022	Team Lead Strategy & Business Development at ViveLaCar
Relevant dimension:	Mobility Start-up
Role and company:	Team Lead Strategy & Business Development at ViveLaCar (VLC; male); responsible for evaluation on strategic questions, project- and portfolio-management, concept development for product extension/innovation
(1)	<ul style="list-style-type: none"> - VLC's growth (number of subscriptions and dealerships) from 2021 (~20% per month) could be maintained, particularly thanks to an increasing awareness of car subscription models - VLC developed a platform on which it markets cars in subscription in collaboration with car dealerships (large groups or single ones) under its own name - VLC offers a white label solution for partners (typically dealerships or OEMs) as "powered by ViveLaCar" - the customer of VLC is the end user, but the customer-facing activities are performed by the partner (this may lead to worse customer service, as partners may not be properly trained) - therefore, VLC offers a fourth distribution channel for dealers and helps them to utilize their fleet more efficiently - VLC addresses all customer groups that value flexibility and low financial commitment; experience shows that most customers are between 40 and 45 years old with a medium to high salary - in collaboration with car dealers, VLC offers its tool "Valor" to determine which vehicle at which stage is ideal for subscription, taking into consideration the non-linear value depreciation of a car; ideally, cars are offered in subscription

	<ul style="list-style-type: none"> - the main revenue stream are the subscription fees that VLC receives from the end user - the main cost buckets are salaries for employees, the payment to dealers, logistics such as the vehicle delivery
(2)	<ul style="list-style-type: none"> - advantage of not owning the fleet are the lower financing requirements, so it might be that platform business models become profitable more quickly - a main vulnerability of VLC is the dependence on the dealership
(3)	<ul style="list-style-type: none"> - strongest competition by other start-ups that received much capital for expansion - for OEMs and rentals, a car subscription is a side service and at the moment, they are reluctant and rather pursue a strategy to test it, often with partners
(4)	<ul style="list-style-type: none"> - car subscriptions keep up their momentum - project VLC ONE: subscriptions move towards car sharing; offering addresses students or young professionals in shared apartments or companies – users can allocate their individual rides and pay accordingly; however, pricing and exact value proposition still in development

Interview C 27-04-2022	Project Leader at Boston Consulting Group
Relevant dimension	Consulting
Role and company	Project leader at BCG (male); core member of the automotive and mobility sector with extensive project experience at OEMs and mobility providers
(1)	<ul style="list-style-type: none"> - Most of customers are commuters, not needing swap between cars - Subscriptions is another form of Finance, Leasing and should build on the same processes and infrastructure - E.g. Sixt: offers many add-ons, such as navigation system, child seat, extra kms - Some cannibalization effect is inevitable if embedded into existing ecosystem - Good VP attracts a new customer segment, that otherwise you would not capture (especially due to rise of shared mobility concepts)
(2) + (3) <i>Due to outsider perspective, the interviewee was asked to evaluate the providers on the market</i>	<ul style="list-style-type: none"> - Difficult for asset-heavy due to current supply shortage and bad terms for purchasing - Advantage of asset-light start-ups: because focus on elements that OEMs are not acting in like development of good value proposition for end customer and partner - Difficulty for subscription: flat pricing, which is however good for customer (transparency)

	<ul style="list-style-type: none"> - But: car owners underestimate the costs for owning a car (Insurance, depreciation, taxes; underestimates costs by 50%) - Pricing of the plans is still a big issue (BMW Access, Porsche Drive too expensive) - Different providers are still experimenting with business model and value proposition - Subscription advantages: USP, customer demand, players that are well positioned and good presence, OEMs see chance in DTC - Bad product-market fit (premium product not accepted by customers who are seeking car subscription services) - OEM's struggle with digital presence and accessibility, they rather use processes already in place, such as rental backends - Don't build it from customer's perspective, rather from their own existing processes (weak UX, UI, good processes, also low conversion rate, bad economics) - OEMs were not able to close contracts with dealers (Agency model changes this, as OEMs are introducing this) - Subscription bind customer long-term, customer lifetime brings value - OEMs are focused only on their own premium brand (subscription customer rather wants to drive a certain car category and not a certain brand) - Rentals are well positioned due to similar processes - SIXT: recent supply problems due to vehicle shortages, so subscription prices were increased by a lot
(4)	<ul style="list-style-type: none"> - In 5 years, car subscription will not be on par with Sales, Financing and Leasing - Until 2030, around 10-15% of market revenue - Subscription will not revolutionize the automotive industry

Interview D 04-05-2022	Intern Business Development at FINN
Relevant perspective	Car Subscription Start-up in Germany
Role & Company	Business Development Intern at FINN (male) FINN: 20,000 subscriptions in 2021; goal for 2022: 30,000
(1) With this expert, the intention was to deep-dive into the business model of FINN as start-up fleet owner; for time restrictions, the other categories were not touched upon	<ul style="list-style-type: none"> - Car dealer on an online platform; doing most steps along the value chain, including fleet purchase, marketing (B2B and B2C) - Delivery of vehicles to customers is outsourced - FINN purchases and finances vehicles through a credit facility directly from OEMs (FINN has good purchasing conditions) - In case of bankruptcy: vehicles are owned by facility that provides credit line - FINN usually hold cars for 1-2 years, after the car is sold to used car dealerships or remarketed by FINN directly

	<ul style="list-style-type: none"> - Main revenue streams from annual recurring revenue (ARR) and from used car sales business - USP: Cost transparency for customers (one all-in package) - Foreign OEMs use FINN as market entry to test new markets (e.g., Chinese OEMs) - Both B2C and B2B segments are targeted; current distribution is about 80% B2C vs. 20% B2B - It is expected that the future will hold more B2B business, since companies need more cars than private consumers - One of the use cases: customers test new car models (e.g. EVs) - Typical customer is a young family and familiar with e-commerce in daily life - The advantage of B2B: typically higher willingness to pay and easier upselling (e.g. fuel cards) - Cooperation with workshops for refurbishment, and with certified appraisers to build trust to clients - As soon as car leaves FINN's parking lot, delivery process is done by external third party (might harm customer satisfaction) - FINN newly established a customer care department because there was a clear demand for customer requests and support - Not profitable yet with main subscription business - In some cases, unit profitability was achieved with used car sales - High costs: Team with 300 employees - 60% of processes are fully automated (large cost savings) - Profit drivers: Subscription fee + Sale of used cars (Insurance is directly transferred from insurance company to customer) - Ambition for next large financing round
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Interview E 11-05-2022	Consultant New Mobility at Porsche Consulting
Relevant dimension	OEM & Consulting
Role & Company	New Mobility expert and consultant at Porsche Consulting (male); previously, project consultant for VW Financial Services (VWFS) and responsible for the setup of VW's subscription services <i>AutoAbo</i>
(1)	<ul style="list-style-type: none"> - VW's subscription started in April 2020 as a pilot to employees and small, assorted customer groups - the strategic guideline was to maximize usage of fleet by only offering car categories, rather than personalized car features - Important to create a platform to respond to customer requests - In general, VW targets younger customer groups - 3 Personas created: young woman, ~32 years old, looking for the flexibility to change cars; young driver, looking to test new technologies (e.g., EVs); young family that might need a larger car soon - A change in mindset in the organization is difficult because the entire organization is designed to sell or lease cars

	<ul style="list-style-type: none"> - For the subscription plan, VW so far integrated all activates along the entire value chain (VW sells cars to VW Leasing, which owns the fleet and becomes lessor to EURO-Leasing (VW Group), which coordinates operations and all customer-facing activities; a third party is in charge of the vehicle hand-over - Dealerships were excluded in the beginning - However, it makes sense to have dealers in network, to have more locations and reduce delivery costs - VWFS builds tech platform and does lead generation in-house - In the beginning VW subscription services only had very few customers per month - Profitability is hard to measure, as vehicles go through different services, such as leasing, rental, subscription - Important to maximize vehicle utilization in order to generate higher margins over a vehicle's useful life - Since the after-market business will decrease in the future due to the rise of EV's, a part of the subscription fee, which includes e.g., maintenance, can compensate at least a part of the decrease
(2)	<ul style="list-style-type: none"> - Car delivery not working well (third party) - Offers need to be better coordinated (Recharging for EVs is charged extra); Should be included all-in-one flat rate - Branding: need to offer better service to customer, respond to emails and potential questions on the service offered - Marketing needs more work: how to reach more potential customers, important to show presence in social media to address younger customer groups
(3)	<ul style="list-style-type: none"> - On paper it makes sense to not own a car fleet, as it requires lower investments; for new cars depreciation is a very high cost - Problem with asset-light model: Low control over the customer journey; only onboarding, but no control over what vehicle the customer gets, as this is done by a third party
(4)	<ul style="list-style-type: none"> - Future will be subscription services, but will need to adapt to MaaS, as current business models are only in tune with individual sales - OEMs must develop and change their offered BMs, so they can offer flexible and digital services, as well as create value for customers and accompany the entire customer journey - Important to optimize conversion rate, pricing, design - Need for an integrated platform, that includes all digital services and supports customers and manages fleets - OEMs need to offer more digital services to follow upcoming trends - Next steps in the automotive sector are autonomous driving, which must be included in MaaS offers