

BECOMING THE PERFECT PARTNER

How to develop a car sharing service that satisfies the needs of the users, the stakeholders and possible future partners

Author

HANNE SNEDSBÖL

Supervisor and examiner

Helena Strömberg

Master of Science Thesis (IMSX30)

BECOMING THE PERFECT PARTNER

How to develop a car sharing service that satisfies the needs
of the users, the stakeholders and possible future partners

Master's thesis in Industrial Design Engineering

In collaboration with GreenMotion Scandinavia

© Hanne Snedsböl 2020

Chalmers University of Technology

SE-412 96 Gothenburg, Sweden

Phone +46(0) 31-772 10 00

Cover Image: By Hanne Snedsböl

Print: Repro Service Chalmers

ACKNOWLEDGEMENTS

To begin with, I would like to dedicate this thesis to my biggest fan Barbro, we miss you.

This report is written by Hanne Snedsböl at Chalmers University of Technology at Industrial and Material Science. The Master Thesis has been written at the request of GreenMotion. Thank you, Kjell Arnesson for letting me write this Master Thesis. I am grateful for getting this opportunity and the way that you generously shared your knowledge and wisdom and support.

I would like to thank everyone who participated in the interviews, the co-creation, and the validation, and contributed generously with your knowledge which gave me valuable insights. A special thanks to Tolly for the mental support along the way and helping me with preparing the co-creation. Thank you, Jenny for all the love and support along the way, especially in the beginning providing me with key insights on how to write a master thesis. And a warm thank you, Gunilla, for believing in me, giving me love and support and proofreading the report several times, your help has been invaluable.

I would like to thank my supervisor and examiner Helena Strömberg for giving me the opportunity to write a thesis on my own. Thanks for guiding me through this project and giving me support when I needed it the most.

Finally, I would like to thank my family, and especially Jonathan, for all the love and support throughout these five years at Chalmers. Without you I would not be able to graduate.

Gothenburg, 2020

A handwritten signature in black ink that reads "Hanne Snedsböl". The script is cursive and fluid, with the first name "Hanne" and the last name "Snedsböl" clearly distinguishable.

Hanne Snedsböl

ABSTRACT

Today's society is too dependent on transportations by privately owned cars that it is no longer sustainable. One step to steer the development toward a sustainable future is to offer environmentally friendly alternatives as a replacement to the private owned car. GreenMotion is a rental company that strives to offer carsharing with the lowest possible climate impact. In 2018, they started their work to develop a rental concept where rental cars could be provided counterless through self-service in the Drive & Go application to the customer. This reduced the number of employees, company buildings and the time it takes the customer to rent a car. The concept was developed in-house by GreenMotion and was therefore in the need of an external analysis during the launch in Sweden 2020.

Becoming the Perfect Partner is about exploring the carsharing market's end-users, stakeholders and possible future partners in Sweden, getting to know their needs and requirements and with this as a basis find a balance between them and create the best possible carsharing service. This was done with a service design approach by using methods like actor map, netnography, literature review and interviews. Early in the project, interest arose regarding Mobility as a Service and the opportunities that a collaboration with such an actor could bring. Therefore, the project was directed to investigate how GreenMotion could become the perfect partner to MaaS.

The project resulted in add-ons to the Drive & Go application, an improved customer journey of the service, suggested future partners, and insights into what factors that is required to participate in MaaS. The results found are largely in line with previous research on MaaS and was confirmed in the study. The thesis has also added knowledge about the difficulty for companies to maintain their corporate identity as a transport supplier to MaaS, and that a close interaction between the services is required to achieve a successful collaboration. In addition, the users have a need for a well-functioning "full service", where everything from the usability of the application to how well the customer service works.

Keywords: MaaS, Carsharing, Collaboration, Iteration, Usability, Requirements

CONTENT

1. INTRODUCTION.....	10
2. THE CASE OF GMS	14
2.1 THE GMS TIMELINE	14
2.2 A DEEP DIVE INTO DRIVE & GO.....	19
2.3 CONCLUSION	25
3. THEORY.....	27
3.1 CAR SHARING & MOBILITY SOLUTIONS.....	27
3.1.1 MAAS: The transport paradigm.....	29
3.2 THE TRAVELLER'S REQUEST	33
4. METHODS & IMPLEMENTATION.....	38
4.1 SERVICE DESIGN	38
4.2 PHASE 1 – GET TO KNOW THE PROBLEM	41
4.3 PHASE 2 -FIND A DIRECTION	42
4.4 PHASE 3 -FOLLOW THE DIRECTION	44
4.5 PHASE 4– THERE YET? OH YES!	44
5. FINDING THE STRATEGIC DIRECTION FOR GMS	47
5.1 WHAT IS EVERYONE ELSE DOING?.....	48
5.1.1 Residential areas	49
5.1.2 Airport	50
5.1.3 Corporate Customers.....	50
5.1.4 Property manager	51
5.2 GMS IS ACTIVE HERE!.....	52
5.2.1 Holmgrens Bil & J Bil facilities	52
5.3 CONCLUSION	53
6. HOW TO BE A GOOD CAR-SUPPLIER.....	56
6.1 THE INTERVIEWS.....	57
6.1.1 Contact	58
6.1.2 Negotiation	59
6.1.3 Contract.....	59
6.1.4 Implementation.....	59
6.1.5 Up and running.....	60
6.1.6 How to be good	61
6.2 TRYING OUT DRIVE & GO.....	62
6.2.1 Conclusion	64
6.3 CO-CREATION WITH GMS	65
6.3.1 GMS <3 MaaS.....	66
6.3.2 GMS in Ten Years.....	67

6.3.3	<i>The Current Customer Journey</i>	67
6.3.4	<i>Challenges and possibilities</i>	69
7.	THE IMPROVED SERVICE	71
7.1	VALIDATION	71
7.2	THE PERFECT PARTNER	72
7.3	DRIVE & GO 2.0	73
7.4	CONCLUSION	80
8.	DISCUSSION	82
8.1	RESULTS AND FINDINGS	82
8.2	METHODS	84
8.3	FUTURE WORK	85
9.	CONCLUSION	87
10.	REFERENCES	89

1. INTRODUCTION

It is not sustainable to use private owned cars for single person transportation to the extent that we do today. The view of the car as the fastest means of transport (McKenzie, 2020) has led to increased use and resulted in high concentrations of air pollutants due to the motor vehicle emissions (Quaglione, Cassetta, Crociata, Marra, & Sarra, 2019) which has been a reality for way to long in many urban areas. Additionally consequences are crowded parking lots and noise pollution within the cities (Quaglione et al., 2019).

According to the '2018 Revision of World Urbanization Prospects' presented by UNDESA, The United Nations Department of Economic and Social Affairs, sixty-eight percent of the world's population is expected to be living in urban areas by the year 2050 (UN, 2018). Put it in the context that nine out of ten of the people living in urban cities breathe polluted air on a daily basis (UN, 2019), this implies that this is an unsustainable situation and something needs to be done. That said, the problem with polluted air within cities are not only due to car driving however, reducing trips being made by private owned car would be a step in the right direction.

It is easy to believe that replacing fossil fuelled vehicles with hybrids or electric vehicles will be the solution, reducing both noise and air pollutions in the cities, but doing that will not reduce the car usage. The car itself is not the biggest problem, it is way people transport themselves in the cities, the motorists' habits. There are over ten million people living in Sweden (SCB, 2020) . In order to change the behaviours and habits of the city resident, car sharing and other smart transportations like mobility services needs to be developed and improved.

In addition, when it comes to private owned cars, ninety-five percent of the time they are being unused, constantly costing its user money (Goodall, Dovey Fishman, Bornstein, & Bonthron, 2017). This provides an opportunity to compete against the norm of car ownership

and replace it with a service to maximize the car's total use and reduce the need to produce more cars. A service that enables car sharing between several people and ensures that access to a car is available when the need actually exists. Today, there are many actors on the Swedish market offering car access. Car dealers offers long term rentals through leasing, gas stations and rental agencies offers rental by the day and car sharing¹ by the hour is provided through companies or private associations.

GreenMotion Scandinavia, henceforth GMS, is a new actor on the Swedish market, originally offering car rental services at Arlanda Airport. The company has recently expanded and is now active in an additional twenty locations around Sweden. From being a company that targeted businessmen and women and private customers (non-business travellers) arriving at Arlanda airport, the service will now also target the city dwellers in Sweden through their self-service rental application Drive & Go, henceforth D&G.

The GreenMotion's service D&G, is developed in-house and does consequently benefit of being examined by an external source in order to adapt best possible to the users at the Swedish market. To develop a service that enables car sharing and reduces the need of owning a car is the answer towards a sustainable future and that is why an investigation of the subject, thus, this master thesis is necessary.

‘

The aim of this thesis is to develop knowledge about what makes a car rental service an attractive alternative among mobility services in Sweden, with the long-term objective to contribute to development that enable more people to use car sharing services.

’

In order to understand which factors that are desirable for a car rental service, the project will investigate needs and requirements of both users and potential stakeholders and thereby decide which market share to target. Today's mobility market in Sweden is hard to break through in, which makes it difficult to be a lone player, thus, to run a profitable and long-term

¹ In this thesis the term car sharing refers to a service that provides car access to their members, either locally in a city or in a country, for further mobility definitions see chapter 3.1 *Car sharing & mobility solutions*.

business requires partnerships. It is therefore important to examine the attractiveness of service towards both the end users and potential partners as well as other stakeholders.

The goal is to come up with insights and requirements that highlights areas of improvement and can be used to improve the customer journey and the user experience of GreenMotions, thus make the Swedish users chose GreenMotion. The findings will be presented and shown in a context as a redesigned concept of the service.

In order to fulfill the aim, the following research questions will be investigated.

- **RQ 1** - Which market share has the biggest opportunity of attracting users?
- **RQ 2** - How should a car sharing service be developed to balance requirements from end-users (henceforth users) with requirements from stakeholders and possible future partners?
- **RQ 3** - How to improve the user experience of the Drive & Go application?

2. THE CASE OF GMS

GMS, a partial newly established company with roots in London and Stockholm, was merged in Jönköping in 2018. Because GMS is a collaboration between several companies, which makes the company complex, it also provides a large advantage in terms of resources and contacts. This is shown by that the development has progressed rapidly and the company is constantly changing.

As a way to bring clarity in the project and understand the complexity of GMS a brief timeline was made of the company's background. First out is a short description of the closest stakeholders within the project together with the timeline of GMS that will be presented below. This is followed by a deep dive into the D&G service, what it is and how it works, and ended with a step-by-step walkthrough of how to rent a car through the application.

2.1 The GMS timeline

1960

HOLMGRENS BIL

'In 1960 Sonny Holmgren started a car sales company in a small facility in Jönköping. It started with used cars but pretty soon it also became new car sales and service workshop. Since then, the company has grown over the years and is today one of Sweden's largest car dealerships. Today they are located in 27 different locations in Sweden and represent several different brands. Holmgrens Bil is a third-generation family business and is a wholly owned subsidiary of Holmgren Group.'

(HolmgrensBil, 2020)



2007

GREENMOTION INTERNATIONAL

‘Richard Lowden founded Green Motion in 2007 with the clear objective of offering a truly ecological car hire option on the international markets. The launch of the brand coincided with a global consensus about the contribution of transportation on the emission of Greenhouse Gases and its impact on climate change. The Green Motion Car and Van Rental franchise service is operating at 450 locations in 47 countries worldwide.’

(GreenMotion, 2020)

2018

GreenMotion Scandinavia

‘Environmentally focused car rental company Green Motion continues its expansion in Europe by opening a franchise in Sweden. The Swedish franchise was acquired by a local entrepreneur, Anders Jutemyr, who currently operates an independent brand. Jutemyr acquired the rights for Green Motion in order for him to pursue his objective of fully developing the country with the support of an international brand. The first Green Motion location opened in July 2017 at Stockholm Arlanda International Airport.’

(AutoRentalNews, 2017)

The journey towards D&G self-service at GMS started with a meeting at Holmgrens Bil in Jönköping, where the board sat down and talked about how to succeed in the future. Realising that car ownership was about to become old fashioned while the demand for car sharing increased, and that the so far successful business of selling cars no longer would be as profitable in the future. That began the search for a more suitable business plan and potential partners.

Almost by chance, Holmgrens Bil came across a car rental company that had a vision claiming that car rental with self-service was the answer to the future. The



rental company, GreenMotion International, henceforth GMI, had the innovative technical solution and Holmgrens Bil had the customers. In addition to the technical solution, being a company that existed in several countries and had valuable collaborations with other companies and brokers, GMI was considered to be the perfect partner for Holmgrens Bil.

GMI selected Sweden and Holmgrens Bil to be the pioneer of the service D&G. Holmgrens Bil therefore, bought the majority of the shares to GMS and took over the business from the three founders in Stockholm. Then the internal work process was started, for example, favourable agreements were concluded with insurance companies and staff were hired. The acquisition of GMS was published at the end of the year.

2019 PREPARATION

A new CEO was hired at GMS and the internal work process continued. The D&G application was further developed in a close cooperation between GMI and Holmgrens Bil. They aimed to create the best possible service according to the Swedish market and at the same time be suitable for users in other countries where GreenMotion was operating. That balance between what GMS wanted in terms of functions and adaptations of the application contra what GMI implemented was considered as normality when being a franchise and seemed to work well under the circumstances.

2020 RELEASE

This was supposed to be THE year, where D&G was released together with a new update, stating to be an awesome mobility solution and new market positions were to be claimed. However, the future provided a completely different scenario and projects were put on hold due to the exceptional circumstances of the pandemic outbreak.



Mars

The latest update of the application used for the service D&G, Green Motion Car and Van Hire, came in the beginning of Mars containing an interface with a mix of Swedish and English text. It was now possible to make bookings by the hour which was considered as a key function in the D&G service.

D&G was released at Göteborg Landvetter Airport as counterless car rental. In addition, a housing based carsharing was started with GMS as the car supplier in Samset, a newly built apartment building area on the outskirts of Jönköping. The carsharing is operated by the real estate company Nivika Fastigheter.

GMS found a new channel to reach users. An integration between the D&G application and the intermediary company Expedia.se made it possible to book GMS cars via Expedia's website.

GMS took over the manned car rental service at twenty of the Holmgrens Bil facilities when the previous rental company's contract expired. The rental service was mainly dealing with insurance matters, providing the customer with a courtesy car while their car was being repaired or in for service. GMS will continue the manned rental possibly with an effort to make it self-serving in the future.

May

Holmgrens Bil bought 49 percent of the shares in J BIL, a car sales company stationed in Stockholm. The merge resulted in Holmgrens Bil transferred its operations in Göteborg to J BIL. This also gave GMS the opportunity to distribute their services through J BIL facilities, which provides access to both offices and personnel.

Negotiations with potential future partners progressed, the next step forward depended on when the strained market situation eased.

GMS in action 2020

A summary of where GMS was operating at during the spring 2020 and the conduction of this master thesis is illustrated by figure 1 below.



Holmgrens Bil and J BIL facilities

Rental over counter, mostly insurance matters



Arlanda City Airport

Rental over counter

Göteborg Landvetter Airport

Self-service through Drive & Go



Residential area

Nivika Samset in Jönköping as a carsharing distributor

Figure 1: Illustration of the areas where GreenMotion Scandinavia is active in Sweden.

2.2 A deep dive into Drive & Go

What has been mentioned a bit in passing, but not being delved into yet is now to be answered, namely, what exactly D&G is. The service was released by GMI in 2018 as traditional car rental without contact with personnel. What differs now when GMS is involved in the development is that the focus has shifted from day and long term rentals to enabling rentals by the hour, which makes it possible to target a new type of user need.

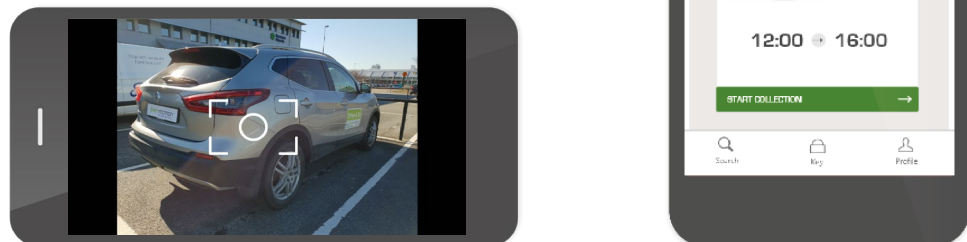


Figure 2: Illustrations of the photo function and the booking page in the application.

Knowledge about the service is crucial to this project because it is through the D&G application that the user get in contact with the service and the company, thus, how GMS communicates to the user. The application must therefore be explored in order to be able to improve the user experience of the service.

The service D&G is described as a quick and convenient counterless car rental, meaning that the whole process of renting a car can be made through self-service via the D&G application in the phone, see the application in figure 2 above. The innovation of the service lies within the technology that enables a digital car key being sent to the user's phone after booking a vehicle. It may be worth mentioning that it is the same application used in Sweden for the GMS's users as for the rest of the GreenMotion world.

“ The innovation lies within the non-need of human interaction, when the car was booked could the user go straight to the car, inspect the vehicle, and drive away.

(GreenMotion, 2020)

”

The hardware is claimed to be both cheaper than the one the competitors are using, as well as quicker to install; it only takes fifteen minutes. Every D&G car is equipped with a telematic box that is controlled by an immobiliser which can communicate with a phone that contains a D&G application with an active digital key.

The key

The digital key is used, like a regular car key, to lock and unlock the vehicle, but also to switch on and off an immobiliser which is controlling the telematic box. The different modes of the digital key are shown in figure 3.

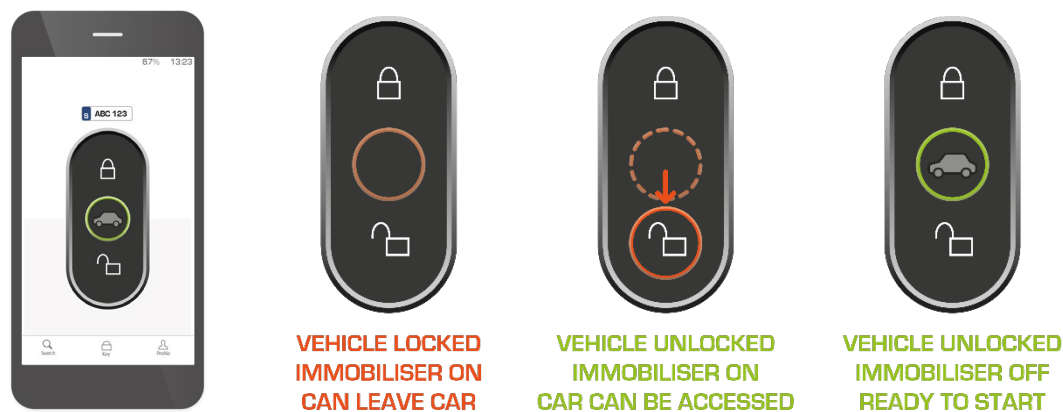


Figure 3: Illustration of the different modes of the car key.

When the phase 'collecting vehicle' has been started in the application, the key can be used to open the car if the phone being used is within the reach of the car. In order to be able to start the car all the 'collecting vehicle'- steps must be completed, which concludes with a signing of the lease. The key can then be used to turn off the immobiliser which makes it possible to start the car by pushing the 'start'-button inside the car, this mode is equal to as if a physical key is inserted in the ignition. The car should therefore not be left unattended during this mode since anyone could be able to drive away with the car regardless of the location of the phone.

The interaction

The car rental process of D&G, from creating an account to returning the vehicle, where interaction with the application is required is divided into the following four areas: Getting Started, Booking Process, Collecting Vehicle and Return Vehicle. The areas are illustrated as a quick summary of the steps in figure 4-7 and further explained in text after each area.

GETTING STARTED

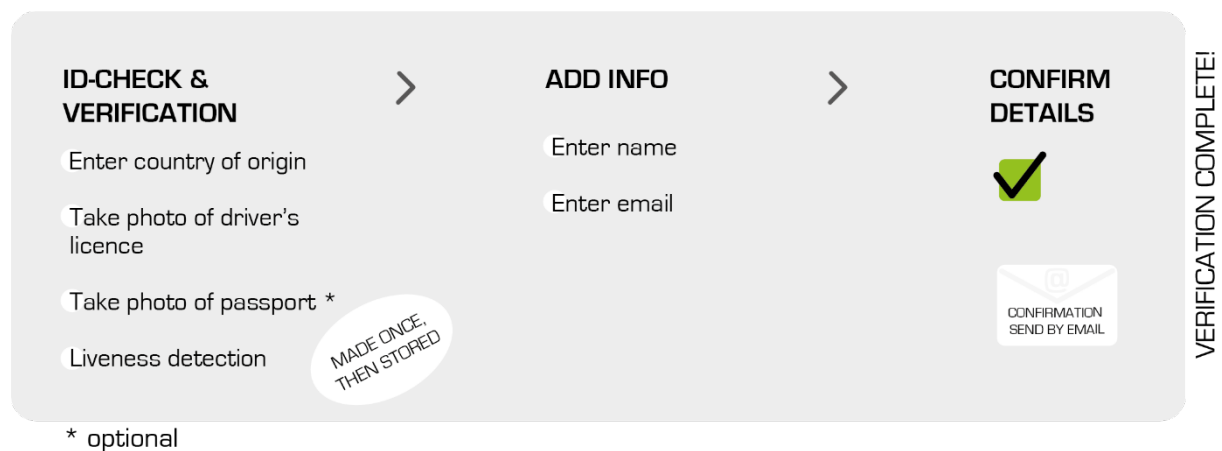


Figure 4: Illustration of the steps of the getting started process in the Drive & Go application.

The first step towards using the D&G service is to create an account. This requires entering country of origin by scrolling through all available countries where GMI is active, followed by taking a photo of the driver license and the passport. For Swedish, the passport photo is optional users due to an improvement proposal by GMS. To verify that the account is accurate a liveness detection test is made by taking a photo of the applicant's face.

After adding name, email address and creating a password one must confirm the details by ticking a box to complete the verification. A confirmation of the account is then sent by email. This step of the process, *getting started*, is only made once, the information is then stored in the application. It is also possible to add payment details which then are stored in the application.

BOOKING PROCESS

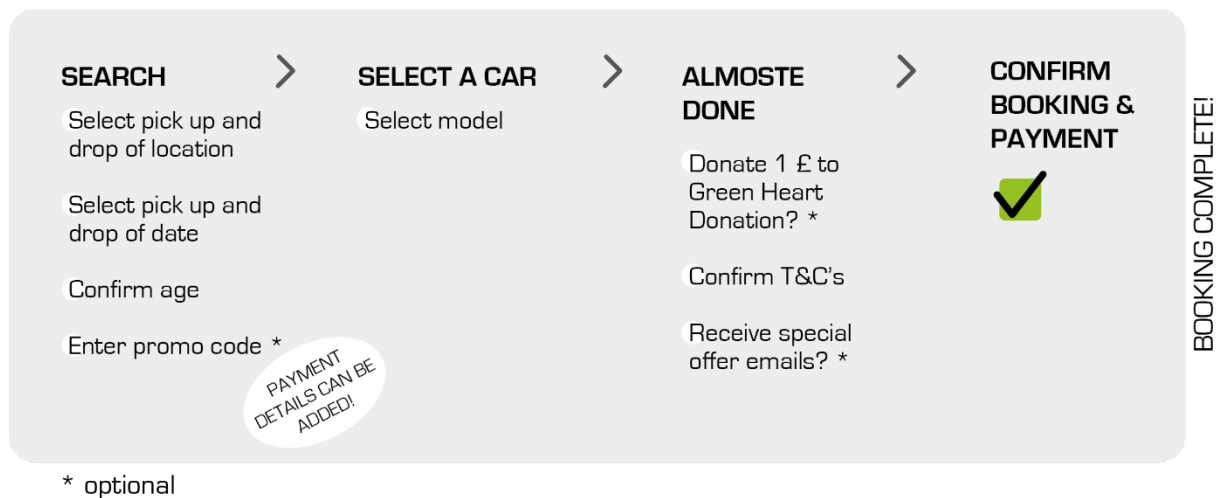


Figure 5: Illustration of the steps of the booking process in the Drive & Go application.

The *booking process* starts with a search for available vehicles by selecting pick up and drop of location through a search bar that lists closest available options. In Sweden during this project, the locations need to be the same in order to find available cars. After entering pick up and drop of date the users age needs to be confirmed by ticking a box. This step ends with the option to enter a promo code.

If the chosen location and date has available vehicles, the different available alternatives are shown in a list with a small picture of the car together with information about the specific models features such as for example number of car seats and if it is equipped with air condition or not. The preferred option is selected by marking the model and proceeding to payment.

Out of the blue, before payment, the question to donate 1 pound to the Green Heart Donation appears. This is part of GMI climate work that can be read on their website but in the application the information is rather poor. Then the terms and conditions should be confirmed by ticking a box and the option to receive special offer emails can be accepted as well. A payment alternative needs to be selected and then press the button to confirm booking and payment to complete the booking.

COLLECTING VEHICLE

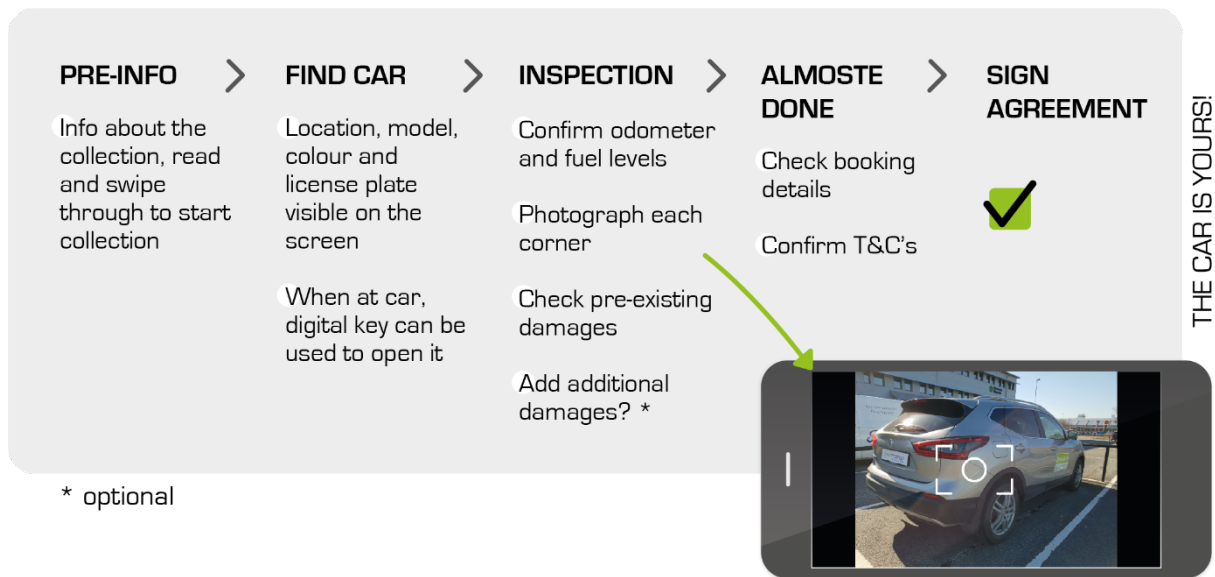


Figure 6: Illustration of the steps of the collecting vehicle process in the Drive & Go application.

One hour before the booking starts, information about how the collection of the vehicle will proceed appears in the application, which can be read and swiped through. It is then possible to start the process of collecting the vehicle by pressing the 'collect vehicle' button in the application. This will display the address of the parking lot along with a link to a map, a picture of the car model, its colour and licence plate. When arriving at the parking lot a digital car key appears in the application which can be activated and used to open the car door.

An important part of collecting the vehicle is to inspect the car. The odometer and fuel levels are verified by entering the driver seat, checking the dashboard, and stating the numbers in the application. The car's exterior is investigated and documented to ensure that the previous user gets responsible for eventual pre-existing damages, this is done by taking photos of the four corners of the car. The application shows already reported damages and if additional damages are found they can be added to the list by marking the placement on a drawing of the car, taking a few photos, stating the size and type of damage.

The inspection of the vehicle is followed by reading the booking details and confirming the terms and conditions of the booking by ticking a box. The booking agreement is signed on the screen of the phone by using a fingertip. After this step is done, the digital car key can be used to start the car engine and it is possible to drive away. During the usage, if any problem occurs or if the need to prolong the rental period appear the GMS support can be contacted through the application.

RETURN VEHICLE

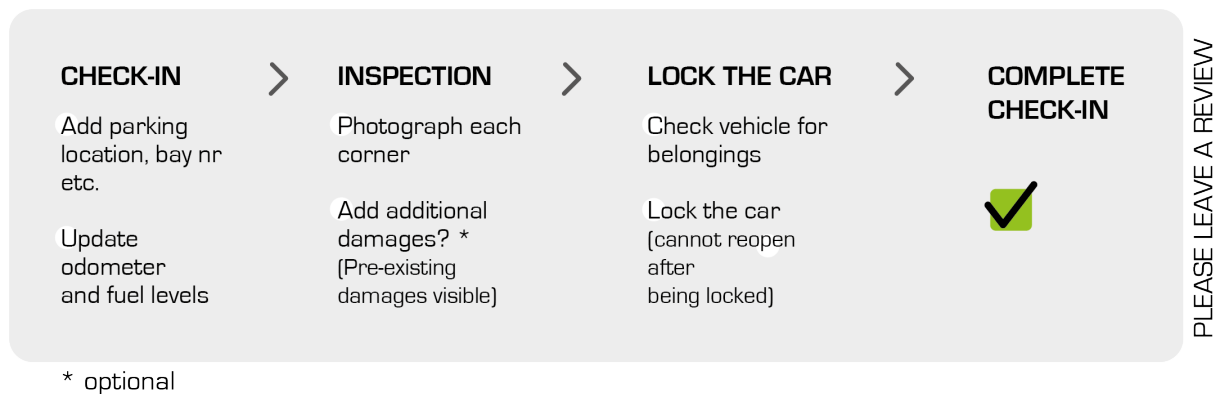


Figure 7: Illustration of the steps of the return vehicle process in the Drive & Go application.

When returning the car at the drop of location and the rental period is about to expire the option *check-in the vehicle* can be selected in the application which starts the *return vehicle* process. It starts with entering the exact drop of location, such as for example the bay number or if the drop of location is in a parking garage which floor number, followed by the odometer and the fuel levels.

An inspection, the same as when collecting the vehicle, is performed by taking a photo of each corner of the car. If any damages have occurred these should be added to the list by taking photos, describing the damage type and seize. This ensures that the right user is being responsible for eventual damages.

The car is locked via the application, but before closing the vehicle an encouragement to check the vehicle for belongings appears. When the car is locked it cannot be reopened! Note that locking the vehicle is not equal to ending the rental, in order to end it the *complete check-in* button should be pressed. When the process is complete a '*thank you for choosing GM*' together with a request to rate the experience and leave a review appears.

2.3 Conclusion

Both Holmgrens Bil and GreenMotion International are big, well-established companies within their field. Being part of them as a start-up means access to means and contacts that an ordinary start-up only would dream about, thus it is a great advantage to be GMS. The flexibility and security that access to recourses give, which enables GMS to participate in both small and big things, makes it unfair to call them a start-up, they are more of a re-branding.

GMS shows an interest in expanding their business in more than one direction and they do not seem foreign to the idea of acquiring different types of business partners, which could imply that they are curious on trying new things.

In line with RQ 1 and which market share that has the biggest opportunity of attracting users, the study will be based in the places where GMS currently conducts business. Since GMS conducts business at Holmgrens Bil and JBIL, two airports and a residential area, these areas should be further investigated. Regarding the airports, since self-service only is implemented at one of them, the investigation will only focus on Göteborg Landvetter Airport.

When it comes to RQ 3 and improving the user experience of D&G, it gets a bit complicated. It might be difficult to develop an application that should be optimized for the Swedish users and at the same time work just as well in the other GreenMotion countries. In addition, is it possible to combine rentals by the hour and traditional daily rentals in the application without making a change in the interaction or layout?

In addition, it is technically possible to make rentals by the hour via the application but there has been no change in the interface so far. Is it possible to combine rentals by the hour and traditional daily rentals without making an interface change and still provide the best user experience? The service needs to be tested in detail to investigate it.

3. THEORY

In order to understand the world of a car sharing company, knowledge about the different car sharing options and what other mobility solutions that are available is crucial. During the search, an upcoming transport phenomenon called MaaS was discovered, which will be explained in detail below. The possibilities and prospects aroused the idea that MaaS could be a perfect fit for GMS. However, a company is nothing without customers, and for GMS this makes car owners and mobility users a relevant research subject in order to get to know what their future-users desire, the traveller's request will therefore end this theory chapter.

3.1 Car sharing & mobility solutions

There are several ways of getting access to a car without owning it according to Alfredsson et al. (2019). When broken down according to who owns the car, there are different options: *P2P* (peer-to-peer), *B2C* (business-to-customer) and cooperatives. The segment that has grown the most lately is P2P, which is private owned cars shared with individuals. This type of car sharing mostly occurs via a company that provides the service between car owners and users, for short time usage. In the B2C case, a business owns the car and rent it, for long term or short term, to the customer which could be both a person and a company, this is usually referred to as car rental. In this master thesis however, the main focus will be on car sharing. The phenomenon cooperatives, are an association which is operated and owned by their members (NE, 2020a) and thus likewise the cars.

B2C could be car leasing, to an individual or a company and is divided between who has the main responsibility for the maintenance of the car (NE, 2020b). During a *financial leasing* it is the customer who has the main responsibility for the car contra an *operational leasing* where

the business keeps the responsibility. Car leasing results in an availability of car equal to a private owned car.

B2C could also be a *company based carsharing* (sv bilpool), which in this master thesis refers to cars that are owned by a business and distributed to a company and their employees. A based carsharing could also be distributed to a facility manager offering car sharing to the residents in the building, like GMS does in the Samset case (see chapter 2.1), and that it is called *housing based carsharing*. Finally, B2C could be a *taxi service, rental over counter*, through *self-service* or car rentals to individuals or companies through *insurance matters*. A rental service that deals with insurance matters provides the customer with a courtesy car while the customer's car is being repaired or in for service.

One-way and *roundtrip* are two different types of car rental services (Alfredsson et al., 2019). A car from a one-way carsharing can be picked-up and dropped-off at different locations within a specific area or a city, while a roundtrip carsharing means that the car has the same pick-up and drop-off location. The one-way carsharing requires more logistics and is not too easily implemented.

A collective phrase that could be used to describe all the above-mentioned ways to access a car is *mobility service*. Public transport and bicycle rental are examples of mobility services too, and there are even *micro-mobility services* which is a term to describe sharing services of dockless electric bikes and scooters (McKenzie, 2020). If combining several different mobility services under the same offer and distributing them to the users, there we have *Mobility as a Service (MaaS)* (Sochor, Arby, Karlsson, & Sarasini, 2018). The concept MaaS focus on the *transport needs of the user* whereas mobility services focus on a specific mobility mode (Sochor et al., 2018). MaaS is one of the future markets for *car access without ownership*, that is why it is of both relevance and interest to GMS and this project to delve further into the subject. In line with RQ2, joining MaaS could be a potential path for GMS and therefore more knowledge about MaaS is required.

3.1.1 MAAS: The transport paradigm

For travels between two locations within a city, the car is often claimed to be the fastest transportation mode (McKenzie, 2020) which causes increased traffic volume, and thereby noise and air pollution within the metropolitan areas. In addition, the majority of these trips are made by single drivers, which is not environmentally defensible in the long run. To find a solution to all these unnecessary car trips, the search for alternative modes of transport began, resulting in the concept Mobility as a Service, henceforth MaaS.

Due to the fact that MaaS is under development (MaaS Alliance, 2017) an established definition of MaaS is not yet available (Sochor et al., 2018). However, the term Mobility as a Service refers to a concept where the need of the user is in focus, offering different types of transportation modes that are accessed through a mobile application within a specific area (Geerlings, Shiftan, & Stead, 2012; Karlsson, Sochor, & Strömberg, 2016; Pangbourne, Mladenović, Stead, & Milakis, 2020). The revolutionary thing about MaaS is to book and pay different transportation modes through one application, either via a monthly bill or *pay as you go*. The transportation modes can be seen figure 8.

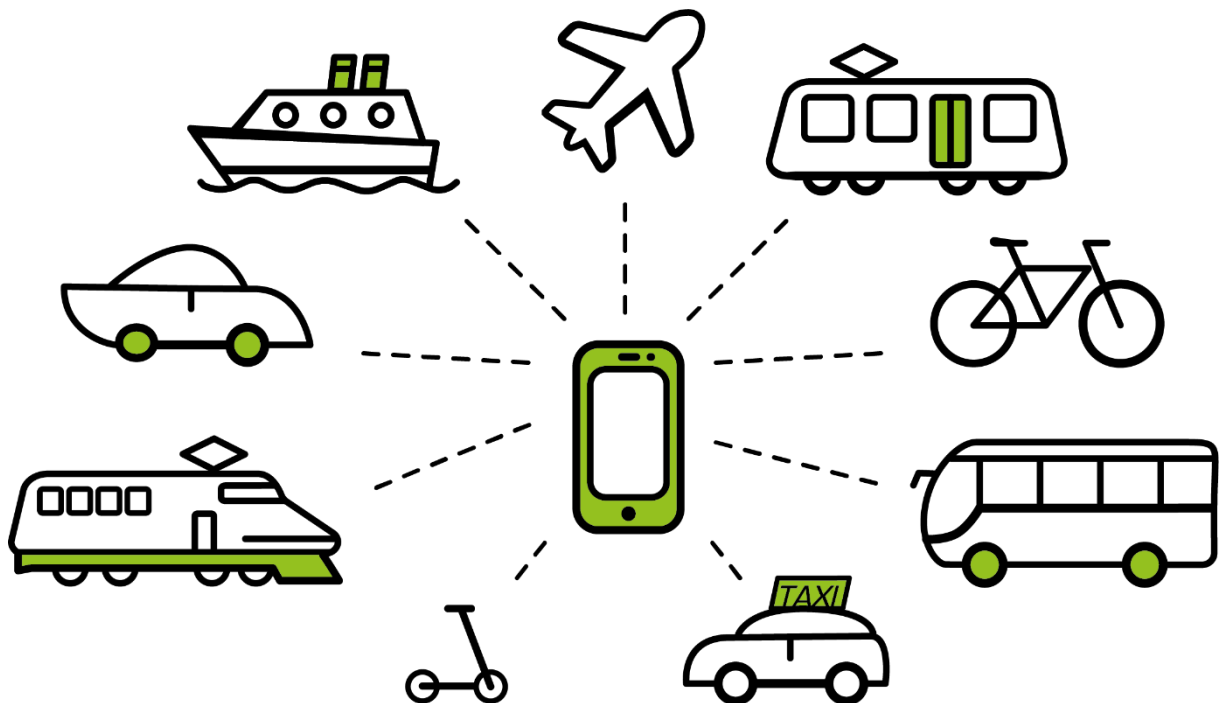


Figure 8: Illustration of the different transport modes that can occur in MaaS

MaaS provides the user with the opportunity to choose transportation depending on mood, travel time, location or for example the weather with the ambition to offer seamless mobility (Polydoropoulou et al., 2020) through the entire transport route by combining different types of mobility options. The bigger aim in the majority of MaaS-projects, within bigger cities, is to make private car owning unnecessary (Goodall et al., 2017) which according to Geerlings et al. (2012) could become a game changer for the environment.

Some trials claims that introducing MaaS will lead to a reduction of the private car use and ownership according to the general MaaS rhetoric's (Sochor et al., 2018). Other studies claim that implementing MaaS will only reduce the number of cars in circulation, however the number of kilometres driven will remain the same (Kerttu, Smidfelt Rosqvist, & Wendle, 2016). A third opinion is that MaaS will be driven by commercial purposes, and consequently attempt to maximise the usage (Bardhi & Eckhardt, 2012; Pangbourne et al., 2020). Even when not driven by commercial purposes, MaaS will increase the car usage among people who have not previously had access to a car (Kerttu et al., 2016).

The strength with MaaS lies within allowing the user to make unbiased choices when choosing transportation modes (Becker, Balac, Ciari, & Axhausen, 2020), which leads to smarter and thereby more sustainable choices. For the user this means saving not only money but the environment as well. For the society the positive effects by implementing MaaS are increased public health by increased physical activity, reduced noise pollution, and improved air quality as well as lowering the need for parking lots (Kerttu et al., 2016).

There are three main roles within MaaS (Kerttu et al., 2016). The first one is in this paper referred to as the *MaaS-operator*. The responsibility within this role includes marketing, user interfaces and customer service. The main task for a MaaS-operator is to present the different mobility services to the users as a joint offer. The second role is the *Platform-provider*, which main task is to make sure that the platform is functioning. The third and final role is the *Service-provider*. The main task is to provide their specific mobility service amongst the other Service-providers within the MaaS-operators service. If GMS would participate in MaaS they would be a service-provider offering car access to the user.

In Gothenburg, the public transport company Västtrafik is a variant of a MaaS-operator, offering tickets and scheduling for transportation by bus, bicycle, tram, train and boat. However, in order for Västtrafik to fully become a MaaS-operator in Gothenburg, and offering additional mobility services, takes capital, and a willingness to develop and adapt the service over time. These sorts of commitments take time and effort, political involvement and public administration (MaaS Alliance, 2017).

As mentioned earlier, MaaS is striving to provide the users with seamless mobility, by offering them tailored mobility alternatives to their individual needs (Becker et al., 2020). The implementation of MaaS during pilots shows crucial behaviour implications regarding car usage and car owning (Becker et al., 2020). The users in the pilots started using public transport and significantly reduced their car-usage. This suggests that MaaS is a successful solution for breaking the crucial role of car ownership.

Being a part of MaaS can be difficult for a car sharing company. It can be challenging and tricky to have a car fleet that meets the demand the whole day, the whole week, all year around. There will always be commute peaks, morning and evening weekdays around holidays and weekends (McKenzie, 2020). Car sharing companies must make a balance of how large car fleet one could have while also running a profitable business. When offering the user different types of mobility options the one selected will always be cannibalizing trips from the other options (McKenzie, 2020). This customer loss can from the service provider's point of view be seen as a factor to not participate in a MaaS-collaboration.

However, since MaaS is in its early stage and the majority of research is based on small-scale pilots MaaS in reality might be different. Theoretically, there are more advantages than disadvantages, but how MaaS is to be practically solved is still unclear. According to MaaS Alliance (2017), *'access and openness data, open APIs (Application Programming Interface) and more flexible transport and mobility regulations'* is what the further develop of MaaS is dependent on.

MaaS Alliance (2017) has discovered that regulations, legislation and technical issues are barriers hindering MaaS development, mainly through preventing the scalability of services. Further barriers are unclear regulations regarding the access and sharing of data, the distribution of funding as well as the lack of knowledge regarding MaaS. Additional barriers are how to establish trust between the partners and to make partnership between public and private sector work.

Whether the result of implementing MaaS will lead to a more sustainable way of travelling compared to the present system or not is still uncertain (Bardhi & Eckhardt, 2012; Becker et al., 2020). According to the literature read, the majority claims that MaaS provides environmental benefit nevertheless, in order to make noticeable system effects and thereby an environmental impact MaaS must replace the car through its service selection (Kerttu et al., 2016).

In conclusion, that MaaS is under development could be both a risk and an opportunity to participate in. However, GMS have great support in Holmgrens and GMI and the risk might be worth taking. MaaS tries to make private car owning unnecessary and that must be appreciated by a car sharing company. To have a big enough car fleet that meets the demand is a key factor, this will nevertheless always be difficult for a car sharing service no matter what GMS chooses to participate in MaaS or not. One advantage for GMS could be if they engaged in several different types of sharing services, had the ability to move the cars between the different businesses when they saw that the need arose. By being part of MaaS will provide an even clearer environmental profile and communicate sustainability towards the users. Thus, for GMS there are only pros to joining MaaS.

3.2 The traveller's request

In Sweden, owning a car is the norm, mainly because we live in a community structure that has been locked in car dependency for almost the past century (Becker et al., 2020; Naturvårdsverket, 2015). For some people it is a part of their personality to drive a specific car because it is a way of expressing identity and status (Quaglione et al., 2019). To have the car as a hobby or a symbol of high status is something that has followed through the years and is nowadays part of the norm. Getting this type of car user to express their status and personality through a rental car is one of the challenges for a car sharing service if aiming to reach this customer segment.

It is too easy to own a car in Sweden at present, which was claimed by Alfredsson et al. (2019) who states that it is both too cheap to buy a car because of subventions and too cheap to use it due to low marginal cost compared to other mobility options. In Norway and Denmark on the other hand, where car sharing is widespread and accepted, the cost of a newly produced car, the taxes and other costs regarding gasoline driven cars are much higher than Sweden (Alfredsson et al., 2019). The low marginal cost combined with the convenience of owning your own car results in Sweden being a difficult market to break through in and run a profitable car sharing service in.

The private owned car enables freedom of movement (Bayart, Bonnel, & Havet, 2018) which is very important for car owners, in fact, the need of total freedom of movement is the heaviest argument for car owning. Besides that, having access to a car increases the trips being made, it is also considered to be a security in case something happens, for example having to go to the animal hospital. Hence, being able to bring furry friends in the car is requested by pet owners when considering becoming a member of a car sharing service. In addition, the user needs to have access to the service around the clock.

The pursuit of fast and smooth mobility within the city leads to choosing the car over other alternatives (Quaglione et al., 2019). People strive to have fast and flexible transportation modes, and since travelling by car within a city is seen as one of the fastest way of transportation the car is often what they choose (McKenzie, 2020). In addition, owning and using cars is directly connected to income (Bröcker, 2005; Kunert & Lipps, 2005; Quaglione et al., 2019; Quinet & Vickerman, 2004). Whereas people that do not have access to a private owned car who are living in a residential area with low density and low household income travels even less (Bayart et al., 2018). The pricing of a car sharing service is sensitive and depending on which level chosen the service will attract different user segment.

There are mainly two types of users when it comes to mobility, one being the frequent user also known as the Power User, and the other one being a user that do not use a mobility mode that often, known as the Casual User (McKenzie, 2020). When designing a car sharing service that wants to replace the ownership it is important to create a service offering that considers the needs and requirements of the different user groups and thus attracts both groups.

Education, age, gender, and marital status or household compositions are factors that influence the extent to which the car is used (Quaglione et al., 2019). The number of trips made, the number of stops during the trip and the distance travelled are factors that differs. The more stops along the way a trip has, the greater likelihood that the car is chosen. Women tends to use public transport more than men (Bayart et al., 2018; Quaglione et al., 2019). The likelihood that a household with children uses the car instead of other mobility options are bigger than households without kids (Quaglione et al., 2019) and the same goes for people living in municipalities less populated. Men and households with children could be potential target groups, there, the company has to make a decision, when adaption the service, whether the primary goal is to attract a new type of user or focus on the user groups that already have the habit of using car sharing services.

People are generally curious about alternatives to their car ownership (Sochor, Strömberg, & Karlsson, 2014), and it is stated to be a strong motivation for trying out mobility services, however habits are difficult to break and as experience increases the curiosity decreases. When trying out a mobility service the factors that keeps up the motivation and makes the user continue using the service are financial or convenience (Polydoropoulou et al., 2020; Sochor et al., 2014). Thus, a car sharing service needs to create an offer that provide the user with this type of motivation.

The residential location affects the importance of car owning (Quaglione et al., 2019). For a user to give up car ownership requires easy access to car sharing and public transport (Sochor, Strömberg, & Karlsson, 2015). This include both the placement and the usability of the service (Karlsson et al., 2016). A user that lives closer than 200 meters from a bus stop (or tram stop) has a 75% likelihood to use public transport as their primary transportation option. A mapping of where most users can be reached is advantageous to do before the service is deployed, or alternatively to be flexible from the start and relocate the as the service is up and running.

The lesser stops or errands a trip back and forth from work has the bigger the likelihood that the user use public transport instead of car. The IKEA-trip often comes up when talking about situations when a car is acquired, because of the possible need of large-item-transport. A car-

sharing car could be used for those trips (Becker et al., 2020). This implies that shopping malls could be a suitable location for a car sharing service.

When it comes to the application that is used for a mobility service, it needs to have high functionality and usability (Becker et al., 2020; Sochor et al., 2014) combined with feedback and information suitable to change the users traveling habits. Users tend to over-estimate their travel demand which is shown different MaaS-trials (Becker et al., 2020; Karlsson et al., 2016) moreover emotional and cultural aspects seems to affect decisions regarding transportation (Quaglione et al., 2019). When given time for reflection, the user usually makes more sustainable and smart decisions (Becker et al., 2020; Cervero & Tsai, 2004). In addition, whether a user makes environmental friendly decisions regarding their travels or not depends on or is affected by how well-versed and enlightened they are in environmental matters (Moons & De Pelsmacker, 2012; Quaglione et al., 2019). This also goes along with how the shift from being a car owner to a car-sharing user often results in using the shared car lesser trips than they previously would have done, and instead they change to travelling with public transport (Cervero & Tsai, 2004).

During a MaaS-trial made in Gothenburg the participants wanted the service to include more transport providers (Karlsson et al., 2016). This contradicts with one of the interviewees who stated that by only working with one company per service led to more advantageous agreements, which thereby gave the users better pricing. The users also wanted the service to include not only the transportation within their city and back and forth to work, but also cover train and bus tickets when they visited another city or country (Karlsson et al., 2016). That requirement puts a lot of pressure on the MaaS operator managing a wide area or collaborating with other MaaS operators.

When introduced to a mobility solution that does not rely on, or is based on, car ownership the user is affected in several ways, however, the most important ones for a car sharing company to consider are highlighted below as key insights.

- Users are curious to try new environmentally friendly services, but in order to make them stay as customers a user centred focus with high usability is required to keep the users making informed decisions and it will keep the users to give up their private owned car.
- Education, thus knowledge, affects how well-versed one is in environmental issues, which thereby is reflected in which choices are made. There is also a

clear link between education and home economics which will affect how much money that can be spent on transportation.

- The pricing of a sharing service can only be higher than the cost of a private car if the service brings added value that outweighs the price increase. Depending on the pricing different user segments will be attracted, thus, knowing the intended user is key!
- This also applies 'be aware of who the intended users are', try to tailor service offerings that suit different user groups.
- The location of where the user lives and thus the proximity to public transport has bearing on how easy it will be to give up the car ownership.
- The user is demanding fast and flexible solutions that can enable the feeling of total freedom of movement.
- In order to reduce or avoid thresholds against using MaaS the service needs to be initiative, easy and smooth.
- Try to create motivation that makes the customer continue using the service.
- Subventions and low marginal costs make it difficult to run a profitable car sharing service.
- Sometimes requirements from one user group conflicts with requirements from another user group, therefore, a consideration must be made as to which user group should be given priority.

4. METHODS & IMPLEMENTATION

The project approach started out as the design process from SVID.se (2020) which consist of the five phases understand, define, ideate, prototype and test & implement. But after a consultation with the stakeholders in the project the GreenMotion case was claimed to benefit from more than good usability while using the D&G-application, therefore, a *service design* approach for the whole service was desirable. When getting introduced to Service Design and influenced by the mindset, the project approach ended up in a double-diamond and the methods used was chosen from a service design point of view. The following chapter explains what service design is, what the benefits of using it might be and how it is implemented in the methods.

4.1 Service Design

To illustrate what service design means, the authors of the book ‘This is Service Design Thinking’ (2010) have described a scenario with two coffee shops that is shown in figure 9 below.

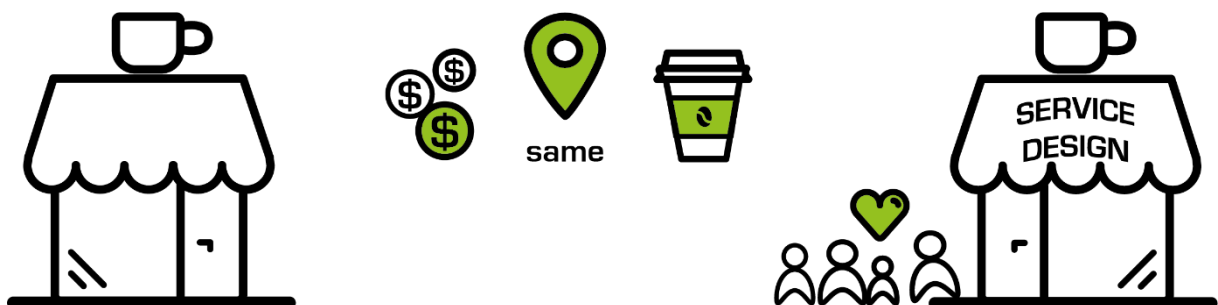


Figure 9: Illustration of what difference the use of service design can make.

The example states that when a customer is given a choice to choose between two equivalent products at the same location with the same price but from two different brands, it is the service design that determines which product the customer chooses. Service design or customer driven business development, is based on the five principles (Stickdorn & Schneider, 2010): *user-centred*, *co-creative*, *sequencing*, *evidencing* and *holistic*.

In order to create a successful service, a *user-centred* approach is crucial (Stickdorn & Schneider, 2010). By doing qualitative research and experiencing the service through the eyes of the customer a thorough understanding of the user is created. Methods used are for example:

- *auto-ethnography*, where the designer tries the service and experiences how it is to be a customer.
- *contextual interviews*, which is an interview made with the user in the investigated situation.
- *work along*, which is a method focusing on the employees at the company that offers the investigated service.

By including all parties around the service in the design process, added value can be created likewise the likelihood of increased loyalty of the customer and their continuing commitment (Stickdorn & Schneider, 2010). The starting point should be that everyone has the ability to be creative. Workshops or trials of prototypes are examples of activities that could be used for *co-creation* (Stickdorn, 2019).

Sequencing is about, almost like movie sequences, visualising all touchpoints of the service as interconnected events (Stickdorn & Schneider, 2010). This helps to divide complex systems into easily understandable separate processes, in addition, it highlights the interactions between the user and the company, including how it affects the user.

Though services often include intangible elements, it is important to make them noticeable to the user, it is called *evidencing* (Stickdorn & Schneider, 2010). This can be made by visualising them in giveaways or messages that could be both informative and appreciative. By doing this, the user experience of the service will be prolonged and the likelihood of a satisfied user increase.

The final principle *holistic*, is about seeing the bigger picture in order to find the actual cause of the problem (Stickdorn & Schneider, 2010). All the parts in the process needs to be validated and if the need occur, improved. This will enable the making of an even better service.

In addition to the five principles, Stickdorn (2019) has also, in collaboration with three hundred people from the service design community, written twelve commandments regarding how to perform service design. To summarise them, it does not matter what the process is called, service design or UX-design, as long as the things created make a fundamental change to the reality. In order to do that, it is crucial to understand the real issue, the root to the cause and find the right problem before jumping into solutions. When creating new ideas, they should be 'shitty first drafts' and then be prototyped and tried in the real context as soon as possible, partly to deselect bad solutions and partly to get closer to implement the idea. Finally, claiming that design always is a double-diamond, diverging and converging the problem image, in order to understand the bigger picture, it is important to shift between 'zoom in' and 'zoom out' to find details and understanding within the different 'zoom-levels' and thereby create solutions that makes a difference.

The core of service design is to know your target group and company values while delivering a good product which makes the customers desire the service. *Utility*, the functional level of what the service is offering the customer, together with how good emotions the interaction with the service brings the customer, *pleasurability*, and the *usability* of the service makes *desirability*.

4.2 Phase 1 – Get to know the problem

The most important output of the first phase was to thoroughly understand the problem. This was done by both knowing the past, the present and in some extent predicting the future. For this project, the focus was within the actors on the car sharing market, the mobility users and the company thus, the methods chosen were based on fulfilling that purpose. Before diving into how to improve D&G the research started with zooming out, investigating the car market at large and searching for everything and nothing regarding cars.

The research started with a twist of the method '*Netnography*' (Kozinets, 2015). The method is about getting to know users through internet research and was used two times during the first phase but with different purposes. The first round of *netnography* was used as a start-up for the project, mostly to read about similar services around the world, innovations, thoughts about MaaS and user insight about car owning and car sharing. The purpose was to get inspiration and ideas for the work to come because it gave insights about the bigger picture, a broader view of the service and market situation. The method was conducted by searching on Google and TED talks on YouTube, keywords used was '*car sharing*', '*car owning*' and '*urbanization*'. The phenomenon '*MaaS*' was spotted during the search thus expanded the search to include MaaS as well. The information was compiled in a *mind map* that was analysed and used as a basis for the planning report and background for the report.

In line with service design, to keep a holistic view of the GMS service, it was necessary to map the actors in the Swedish car sharing business, thus, during the second round of *netnography*, the search was focusing on the Swedish market. In order to gain knowledge about how users in Sweden used different services and what he or she thought about them, a Google search on different car rental and car sharing services was made. This also included reading reviews and forums from car sharing members.

A SWOT-analysis was conducted for each actor by investigating them through a web search: searching for '*biluthyrning*' (eng car rental), '*bildelning*' (car sharing), '*bil*' (car) + '*Sverige*' (Sweden) or different cities in Sweden. The gas stations in Sweden were mapped according to which company that offered car rental services. The actors at Göteborg Landvetter Airport were mapped out and prices were compared. Several car rental websites were visited and ranked according to how easy it was to find the acquired information. The method gave insights about how many actors there were on the Swedish market, what the company offered and to whom they were targeting, what the users thought about the company service and also

how companies responded to their customers when something went wrong. The output of this method was an actor map and a definition of the needs of car sharing users.

A literature study regarding mobility, MaaS, car history, car sharing in cities, and environment was conducted. The keywords used on the search engine Google Scholar and the Chalmers Library's website was '*MaaS*', '*mobility*' and '*urbanization*'. In total thirty-seven academic papers were read, both Swedish and English ones. The selection of papers was made by reading the abstract, and then deciding whether the content was appropriate for the project or not. The output of this method was a definition of MaaS and additional information to define the user needs.

To get a better understanding of the company GMS, an interview with the CEO at the company was held. The purpose of the interview was to provide information about how it all started, the company vision and goals, how the service works and the plans of the future. The interview was semi structured, with a few prepared questions and topics but the intention was that he would be able to speak freely during the two hours the interview went on. The output of this method was a definition of the company and additional information to the background.

4.3 Phase 2 -Find a direction

To find the strategic direction for GMS and D&G the different options had to be investigated. This started with making an actor map to get an easy overview of the Swedish car sharing market. The actors that offered similar services as GMS were categorized into four different areas depending on where they were operating. The strengths and weaknesses of the areas, depending on the actors, made it possible to map out where GMS was in relation to their competitors and highlighted possible ways for the company niche.

In order to create an accurate customer journey of the D&G-service, an *auto-ethnography* on car rental was conducted together with the CEO of GMS. This ensured that the *user-centred* approach in the service was not forgotten. The service was tried from downloading the D&G application and creating an account to making a booking, finding the car from the airport, to finally driving and parking the car. The CEO's involvement was mostly because the service was not fully released when the *auto-ethnography* took place, hence, he had the opportunity to help if something went wrong, or in the event of a bug in the system. Nevertheless, it provided insights about how the back office views the bookings and visualized from a user perspective how much technical aspects that are behind each car booking. During the *auto-ethnography*,

the car rental was monitored through the internal system on a laptop and the various steps was visible in the system. The purpose with the *auto-ethnography* was to experience the usability of the service and application and thereby get user insights and highlight possible areas of improvement. Furthermore, it was used for making a customer journey.

Since D&G at GreenMotion was under development and were not fully released when this project was conducted, some information could not receive by searching the web or trying the service at the beginning of the project. One of these issues was to map out the use chain for GreenMotions customer when using the D&G application. In order to perform that a request on the updated application files and information from the London head office GMI was requested, but unfortunately, the information was never received.

After reading papers on MaaS and realising the opportunities of GMS being a part of it, an urge to speak directly to the source appeared. Thus, began the search for people working with, or researching on, MaaS who could participate in an interview. A procurement journey was used as a basis for the interviews to make the interviews as similar as possible, regardless of if the interviewed was selling MaaS services or was researching in the field. Since all types of B2B collaborations is built on a procurement of some kind a procurement journey was made according to five questions that was predicted to need to be answer in a collaboration like MaaS. The questions:

'How do you find each other?', 'What do you want to get out of the collaboration?', 'What needs to be decided?', 'How to integrate two companies?' and 'How does the it work when up and running?'

resulted in five areas that became the procurement journey used in this project:

contact → negotiation → contract → implementation → in operation.

Depending on what the interviewed preferred according to personal contact, interviews were held through Skype, via email, over the phone or face-to-face, in person. The interviews were transcribed, and insights and key notes was compared between the different correspondents in a KJ analysis and then compiled into one list of guidelines. The purpose of this method was to gain insights about what MaaS operators would require or wish for from a car sharing company service in order to consider making them a partner. The output was a list of guidelines which were used as a starting point for the next phase.

4.4 Phase 3 -Follow the direction

To follow the direction is about making sense of the compiled findings and transcribe them into feasible solutions. It was done through a three-hour intern co-creation session that was the main activity during this phase. The co-creation took place at the Holmgrens Bil and GMS headquarter in Jönköping, Sweden, with employees from GMS, working at different departments of the company. The co-creation started with questions regarding flexibility, habits and communication, keeping a zoomed-out level on the topic. The level then changed to zoom-in during the main event, to conduct a customer journey, to fully focus on D&G. The participants started by working in pairs and creating a customer journey for the 'main' customer, ordering through the D&G-application. Then they presented the result and compared notes, and together made a joint customer journey. Afterwards followed a Swedish Fika meanwhile they were asked to consider if the journey would change if the service was used through a MaaS-operator and in that case how, then they shared and discussed their thoughts in the group.

The purpose of the workshop was to analyse the business model and service, and discover areas that needed improvement, and what it was specific in that area that needed to be improved and why. Furthermore, to come up with solutions and ideas on how to fix them. The output of this method was a list of areas of potential and challenges which was used as a basis to make an improved service.

4.5 Phase 4– There yet? Oh yes!

This phase is all about prototypes and testing. Iteration is key in all design processes, therefore, to test, improve and verify the solutions prototypes needs to be done. The solutions created at Holmgrens headquarter together with all of the facts that were received during the course of this project were taken into consideration and combined into solutions that was considered suitable within the framework of GMS. They were then put into context by making digital prototypes in order to be able to verify them.

The first one to be created was a digital version of a new and improved customer journey of the service. The customer journey contained a collection of improvements of various degrees, changing the service on a holistic level. The journey was illustrated in the vector program Adobe Illustrator and then inserted in a PowerPoint which made it possible to swipe through the various steps of the journey.

The second solution was a combination of some re-designs of the application together with some potential future add on:s which resulted in an improved version of the D&G application. The icons from the existing D&G application was created in Adobe Illustrator and then inserted in Adobe XD which is a program that can be used to creates interactive prototypes. This enabled testing of fictitious bookings and gave a better overview of the flow between the different frames.

The final solution was a suggestion on an interface for a search bar for rentals by the hour. The prototype was created in Adobe Illustrator and inserted in Adobe XD but it never made it to become interactive prototype. Instead it was validated as a picture.

Nobody is perfect and nor is an untested prototype. To test and refine the solution, the three solutions was validated by ten people with different vast knowledge in the area of car sharing, some were potential users, and some had expertise knowledge within the topic. The validation was carried out through storytelling of a car rental scenario. During the test, questions and feedback was collected and compared. Afterwards the result was analysed, and adjustments were implemented before stating the final concept of the journey.

5. FINDING THE STRATEGIC DIRECTION FOR GMS

In line with the first research question, and to find a strategic direction for GMS, the car sharing market was investigated by mapping out the actors. The results are shown below.

There are plenty of companies that engage in car sharing or car rental. Their offer is more or less equal, what differs is who owns the vehicle and how long their primary offered rental period is. During this project 27 services have been noticed; they can be seen in figure 10. Three of these was research projects, three appeared along the way and at least three of them disappeared during the past year.

Despite the large number of actors, no one seems to be able to fully replace car ownership. Some of the actors are located too far away from the users, making them cumbersome to use. At airports, on the other hand, the players are placed next to each other, which creates high competition for users. Some actors have a bad reputation because they are considered to charge damages several times by different users, others are considered to be too expensive.

5.1 What is everyone else doing?

The illustration below of the market analysis, figure 10, shows the actors that were found around the three largest cities in Sweden, Stockholm, Göteborg and Malmö, and the Göteborg Landvetter Airport. The actors were divided into four different areas according to where they were operating, thus the investigated areas in RQ 1 was expanded to five by including car sharing through a property manager.

As previously mentioned, (see chapter 3.1) there are different types of car sharing, for example: cooperative, B2C, P2P, roundtrip and one-way. In this study however, cooperatives were excluded due to that they have a very local distribution. The possibility that the cooperatives would merge into a large joint cooperative, take over market shares and become a major competitor were considered to be relatively low.

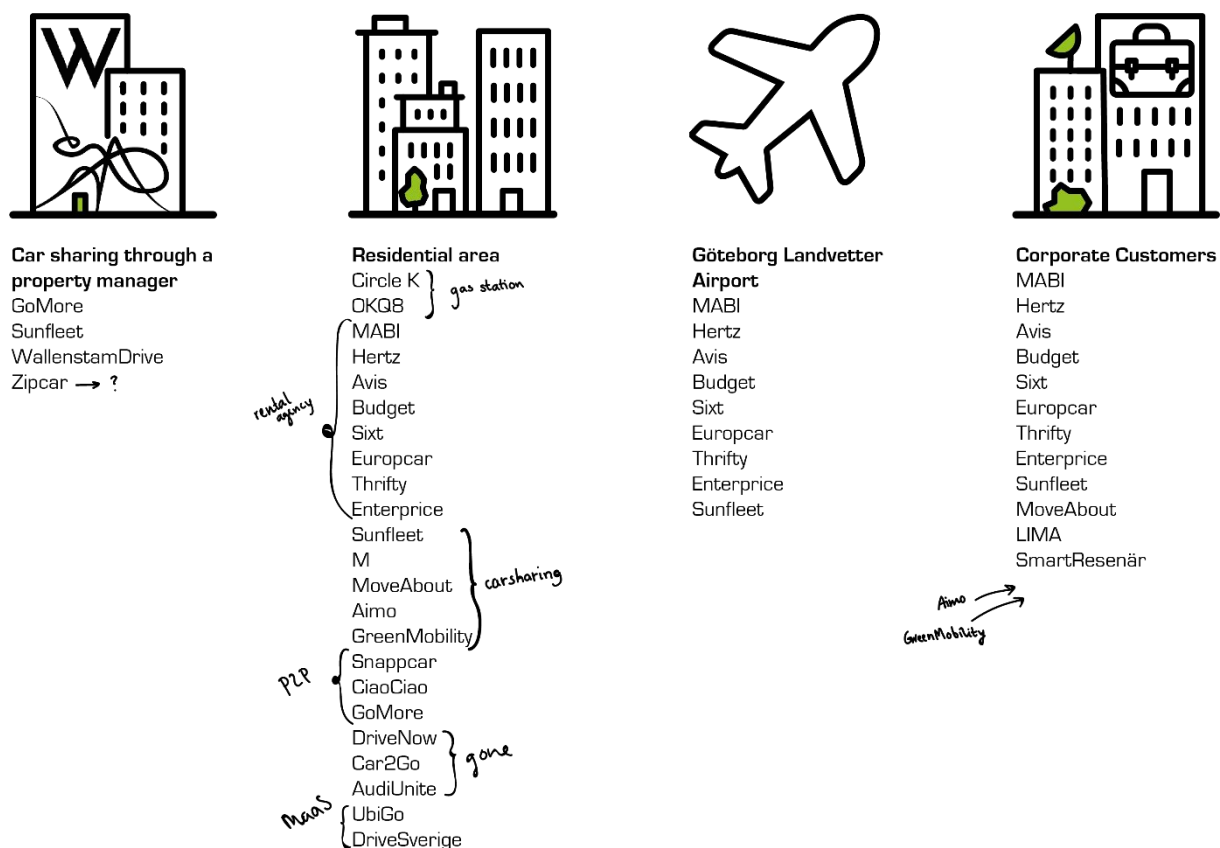


Figure 10 - The illustration of the market analysis shows that the majority of actors can be accessed through the residential area.

5.1.1 Residential areas

In this paragraph, residential areas refer to a densely populated area, with either apartment complexes and/or villas. This area offered the most rental options of all areas investigated, predominantly from the most common rental agencies followed by the car sharing companies, both established and rookies. All the rental options differed according to how easy to access the service was, however, that depended entirely on where the user lived. For example, a gas station is often not located next to the homes in the middle of the city centre but can be located right next to a housing complex on the outskirts of the city.

The car needs of the area are characterised by slower and more flexible decisions. The rental period varies from an hour to several days, mostly during evenings and weekends.

DriveNow (BMW & Sixt), Car2Go (Daimler & Mercedes-Benz) and AudiUnite (Audi) three big car sharing trials from car manufacturer, similar to D&G, was released in Stockholm during the past years and had recently discontinued its operations, marked *gone* in the illustration above. The main challenge regarding residential areas was the great competition for the users. Another issue could be that it would be hard to reach out to the users and that the advertising costs could be very high without receiving dividends from it in the form of new users.

A rising number of actors that were found was only focusing on P2P. These companies might gain market shares over the years to come. However, if reasoning that private car ownership will decrease in the cities and car sharing will increase these companies will not be competitors to GMS in the long run and were therefore excluded in the further analysis.

A big potential in the area was that the car sharing service Sunfleet will be replaced by M in the bigger cities of Sweden while the smaller cities will be without service, leaving a market share with users that has both the habit and the need of car sharing. Not to mention that everyone lives in some sort of residential area and therefore the potential market was considered to be large.

5.1.2 Airport

In connection to airports, there are usually car rental companies, mostly targeting tourists and officials. All the big car rental companies were found on Göteborg Landvetter Airport, together with the biggest carsharing distributor in Sweden. The car needs of the area were characterised by an urgent need. The users at the airport were often in a hurry, wanting a quick and easy option. The rental period differs from one to several days. The area had a customer flow throughout the day that could consist of both domestic and foreign users, thus making accessibility requirement both in terms of language and time. To have a steady stream of users was seen as a potential, combined with GM in other countries launching D&G creating recognition and a greater chance for GMS of getting users.

To ensure customer support around the clock was seen as a challenge, however, the solution to the problem was considered more of a procurement issue of support agreements than a design problem. If disregarding any lack of internet connection on the aircraft which can affect the possibility of making a booking, the main design challenge within this area was application development maximizing the usability and review the signage for maximum clarity while at the airport.

To introduce D&G and thereby self-service at an airport was however considered to be a service that managed itself and it was therefore decided to not investigate the area further.

5.1.3 Corporate Customers

Many jobs require business travels; therefore, some corporates offer car access to their employees by purchasing the service. For example, it can be access to a rental car or having a company based carsharing adjacent to the corporate's premises. The customer towards the car sharing company would be the corporate whilst the user would be the corporates employees.

When providing a company based carsharing for a corporate and their employees the main difference between private users and employees was where the bills were sent. The company pays trips during workhours and private trips will be paid by the employee. The car needs of the area are characterised by trips during office hours.

The challenges found in this area were that the usage of the cars was low or non-existing during the evenings and weekends. On the other hand, the potential was that the corporate

pays a monthly amount for the service whether the frequency of use, hence the distributor of a car sharing service gets a steady income. The area on its own was however not considered to be interesting enough for further investigation. Having said that, if the service target corporate customers combined with residential users, the occupancy of the cars could be optimized. The decision was taken that the possibility to distribute the service through a MaaS-operator that operated in both areas could be an interesting option hence to be further investigated.

5.1.4 Property manager

Car sharing through a property manager means that the property manager negotiates an agreement with a car sharing distributor and then offers car access to the residents in the building.

The characterised car needs of the area was the same as for the residential area. What could distinguish was how to access the service, some accessed it through the property managers webpage and others through the service's own channels.

The challenges considered was to contact and make agreements with the property managers. As a newcomer to the market, it could be difficult to establish the confidence needed to convince an agreement. Having said that, the potential was that the service was visible to anyone who lived at the property, creation a recognition factor.

In order to improve the service within this area and meet the property manager's needs, a review of the business model and how the offer should be packaged will be required. The area was considered as interesting but not to be further investigated.

5.2 GMS is active here!

In addition to the areas where the actors were found an analysis of car sharing at Holmgrens Bil & J Bil facilities was made.

5.2.1 Holmgrens Bil & J Bil facilities

Both Holmgrens Bil and J Bil conduct car sales and also car service from their facilities. Customers who hand in their car for service may need a courtesy car during the service, because of these customers a car sharing agency on the premises is acquired.

The term car rental would be more accurate at this area, because the car needs of the area are characterised by being insurance matters. They are usually a lengthy process both in terms of the processing time and the rental period. In addition, the rental service is only available during office hours.

The rental service has the potential of being offered as self-service through D&G, and thereby giving the personnel time for more important things than handing out car keys and managing bookings. The main challenge with implementing D&G will be a technical issue, mostly about getting information about the customer from the insurance company and then be able to send out a confirmed booking which the customer can get access to via the application. The area was decided not to be investigated further, however, car sharing through the facilities was considered to be accessed through the residential area.

5.3 Conclusion

In conclusion, see figure 11, GMS and D&G could reach the biggest market share if distributed at residential areas, however keep in mind that the utilization during a week might be irregular which makes the need for additional user's segments is required. The service distributed at Airports and Holmgrens Bil & J Bil facilities works well enough by itself without further development. Moreover, no matter which area that is improved, it will mean an improvement for the users at this area as well. Corporate customers had a service utilization mainly restricted to business hours hence the need to combine the area with more areas to maximize the occupancy.

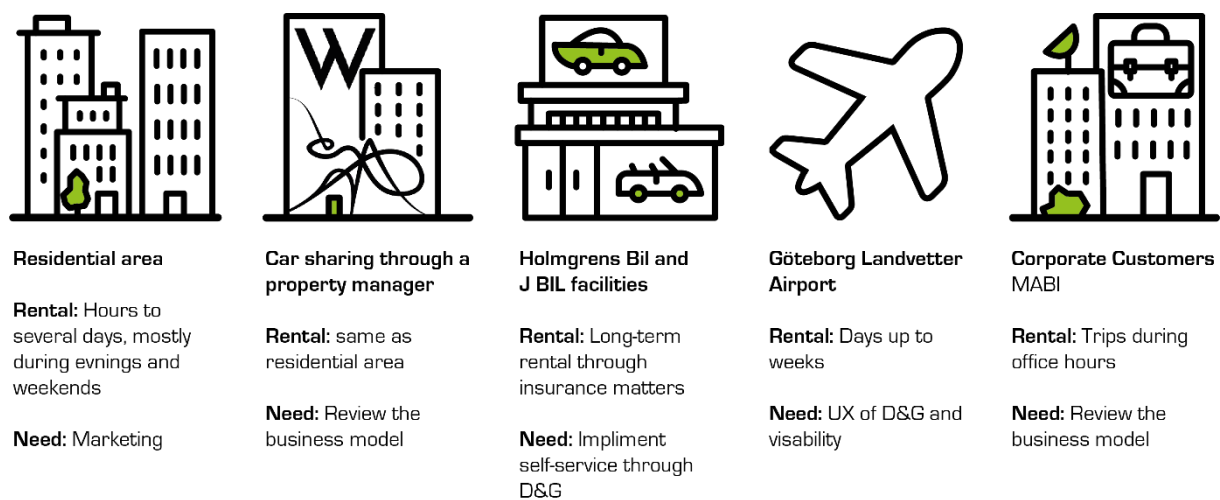


Figure 11: Illustration with a summary of the area's characteristic rental forms and what the area need to focus on in order to be improved.

The strategic direction for GMS, in order to maximize the utilization rate of the cars, should be to become a car-supplier to a MaaS-operator. D&G would thereby reach both residential area and corporate customers, through the MaaS-operator without having to chase users by themselves. That could include that the service will be acquired by property managers and hence the service reaches that area too. Thus, RQ 1 is answered with GMS reaching, by being a part of MaaS, the most users in the areas: Residential areas and Corporate customers.

The decision was taken to investigate how GMS's service could be developed in order to best function if distributed through a MaaS-operator, see figure 12. The car sharing market is, as previously mentioned, a tough market to enter with high competition and small margins. To participate in MaaS strengthens the brand awareness among the users. In addition, GMS also avoid paying for expensive advertising campaigns. By being a part of Holmgrens Bil it might be easier to be perceived as credible, thus easier to conclude advantageous agreements that reduce turnover costs. Finally, a big advantage for GMS is the opportunity to distribute their services through Holmgrens Bil and J BIL facilities, which provides access to both offices and personnel.



Figure 12: Illustration of how GMS by participating in MaaS reaches both residential areas and corporate customers.

6. HOW TO BE A GOOD CAR-SUPPLIER

This chapter describes the results of the interviews, showing an optimistic and positive side of MaaS, and on the other hand a realistic, complex, and costly process with several companies trying to collaborate, see figure 13. The result was summarized according to the procurement journey, and as general thoughts regarding being a car sharing supplier to a MaaS-operator. In addition, a list of guidelines is presented in the end of the section. Furthermore, the reflections from the auto-ethnography and the output of the co-creation will be shown followed by the challenges and opportunities regarding the current customer journey.



Figure 13: Illustration of all the parties that are involved in a real life MaaS project.

6.1 The interviews

According to the interviewees, in order to understand the collaboration between the actors within MaaS, it is important to understand that MaaS is still a new phenomenon that rely heavily on social contacts. MaaS requires new forms of collaborations between several different actors who have little or no experience at all of collaborations. Therefore, the work process needs to be flexible and adaptable. It was also stated that it is not all about the application, instead the main focus should be on the service that were provided.

The procurement journey that was made as a basis for the interviews can be seen below in figure 14. One of the interviewees said that it was difficult to see the collaboration as a procurement journey and stated that no one knew that it would be a such complex collaboration that required new business models. There are several different types of companies that needs to be involved for MaaS to happen, companies that usually do not work together because they operate in totally different industries or are competing for the exact same customers. The key is to make these companies get satisfied enough to come to a deal, which is to sign a contract. The complexity of the contract is mainly due to that the profitability must outweigh the distribution of responsibility and risk at the same time as the groundbreaking service demand the contract to be flexible and developable. Furthermore, the result of MaaS is considered too unclear and that it is hard to predict the outcome in advance and how it might evolve. Therefore, collaboration and collaboration models are at the heart of MaaS whereas iteration is claimed to be key in MaaS-collaborations.

Procurement journey

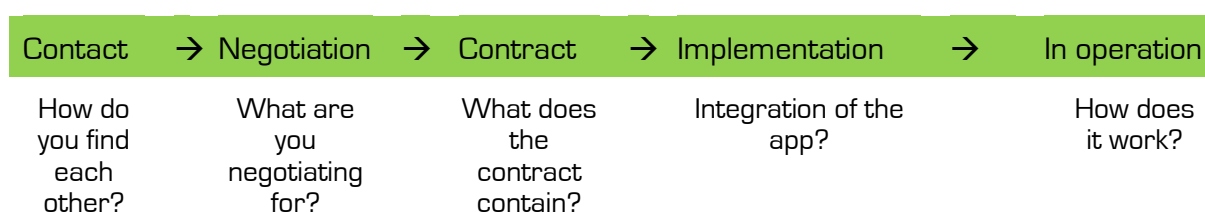


Figure 14: A chart of the procurement journey used during the interviews.

6.1.1 Contact

During an interview with a MaaS-operator, insights about how difficult it was to be a pioneer in the field was revealed. For MaaS-operators, the main issue was to convince other companies to become partners and allow their services to be used through the operator's service. That was usually why the operators sought out and contacted potential service distributors or partners. The return of investment was seen as too long versus the benefit of learning the business model which was the reason why companies did not dare to invest.

During MaaS-trials, the companies were more inclined to want to be involved. This was mostly due to the fact that research money was involved and that the risks were not considered as high in research projects. However, the reluctance to cooperate with companies that was considered inferior or less developed was particularly evident during an interview with a car sharing company and would thereby be a reason not to participate. The car sharing company did not believe that a cooperation would be beneficial enough for the own company but instead gain the competitors that participated, and a feeling of giving away sensitive information was uttered. Likewise, would the fear of losing control over the own service, sharing profits and the marketing of the service contribute to not wanting to participate. However, this is the premise for collaborating on a project, which makes it difficult to avoid.

It is both costly and time consuming to be a part of a research project, especially if being a small company under development, if the collaboration only seems to be beneficial to the other parties the reluctance of participating is too big. Having said that, getting connected to other types of services that complemented the own service and getting new user segments was claimed to be what persuaded the most to join MaaS.

Finding the perfect MaaS partner was claimed to be difficult, characteristics that were sought for were curiosity, having the right attitude, the desire to participate, the ability of being flexible and the understanding of that some things needs to change and develop. Additional features that were considered to be good to have were a healthy mind, good business ethics and a good intention.

6.1.2 Negotiation

The process of MaaS-collaborations was not easily overviewed in advanced. Therefore, in order to create successful MaaS collaborations between operator and suppliers, there must be a close cooperation, an open discussion and an open mind. The main issue during the negotiation, was how to divide the financial risks and the responsibilities between the parties. Who got to access the user's data and who got to use the information in marketing purposes were further topics discussed. Negotiation was stated to be a discussion that required rhetoric, but it was also about getting to know if the interest and resources required existed.

6.1.3 Contract

Because there are so many actors involved in MaaS, which makes it very complexed, completely new types of collaborations are required. What an ideal collaboration should look like is far from clear and will need to be developed over several years to reach its full potential. This obviously affects the writing of the contract.

Fixed contracts were considered as difficult to write because iteration was the key in MaaS-processes. The contract therefore needs to enable iteration of what had been determined. It contained aspects that one wanted to agree on, i.e. what level of service, what time, how to cooperate and financial agreements.

One interviewee pointed out that the contract was more of an agreement, claiming that an agreement was more flexible. Another interviewee called it an innovation procurement which was written according to the best of their ability but with a reservation that it was a start-up and that the terms might shift.

6.1.4 Implementation

To integrate services was told to be a very expensive and time-consuming process and considered as a big problem and a main challenge when a service would be implemented. There was no standard for what the integration would look like and there was no ready solution for how it would work yet. Regardless of the aforementioned, an easily integrated API would be desired.

The integration of completely different types of services that would work in an application, where the common denominator was transportation, should not be that hard but according to an interviewee the main reason was lack of commitment. In an optimal collaboration, the various services should be as synchronized as possible. Hence, a mobility supplier must be careful to not lose functionality of the service due to that it will be used via a MaaS-operator.

6.1.5 Up and running

In addition to that iteration was considered a key factor, the ability of collaboration was also stated a key issue. When running a MaaS trial the main challenge was that there were many actors who all wanted to get their will through. Additionally, the collaboration was said to be about mutual trust and a desire to develop.

The customer recruitment costs were stated to be ridiculously high which could be explained by that it takes time to understand how to use the various services, and that the adoption process was considered complex. The service must appear as a real service and perceived as if the company behind it had a long-term perspective, especially if it for the user is about giving up or not buying a car. The user needed to be able to trust their alternative.

A risk that was highlighted by a car sharing supplier was that when doing ongoing deliveries, as it is within MaaS, the control of the user experience was not made, moreover, lost contact with the user and no feedback. From a service design point of view, such an approach would be catastrophic, at least if one wants to create and convey the best possible service towards the user.

People were claimed to be habit-driven and in order for MaaS to get people to give up their private cars, MaaS would have to offer an equivalent/corresponding service that was flexible without sacrificing simplicity. From the user's point of view, the questions regarding how their data was handled and who had access to it was important in order to be able to trust the service.

6.1.6 How to be good

To conclude this chapter the most important insights are summarised below.

- To be flexible and open-minded is desirable.
- The contract needs to enable iteration; thus, the company need to be flexible.
- The field of MaaS is young and unfinished, there should be a clear distribution of the risks.
- Beware, there is a risk that the user focus will be lost along the way in terms of usability and user satisfaction.
- To implement the service in the application or not depends on how the service is built.
- The service provided must be easy to use and easy to access.
- How a MaaS-operation in reality works is an iterative process.
- The core of a successful MaaS-collaboration was considered to be in the service and contract innovation rather than services and applications.

6.2 Trying out Drive & Go

While the previous subchapter addressed the theoretics around how to be a good car supplier from a MaaS-operators point of view, this section will address the topic from a users' perspective. Since the access of available subjects was limited and D&G, not fully up and running in Göteborg at the time this project was conducted an auto-ethnography in line with the *user-centred* approach in Service Design was chosen to be suitable.

The auto-ethnography at Göteborg Landvetter Airport was operated by the CEO of GMS who made it possible to monitor the process through a computer, which gave insights about how the back-office views and handles the bookings and provided a wider view of the process. The reflections regarding the auto-ethnography is divided into the course of events shown to the left of the text below.

Download app

During the search of the application it was discovered that it was not named after the service *Drive & Go* which caused confusion. Moreover, the application was expected to be in Swedish but was only available in English.

Create account

When creating an account, some of the menus that had to be scrolled through felt ineffective and the slightest misprint forced a redo. There was a bit of a struggle to get the face recognition to confirm the face with the passport photo during the liveness detection test.

Book a car

To make a booking was a smooth process. For a brief moment it was perceived as every booking required a one-pound donation to the Green Heart Donation, because the calculator had added one pound to the fee. That said, when clicking forward to the next slide it was shown to be an optional decision to donate. Moreover, the payment took care of itself without being noticed. Money was withdrawn from the account, much like using a subscription service, which was interpreted as convenient

Find car

There were no signs at the airport indicating that GreenMotion was available as a car rental option. However, there was an address in the booking confirmation in the application, yet in order to find the location of the car, a search on *Google Maps* was necessary.

Open
car

At first, when the car key was received in the phone it did not work properly. In a later troubleshoot, it turned out to be an old version of operative system in the phone that triggered the problem. Inspecting the vehicle by taking photos from the four corners and comparing pre-existing damages with the damage sheet was considered to be a nicely designed process that worked well.

Drive
and park

The experience of using the car was positive due to that it was a brand-new vehicle. The car had all the conveniences that a newly produced car was expected to have, but the rear-view camera was considered an extra nice feature.

Return
car

The process of returning the car was perceived as easy, however some confusion occurred due to that the procedure is called 'check-in', clearly not named from the user perspective. The vehicle was returned with the thought that *'I want to try this service again, but for real'*.

One question that came up was how many percent phone battery that was required at minimum in order to complete the process and lock up the car where a charger was available. Another thought was how to take pictures if the phone camera was broken or if it due to weather conditions or bad lightning was difficult to take pictures that reflected reality.

6.2.1 Conclusion

The application needs an update with consistency regarding language and naming. As a suggestion the application should have the same name as the service. A further investigation of the interaction in the application is acquired. There are a number of areas for improvements which, if remedied, would create an even better user experience. In addition, to identify oneself through passport and facial recognition felt outdated. Anyway, even though there were many steps to go through, it was not perceived as time-consuming and did not feel difficult to accomplish.

Since D&G was not fully released, it is not so strange that the visibility of the company was poor at the airport, but the importance of being visible can still be good to keep in mind for the future. The message about the Green Heart Donation needs to be clarified and strengthened even before the user enters the application to make a booking. The information should be available in Swedish through GMS's own channels.

A question that needs to be answered is if the primary goal with developing this application is to be the best possible for the car sharing in Sweden and rentals by the hour, or if it should be developed for counterless traditional car rental for the rest of the GreenMotion franchise.

6.3 Co-creation with GMS

While the project had proceeded and insights had been gained, it was time to involve the company and see how GMS respond to the gathered information. In line with service design and also to get help from them to create solutions a creative workshop was conducted. This paragraph will address the insights and solutions produced during the co-creation that could be applicable to GMS and D&G.

The co-creation was held in Jönköping at the Holmgrens Bil headquarter where GMS have their office, the CEO and a number of key personnel within GMS were present for just over 3 hours. The session gave the opportunity to get to know GMS' views on the findings collected so far, their reactions to different scenarios and their opinions on car sharing in general. In addition, it provided insights into how open-minded GMS are when it comes to start new collaborations or to tweek their business in one way or another.

During the workshop different scenarios were analysed which highlighted various technical solutions or possibilities. One scenario was that D&G was offered as a service similar to '*Styr & Ställ*' in Göteborg where rental bicycles could be picked up and left at various stations around the city. A solution suggested was that through discounts or offers control customers' use and travel plans to facilitate logistics around the cars and thereby avoiding that all cars were gathered in one place. This solution was said to require cooperation with those providing the parking spaces, but also the opportunity to obtain free parking spaces, for example, outside grocery stores.

In order to be able to offer a flexible service where there was a possibility to park at any place within a specific area, cooperation with the municipality was proposed. This could be made possible through subsidized parking spaces distributed by the municipality appropriated earmarked for carsharing vehicles.

Error management was considered as an area that required improvement; at the same time the solution was considered to be purely technical in nature. And therefore, no further solutions were created. Getting users to find GMS and D&G was also a problem that was highlighted. However, this was explained by the fact that the application D&G was not yet complete and therefore there was no reason to market it when wanting the first impression to be on top.

Another thought that existed was the risk of parking fines and the problem of sending the right parking ticket to the right user. If the parking cooperation with the municipality already

existed, it would be conceivable that a wrongly parked carsharing vehicle was not fined, but instead moved to another location. This idea was then waved away as it was considered to contribute to all carsharing vehicles therefore being wrongly parked in handicapped places and the similar due to the laziness of the user.

The co-creation made it clear that there were many plans that were put on hold due to the corona pandemic. If the situation were different, GMS would not have been unknown to the inhabitants of Sweden and information had been found on the internet and advertisements.

6.3.1 GMS <3 MaaS

The participants were asked about their thoughts regarding a collaboration between GMS and MaaS and the opinions were unanimously positive. They stated that such collaboration, by joining a niche service where the users already had the habit and the need for flexible mobility, would significantly increase both the availability and visibility of D&G. 'The more inputs to the service, the better'. One participant expressed the idea that mobility plans for new housing constructions love the 'MaaS thinking' and that it would be the solution for future construction and housing.

By participating in MaaS, GMS saw the opportunity to combine car rental and car sharing, in addition to have subscribing customers who brought a continuous source of income was even better. From a technical point of view, it was considered challenging to have full integration into the MaaS-application, but since an integration was already made with *Expedia.se*, this posed no major problems but would rather facilitate integration with others.

When asked about what was preferred, the MaaS operator using its own application or forwarding to D&G when the user wants to make a booking of a car, it was considered better if the user was forwarded from the MaaS-application to the D&G application, due to the increased brand awareness that would follow. In the long run this require that the D&G-application could be able connect multiple users to the same payment account since some of the MaaS trials implies that the whole household should be able to have a single joint account and one monthly bill. However, the technical solution that is required for D&G was said to be under development and soon to be completed.

6.3.2 GMS in Ten Years

When given the question ‘What do you think will happen with GMS and D&G in ten years?’, ten years was considered a very long time in digital development and much would certainly have happened. The product and service flora were predicted to look very different, and car ownership was thought to be secondary. GMS and D&G most certainly competes with car sales because people probably do not want to own cars in the future to the same extent, this was said to be especially true in bigger cities. A greater demand for accessibility from the users at the same time as the use of traditional car rental was thought to decrease was also expected.

GMS and D&G was predicted to be larger than Holmgrens Bil and J Bil was at the present. However, in order to grow, one of the most important characteristics was considered to be listening to the users and following the market to be able to offer what the users demand. Electric cars were anticipated to become cheaper, and presumably there were vehicles that were electrified but of a different kind than those that exist today. If self-driving cars existed, they were assumed to be in major cities, probably within specific tested areas.

6.3.3 The Current Customer Journey

The participants made a customer journey of the current service to become aware of what it is like to be a user of D&G. The exercise made them realize how easy it is to forget details.

The reflections from the auto-ethnography, see section 6.2 *trying out Drive & Go*, combined with the output from the co-creation with GMS resulted in the current customer journey below (see figure 15). The main activities are stated on the top row and the first column to the left shows the questions that should be answered for each activity. As can be seen in figure 15 the journey starts with *need arises*. During every activity it is stated what the users interacts with, their predicted thoughts on what they are doing, and what the users actually is experiencing. This is followed by what is good with the activity or what could be improved in the pros and cons section. *Opportunities* is the final row which highlights the activity’s opportunities for improvement.

	<i>Need arises</i>	<i>Download app</i>	<i>Create account</i>	<i>Book a car</i>	<i>Payment (made during booking)</i>	<i>Cancel/ Extend booking</i>	<i>Find the car</i>	<i>Open the car/ Check OUT</i>	<i>Needing service</i>	<i>Drive/ refuel</i>	<i>Leave car/ Check IN</i>
<i>Interaction</i>	Using the phone to check ratings	Searching on Google Play	Adding info to the app Calling support explaining the problem	Searching available car in the app	Adding credit card info	Trying through the app Calling support instead	Look at the address in the app, the searching Google Maps	Using app + camera to inspect the car Searching for damage Use key to open	Searching info in the app Calling support explaining the problem	Using the car navigation system Charge an electric vehicle	Finding pickup place and park Using app + camera to inspect the car Searching for damage Use key to lock
<i>Thinking</i>	'I will decide company due to reputation/ ratings'	'Why isn't it named as the service?'	'why did it stop working?' 'ineffective scrolling'	'Which model?' 'Will it work?'	'Convenient, almost like a subscription service'	'It's for free' / 'Hope that it's possible'	'Convenient' 'Nice car'	'Feeling worry about old bumps and scratches' 'It takes time but will be worth it'	'Oh no, what's the problem?'	'How does all the features work?' 'How does the charger work?'	'Hope that the car is ok' 'Think that I took out all my belongings'
<i>Experiencing</i>	Insufficient information, poor visibility	Confusion	Liveness verification lags	Many different models to choose from	A quick and easy process	Phone queue during office hours, answering machine during night-time	How hard it is to find the car, among many similar cars Car and colour match picture in app	To be accurate it takes time Key does not work- had to restart app	A slow process	A new car model and new technology 'Silent' driving	An easy process to add new damages in the app
<i>Pros/ Cons</i>	- Hard to find GMS and Drive & Go	+ The app is free of charge - Only available in English + Supports both Apple and Android	+ At home, managing by yourself - Requires IT-knowledge	+ Many models to choose from + Quick - Too few models - Fully booked	+ Card info is stored in app + No additional fee	+ Possible to extend bookings if the car is unoccupied - Not possible if occupied	- Some pictures yet have the wrong colour	- Photos might not be optimal during specific conditions - Phone require update + No employee needed	- Support required from England - User might be late or need a new vehicle + Available phone charger	- Invalid home navigation - Requires IT-knowledge + Eco-friendly car	- Cannot open the car after check IN + No employee needed
<i>Opportunities</i>	Increased accessibility	Creating a Swedish version, changing the name	To provide support 24/7 through app Implement bank-id or e-legitimation	More eco-friendly models. Offer child car seats. Accessibility.	Enable invoice to companies Family account: one driver and another payer	Make it possible through the app	A technical matter	Add a text box for additional info. Clarify requirements regarding the phone.	Offer support in Swedish. Might be good to offer Taxi in some cases.	Implement a 'set home address' - routine when moving cars between locations	Push-notice to remind user to end rental the right way before rental period is up.

Figure 15 - Customer journey of the existing service, the top row states the main activities during car rental and the first column states the questions that should be answered for each activity.

6.3.4 Challenges and possibilities

The following paragraph is a summary of the main challenge and possibilities that was discovered during the co-creation. When the participants discussed the usability of D&G, and the confusion that sometimes arose while using the application, they emphasized that it is a challenge to create a user-friendly service. It is also challenging to make car owners to give up their cars and start using a sharing service. While being a car sharer amongst many similar services it is challenging to be visible towards the customer and gain market shares. The main challenge, however, was to be fully booked and received as non-accessible by the users. That could cause the user to look for competing services instead and lead to the user choosing a competitor in the future. It might also lead to a user that do not want to give up their owned car due to the perceived uncertainty of car access.

Integration with other services could be a challenge but because an integration already was made it was also considered a possibility to be better prepared for future integrations, and thereby provide a smoother process. Another issue that was considered both a challenge and a possibility is that the service needs to be flexible and one must be responsive and take in the user's need to succeed.

Being a part of MaaS offers a big potential to get new customers, in addition it also allows the service to combine both car rental and car sharing. Collaborations with municipalities to create parking spaces for car sharing is viewed as a big potential in order to get easier access to parking lots. The main potential is that the user needs is about to change. The society is going towards sharing being self-evident and users are becoming more familiar with using technology, which makes a self-serving car sharing service just right in time.

7. THE IMPROVED SERVICE

The following chapter starts with a summary of the result from the validation and continues with describing the overall improvements made on the GreenMotion service. Then, the new functions of the D&G application are described followed by a design proposal of the improved search function.

7.1 Validation

The overall impression of the service, according to the participants, was that it seemed simple and convenient to rent a car over the phone, the service seemed informative and it was considered difficult to fail in the various steps of the process. That GMS is a new and unknown company in Sweden can be perceived as ‘a shady business’ but because a large and established company like Holmgrens Bil is involved, it nevertheless brings confidence. It was considered trustworthy that the company only has environmentally friendly cars in its fleet. To highlight the environmental impact even more, it was suggested to add a note in the booking details that enlighten the user about how much carbon dioxide that has been saved by using D&G.

One participant erupted, ‘Very many steps for an hour's rent!’, followed by the question ‘how long does it take?’. It was considered to be stressful, if only renting the vehicle for an hour or two, to go through all the steps while knowing that the time count went on. This led to a proposal that in case of hourly rent, the time count is started only after the *collect vehicle* process is completed.

Several questions related to refuelling came up during the validation, for example how much fuel the car should be returned with, what does it cost and who is going to pay for it. The information regarding refuelling is currently available in T&C's and therefore requires a few

minutes of searching to be found. A suggestion was to include some of the information in the 'pre-info' step before returning the vehicle.

To take pictures of the car when collecting and returning the vehicle was considered difficult or time consuming. However, at the same time it was stated to be a good feature, because it gave a feeling of having security. 'It is actually half a million SEK car you can borrow so of course you have to make a little effort to have it.' and 'There must be some steps to be considered serious'. Stating that it is a big responsibility and if the car was just to be picked up without any insurance whatsoever, it would not feel like a serious business.

The service was considered to be right in time and the future prospects was believed to be bright. The possibility to connect the service to other mobility services was considered as a step in the right direction to avoid car ownership. In addition, it was stated to be convenient to have self-service and to avoid queue, increasing the proximity and accessibility to mobility.

7.2 The Perfect Partner

A company called GreenMotion should communicate pro climate services, and their unique selling point should be that they are green. The mother company GMI strive towards providing an ecological car rental business and that permeates all their work, this should also apply to GMS. As a part of GMI, GMS climate commitment should be equal and that needs to be visible to the user. A figure of a green GMS car can be seen below in figure 16.

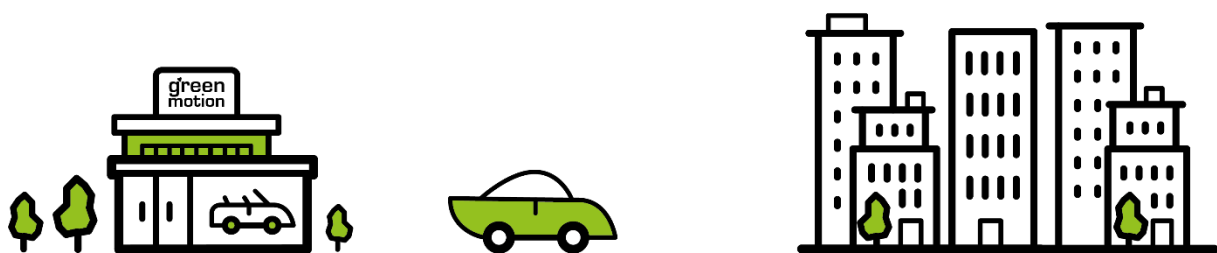


Figure 16: Illustration of a Perfect Partner car that is about to enter the Swedish carsharing market.

A green influence from GMI together with the findings from the theories, the strategic conclusion and the *How to be good* advices ended up in the solution; GMS 2.0. The improved service GMS 2.0 will be explained further in the following paragraphs.

Collaborations

In order to distribute the risks, several different collaborations have been started and D&G are now operating at the majority of the major airports and train stations in Sweden, in addition to different types of travel centres. GMS is also an active partner to a MaaS-operator, distributing car sharing and promotes the mobility services for construction companies to use in their upcoming projects. Newly built residential areas often benefit from offering car sharing or other mobility services as a way to reduce parking lots.

Environmental action

In line with GreenMotion International's vision regarding the environment and offering an ecological car hire, there are no longer gasoline cars available in the GMS car fleet; All cars are eco-friendly vehicles. This makes the company true to its name. By providing actual green mobility to their users makes GMS more trustworthy and rises the sense of commitment.

The Green Heart Donation will be explained and highlighted in Swedish, raising the awareness of the GMS environmental commitment at the same time as educating in the tree plantations in Costa Rica, that the donations enable. The likelihood of donations increases together with the perception of using the service is an environmentally friendly user experience.

To target the car owner that is too afraid of giving up their car, a free trial of the service will be offered in order to help motivating them to sell their car or not buy a new one.

7.3 Drive & Go 2.0

To begin with, the name of the application has been changed to: Drive & Go -Green Motion Car and Van rental. The new name will reduce the confusion when searching for it in App Store or Google Play by being named after the service. At the same time, users in other countries using the application for its other functions will still be able to find it. In addition to the name change, will there be an option in the application to change language entirely to Swedish and this also includes the prices being shown in SEK (Swedish kronor).

The terms and conditions (T&C's in the illustration, see figure 17) have been updated to suit short term counterless rentals. For example, the pricing that otherwise was specified 'per day' has now been changed to include information about rent by the hour, in addition, the obligation to bring a printout of the booking confirmation is removed. Moreover, the information about the fuel policy, which states that the car should be fully fuelled when returning the vehicle, has been made visible in the pre-info step in the application.

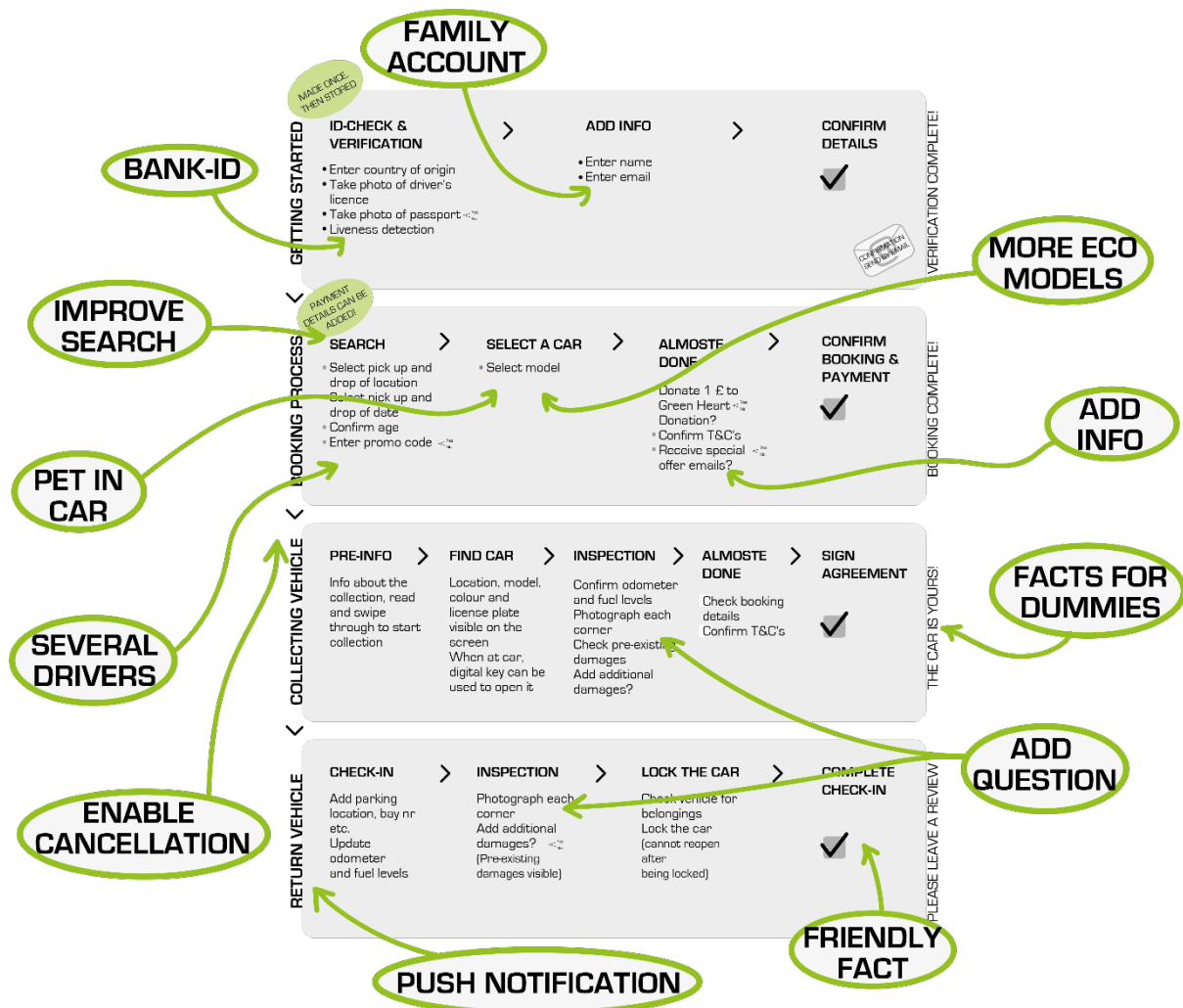


Figure 17- Illustration of the changes and add-ons that have been implemented in the interaction with the Drive & Go application.

Bank-ID

To make the ID-check a smoother process and reduce the struggles with liveness detection, Bank-ID is implemented. Bank-ID is a digital ID-checking service that is used by most large authorities and companies in Sweden as well as banks whose services require ID verification (BankID, 2020). The service is safe, fast, and well-known by the Swedish citizens.

Family account & Several drivers

The option to create family account means that by connecting other persons to the family account allows bookings to be controlled by more than one person. This makes it possible to add several drivers during the same rental period with previously stated personal information. Within the family account, there is the possibility to have separate bills or one joint payment solution for all members.

The option to include several drivers is important when it comes to the insurance matters, and by implementing the alternative in the application means that the service continues to be self-serving. This specific option enables the opportunity to include drivers that is not included in a family account.

Pet in car

Since some of the users asked for the possibility to bring their furry friends during the ride, an option is added before starting the search for an available vehicle. 'Bring pet in car' can be chosen and the search will then only show cars provided for animal transportation. The option implies a special sanitation charge that is included in the rental price, which makes the booking a bit more expensive than a regular one. This option makes it easier to ensure that the vehicles provided are safe to use by people with fur allergies, while stating to the pet owners that D&G is a full-fledged alternative to car ownership.

Enable cancellation and extension of booking

In order to fully become a self-service of car rental, the steps of cancellation and extension of bookings need to be implemented in the application, the functions are therefore available in the new and improved D&G service. Cancellation can be made free of charge for rental by the hour, and up to one day before the rental starts for rentals by the day, to enable flexible and spontaneous decisions.

To extend a booking, a request it made in the app and if the option is available the extension is confirmed. Since the car used might be booked during the requested time, this step might involve GMS employees receiving the requests and manually change the bookings in order to meet the user needs depending on the accessible technology.

Pre-info

Similar to the pre-info that is shown before starting the collection of the vehicle, a pre-info regarding the check-in of the vehicle have been added to the application. The information provided will highlight the importance of making a check-in while leaving the vehicle at the drop-of location. If the car is being left at the drop-of place and only locked with the digital key in the application, the booking will continue, and not be ended until a proper check-in is performed.

To avoid cars being returned without a correctly made check-in, an information bar will appear in the application thirty minutes before the time of the rental is over. The user will be notified with a text that states that 'When returning the vehicle, make sure to follow all the steps in the check-in procedure!' together with information about the steps of the return that can be read and swiped through. A reminder to refuel the car before leaving the vehicle is also given, or if it is an electric car that has been rented, a reminder to put the car on charge when leaving it.

Add info

Since the D&G service is completely dependent of a functioning mobile phone, a short information is added during the booking phase. The information highlights the importance of a charged phone during the collection of the vehicle. This reduces the possibility of users failing to pick up their car quick and easy. In addition, GMS has its back free if any user complaints about not being able to retrieve the car due to discharged phone.

Taking quality photos of the vehicle and documenting damages is a crucial part of the rental process. Therefore, the information should also include a highlight of the importance of a functioning phone camera, and that it is required in order for a successful rental experience.

Fact for Dummies

It might occur that a user chose to rent a specific car brand or model that he has not driven before. Then, to avoid giving him the feeling of not being smart enough when questions regarding how to use the special functions of the car arises, a 'Facts for Dummies' option is implemented in the application. When the desire for additional information occur, the icon is pressed, and the selection menu appear. The user then gives the opportunity to choose between different topics that he would like information about. The first alternative gives a short introduction of the car and the following options provides specific information about a topic.

Questions that can occur when driving a new-to-me car and that the topics should be able to answer are; Where is the fuel cap? How to charge an electric car? How do I connect the phone to the car? How to raise and move the seat? How to set cruise control? What is distance assistance and how to set it up? How does the light panel work?

Support

It is no longer necessary to call the UK-support number. GMS offers its users phone support in Swedish around the clock. In addition, support is now also available in a chat function in the application. Furthermore, the option to read FAQ is available in the application as well, providing not only answers to questions but also replies with a guidance, 'try this OR this' as a way to solve issues quickly without having to sit in a telephone queue and wait for help.

Friendly Fact

When check-in is complete and the rental is over, the user is left with a small notice with the final word 'Thanks for choosing D&G, by using GMS you've helped the environment by saving xxx in CO₂ emissions!'

Improved search

One big issue for rental companies was said to be the risk of being fully booked. This caused a bad user experience which during several occasions could lead to that they went to competitor services instead or that they bought a car. To solve the issue of an ungainly search a flexible search function was developed.

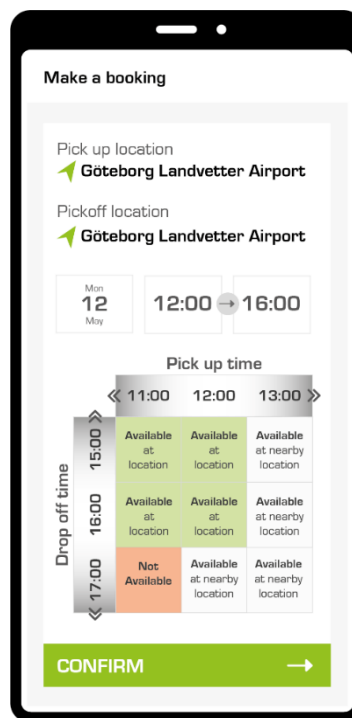


Figure 18 - The new design of the search function. In this view, the option 'search for nearby locations' is also being used.

This solution is developed for rentals by the hour, optimized to search for available cars in for example a carsharing service, where there could be several shorter bookings during a day. When a booking for a few hours is made, the system senses it and instead of showing the ordinary layout, the booking interaction changes to the layout shown in figure 18 above.

The pick-up time and drop off time can be scrolled through in order to find a suitable time interval with available cars. When a suitable option is found, the timeslot is selected in the interaction menu and then the 'confirm' button will be available.

The solution is inspired by the search function provided by some of the airline booking pages when searching for available flights.

7.4 Conclusion

Divided according to the three research questions it is summarized how GMS has become the perfect partner towards potential partners and towards the users.

RQ 1 - *which market share has the biggest opportunity of attracting users?* was answered in chapter 5.3 *Conclusion* where the market shares residential area and corporate customer was to be reached via MaaS. However, the GMS service has been developed in order to address these users, among other things, by the improved search function, which enables optimized search for both hourly and daily rent.

When it comes to RQ 2 - *how should a car sharing service be developed to balance requirements from end-users (henceforth users) with requirements from stakeholders and possible future partners?*, GMS together with Holmgrens Bil is a big actor with a self-confidence, they do not seem to have the need to assert themselves in the market which means that they do not necessarily have to be a visible player in collaborations. They are open to different collaborations and opportunities and as a company they are flexible and their service is ready to implement which is demanded by MaaS, thus, the requirements of possible partners are met. In addition, MaaS requires that the service should be easy to use and easy to access, which is in line with the user's requirements but that opportunity for improvement is covered in RQ 3 below.

In order to answer RQ 3- *how to improve the user experience of the Drive & Go application*, the usability issues in the application have been solved with several improvements. Including through implementing Bank-ID, Family account & Several drivers, Enable cancellation and extension of booking, and making sure that support is available in Swedish both via a phone call or through the FAQ in the application.

GMS has a green approach, which conveys credibility both in a sustainability perspective towards the user and as a partner to MaaS. Another way to communicate sustainability, is through the thank you notice *Friendly fact*.

The improved search reduces the chance of not finding an available vehicle while making a booking. By adding both additional info, questions, and pre-info the likelihood of misunderstanding how to use the application decreases. Facts for Dummies, makes sure that even first-time users get a positive user experience.

8. DISCUSSION

The aim of the project was to enable more people to use car sharing services, by making D&G an accessible service with good usability and user experience. This has been fulfilled by investigating the D&G service, the user and mobility services which has highlighted areas of development and thereafter provided the problems with solutions. According to the conditions given, the best possible work has been done, and now with GMS's competence and wherewithal, it is now the responsibility of the company to market it properly to reach the users.

8.1 Results and findings

The results found through this study are largely in line with previous studies of MaaS (Becker et al., 2020; Karlsson et al., 2016; MaaS Alliance, 2017; Naturvårdsverket, 2015; Sochor et al., 2014), for example the collaboration difficulties between profitability and user demands, the complexity of creating a functioning MaaS which is both time consuming and requires great commitment, and the difficulty of getting users to break old habits has been confirmed. However, the thesis has also added the knowledge by highlighting the importance of the users' need for the "full service" to be well-functioning, where everything from the usability of the application, how easy it is to find the application in Appstore and where the cars are located, to how well the customer service works, is vital. The difficulty for companies to maintain their corporate identity as a transport supplier to MaaS, and that a close interaction between the services is required to achieve a successful collaboration is also new knowledge. In addition, new insights regarding how the user experience the carsharing process and new details on the process of packaging or 'to put together' a carsharing service.

Considering GreenMotion together with Holmgrens Bil, having the experience, the financial strength combined with existing employees, the company cannot be counted as a start-up but must be perceived as a launch of a new service. A real start-up, starting from scratch without a large and established company to lean back on, creating opportunities in favour of the start-up, would have struggled and increased risk of failing. The actors mentioned in the market analysis that started and closed down within a few years did not invest full hearted in the Swedish market. They did not have the opportunity like GMS has to shift operations, move flexibility, move cars, invest in several different markets at the same time, combined with a technology that is both cheaper and can be installed in a car within fifteen minutes. That said, GMS has an enormous opportunity to succeed.

A big problem for companies that work towards running their businesses with sustainable profiles is the political process. For car sharing services the congestion charge becomes a major problem. The charge creates a too big of a cost for the companies who pays them their self, and a too big of a administrative burden for the companies who tries to connect the booking with the right congestion charge and then debit the user. Politicians should take more responsibility and actively work to simplify for companies that wants to be environmentally friendly.

When working with a dynamic company as GMS, that constantly adapts to the political situation and market development, it is sometimes difficult to state the direction of the company. Hence, the dilemma of finding the root cause of the problem which leads to not knowing what solution that is worth investigating in. This created a sense of uncertainty which in turn led to delayed decisions.

8.2 Methods

The methodology selected for this project was chosen according to the service as a whole. A UX design approach would have been more appropriate for investigating the application, yet the goal was not to develop the best possible application but the best possible service for the Swedish market.

An issue, while trying to follow a service design methodology, was the lack of accessible users which made it impossible to utilize the full potential of the method. Having actual users at the workshop and being able to make observations during a car rental would most certainly contribute to more insights than the ones gathered in this project thus highlighted more areas of improvement.

The interviews and the auto-ethnography were considered extra rewarding for the project. The MaaS interviews provided both an optimistic and a realistic view of MaaS while the GMS interview gave key insights of the company. The auto-ethnography was the closest thing to a general user experience and thereby important to the project.

The participants at the workshop had great knowledge of the company and the desired service in theory. However, their knowledge regarding how the application actually worked differed. If the participants had been asked to test the service in close connection to the workshop the result would probably be more accurate to the reality and other useful insights might have occurred.

The validation of the improved service would most certain have given a better result if a physical prototype that the user could interact with had been made. However, the ten persons who participated at the validation was of different sexes, different ages and had different experiences both in car driving and car rental and thus given the circumstances, the best possible situation was made.

The remaining methods was considered relevant and contributed to its purpose, the advantage of using several different methods became clear when doing the method netnography. While the first round of netnography on MaaS showed a positive and exaggerated image, the MaaS interview gave a completely different view. Showing how much work that still needed to be done before getting a great solution, and that the process will be expensive. The lack of fast money and the uncertain market cause many companies to refuse to invest in partnership with Maas operators, which forces the operators to struggle to convince companies to join the party.

8.3 Future work

The improvements of the service need to be tested in the real world on actual users, and further developed to ensure that the service provides great usability and utility.

The pricing of car sharing is considered a key factor when it comes to make people use mobility services. This study has only stated the importance but not discussed it further and hence not come up with an answer. What it actually costs to rent a car to the customer, versus what the customers actually want to pay therefore it is proposed as future work.

9. CONCLUSION

A service like D&G has a lot of potential being both successful from a business point of view but also the ability of contributing to a more sustainable future.

Without political commitment, it is difficult to fully pursue the vision of MaaS providing the city resident with mobility. MaaS is still a young phenomenon and it will take years before we can see its true potential.

The potential of development for D&G and GMS is great and the opportunity to take on additional market shares is promising. The only question soon to be answered is how GMS will choose to market its service and through what channels.

10. REFERENCES

Alfredsson, M., Arnehed, F., Östman, E., & Ramboll, S. A. (2019) Delad mobilitet i Norden -utmaningar och möjliga lösningar. In: Trafikverket.

AutoRentalNews. (2017). Green Motion Launches Franchise in Sweden. Retrieved from <https://www.autorentalnews.com/140335/green-motion-launches-franchise-in-sweden>

BankID. (2020). BankID e-legitimation. Retrieved from <https://www.bankid.com/>

Bardhi, F., & Eckhardt, G. M. (2012). Access-Based Consumption: The Case of Car Sharing. *Journal of Consumer Research*, 39(4), 881-898. doi:10.1086/666376

Bayart, C., Bonnel, P., & Havet, N. (2018). Daily (im)mobility behaviours in France: An application of hurdle models. *Transportation Research Part A: Policy and Practice*, 116, 456-467. doi:<https://doi.org/10.1016/j.tra.2018.07.003>

Becker, H., Balac, M., Ciari, F., & Axhausen, K. W. (2020). Assessing the welfare impacts of Shared Mobility and Mobility as a Service (MaaS). *Transportation Research Part A: Policy and Practice*, 131, 228-243. doi:<https://doi.org/10.1016/j.tra.2019.09.027>

Bröcker, J. (2005). Principles of Transport Economics. *Journal of Economic Geography*, 5(2), 257-259. doi:10.1093/jnlecg/lbh065

Cervero, R., & Tsai, Y. (2004). City CarShare in San Francisco, California: Second-Year Travel Demand and Car Ownership Impacts. *Transportation Research Record*, 1887(1), 117-127. doi:10.3141/1887-14

Geerlings, H., Shiftan, Y., & Stead, D. (2012). Transition towards sustainable mobility: The role of instruments, individuals and institutions.

Goodall, W., Dovey Fishman, T., Bornstein, J., & Bonthron, B. (2017). The rise of mobility as a service (20), 112-129.

GreenMotion. (2020). Green Heart Donation. Retrieved from <https://greenmotion.com/green-heart-donation>

HolmgrensBil. (2020). Om oss. Retrieved from <https://www.holmgrensbil.se/om-oss/>

Karlsson, I. C. M., Sochor, J., & Strömberg, H. (2016). Developing the 'Service' in Mobility as a Service: Experiences from a Field Trial of an Innovative Travel Brokerage. *Transportation Research Procedia*, 14, 3265-3273. doi:<https://doi.org/10.1016/j.trpro.2016.05.273>

Kerttu, J., Smidfelt Rosqvist, L., & Wendle, B. (2016). Konsekvenser av Mobility as a Service. Jämförelse av alternativa scenarier för implementering av nya mobilitetstjänster (förstudie) (2016:112). Retrieved from www.trivector.se

Kozinets, R. V. (2015). Netnography. The international encyclopedia of digital communication and society, 1-8.

Kunert, U., & Lipps, O. (2005). Measuring and explaining the increase of travel distance: A multi-level analysis using repeated cross sectional travel surveys. *DIW, Berlin*.

MaaS Alliance. (2017). *White Paper - Guidelines & Recommendations to create the foundations for a thriving MaaS Ecosystem*. Retrieved from www.maas-alliance.eu

McKenzie, G. (2020). Urban mobility in the sharing economy: A spatiotemporal comparison of shared mobility services. *Computers, Environment and Urban Systems*, 79, 101418. doi:<https://doi.org/10.1016/j.compenvurbsys.2019.101418>

Moons, I., & De Pelsmacker, P. (2012). Emotions as determinants of electric car usage intention. *Journal of Marketing Management*, 28(3-4), 195-237. doi:10.1080/0267257X.2012.659007

Naturvårdsverket. (2015). *RAPPORT 6672: Hållbar mobilitet och miljöhänsyn i transportplanering*. Retrieved from www.naturvardsverket.se/publikationer

NE. (2020a). Kooperativ. Retrieved from <http://www.ne.se.proxy.lib.chalmers.se/uppslagsverk/encyklopedi/lång/kooperativ>

NE. (2020b). Leasing. Retrieved from <https://www-ne-se.proxy.lib.chalmers.se/uppslagsverk/encyklopedi/l%C3%A5ng/leasing>

Pangbourne, K., Mladenović, M. N., Stead, D., & Milakis, D. (2020). Questioning mobility as a service: Unanticipated implications for society and governance. *Transportation Research Part A: Policy and Practice*, 131, 35-49. doi:<https://doi.org/10.1016/j.trra.2019.09.033>

Polydoropoulou, A., Pagoni, I., Tsimpa, A., Roumboutsos, A., Kamargianni, M., & Tsouros, I. (2020). Prototype business models for Mobility-as-a-Service. *Transportation Research Part A: Policy and Practice*, 131, 149-162. doi:<https://doi.org/10.1016/j.trra.2019.09.035>

Quaglione, D., Cassetta, E., Crociata, A., Marra, A., & Sarra, A. (2019). An assessment of the role of cultural capital on sustainable mobility behaviours: Conceptual framework and empirical evidence. *Socio-Economic Planning Sciences*, 66, 24-34. doi:<https://doi.org/10.1016/j.seps.2018.07.005>

Quinet, E., & Vickerman, R. (2004). *Principles of Transport Economics*: Edward Elgar Publishing.

SCB. (2020). Sveriges befolkning. Retrieved from <https://www.scb.se/hitta-statistik/sverige-i-siffror/manniskorna-i-sverige/sveriges-befolkning/>

Sochor, J., Arby, H., Karlsson, I. C. M., & Sarasini, S. (2018). A topological approach to Mobility as a Service: A proposed tool for understanding requirements and effects, and for aiding the integration of societal goals. *Research in Transportation Business & Management*, 27, 3-14. doi:<https://doi.org/10.1016/j.rtbm.2018.12.003>

Sochor, J., Strömberg, H., & Karlsson, M. (2014). Travelers' Motives for Adopting a New, Innovative Travel Service: Insights from the UbiGo Field Operational Test in Gothenburg, Sweden.

Sochor, J., Strömberg, H., & Karlsson, M. (2015). Challenges in Integrating User, Commercial, and Societal Perspectives in an Innovative Mobility Service.

Stickdorn, M. (2019). *Utveckla tjänstedesign inom en organisation*. Paper presented at the Inuse, Lilla Cirkus i Stockholm.

Stickdorn, M., & Schneider, J. (2010). *This is service design thinking : basics--tools--cases*. Amsterdam: BIS Publishers.

UN. (2018). *2018 Revision of World Urbanization Prospects*. Retrieved from UN.org/en: <https://www.un.org/development/desa/publications/2018-revision-of-world-urbanization-prospects.htmlhttps://search.un.org/results.php?query=World+urbanization+prospects&>

UN. (2019). About the Sustainable Development Goals. Retrieved from <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>