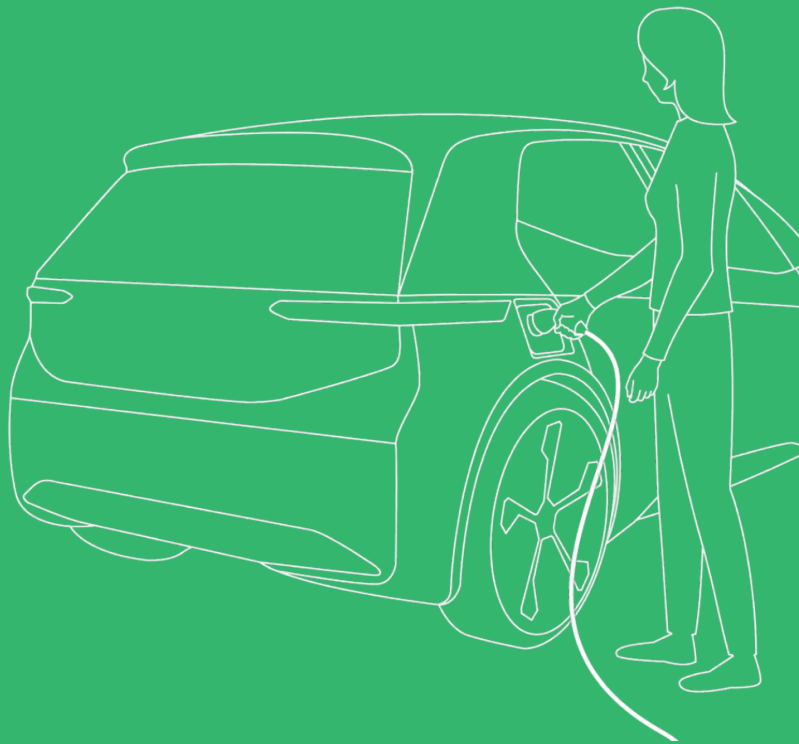


The future of corporate car sharing

Creating an innovation strategy
for Greenwheels



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Acknowledgement

With this thesis I finalise my time as a student at the faculty of Industrial Design Engineering at the Delft University of Technology. This graduation project has been challenging in multiple ways. However, most of all it has been a valuable learning experience. I am very grateful that I got the opportunity to work together with Greenwheels and for all the wonderful and inspiring people I met along the way. Before presenting my work, I would like to thank a few people that helped me throughout this project.

First of all, I would like to thank my supervisory team. Paul, thank you for introducing me to Greenwheels and the world of car sharing. Your guidance and enthusiasm during the entire project helped me tremendously. Ruth, thank you for always asking the right questions. Your coaching really helped me focus on the consumer behaviour and design aspect of this project. Nancy, thank you for your valuable feedback, encouragement and showing me the academic and sustainable perspective during this project.

Additionally, I would like to thank Sebastiaan van Meggelen, Ingrid Sloots, Marjon van der Valk, Paul van Merrienboer and the other people at Greenwheels that helped me during this project. Also, a special thanks to Paul Hekkert, Dirk Snelders and the people who participated in the interviews and creative sessions.

Lastly, I would like to thank my friends and family. Specifically, I want to thank Thom Bremer and Paul van der Veen for thinking along and supporting me these last few months.

Enjoy reading!

Yannic

Executive summary

Our contemporary society faces serious social and environmental challenges due to the increasing usage of automobiles. However, researchers have suggested that stimulating the acceptance of car sharing is a promising solution for dealing with these issues. Therefore, the goal of this graduation project was to support the car sharing company Greenwheels in growing its corporate car sharing business. In order to accomplish this goal, an innovation strategy for Greenwheels was created.

The innovation strategy was constructed by executing a considerable amount of internal and external analyses. The resulting insights established the foundation of a future vision for corporate car sharing in 2025. This future vision describes what needs to be achieved by the innovation strategy, in order for Greenwheels to develop a future proof corporate car sharing service. The future vision is defined as:

"Realising a personalised, zero emission, corporate car sharing service, with a motivated and knowledgeable community of users."

In order for Greenwheels to achieve this future vision, three design solutions were developed. These design solutions will be implemented at different points in time, building onto each other and thereby creating valuable synergies. The proposed solutions are:

- **Experience Workshop:** An interactive workshop day for new users, offered as an additional service to corporate clients.
- **Unity platform:** An online car sharing platform based on gamification and online learning in order to train and motivate the end-users over a longer period of time.
- **Smart Shared Fleet:** Optimising the shared car fleet by utilising bi-directional charging technology, connected car technology and personalisation of the car sharing service.

The implementation of these solutions is presented in the form of a tactical roadmap. This roadmap provides an actionable step-by-step approach for moving towards the desired future vision of 2025. It does so by presenting a comprehensive overview of the main value propositions, the value created for different stakeholders, the features of the design solutions, the required technology and data streams, the corresponding revenue streams and the internal and external resources that are needed. Additionally, one of the design solutions was further conceptualised in order to showcase a tangible example.

The next steps for Greenwheels include: estimating the total market demand more accurately, creating validated revenue models, establishing new partnerships and further refining the design solutions through extensive user-testing.

Reading guide

Abbreviations

AI	-	Artificial Intelligence
B2B	-	Business to Business
B2C	-	Business to Consumer
CaaS	-	Car as a Service
CCS	-	Corporate Car Sharing
CEO	-	Chief Executive Officer
CSR	-	Corporate Social Responsibility
DMU	-	Decision Making Unit
EV	-	Electric Vehicle
FBM	-	Fogg Behaviour Model
GHG	-	Greenhouse Gas
MaaS	-	Mobility as a Service
PSS	-	Product-Service-System
P2P	-	Peer-to-Peer
SME	-	Small or Medium-sized Enterprise
TLBMC	-	Triple Layer Business Model Canvas

Key insights

To quickly find the main takeaways, read the text in the green text boxes at the end of each (sub)chapter.

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Chapter 1: Introduction

The goal of this chapter is to show the general structure of the graduation project and this thesis. It provides information about the current situation, the project scope, research questions, deliverables and the design process.

1.1 Current situation

At this moment there are almost 8.4 million passenger cars registered in the Netherlands and this figure is steadily increasing each year (CBS Statline, 2018). Unfortunately, this growing number of vehicles negatively affects the frequency and severity of traffic jams and congestion in the Netherlands (ANWB, 2018). In fact, traffic congestion has already increased by 20% in the first three quarters of 2018 alone (Ritzen, 2018).

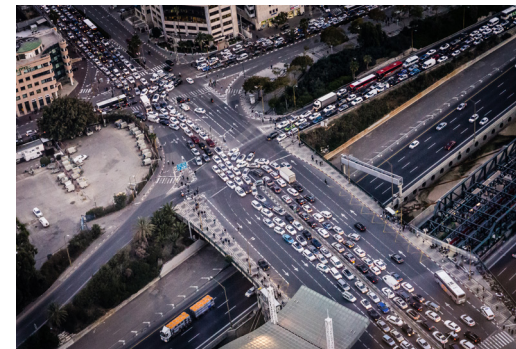


Figure 1: Traffic congestion. Source: Unsplash.

Despite becoming more fuel efficient, passenger cars are responsible for an increasing amount of greenhouse gas (GHG) emission (CBS Statline, 2018b). In 2017, the transportation sector was responsible for more than a fifth of the total CO₂ emissions in the Netherlands. Furthermore, the environmental impact of passenger cars has grown by 30% since 1990 (CBS, 2018).

Not only does personal car usage negatively impact the environment, it also poses a serious threat to people's health (Carrington, 2018; Kampa & Kastanas, 2008). The exhaust fumes of cars cause a significant amount of air pollution, mainly in the form of particulate matter.

Consequently, the air quality guidelines of the World Health Organisation (WHO), and even the slightly less strict guidelines of the European Union, are regularly being violated in the Netherlands, resulting in an estimated 6,700 to 12,900 premature deaths (Krzyzanowski & Cohen, 2008; Speksnijder, 2018).



Figure 2: City covered in smog. Source: Unsplash

Lastly, the increasing number of vehicles is causing a severe shortage of parking space in larger cities. It is expected that this parking space shortage will increase drastically over the coming years, especially in strongly urbanised areas (Coevering et al., 2008). In conclusion, radical change in the way people use personal transportation is needed.

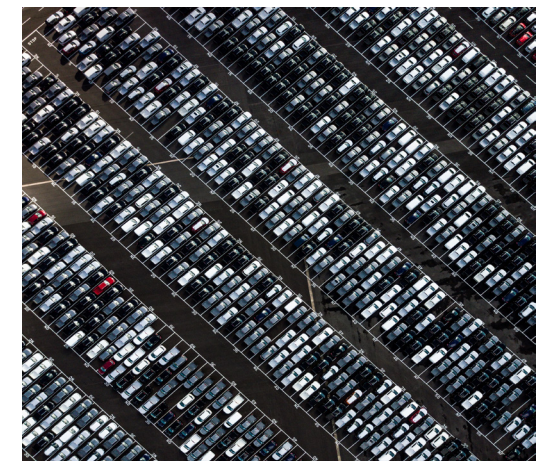


Figure 3: Parking lot. Source: Unsplash.

Transition towards the sharing economy

Currently, there is an important societal shift taking place which could contribute towards solving the previously mentioned social and environmental issues. Consumer attitudes towards consumption have changed over the recent years, spurring the transition of the “make-use-discard” economy towards the “sharing economy” (Cohen & Kietzmann, 2014).

This transition to the sharing economy, often referred to as “collaborative consumption”, can be defined as:

“The rapid explosion in swapping, sharing, bartering, trading and renting being reinvented through the latest technologies and peer-to-peer marketplaces in ways and on a scale never possible before”

Botsman & Rogers (2010, p.xv)

There are already many examples of new business models geared towards the sharing economy.

For example, Airbnb, which enables people to share their home with travellers, Wikipedia, which enables people to share knowledge online and Peerby, which allows people to share consumer products with each other.

Due to this transition towards the sharing economy, the automotive industry is on the verge of disruption. Therefore, car manufacturers are starting to experiment with new types of business models (Autodelen.info, 2018). This experimentation mainly manifests itself in the form of Car-as-a-Service (CaaS) solutions for both companies and consumers, Peer-to-Peer (P2P) car sharing, P2P Ride sharing services, B2C car sharing and Business-to-Business (B2B) car sharing (see figure 4).

CaaS solutions are subscription-based services, such as corporate and private leasing. P2P car sharing allows people to share their private car with other people through an online platform (e.g. SnappCar). P2P ride sharing, also known as carpooling, is becoming increasingly accepted through online platforms such as BlaBlaCar. B2C and B2B car sharing models are based on providing people access to a fleet of company owned cars. Examples of such car sharing companies are for example Zipcar and Car2Go.

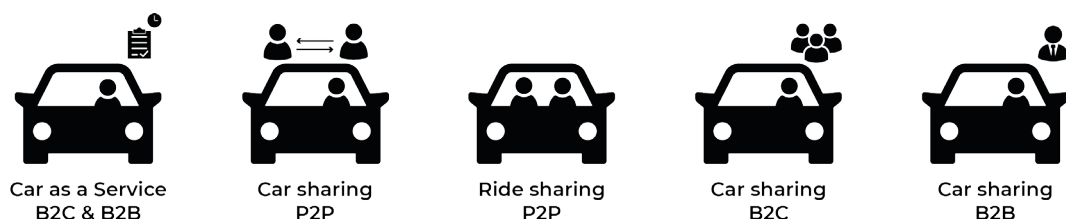


Figure 4: Types of shared car mobility.

Benefits of car sharing

Researchers have suggested that car sharing results in reduced levels of CO₂ emissions, car ownership and urban congestion (Nijland & van Meerkerk, 2017; Firnkorn & Müller, 2011; Shaheen & Cohen, 2007; Katzev, 2003).

Therefore, it is regarded as a promising solution for the aforementioned social and environmental issues.

1.2 Project scope

This graduation project was conducted in collaboration with the car sharing company Greenwheels. This company is market leader in the Dutch car sharing industry, with nearly 25 years of experience. They offer consumers and businesses access to a fleet of over 1800 publicly shared cars nationwide.

This project specifically contributes to the company's goal of growing the corporate car sharing business in the Netherlands.

1.3 Research questions

Greenwheels has the ambition to grow its B2B car sharing business over the coming years. However, the company faces three main obstacles while trying to accomplishing this goal.

First of all, potential corporate clients have difficulties identifying their own mobility needs. Therefore, Greenwheels needs to identify their needs, in order to provide a fitting corporate car sharing service. Consequently, the first research question is formulated as:

RQ1: What are the current car sharing needs of corporate customers in the Netherlands?

Furthermore, the contemporary car sharing industry is changing rapidly because of new mobility concepts (e.g. Electric vehicles, Mobility as a Service). These developments make the corporate car sharing market increasingly complex. Therefore, the second research question of this graduation project is:

RQ2: What will the world of corporate car sharing look like in the Netherlands in 2025?

Lastly, the company will need to keep adapting its corporate car sharing service and business model, in order to remain market leader. Therefore, the third and final research question is defined as:

RQ3: What will be the role of Greenwheels within this future context, and how will it get there?

1.4 Deliverables

As previously stated, our society is facing a myriad of problems due to our current unsustainable car usage (ANWB, 2018; CBS Statline, 2018b; CBS, 2018; Krzyzanowski & Cohen, 2008; Speksnijder, 2018; Coevering et al., 2008). The goal of this graduation project is therefore to support the transition towards the sharing economy by stimulating the acceptance of corporate car sharing.

In order to do so, this project aims to provide Greenwheels with an innovation strategy until the year 2025. This strategy will be made explicit in a tactical roadmap, which showcases the step-by-step approach for moving towards the desired future vision. Additionally, a prototype will be created for one of the design solutions in order to provide a tangible example.

1.5 The design process

This design project can roughly be divided into four different phases: (1) Discover, (2) Define, (3) Develop and (4) Deliver (see figure 5). This approach is based on the Double Diamond design model proposed by the Design Council UK (2005).

Within this design approach there are two distinct phases where divergent thinking will be applied, and two phases where convergent thinking will be used, as is illustrated in the figure on the right.

Even though this design process might seem linear, in reality it was not. Each step of the double diamond model is in-fact iterative. Therefore, the double diamond model functions mainly as a communication tool, rather than a detailed design method.

“Although design processes are in reality non-linear, it is possible to articulate an outline structure. It is important to understand that this structure is iterative in its approach”

Marc Stickdorn (2011)

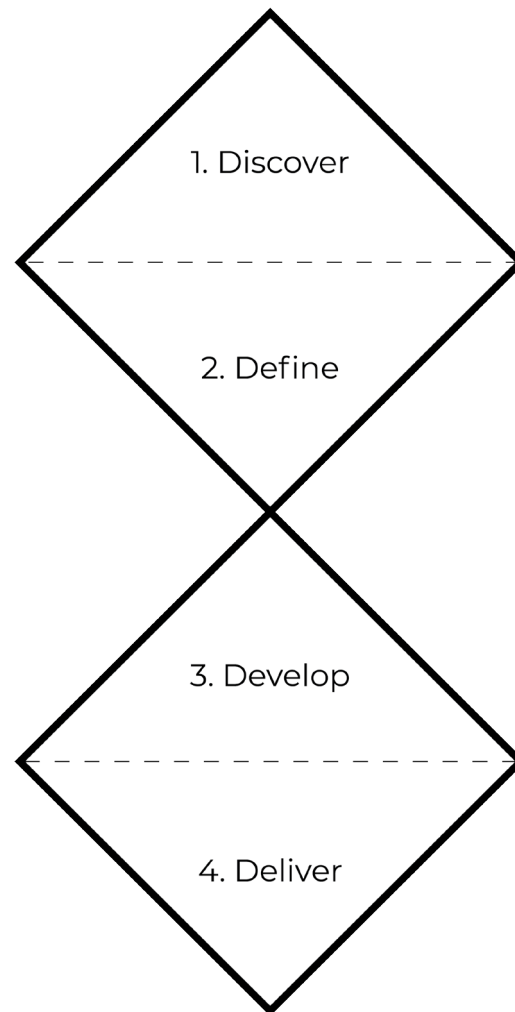


Figure 5: Double Diamond model. Based on the Design Council UK (2005).

The objectives of the four phases within the project will now be discussed below.

Phase 1: Discover

In the first phase of the project, divergent thinking was used to generate insights about the company, the car sharing service, the market, the customers, stakeholders and relevant technological, societal and market trends. These insights were important for gaining a thorough understanding of all relevant aspects within this design project.

Phase 2: Define

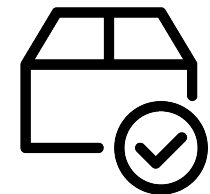
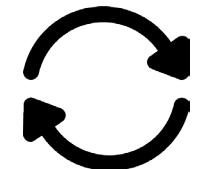
The second phase of the project used convergent thinking in order to synthesize the findings of the first phase into multiple design challenges. Additionally, these design challenges formed the foundation for a clear future vision.

Phase 3: Develop

During the third phase of the project, divergent thinking was used to come up with multiple solutions for the previously proposed design challenges. The main activity during this phase was the development and selection of solutions.

Phase 4: Deliver

In the fourth and final phase of the project, the chosen design solutions were translated into an innovation strategy by creating a detailed roadmap. Additionally, one design solution was conceptualised in order to provide a tangible example of the future of corporate car sharing.



Project roadmap

During the four phases of the graduation project, multiple design methods were used. The following roadmap gives an overview of the methods that were used at each stage of the project (see figure 6).

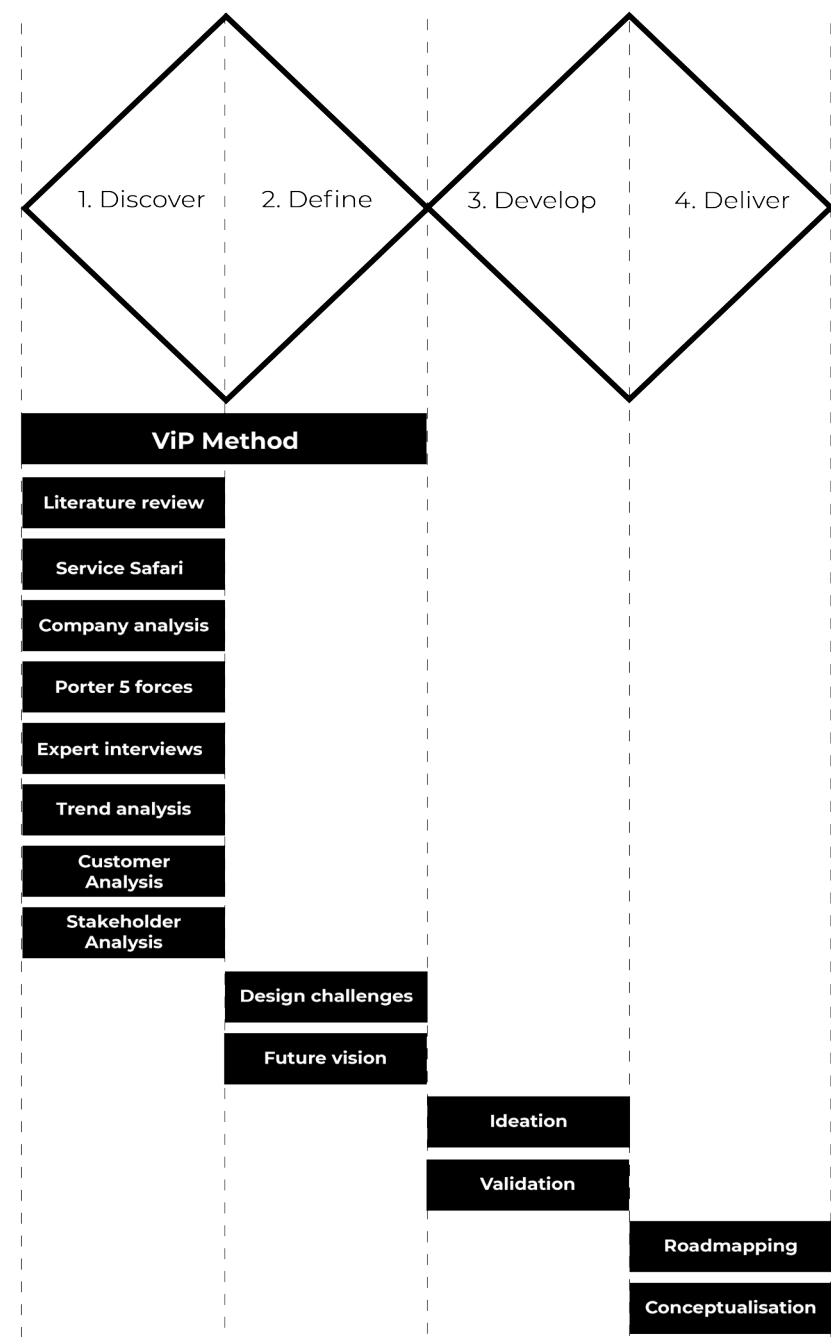
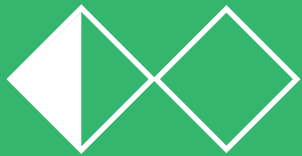


Figure 6: Project roadmap.

Phase 1: Discover



In the first phase of the project, divergent thinking was used to generate insights about the company, the car sharing service, the car sharing market, the customers, stakeholders and relevant societal and market trends. These insights were important for gaining a thorough understanding of all relevant aspects within this design project.





Chapter 2: Literature Review

This chapter explores the context of corporate car sharing from an academic perspective. It starts with a broader view, focussing on the rise of the sharing economy, product-service systems and the categorisation of Greenwheels within this paradigm. Additionally, possible determinants for the acceptance of PSSs and corporate car sharing will be explored more in-depth.

The following research questions guided this literature review:

RQ1: What is the sharing economy, and how did it evolve to what it is today?

RQ2: How can Greenwheels' car sharing service be categorised within the sharing economy paradigm?

RQ3: What are the determinants of product-service system acceptance?

RQ4: What are the determinants of corporate car sharing acceptance?

2.1 The sharing economy

Over the recent years, attitudes towards consumption have shifted, causing the transition of the current "make-use-discard" economy towards the "sharing economy" (Belk, 2013; Cohen & Kietzmann, 2014). Botsman & Rogers (2010) state that the main goal of this sharing economy is to increase the utilization of goods by replacing individual ownership with temporary on-demand access.

In literature, a wide variety of definitions describing the practice of this shared consumption can be found, such as: "Access-based consumption" (Bardhi & Eckhardt, 2012), "Commercial sharing systems" (Lamberton & Rose, 2012), "Collaborative consumption" (Botsman & Rogers, 2010), "Consumer participation" (Fitzsimmons, 1985) and "Product-Service Systems" (Mont, 2002).

Hamari et al. (2016), who utilize the term "Collaborative consumption", define it as:

"The peer-to-peer-based activity of obtaining, giving, or sharing the access to goods and services, coordinated through community-based online services."

Hamari et al. (2016)

As highlighted in this definition, the rise of collaborative consumption has largely been supported by the growth of the internet and associated information and communication technologies. Due to these new technologies, the rapid sharing of access to goods and services became possible on a large scale. Especially the development of Web 2.0 enabled the development of the platforms necessary for supporting the sharing of products (Belk, 2014).

However, it is also possible that these types of sharing models emerged from a need of frugal spending after the financial crisis in 2008, or due to the increasing environmental consciousness of consumers (Hamari et al., 2016; Cohen & Kietzmann, 2014).

Of course, the activity of sharing is not new. Humans have always shared, since it breeds social relations and solidifies cultural routines (Belk, 2009). Moreover, Carol Stack already highlighted the importance of sharing among poor African-American citizens in the U.S. more than a few decades ago (Stack, 1974). However, what is different with the contemporary occurrence of sharing, is the concept of "stranger sharing" (Schor, 2014).

Historically, people tended to share only with people within their own (trusted) social circle, whereas the current sharing platforms allow people to share goods with people they have no social connection with whatsoever. Therefore, this new form of sharing entails a higher degree of risk.

Sharing platforms are trying to reduce this risk by implementing ratings and reputational systems, although multiple researchers question the reliability of these methods (e.g. Zervas et al., 2015; Overgoor et al., 2012). Regardless, many authors confirm the rising popularity of the sharing economy and its impact on the global economy (e.g. Bardhi & Eckhart, 2012; Belk, 2014).

2.2 Product-Service-Systems

By analysing the business model of Greenwheels, it can be concluded that it doesn't strictly meet the definition of the sharing economy as proposed by Hamari et al. (2016). The car sharing service does not utilise a "peer-to-peer community-based platform". Perhaps, a more fitting term would thus be "Product-Service System", which is defined as:

"A marketable set of products and services capable of jointly fulfilling a user's need. The product/service ratio in this set can vary, either in terms of function fulfilment or economic value"

Goedkoop et al. (1999)

Some authors argue that product-service systems (PSSs) are not part of the "sharing economy" paradigm (e.g. Frenken & Schor, 2017). Personally, I believe that regardless of who owns the asset (in this case the car), PSSs should be regarded as part of the sharing economy, since the core goal of sharing access to goods and services in order to increase efficiency (Botsman & Rogers, 2010) is still in place.

Tukker (2004) illustrated the varying degree of product/service ratio using a framework that identifies the eight types of PSSs (see figure 7). In the case of Greenwheels, the service proposition can be categorised as "Use oriented" and specifically as a product sharing solution (PSS Type B4).

Researchers suggest that these types of PSSs are a promising solution for many of the sustainability issues our society is currently facing (Tukker, 2004; Mont, 2002).

Tukker (2004) evaluated the eight sub-types of PSSs based on their sustainability characteristics. His results show that the type of PSS which Greenwheels utilizes has the potential of incremental to considerable environmental impact reductions compared to traditional product ownership.

However, despite being a promising solution for overcoming sustainability issues, the question remains to what extent consumers will adopt such a PSS. To answer this question, the next chapter explores the acceptance of PSSs from an academic perspective.

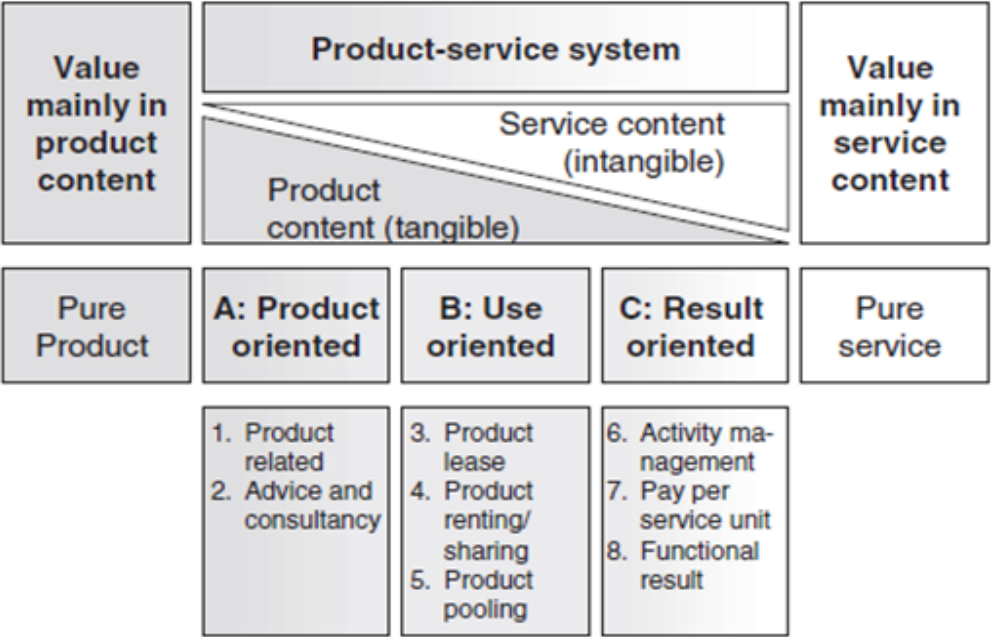


Figure 7: Product/service framework. Source: Tukker (2004).

2.3 Consumer acceptance of PSSs

As previously stated, PSSs have the potential of incremental to considerable environmental impact reduction. Yet, the consumer acceptance of these types of business models remains unreliable. For example, in the Netherlands, only 1% of the adult population uses car sharing (Jorritsma et al., 2015). Therefore, it is valuable to investigate which factors could stimulate the acceptance of such a PSS.

Researchers found a variety of factors influencing the consumer acceptance of PSSs. These can be split between (1) factors related to the service component, (2) factors related to the product component and (3) psychological factors (Tunn et al., 2019). In order to visualise these factors, a conceptual framework was created (see figure 8).

Factors related to the service aspect of PSSs are: Price complexity (Schmidt et al., 2016), the (perceived) reliability of the service provider (Poppelaars, 2018), availability of product information (Schenkl, 2014), accessibility of products (Pedersen & Netter, 2015) and product availability (Tukker, 2015).

Factors related to the product aspect of the PSS are: the degree of changing habits (Rexfelt & Ornäs, 2009), learning new skills (Mylan, 2015) and the repair and maintenance of products (Cherry & Pidgeon, 2018). Additionally, there are a number of psychological aspects that also influence the consumer acceptance of PSSs.

In general, consumers have the desire to own products (Armstrong et al, 2015; Schenkl, 2014).

This tendency is explained by the perceived control over the product (Tukker, 2015), fear of damaging the product while using a PSS (Cherry & Pidgeon, 2018), hygiene concerns (Edbring et al, 2016) and symbolic value and social status (Santamaria et al., 2016).

It can be concluded that PSSs often don't provide the intangible benefits that ownership does, or that the PSS is not correctly designed in terms of product or service-related aspects, resulting in barriers for consumer acceptance. However, some authors also suggest possible solutions for overcoming these barriers.

For example, Armstong et al. (2015) performed a study on PSSs in the clothing industry. The results suggested that "... a variety of emotional needs (experiential, satisfaction, change needs, uniqueness) that could be met through PSS models offering personalized or customized design" (p.38). Tunn et al. (2019, p.9) support this finding by stating that "Customising products using temporary customisation strategies could potentially even lead to a feeling of psychological ownership that in turn leads to consumers treating products with more care, and probably to more intensified use".

On the other hand, Edbring et al. (2016 p.1) state: "... consumer attitudes vary greatly to the consumption models and depending on the product group". Therefore, it is valuable to investigate the acceptance specifically for corporate car sharing (from now on referred to as CCS), since the determinants for its acceptance could vary significantly from other product groups.

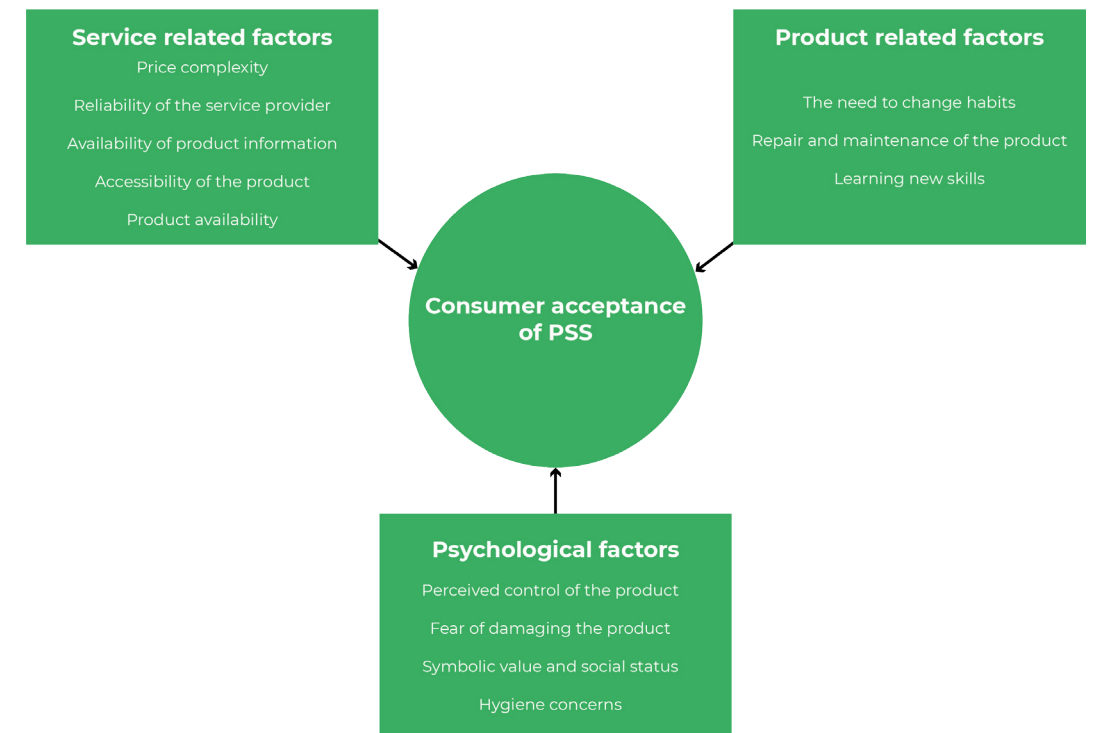


Figure 8: Possible determinants for the acceptance of PSSs.

2.4 Consumer acceptance of corporate car sharing

Even though the topics of car sharing, PSSs and sustainable business models are covered extensively in literature, CCS has received little to no attention. Only one previous study was found that specifically investigated possible factors influencing the intention of using a CCS service.

This study, by Fleury et al. (2017), tested the influence of several dimensions on the behavioural intent of employees to use a CCS service. The study was performed at a French telecommunication company and included 259 participants in total.

In this study, the influence of the following dimensions were tested:

- Performance expectancy (I.e. Will using the service help me improve my job performance?)
- Effort expectancy (I.e. How hard is it to use the service?)
- Facilitating conditions (I.e. Does the company provide the necessary context and resources to use the system?)
- Social influence (I.e. Does using this service fit the norms of my social group and does it improve my social status?)
- Perceived Environmental Friendliness (I.e. What is the impact of using corporate car sharing on the environment?).

The results showed that effort expectancy was the most influential factor for determining the behavioural intention. Additionally, it was found that perceived environmental friendliness had a small effect on behavioural intention and was mediated by performance expectancy (see figure 9). Overall, social influence was the least influential factor.

The practical implications of this study highlight the importance of the facilitating conditions for influencing the effort expectancy. Participants suggested using videos and training workshops to familiarise the employees with the car sharing concept, thereby improving the effort expectancy. Furthermore, any communication towards potential users should stress the ease of use and the simplicity of the booking service in order to further improve effort expectancy.

The authors also suggest that the perceived environmental friendliness could be improved by clearly communicating the amount of resources that are being saved by using the car sharing service, since communicating these impacts will justify the purpose of the CCS service.

Despite the limitations of this study, it is currently the most applicable source of academic literature for this graduation project. Therefore, the importance of improving performance expectancy and effort expectancy will be taken into account during the remainder of this graduation project.

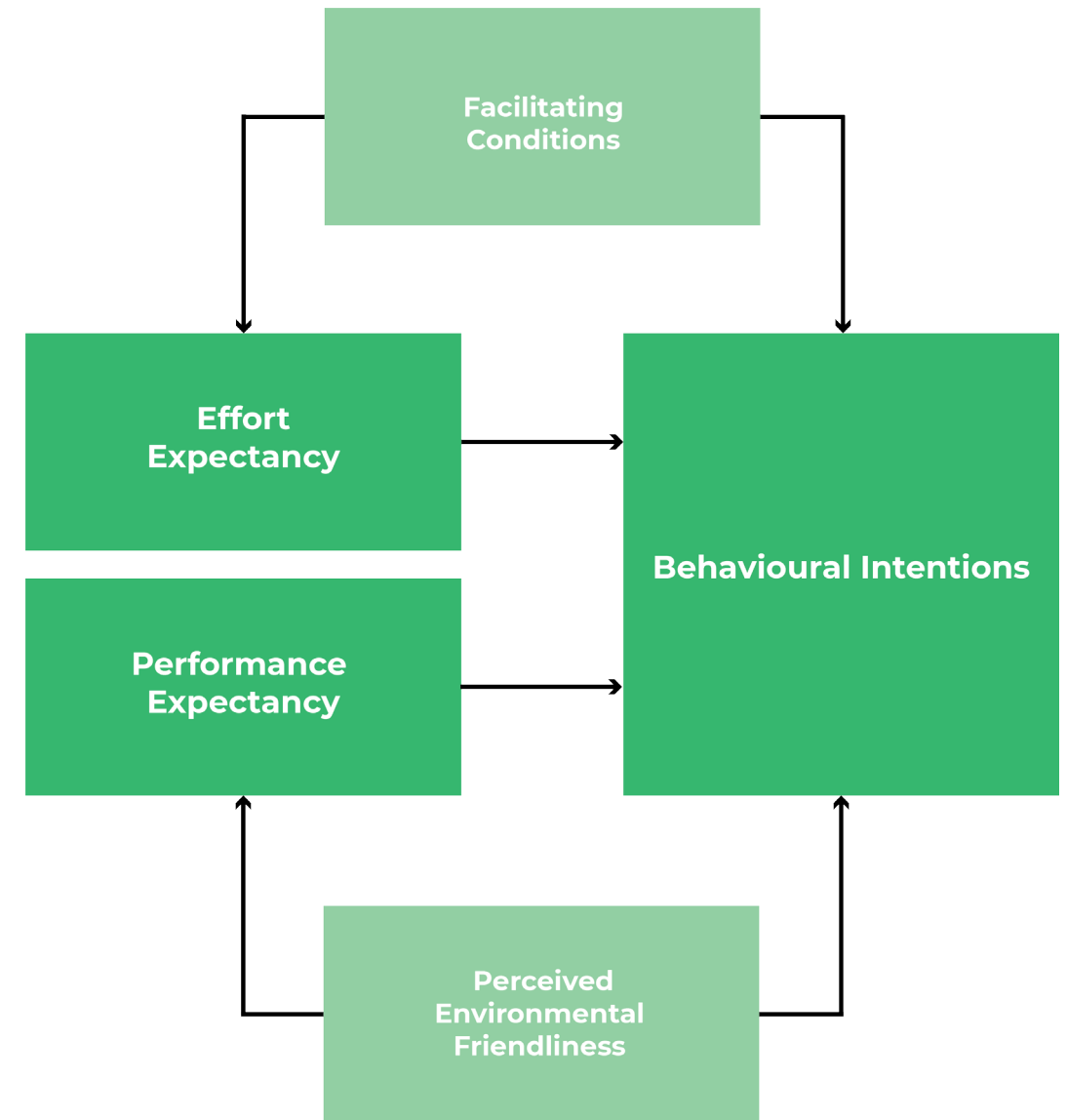


Figure 9: Determinants for the acceptance of CCS. Based on Fleury et al. (2017).

Key insights

The insights from this literature review will now briefly be discussed according to the four research questions that guided it.

What is the sharing economy, and how did it evolve to what it is today?

The main goal of this sharing economy is to increase the utilization of goods, by replacing individual ownership with temporary on-demand access (Botsman & Rogers, 2010). The transition to this new economy is mainly driven by the development of new information technologies and changing consumer attitudes.

How can Greenwheels' car sharing service be categorised within this sharing economy?

Within the sharing economy paradigm, the car sharing service of Greenwheels can be regarded as a use-oriented PSS (Tukker, 2004).

What are the determinants for increasing the acceptance of product-service systems?

Various researchers uncovered determinants for the acceptance of PSSs. These determinants can be divided between service, product and psychological factors.

Service factors

- Price complexity
- Reliability of the service provider
- Availability of product information
- Accessibility of product
- Product availability

Product factors

- The need to change habits
- The need to learn new skills
- Repair and maintenance of the product

Psychological factors

- Perceived control over the product
- Fear of damaging the product while using it
- Hygiene concerns
- Symbolic value and social status

What are determinants for stimulating the acceptance of CCS?

In order to stimulate CCS, it was found that users should understand how the service helps them personally (performance expectancy) and how easy is it to make use of it (effort expectancy).



Chapter 3: Company Analysis

This chapter discusses the company analysis by exploring its history, marketing strategy, business model and sustainable value creation.

3.1 History of Greenwheels

Greenwheels is a Dutch car sharing company, with its headquarters located in Rotterdam. It was founded in 1995 by Gijs van Lookeren Campagne and Jan Borghuis, based on the idea that owning a car is terribly inefficient. Most cars stand idle during the majority of the day. They take up precious parking space and costs the owner a significant amount of money even without being used. Research has supported this assumption by showing that cars are not being used 95% of the time (ANWB, 2015). The founders therefore envisioned that sharing a car with multiple people would not only financially appealing, but could also be beneficial for the environment, since less cars would be needed overall.

In the starting years, Greenwheels grew rapidly by acquiring other car sharing companies within the Netherlands. Additionally, they formed a partnership with the national railway company NS. This partnership allowed them to place their cars near train stations across the country, giving them a competitive advantage over other car sharing companies. In 2015, Gijs and Jan completely sold Greenwheels and it became a joint venture of Volkswagen Financial Services and Pon Holdings (see figure 10).

MILESTONES

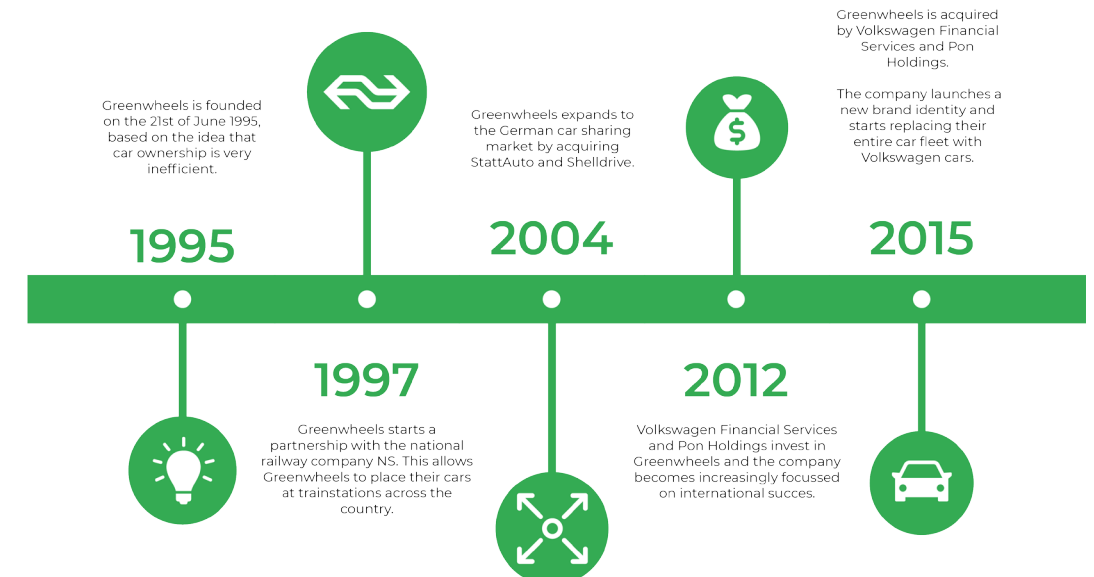


Figure 10: Greenwheels milestones.

With the change in ownership of the company, the brand image also changed radically. New subscriptions were introduced, the entire car fleet was replaced with Volkswagen cars and a new website and mobile application were launched with a stronger focus on the user experience (see figure 11). These changes allowed the company to successfully reach a larger group of consumers, resulting in a customer growth of 43% during 2016 (see figure 12).



Figure 11: Design of the new website and application.



Figure 12: Newspaper article on the growth of Greenwheels. Source: Homan (2017).

3.2 Marketing Mix

In this section, the company is analysed in order to provide a comprehensive overview of its business operations. The analysis of the company was performed using the 4 Ps the marketing mix (Product, Price, Place and Promotion) approach as proposed by Constantinides (2006).

Product

The product proposition for the B2B division is split up into three different types: “Public business subscription”, “On site” and “Tailored”. Each of these propositions will now briefly be discussed.

Public business subscription

The first proposition is most similar to the consumer car sharing service. Employees gain access to the network of 1800 public cars spread across the Netherlands. The cars can accessed using a company key card, a personal MaaS card (e.g. NS business card) or the Greenwheels mobile application.

Greenwheels uses a station-based car sharing model for their publicly shared cars. This means that every car needs to be returned to the same spot where it was picked up (see figure 13).

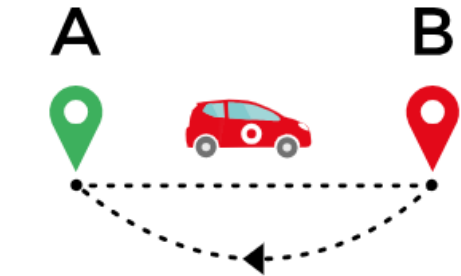


Figure 13: Station-based model.

One of the main advantages of this model is the lower operational cost, since cars don’t need to be redistributed over the country. Another advantage is reliability. People know where the cars are parked and are therefore not faced with the uncertainty whether a car is nearby. Conversely, the station-based model lacks freedom during usage. A free-floating concept (see figure 14), for example, would allow users to leave the car wherever they want.



Figure 14: Free-floating model.

Greenwheels will not switch to a free-floating model any time soon. Doing so would significantly decrease overall profits. Additionally, a recent study showed that 84% of customers are satisfied with the current station-based model and only 2% would be interested in using a free-floating service (Goudappel Coffeng, 2019).

The company aims to expand the total number of shared public cars in order to serve more customers. However, it is limited in doing so by local municipalities, who regulate the distribution of parking permits. Therefore, collaborating with these local municipalities is essential for future growth.

In a nutshell, the public business subscription is a very flexible solution, due to the extensive network of shared cars, however, it does not provide

exclusivity for the users. This means that Greenwheels cannot guarantee a car is always available when an employee wants to make a reservation.

On site

The “On site” proposition offers organisations exclusive shared cars. The shared cars are placed at the client location, however, they remain within Greenwheels’ possession. Nonetheless, the type of car and its appearance can be customised to fit the needs of the client. Furthermore, Greenwheels offers its fleet management services (e.g. cleaning and maintenance on location) and automated travel-expense administration for the client’s employees.

The On Site service starts at a minimum contract period of 12 months, providing more flexibility than (most) corporate leasing contracts. On top of that, employees also gain access to the public network of shared cars.

Tailored

The third proposition offers a completely customisable company car fleet. This means that Greenwheels will transform the existing car fleet into a shared car fleet. This service proposition also includes fleet management services and automated travel-expense administration. Similar to the On site service, employees also gain access to the public network of shared cars.

Examples of customers who use the On site and Tailored service are: Magazijn de Bijenkorf, Stedin, de Rijksoverheid, Gemeente Meierijstad, Gemeente Woerden, Gemeente Den Bosch and Gemeente Brummen.



Figure 15: Delivering exclusive cars at the municipality of Meierijstad.



Figure 16: Exclusive cars at the Ministry of Infrastructure and Water Management.

Price

The pricing of the On Site and Tailored propositions depends on the needs of the client, since these services are customisable. The pricing of these services is based on the combination of the leasing costs of the shared, car and a flat service fee for the fleet management services.

The prices of the public business subscriptions are composed of a fixed monthly fee and a variable price based on the usage of the car. The variable price is made up of a price per hour and a price per kilometre driven. Businesses can choose from three different subscriptions: Business Occasional, Business Regular and Business Frequent (see figure 17).

	Business Occasional			Business Regular			Business Frequent		
	€ 5 P/MONTH			€ 25 P/MONTH			€ 50 P/MONTH		
Tariffs (fuel incl.)									
PER HOUR	€ 4,10	€ 6,10	€ 9,10	€ 3,10	€ 4,60	€ 7,50	€ 2,05	€ 3,05	€ 6,70
PER KM	€ 0,29	€ 0,39	€ 0,17	€ 0,23	€ 0,32	€ 0,12	€ 0,21	€ 0,29	€ 0,10
Long trips (km, excl.)									
DAY	€ 45	€ 49	€ 79	€ 35	€ 39	€ 69	€ 25	€ 29	€ 59
WEEKEND	€ 59	€ 69	€ 119	€ 49	€ 59	€ 109	€ 39	€ 49	€ 99
WEEK	€ 139	€ 149	€ 249	€ 129	€ 139	€ 239	€ 119	€ 129	€ 229
Conclusion	Most economical option from a maximum of one trip a month.			Most economical option from up to five trips a month.			Most economical option from six trips a month or more.		
	CHOOSE BUSINESS OCCASIONAL			CHOOSE BUSINESS REGULAR			CHOOSE BUSINESS FREQUENT		

Figure 17: Pricing overview for companies

As can be seen in the figure above, all subscriptions for corporate users have a fixed monthly fee. The variable costs per hour and kilometre are significantly lower for the more expensive subscriptions. Businesses that frequently use the car sharing service are therefore advised to take a different subscription as opposed to companies that only incidentally use the service.

Place

The CCS services can be divided into the public business subscription and exclusive cars services (On site and Tailored). How these different types of services are acquired will now be discussed below.

Public business subscription

Acquiring a public business subscription is easily done online. Customers are able to register an account on the company website, using their company name and chamber of commerce number. After setting up their account and method of payment, they are able to register the employees who will gain access to the service.

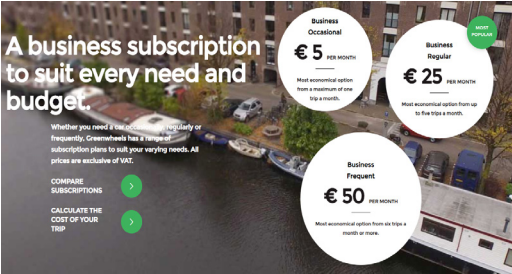


Figure 18: Choice of subscriptions.

Exclusive cars

Acquiring the On site of Tailored service is more complex compared to the public business subscription. These services are developed in consultation with the customer. Therefore, the process of acquiring exclusive shared cars is mostly done through personal contact. In order to accomplish this goal, Greenwheels has a number of employees who are responsible for the account management of corporate clients.

Promotion

Promoting the corporate proposition has not gained a high priority within Greenwheels until now.

Currently, potential corporate customers approach Greenwheels through an online contact form on the website and through third party sales teams. This reactive promotional strategy has been successful so far, since the available resources for managing new clients was limited. Furthermore, the CCS proposition needs to be improved before it is promoted more intensively.

In the future, Greenwheels plans to promote their CCS service in multiple ways. First, Greenwheels plans to launch a new separate website for their corporate proposition in order to streamline the communication towards potential corporate customers. Secondly, LinkedIn will be used to selectively target potential customers. Additionally, account management teams of partner MaaS platforms will start to promote the CCS service. Fourth, trade shows will be used to directly promote the CCS service to professionals within the mobility sector. Lastly, Greenwheels will start publishing white papers on new developments within the car sharing industry. This way the company is able to showcase their knowledge and expertise to potential clients.

3.3 The business model

In order to understand the business model of Greenwheels, the Business Model Generation book by Osterwalder & Pigneur (2010) was used. As the authors state, it is important to first establish a clear definition of a business model. The definition of a business model used in this graduation project corresponds with the one proposed by Osterwalder & Pigneur (2010):

“A business model describes the rationale of how an organization creates, delivers, and captures value”

Osterwalder & Pigneur (2010)

Business model canvas

Osterwalder & Pigneur (2010) defined nine 'building blocks', which together create a clear overview of how a business model is structured. These building blocks cover the four main areas of business: customers, infrastructure, offer and financial viability. The model that integrates and visualises these nine building blocks is often referred to as the “business model canvas”. According to this model the business model of Greenwheels was analysed (see figure 19).

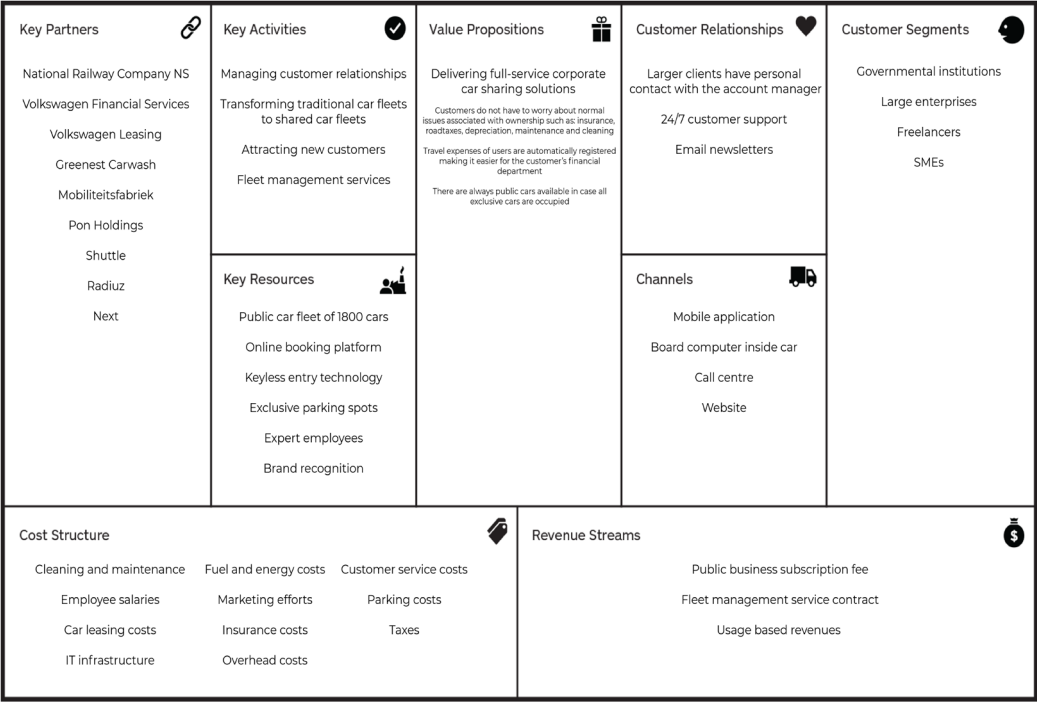


Figure 19: Business Model Canvas.

3.4 Sustainable value creation

It is important to understand how Greenwheels creates sustainable value using the current CCS service. In order to visualise how sustainable value is created, the triple bottom line approach (Elkington, 1998) was used.

The triple bottom line approach states that value creation of companies should not focus purely on economic gains, but also take into account social and environmental aspects. This approach is often referred to as the triple bottom line and focusses on three elements: People, Planet and Profit (see figure 20).

To explore how Greenwheels currently creates value along these three aspects, the Triple Layer Business Model Canvas (TLBMC), developed by Joyce & Paquin (2016), was used. The TLBMC is an extension of the traditional economically-oriented business model canvas by Osterwalder & Pigneur (2010). It integrates two additional layers: one focussing on social value creation and another focussing on environmental value creation. These two new layers were used to showcase the sustainable value creation of the CCS service.



Figure 20: The triple bottom line. Based on Elkington (1998).

Social layer

Joyce & Paquin (2016) state: “Social value speaks to the aspect of an organization’s mission which focuses on creating benefit for its stakeholders and society more broadly”. The social value creation process of Greenwheels was analysed and translated into the social value layer shown below (see figure 21).

Local Communities Working together with local businesses and governmental bodies to promote car sharing	Governance Autonomous joint-venture of Pon Holdings and Volkswagen Financial Services Employees Flexible workplace with lots of autonomy for the employees Strong customer relationships	Social Value Developing long term mutual beneficial relationships with clients Enhance the quality of client employees' lives by offering accessible and sustainable mobility solutions	Societal Culture Promoting a culture of sharing and environmental responsibility Scale of Outreach Active in two countries, with a growing number of customers	End-User Car mobility on demand Feeling of environmental responsibility Intuitive booking platform
Social Impacts Potential job loss of car fleet service employees from the client organisation Users lose their personal car as a status symbol			Social Benefits Contributing to a healthier environment by reducing particulate matter emissions from vehicles Using scarce parking space in urban environments more efficiently Accessible mobility for everyone	

Figure 21: Social Value Layer.

As the social value layer shows, the CCS service mainly creates social value by enhancing the lives of the end-users, and through developing long term mutual beneficial relationships with client organisations. On a larger scale, Greenwheels contributes to society by reducing air pollution, congestion problems in cities and lowering the total amount of required parking space.

Environmental layer

Environmental value "encompasses the ecological value the organization creates through environmental impact reductions and even regenerative positive ecological value" (Joyce & Paquin, 2016). The environmental layer (see figure 22) visualises the creation of environmental value, thereby showing the major environmental impacts and benefits the CCS service creates.

Supplies and Out-sourcing Car manufacturing Energy or gasoline usage Telematic hardware production Cleaning services	Production IT infrastructure Transporting people Fleet management services Materials IT resources Office building Car fleet	Functional Value Mobility in terms of kilometers driven multiplied by the number of users over the period of one year	End-of-Life Returning the car to Greenwheels or a leasing company for refurbishment and re-use Distribution Delivering shared cars to customers Travel of fleetcheckers to client location	Use Phase Energy usage of electric cars Fossil fuel consumption of non-electric cars Repairs and maintenance
Environmental Impacts Greenhouse gas emission during usage of non-electric cars Particulate matter emission during usage of non-electric cars Indirect greenhouse gas emission of energy production facilities required for charging the electric cars		Environmental Benefits Zero-emission transportation when using electric cars Gasoline cars have improved fuel efficiency compared to the average passenger car in the Netherlands Less cars are needed in total, reducing the environmental impact of the manufacturing phase		

Figure 22: Environmental Value Layer.

It can be concluded that the CCS service has a positive impact on the amount of GHG emission, mainly by lowering environmental impacts during the use-phase of the car. Furthermore, the total number of required cars is reduced, resulting in lower impacts of the production phase. Most environmental impacts of the CCS service are generated during the use phase, while the production and distribution phases have a relatively small impact. Therefore, environmental value can be significantly improved by switching from fossil fuel powered vehicles towards fully electric vehicles (EVs).

3.5 Impact study

To illustrate how Greenwheels creates different types of value, a real-life example was explored. The municipality of Meierijstad, one of Greenwheels’ customers, will be used as the focal organisation. In 2017, the municipality completely replaced their car fleet with Greenwheels’ shared cars. The resulting impacts of this transition is shown in the figure below (see figure 23).

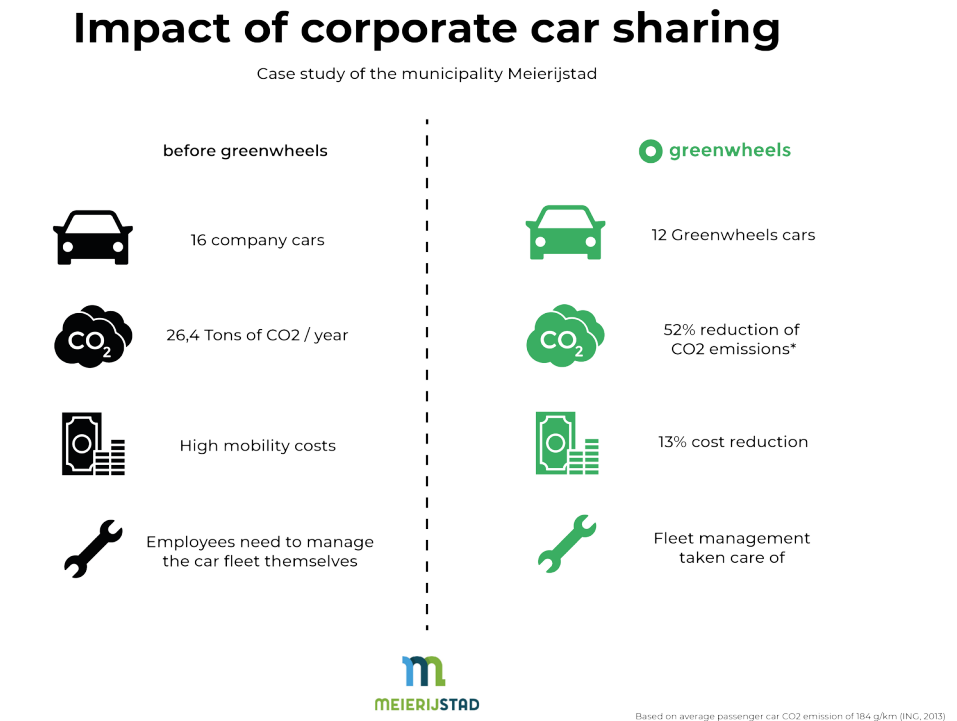


Figure 23: Case study municipality of Meierijstad.

As can be seen in figure 23, the CCS service not only had a positive impact in financial terms, but also for the environment (52% reduction of CO₂ during use-phase), and the amount required parking space (reduction of 4 parking spots). Furthermore, employees were better able to focus on their own responsibilities since they no longer needed to manage the company cars themselves. Nonetheless, the environmental value could be significantly improved by replacing the gasoline powered cars with electric cars.

Key insights



What value is created?

The value that is created by the CCS service is divided over multiple aspects. First of all, the CCS service removes the burdens of traditional car ownership, such as insurance, maintenance and cleaning costs. Furthermore, the CCS service enables administrative automation, making it easier for companies to process the travel expenses of their employees. The CCS service also creates social value by establishing mutual beneficial relationships with customers, reducing air pollution and lowering the amount of required parking space in cities. Environmental value is created by lowering GHG emissions and car ownership, especially while using electric cars.



Who are the customers?

The customers of the CCS service can be split up into four customer segments: (1) governmental institutions, (2) large enterprises, (3) freelancers, and (4) small and medium-sized enterprises (SMEs). Each of these segments has their own set of needs and wishes. Selecting the right customer segment is therefore important, and will be further discussed in chapter 6.



How is the value delivered?

Greenwheels uses both online and offline channels for delivering value to its customers. In general, most customer interactions take place online. End-users mainly interact with the website and online booking interface. Occasionally, the customer service department will be contacted by phone. Only the mobility managers of larger clients have personal contact with Greenwheels employees, in order to evaluate the performance of the CCS service. Additionally, partner companies (e.g. Pon Holdings) support Greenwheels in selling their car sharing services using their sales teams.



How is value captured?

There are three different revenue streams that keep Greenwheels financially viable: (1) the company generates revenue with its monthly business subscriptions fees, (2) revenue is generated through fleet management service contracts for exclusive cars, and (3) the company earns a variable income based on the usage of its public shared cars.



Chapter 4: Service Analysis

This chapter shows the analysis of the current corporate car sharing service by experiencing it first-hand. Consequently the experience was translated into a customer journey map.

4.1 Service Safari

A Service Safari is a research method used to gain a better understanding of a specific service or type of service. This research method was used at the beginning of this graduation project in order to identify how the Public Business Subscription delivers value to the customers. The objective was to experience the service first-hand, thereby generating a thorough understanding of the customer experience. During the Service Safari, all touchpoints were documented using screenshots and photographs (see figure 24).

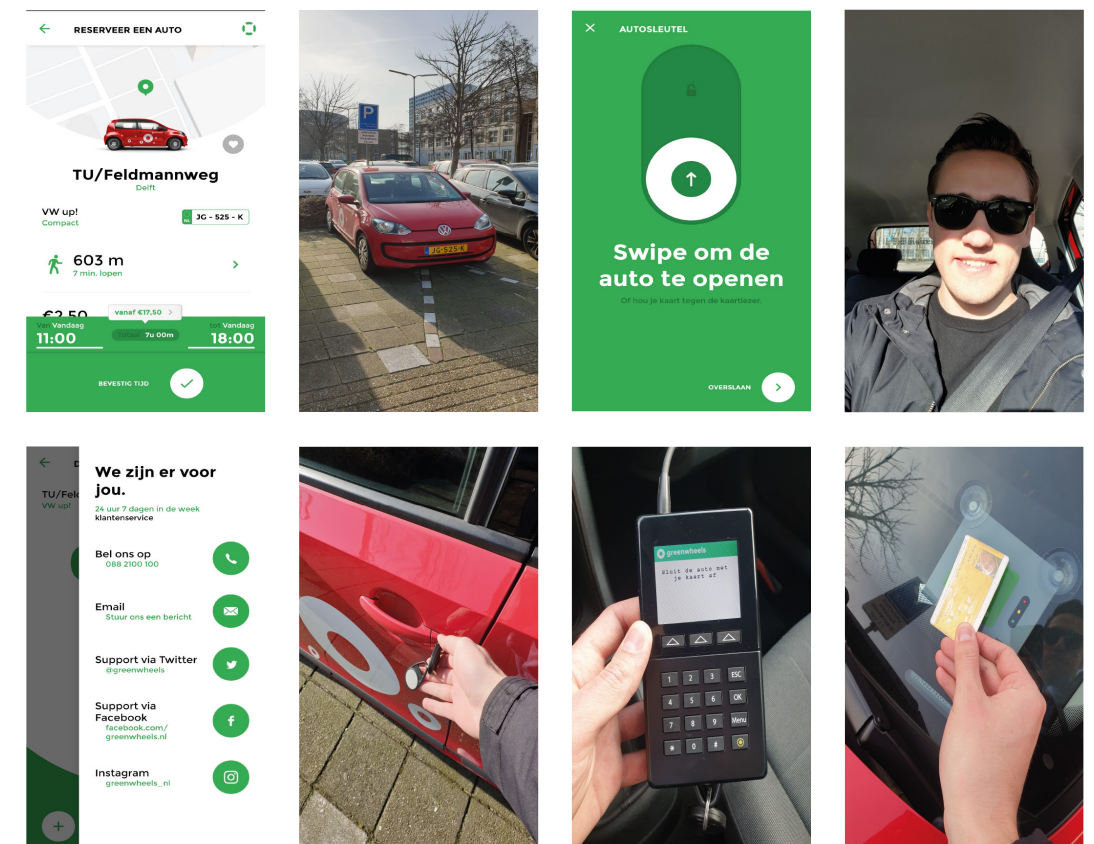


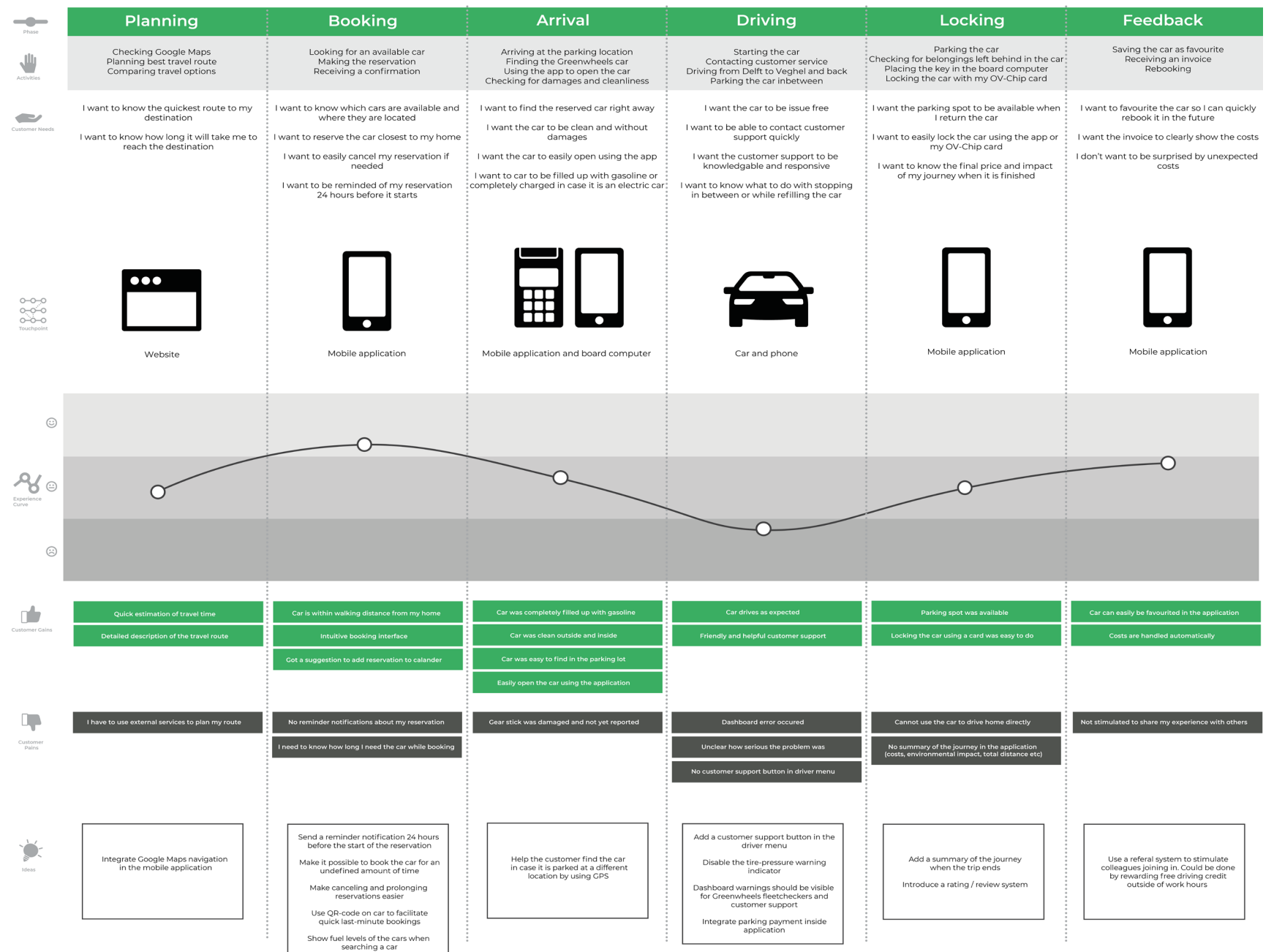
Figure 24: Impression of the service safari.

4.2 Customer Journey Map

Based on the service safari, a customer journey map was created in order to translate the experience into a structured visualisation (see page 48-49). The customer journey shows the activities that were performed, the needs during these activities and the touchpoints that were used. Additionally, the emotional experience was visualised as well. At the bottom of the customer journey map, the pains and gains during the experience, and various improvement suggestions are shown (see Appendix H for full list of suggested improvements).

Legend

-  **Phase**
In which segment of activities is this taking place?
-  **Activity**
What action or activity is the customer performing in order to reach their goal?
-  **Customer Need**
The need or goal that the customer fulfills in order to reach its goal.
-  **Touchpoint**
Every point in the customer journey where the customer comes in contact with the service.
-  **Customer Gain**
Advantage which helps the customer to perform tasks easier, faster, cheaper or better.
-  **Customer Pain**
Barrier or problem that prevent the customer from reaching his or her goals.
-  **Experience Curve**
Result of the positive and negative aspects of the customer experience.
-  **Idea**
Idea how to improve the customer experience.

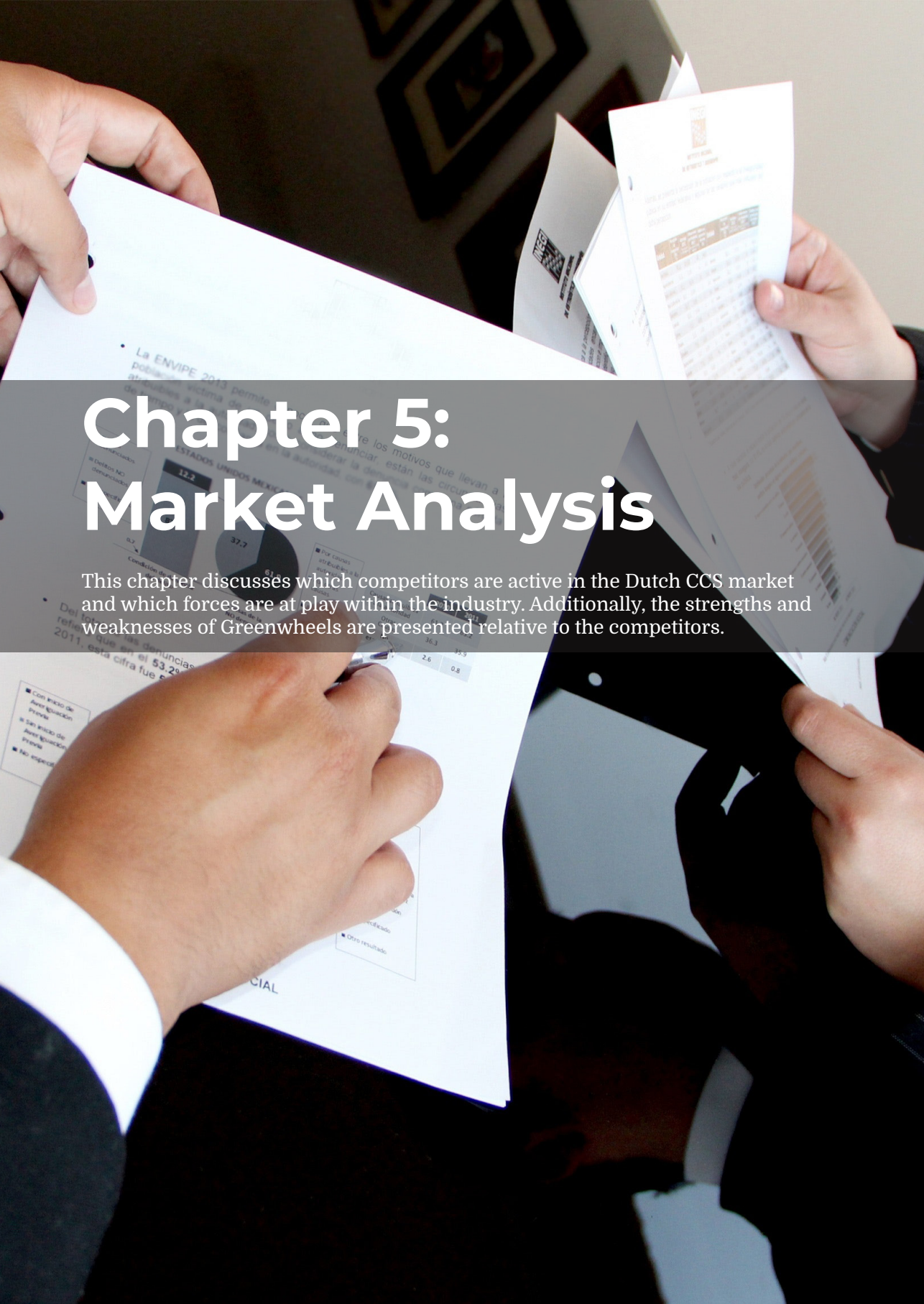


Key insights

Experiencing the car sharing service first-hand resulted in a number of incremental design suggestions for the current booking interface. The most important improvements are the following:

- Integration of a navigation service into the driver application.
- Implementing a notification system to remind users of their reservation in order to reduce the number of no-shows.
- Last-minute changes and cancellations should become possible for business users.
- The booking interface should show the battery or fuel level of the available cars so users can choose a vehicle that fits their trip.
- Parking payments should be integrated inside the driver application.
- Users should receive feedback about the environmental impact of their trip.
- A referral system should be implemented in order to stimulate user growth.





Chapter 5: Market Analysis

This chapter discusses which competitors are active in the Dutch CCS market and which forces are at play within the industry. Additionally, the strengths and weaknesses of Greenwheels are presented relative to the competitors.

5.1 Market overview

The Dutch CCS market is a relatively young and fast-growing industry. Even though the number of shared cars only accounts for only a small percentage of the total corporate car fleet (VMS Insight, 2018), multiple companies are active in this market. These competitors can roughly be divided into leasing companies and service providers. While leasing companies (e.g. Leaseplan) usually offer a CCS service as a side business, service providers do so as their core-business.

Competitor levels

In order to create a clear overview which companies Greenwheels is competing against, multiple competitors were identified. These competitors are grouped into three different competitor levels, which are defined as follows:

Level 1: Direct competitors: Full-service CCS providers

Direct competitors are defined as companies who provide a full-service CCS solution in the Netherlands. This means that they provide the shared car, the hardware, an online booking platform, and offer additional services such as maintenance and cleaning. A price comparison for the core competitors can be found in Appendix A.

Level 2: Indirect competitors: Products and services related to CCS

Indirect competitors are companies who provide car sharing solutions in the Netherlands, but cannot be considered a full-service CCS provider. This group of companies is made up of two types. One group offers their car sharing service to a different customer segment (e.g. consumers). The other group of companies offer a product or service which includes a limited number of aspects of the full-service CCS providers (e.g. only selling car sharing hardware).

Level 3: Generic competitors: Substitute products and services

The third level of competitors can be regarded as alternative transportation methods for CCS. This group includes personal vehicles (e.g. private cars), different means of transportation (e.g. public transportation), and technologies for working from home instead of at the office (e.g. Skype).

The figure on the next page shows an overview of these competitors along the three competitor levels (see figure 25). The outer ring shows level 3 competitors, the middle ring level 2 competitors, and the inner ring level 1 competitors.



Figure 25: Competitor overview.

5.2 Porter's Five Forces

In order to shed light on the forces at play within the Dutch CCS industry, Porter's Five Forces framework (Porter, 2008) was used. This framework helps identify the degree of rivalry among the direct competitors by estimating the threat of new entrants, bargaining power of buyers and suppliers, and threat of substitute products or services. These insights were summarised in the visual framework below.



Figure 26: Porter five forces framework.

The threat of new entrants

Entering the CCS market is relatively easy. The required resources are freely available. However, the investment costs are considerable. Moreover, most customers in the B2B market require CCS providers to prove their reliability through their track record. Start-ups entering this market will struggle to prove their reliability and will therefore face difficulties when looking for launching customers. Furthermore, Greenwheels’ experience in the car sharing industry resulted in a highly efficient operations department which will take new entrants years to achieve.

Bargaining power of buyers

The consumers in this market have a significant amount of power. They can easily switch between CCS providers, since the service contracts are usually short-term (starting from 12 months). When a company uses a subscription-based service, switching between providers is even easier as it is possible to cancel the subscription at any time without any significant costs. However, the total number of providers remains limited and because of the limited amount of differentiation, customers have less incentive to make a switch.

Bargaining power of suppliers

Suppliers play an important role within the CCS industry. Within the CCS context, suppliers are usually car manufacturers who sell or lease their cars to the car sharing service providers.

Currently, suppliers are actively acquiring car sharing companies in order to move into the CCS market (Autodelen.info, 2018). Through this forward vertical integration, car manufacturers are able to quickly enter the CCS market without any prior experience or development time.

Car manufacturers do so in order to prevent potential revenue losses in the near future, due to the economical shift from ownership to performance.

Threat of substitute products or services

There are many alternative transportation options to car sharing. For example, employees could use public transportation, a private car or an electric bike to make their business trips. However, the impact of these substitutes on the acceptance of CCS is limited. Alternative transportation solutions could actually stimulate the acceptance of CCS, since first and last mile trips are often not possible using a shared car. For example, employees have to use public transportation or their bike in order to get home from the office where the shared car needs to be parked. Therefore, substitute products and services are not considered a direct threat to the CCS market but rather a complimentary element.

Competitive rivalries

Considering the combined effect of the four forces within this industry, it can be concluded that rivalry between existing car sharing companies is moderate. Despite being a relatively easy market to enter, it is not as straightforward to gain consumer trust without any prior experience. The ongoing consolidation within the CCS market results in a limited number of competitors, however, due to the rising customer demand, rivalry between these companies is low.

Key insights

Analysing the business model of Greenwheels in relation to its competitors helped identify multiple unique strengths and weaknesses. These insights are shown in the overview below.

STRENGTHS



Car sharing experience

With over 20 years of experience, Greenwheels is one of the longest existing car sharing providers in the Netherlands

Large fleet of public cars

There is always an available car nearby, with a network of over 1800 cars spread across the Netherlands

Unique partnerships

Partnerships with NS, Pon and Volkswagen provides Greenwheels with a competitive advantage

Sustainability

Greenwheels actively contributes to sustainable consumption by moving towards zero emission vehicles and reducing the total number of cars in the Netherlands

WEAKNESSES



Limited differentiation

The business model of Greenwheels is relatively comparable to that of competitors

Lack of internal resources

Greenwheels outsources a lot of its development projects and has therefore limited control over its innovation process

Short-term focus

The current company strategy is focussed on the short-term growth which increases the risk of disruption due to new technologies and trends

Lack of structured approach

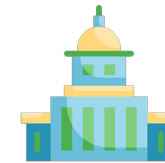
Greenwheels needs a more structured approach in order to optimize the time spent per corporate client.

Chapter 6: Customer Analysis

This chapter discusses the evaluation of multiple customer segments, in order to identify which one is the most appealing target group for the CCS service. Consequently, the selected customer segment will be analysed in more detail.

6.1 Customer segments

Each customer segment has its own unique characteristics. Therefore, the attractiveness of each segment was analysed, in order to select the most promising one. Within the CCS market, the following customer segments are found:



Governmental institutions

This customer segment is made up of public organisations such as ministries, municipalities and water boards. These organisations usually have multiple locations spread across the country, and employ a large number of people. Furthermore, the level of Corporate Social Responsibility (CSR) commitment is high compared to the other segments, due to the exemplary role of the Dutch government.

However, governmental institutions are already Greenwheels' main corporate customers. Therefore, focussing on this segment will result in little revenue growth.



Large enterprises

This customer segment is defined as businesses that employ more than 250 employees. There is a wide range of companies that fit this definition from various industries. Some large enterprises are interesting prospects for Greenwheels' exclusive car sharing service.



Freelancers

This customer segment is made up of professionals who are self-employed, and not necessarily committed to one employer for a longer period of time. They usually work on a temporary or project basis, and frequently switch clients. Research shows that this customer segment will grow rapidly over the coming years (CBS, 2018d). Freelancers are mainly interested in the public business subscription, since they won't be able to share an exclusive car with other employees. Furthermore, they are more likely to work at home compared to other people (de Waard, 2018).



SMEs

The last customer segment consists of SMEs. In this case, SMEs are defined as businesses that employ between 10 to 250 people. This customer segment has grown slightly over the last years (Staat van het MKB, 2018). However, due to the limited amount of employees, most SMEs are unlikely to make use of the exclusive CCS service of Greenwheels.

6.2 Evaluation of segments

Selecting the most promising customer segment was done by evaluating each customer segment on three different criteria:

- **Level of competition:**
How many customers are there compared to the number of car sharing providers?
- **Potential growth**
How much additional revenue growth could be realised when focussing on the customer segment?
- **Number of users:**
How many employees are going to use the CCS service per customer?

	Competitiveness	Potential growth	Number of users
Governmental Institutions	-	- -	++
Large Enterprises	- -	+	++
Freelancers	++	+/-	- -
SMEs	+	+	-

Figure 27: Customer segment overview.

Taking these three factors into account, it was decided that large enterprises are the most promising customer segment for the CCS service. This customer segment has a favourable number of users per client and possesses a positive potential growth. However, the customer segment still contains a wide variety of businesses. Therefore, the next sub-chapter identifies a number of characteristics that can be used to determine the attractiveness of a firm.

6.3 Characteristics of large enterprises

As previously stated, the chosen customer segment of large enterprises consists of a wide variety of businesses. Therefore, this section aims to identify which characteristics can be used to determine the attractiveness of a large enterprise. The characteristics that will be discussed are: CSR commitment, mobility needs and organisational structure.

CSR commitment

An increasing number of companies are backing CSR efforts, due to the mounting evidence that these efforts have a positive influence on purchase behaviour of consumers (Sen & Bhattacharya, 2001). Additionally, research suggests that an organisation’s reputation can be regarded as ‘reputation capital’ or a “stock of perceptual assets and social assets” (Fombrun & van Riel, 2004, p. 32).

Improving the CSR reputation of an organisation is therefore increasingly regarded as a strategic investment by companies. Greenwheels can leverage this development in two ways: by positioning the CCS service as a sustainable alternative to personal car usage and by specifically targeting large companies who are actively trying to improve their CSR reputation.

Identifying which companies are committed to improving their CSR reputation can be done by collaborating with sustainable mobility initiatives such as the Dutch Sustainable Mobility Pledge (Anders Reizen, 2018).

The Dutch Sustainable Mobility Pledge is a voluntary program for large organisations, with the goal of reducing CO₂ emissions by stimulating sustainable mobility options. In return for signing this pledge, companies are able to communicate their CSR efforts more effectively to their stakeholders.

Since the participating companies recognise the value of their CSR reputation, they will be more likely to adopt a sustainable mobility solution, such as the CCS service. Therefore, it would be advisable for Greenwheels to first target these types of companies.

Mobility needs

Another important factor for evaluating the attractiveness of large companies, are the (car) mobility needs of the employees.

At one end of the spectrum, there are large businesses that barely have any employees who need to travel during work hours (e.g. manufacturing plants). These types of companies are less interested in acquiring a CCS service, since the shared cars won’t be used enough. At the other end, there are companies that have a group of employees who need to travel almost every day. These companies are also not interested in the CCS service, since providing these employees with a (personal) lease car would be more cost-effective. Therefore, the most attractive group of companies are located between these two extremes. They employ a large group of people who have to travel during work hours a few times each month, which is not enough to legitimise the use of a personal lease car. Additionally, it is important for employees to easily commute to and from the office when they use the CCS service.

Preferably, these employees are able to use public transportation to travel home from the office, in order to save valuable parking space and reduce environmental impacts further. Therefore, it is advisable to target companies that have an office building located in a strongly urbanised location. In these areas, parking space will be limited and public transportation options are widely available.

Organisational structure

The third aspect that needs to be taken into account is the organisational structure of the company.

Buying behaviour literature (see Appendix B) suggests that it is favourable for suppliers to sell to narrow organisations rather than wide organisations. Within narrow organisations, less people will be involved in the purchasing process, resulting in a lower decision time. Therefore, it can be concluded that the CCS service is best marketed to companies that have a separate person or department dedicated to handling the mobility policies of the employees. This would not only increase the efficiency of the sales process, but also support the development of trust since there will be a single point of contact between Greenwheels and the client.

Key insights

The main insights of the customer analysis are as follows:

- Large enterprises are the most appealing customer segment for the CCS service.
- Targeting large companies who are actively engaged with improving their CSR reputation is advisable.
- Large enterprises that employ people who need to travel a couple times per month are most interesting.
- Marketing efforts should be aimed at companies that have a narrow organisational structure, preferably with a single person or department who is responsible for the mobility policy. This would increase the efficiency of the sales process and build trust between Greenwheels and the client, since there is a single point of contact.



Chapter 7: Stakeholder Analysis

This chapter discusses the different types of stakeholders that can be found inside the client organisation. Furthermore, it highlights multiple expert interviews and shows how the insights were translated into customer profiles for the most important stakeholder roles.

7.1 Stakeholder roles

This section discusses the different stakeholder roles that are present within the client organisation, according to the Value Proposition Design book by Osterwalder et al. (2014). Using this method, the following types of stakeholders are defined: Influencers, Recommenders, Economic Buyers, Decision Makers, End-users and Saboteurs. Each of these stakeholders will be now be discussed in relation to the CCS service.



Influencers

These are the people who influence the decision-making process, without being directly involved. People such as the family and friends of the decision makers, but also employees who won't use the shared car service themselves can be part of this group of stakeholders. Additionally, people not connected to the customer might also be part of this group by spreading positive or negative word-of-mouth about the product or service.



Economic Buyers

The economic buyer is the person who has the budget and can make the sale happen from a financial point of view. Usually, the financial department, or the individual responsible for making the yearly budget of the company fits this stakeholder group. They oversee the yearly spending and check if there are enough financial resources to make changes to the mobility policy of the company.



Decision Makers

This group of stakeholders is usually composed of the board of directors or the CEO(s) of the company. They have the authority to make changes to the budget allocation and have the final say over the purchase decision of new products or services. Within some organisations, the mobility manager is authorised to make changes to the mobility policy without needing approval from other people, hereby making him/her both recommender and decision maker.



End-users

The end-users are the employees of the client organisation who will use the CCS service. Usually, this is a specific group of employees who occasionally have to travel during work hours. For example, account managers or project managers who have meetings their clients or stakeholders outside of the office. Often, these employees have some type of mobility solution provided by their employer. This stakeholder group is important because the customer satisfaction of the CCS service largely depends on their approval.



Recommenders

The recommenders are people who carry out the evaluation process and make a formal recommendation for or against the acquisition of the product or service. In the case of CCS, this group often includes mobility managers, fleet managers, facility managers HR managers or office managers, depending on the type of organisation. This stakeholder group is important since they will most likely form the point of contact between Greenwheels and the client.



Saboteurs

People belonging to this group can obstruct or derail the process of searching, evaluating and purchasing the CCS service. They are not directly using the service and can be inside or outside the client organisation. An example of a saboteur could be someone whose own job might be at risk due to the acquisition of the CCS service. For example, a leasing company employee who is currently managing the car fleet of the client organisation.

7.2 Expert interviews

This section discusses seven interviews that were held with a variety of experts (see Appendix C).

The aim of these expert interviews was threefold: (1) getting an accurate understanding of the user experience, (2) identifying relevant market trends and technological developments, and (3) understanding the perspectives of the recommender and decision maker stakeholders.

The interviewees included an end-user, mobility consultant, mobility manager, business development manager, HR manager, facility manager and product manager. During the interviews, their job responsibilities, past experiences with car sharing, market trends and technological developments were discussed. In order to guide the interviews, trigger questions, as defined by Osterwalder et al. (2014), were used (see Appendix C).

Most interviews were audio recorded and transcribed, in order to make the insights more explicit. The outcomes were used for the generation of the future vision (see Chapter 9), the creation of customer profiles (see page 71-74), and as a source of inspiration during the ideation process (see Chapter 10).



Louis van der Hoeven – End-user

Louis is a project leader at Stedin. This company is a Dutch grid operator and currently one of Greenwheels' corporate customers. During his job, Louis frequently visits project sites or meets up with project stakeholders. During these trips he uses a shared electric car, which is placed at his office building in Rotterdam. Interviewing Louis helped me gain insights into the CCS experience from the user perspective.

"In the past I owned a diesel car, which I drove with a lot. However, after I experienced driving the shared electric cars at work, you could say I became infected with the electric car virus. Shortly after, I chose to trade in my personal car for an electric car as well."

- Louis van der Hoeven



Jelle Oosterhoff – Industry Expert

Jelle is a mobility consultant at Pon Business Mobility. He advises, supports and guides companies in their journey towards multi-modal mobility. Interviewing Jelle helped me understand which mobility solutions are currently available for companies and how companies are able to achieve behavioural change within their organisation.

“Achieving behavioural change is one of the most important aspects of product and service development. You have to find a way to achieve it without making the user feel forced. This can be done by rewarding good behaviour and through internal activation within the organisation.”

- Jelle Oosterhoff



Gertjan Sybrandi – Recommender

Gertjan is the mobility manager of Stedin. His job is to assure that the company has an efficient car fleet, while also stimulating the transition towards sustainable modes of transportation. Interviewing Gertjan helped me understand how corporate mobility policies are created and which aspects a mobility manager is looking for when evaluating different mobility providers.

“We want to remain an attractive company to work for. At the same time, we need to achieve our sustainability goals, while also being cost-effective. Combined, these are the three main elements which we take into account while drafting our mobility policies.”

- Gertjan Sybrandi



Matthijs Boon – Industry Expert

Matthijs Boon is a Business Developer at Next Urban Mobility. The goal of this company is to create mobility hubs where users are able to book a variety of vehicles through one mobile application. Similar to Greenwheels, the company is part of Pon holdings. Interviewing Matthijs helped me understand the future of MaaS providers, which developments are currently important in the shared mobility sector and what groups of people are the most interesting customer groups for these mobility hubs.

“Everyone uses Spotify, Netflix and data plans for their phone these days. This indicates people are willing to pay for access instead of ownership. The same will happen to mobility. People want to pay one simple fee in order to have access to a car whenever they need it.”

- Matthijs Boon



Marijk van der Hoek - Recommender

Marijk is a strategic advisor for human resource management at the municipality of Meierijstad. This municipality is one of the corporate customers of Greenwheels. Part of her job is to keep the employees who use the CCS service satisfied. Furthermore, she wants to stimulate other employees to start participating in the CCS program. Interviewing her helped me understand which aspects are important for achieving the transition towards Car Sharing within a public organisation.

“In the past, we had a lot of no-shows with the users of our shared cars. However, when we started to approach them individually and explained what they could do to cancel their reservation, we immediately saw positive results.”

- Marijk van der Hoek



Marjolein Peters – Recommender

Marjolein is a facility manager at Stichting Vluchteling-Studenten UAF in Utrecht. She is head of the facility team within the organisation. Part of her responsibilities include managing the mobility policy of the employees. Interviewing Marjolein was interesting because the organisation has been a customer of Greenwheels for some time, however, they recently decided to cancel their business subscription. Interviewing her helped me understand what considerations led them to this decision and how she thought things could be improved.

"Greenwheels seemed like a great solution for our mobility needs. However, we noticed that our employees didn't use the service a lot because they didn't know how it worked or they encountered technical problems."

- Marjolein Peters



Wouter Oldenburger- Industry Expert

Wouter is a senior product manager at MIND Mobility. This company is a subsidiary of Pon Holdings and focusses on developing intuitive mobile applications and online portals which integrate vehicle data and real-time driving behaviour. The company also provides hardware for transforming non-connected cars into connected cars. Talking to Wouter helped me understand what the possibilities of a connected car are, and how telematics technology will evolve over the coming years.

"The new line of electric Volkswagen cars will be able to gather a huge amount of data without any modifications. Therefore, I foresee a future where companies are able to use this data for new products and services."

- Wouter Oldenburger

7.3 Customer profiles

Traditionally, marketing literature suggests analysing customer groups based on their socio-demographic characteristics, and their product or service preferences. However, this approach has its limitations. Most people are unable to exactly formulate what they want, especially in the case of new services. The following quote, often falsely believed to have been said by Henry Ford, illustrates this problem clearly:

"If I had asked people what they wanted, they would have said faster horses"

Therefore, Osterwalder et al. (2014) suggest it is better to investigate what people are trying to get done in their lives, and their pains and gains associated with these experiences, rather than straightforwardly asking what they want. In order to uncover the needs of different stakeholders, the following three aspects were identified:

Jobs-to-be-done

The jobs-to-be-done concept refers to all tasks people are trying to get done in their work life and personal life.

Pains

Pains refer to negative things people experience or could experience before, during, and after getting the job done.

Gains

Gains refer to every benefit someone expects, desires or would be surprised by while using the product or service.

Usually, the buyer and user of a product or service are the same person. However, since Greenwheels offers the CCS service to organisations instead of consumers, the context is different. Therefore, it is important to map the jobs, pains and gains for multiple stakeholders within the client company. As Osterwalder himself states:

"Companies don't really buy or use your products and services in B2B. People do. That's why it's important to understand the most important categories of people involved in buying and using your products and services."

- Osterwalder (2018)

Therefore, the jobs, pains and gains were mapped for the decision maker, end-user and recommender stakeholders, since they are the most influential stakeholders in the search, evaluation, purchase and use phase of the CCS service.

The saboteur stakeholder could also have a significant impact on the purchasing process. However, Greenwheels has a limited ability to sway the opinion of this person. Therefore, it is best to focus on three previously mentioned stakeholder types by creating a car sharing service that appeals to their needs. In order to identify their needs, customer profiles were created, which can be seen on the next pages (see figure 29-31).

Customer profile

End-User



Customer profile

Recommender

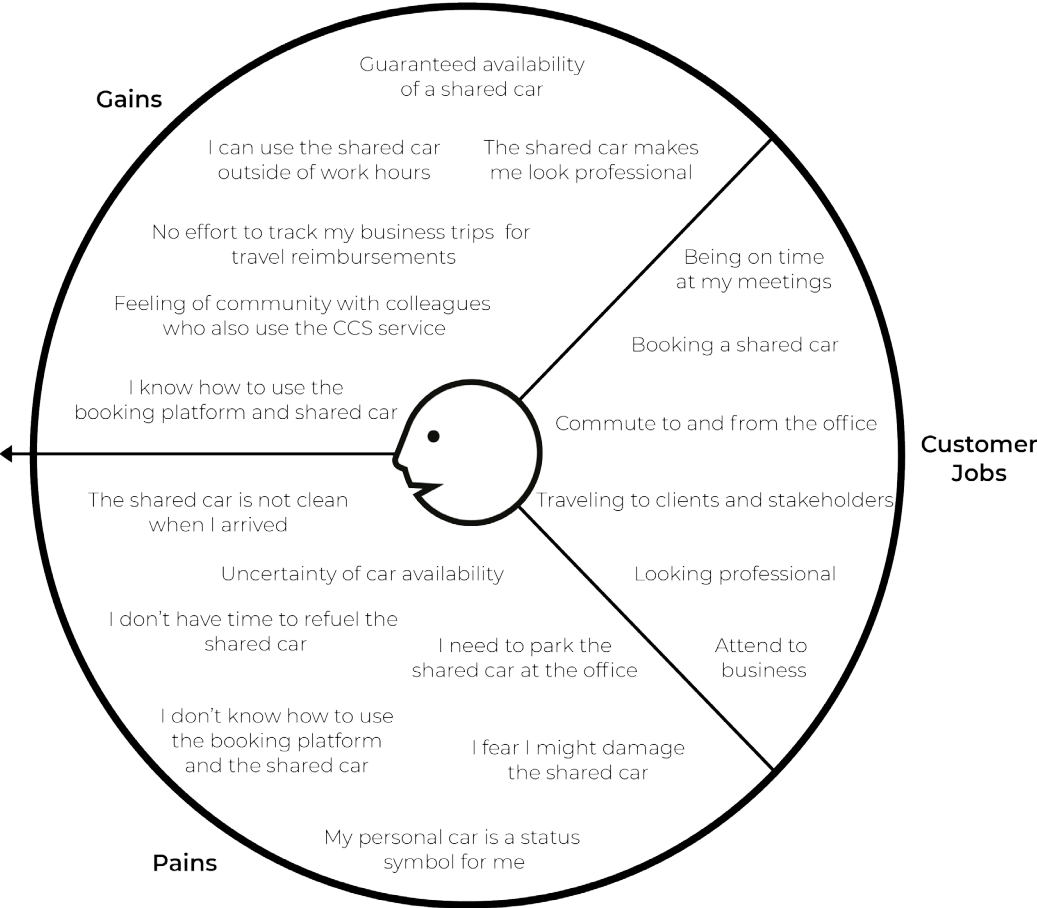


Figure 28: Customer profile of end-user.

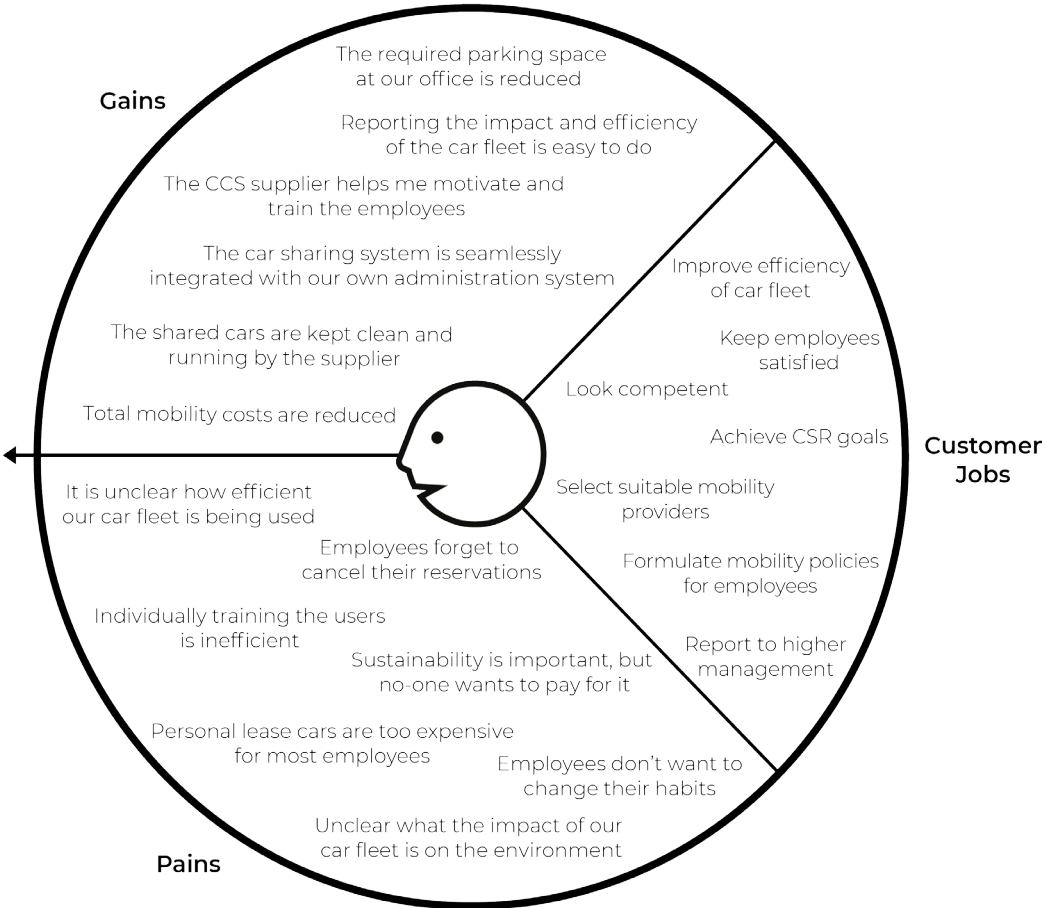


Figure 29: Customer profile of recommender.

Customer profile

Decision maker

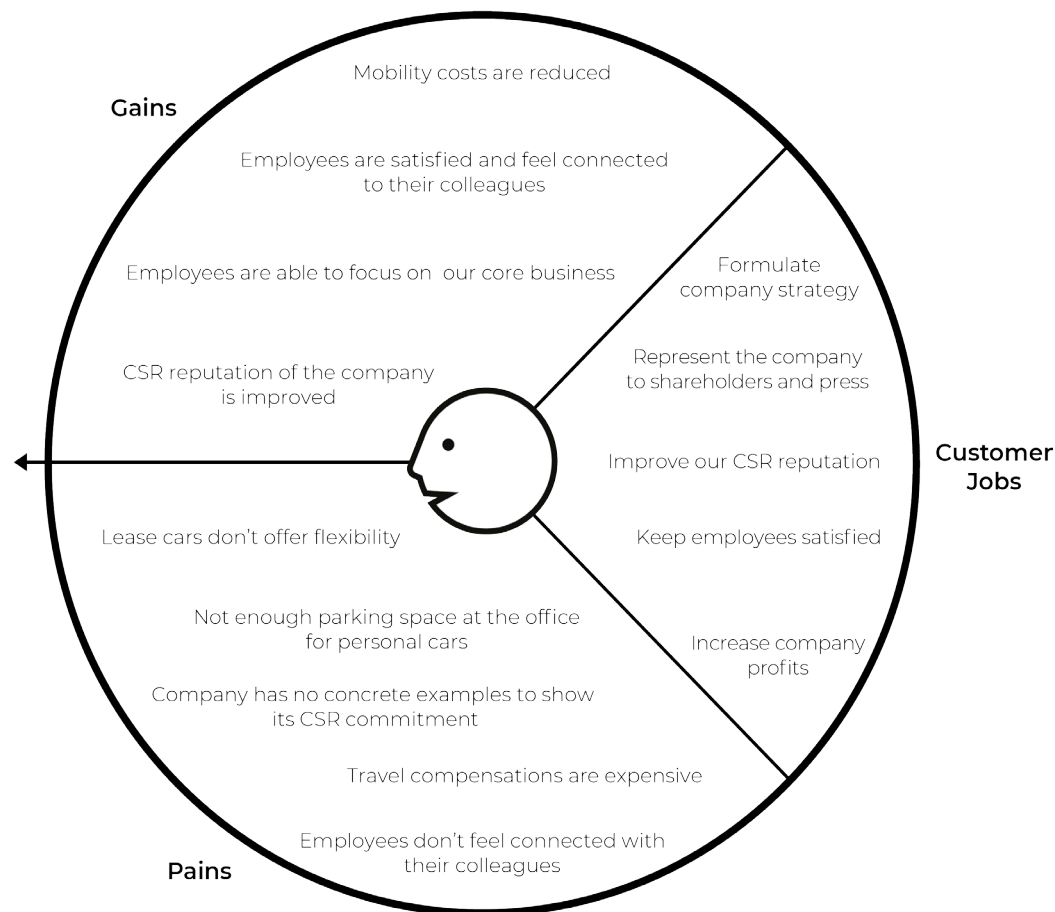


Figure 30: Customer profile of decision maker.

Key insights

Within this chapter different types of stakeholders were identified. The three most influential stakeholders (end-user, recommender and decision maker) were analysed more in-depth by creating customer profiles. The customer profiles show their jobs-to-be-done, pains and gains in relation to the CCS service (see figure 28-30). The following insights were considered most important:

End-user

- Needs to be motivated to use the CCS service.
- Needs to become familiar with the booking interface and shared car in order to use the service correctly.
- Needs to have a satisfying first time experience with the service in order to keep using it.

Recommender

- Needs to have tools to make his job of managing the shared car fleet, and training the users easier.
- Looking for ways to motivate the users.
- Needs help making the shared car fleet more efficient.

Decision maker

- The client is mainly interested with improving the CSR reputation of the company, and the realisation of cost savings.
- We only want to focus on our core-business. Therefore, every aspect of the CCS service should be provided by the supplier.

In order to create the customer profiles, multiple expert interviews were conducted. These interviews also provided a thorough understanding of the user experience, relevant market trends and technological developments within the CCS industry. These insights were later used for the creation of the future vision (see Chapter 8), and as a source of inspiration during the ideation process (see Chapter 10).

Chapter 8: Context Factors

This chapter shows how the future of car sharing was analysed by identifying relevant developments, trends, states and principles.

8.1 Generating context factors

The generation of context factors was the first step towards understanding the future context of corporate car sharing. Context factors are defined as:

“Observations, thoughts, theories, laws, considerations, beliefs or opinions”

- Hekkert & Van Dijk (2011)

Generating context factors was done by using a variety of research methods. These included:

- Secondary sources of information, such as newspaper articles, scientific literature (see Chapter 2) and trend reports.
- Experiencing the service (see Chapter 4)
- Talking to Greenwheels employees
- Interviewing stakeholders and industry experts (see Chapter 7).

While generating the context factors, each factor was categorised as a development, trend, state or principle. Developments refer to various changes in the world around us, and trends are consequences of these developments, observed in the daily behaviour of people. For example, when the economy goes down (development), people spend less money on luxury goods (trend). States are the stable factors included in any context. They refer to phenomena that appear fixed, but do not necessarily need to remain that way in the long run. Lastly, principles are stable unchanging patterns in life. They are often laws of nature or fundamental human psychological concepts.

The generation of context factors was finished when sufficient variety from different fields (e.g. economics, psychology, technology) and across different categories (developments, trends, states and principles) was achieved (see figure 31).

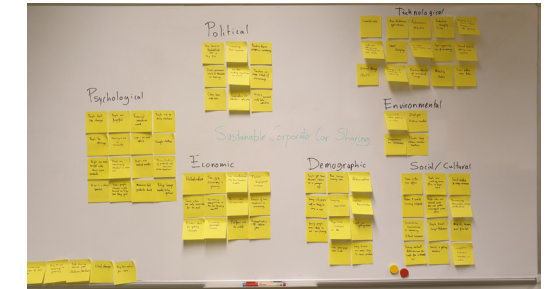


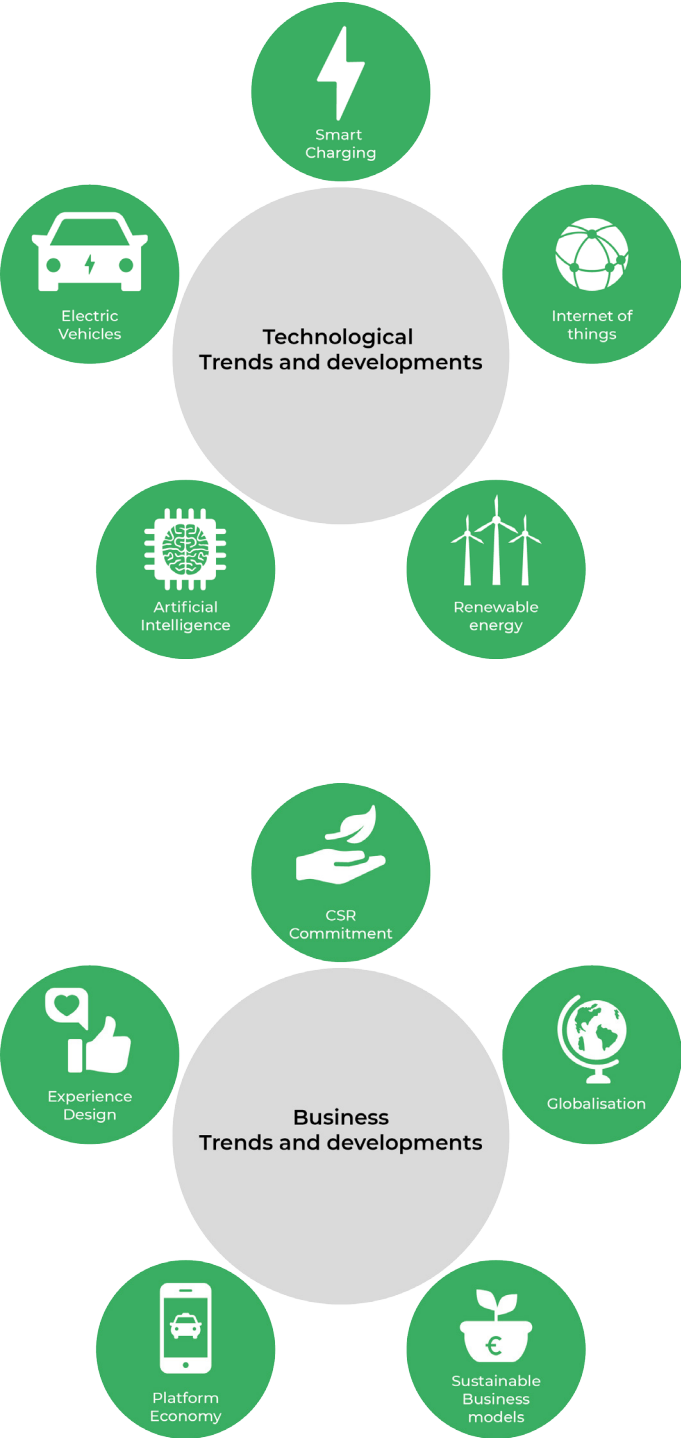
Figure 31: Generating Context Factors.

In total, 85 different context factors were generated (see Appendix D). However, the initial list of context factors was reduced in order to select the most suitable context factors for this project. This selection process of was done based on the relevance to the domain and the originality of the context factor.

Some context factors were relevant to the domain, but felt more like constraints (e.g. legislation). These context factors were unlikely to stimulate the concept development process later on. Therefore, they were temporarily put aside and grouped as “Requirements” (see Appendix D). Other context factors that lacked originality or relevance were also excluded from the rest of the design process.

In the end, 52 context factors were selected as the foundation for the future vision (see Appendix D). A number of important context factors, related to technology, business and society, are highlighted on the next page.

Highlighted context factors



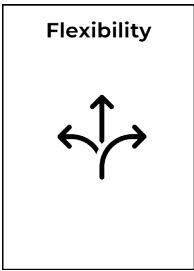
8.2 Context clusters

In order to make sense of the gathered context factors, clusters were created. The goal of clustering the context factors was to have as few groups as possible, without losing the meaning and richness of the individual context factors. This clustering process was done using common-quality clustering. Common-quality clustering implies the underlying factors all point towards the same direction forming a new “meta factor”. For the full list of clusters and their corresponding context factors see Appendix D.

In the end, the following factor clusters were identified:



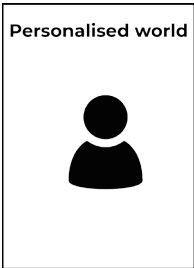
Responsibility: Having a positive CSR reputation is increasingly important for public and private organisations.



Flexibility: People have increasing options in their life, resulting in more flexibility in both their work life and mobility options.



Driving = Emotion: Driving a car doesn't only involve the rational process of getting from A to B. People experience a wide arrange of emotions associated with owning and driving a car.



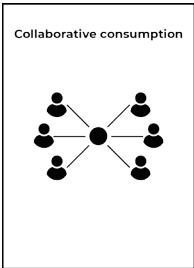
Personalised world: Products and services are increasingly tailored to our personal preferences. Therefore, consumer expectations are also changing.



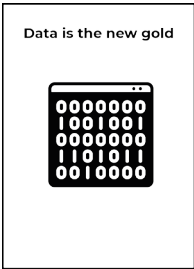
The office is anywhere: Working is no longer associated with being at the office from nine till five. People are increasingly working on different locations and at different times.



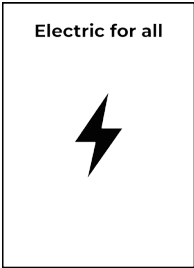
Elitist cities: Living in a city is becoming unreachable for most people, due to increasing housing and parking prices, and the increasing wealth gap.



Collaborative consumption: People are looking for companies that provide access to products instead of ownership. This societal shift towards usage is supported by the rise of online platforms and mobile applications.



Data is the new gold: Data gathering is becoming increasingly important for the improvement of products and services. In the domain of CCS, the introduction of the connected car will significantly increase the amount of data that can be gathered on drivers and their cars.



Electric for all: Fully electric vehicles are becoming increasingly accessible. The prices are dropping, the ranges are increasing and the charging infrastructure is improving.



Transition management: Changing human behaviour remains one of the main obstacles for any transition process. However, there are certain psychological triggers that can be used in order to achieve the desired outcome.



Battle for our attention: People are increasingly being exposed to an endless stream of distractions. Therefore, products and services need to adapt to the shortening attention spans of most consumers.

Phase 2: Define



The second phase of the project used convergent thinking in order to synthesize the findings of the first phase into multiple design challenges. Additionally, these design challenges formed the foundation for a clear future vision.



Chapter 9: Future Vision

This chapter shows how the context factor clusters were used to create a context framework along the social outlook and attitude dimensions.

9.1 Context framework

After defining the context factor clusters, a framework was created to illustrate the future context of corporate car sharing (see figure 32). This framework shows how the factor clusters are placed along two dimensions: Social outlook and Attitude. By categorising the context factors, four different worldviews emerge according to the following aspects: collectivism, individualism, experience oriented design and result oriented design.

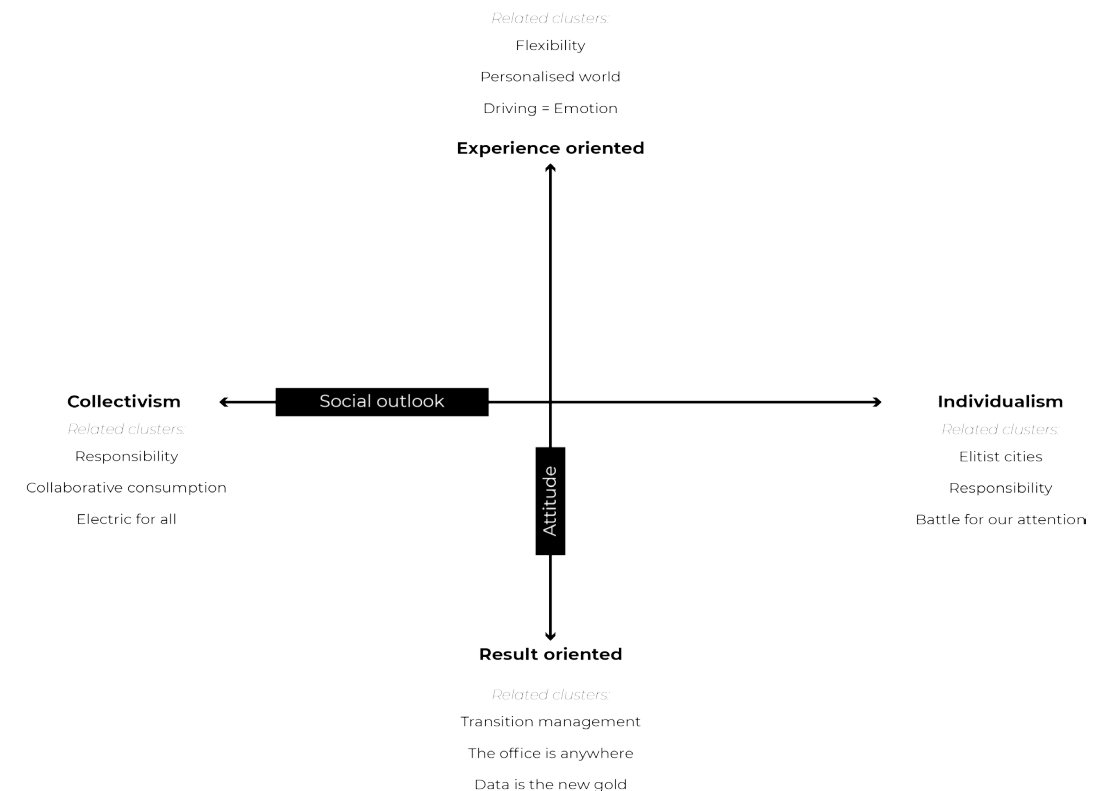
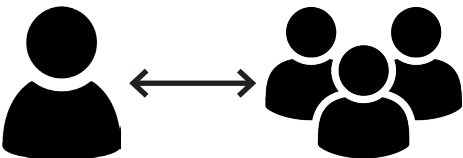


Figure 32: Context framework.

Social outlook

The social outlook dimension shows that there are some factor clusters suggesting a collectivistic future world. This worldview is supported by the increasing accessibility of sustainable mobility, the rise of collaborative consumption and an increasing demand for CSR efforts by public and private organisations.

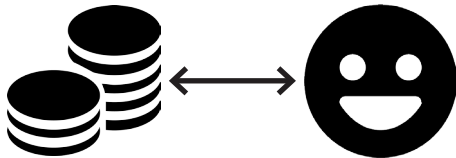
On the other hand, there are some clusters that describe a future world of individualism and exclusion. The clusters of context factors that support this worldview indicate that living in a city is becoming exclusively accessible for an elite group of people. Additionally, people are increasingly living in their own personalised bubble because of digital media and loose touch with reality.



Attitude

There are also two possible worldviews along the attitude dimension. On the one hand there is a worldview which is mainly focussed on the experience of using a product or service. Within this worldview, products and services increasingly adapt themselves to the use context and provide users with an optimal experience by taking emotions and human psychology into account.

A contrasting worldview is found as well. Within this future worldview, products and services become purely focussed on increasing efficiency. Functionality is all that matters, regardless of the user experience. This worldview is supported by technological innovations such as Artificial Intelligence (AI) and personalised marketing.



9.2 Design opportunities

After creating the context framework, and establishing the relationships between the context factor clusters, the CCS service and traditional car ownership were placed inside the context framework. By doing so, it becomes clear to which worldviews these two concepts are connected.

It was found that car ownership fits the individualistic and experience driven worldview, while the CCS service is part of a collectivistic and result-oriented worldview (see figure 33).

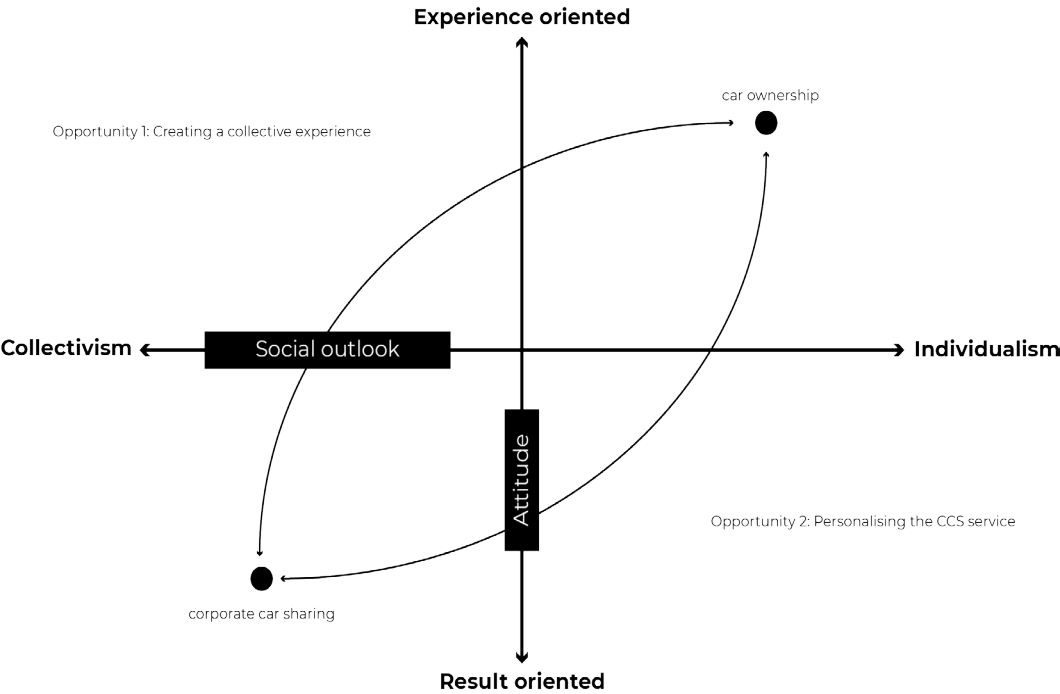


Figure 33: Design directions in the context framework

By bringing the benefits of car ownership and CCS closer together, two possible design opportunities were identified (see figure 33):

- Improving the experience of CCS service by creating a feeling of community among the users.
- Improving the efficiency of the CCS service through personalisation.

9.3 Design challenges

Key insights from the Discover phase (chapter 2-8), and the design opportunities presented earlier in this chapter, were combined into four design challenges. These design challenges guided the ideation process (see Chapter 10) and established the foundation of the vision statement (see page 89). Below, the insights and the corresponding design challenges are shown.

Motivating employees

- Employees need to be intrinsically and extrinsically motivated to use the CCS service in order to ensure the service is being used.
- Mobility managers need help in motivating the employees.
- Employees need to understand what the benefits of car sharing are.

Therefore, the first design challenge is formulated as:

"How can Greenwheels help organisations motivate their employees to start car sharing?"

Training employees

- Employees need to understand how to use the booking interface and the shared car in order to use the service correctly.
- Greenwheels is able to reduce its customer support and operational costs by making the end-users more knowledgeable.

The second design challenge is consequently formulated as:

"How can Greenwheels facilitate the training of end-users?"

Community building

- Creating a feeling of community among the users will stimulate engagement with the service.
- Experienced users will be able to help newer users get started.
- Sharing success stories inspires more people to join the CCS program.

The third design challenge therefore was formulated as:

"How can Greenwheels create a feeling of community among the users?"

Personalisation

- The efficiency of the CCS service can be improved by using data from the shared car and the driver.
- Connected car technology enables increasing amounts of data to be gathered.

Consequently, the last design challenge is formulated as follows:

"How can Greenwheels personalise the car sharing service using data?"

Sustainability challenge

Next to these design challenges it is also important to stress the importance of increasing the social and environmental value that the CCS service creates. In order to do so, this graduation project includes the goal of offering an emission free car sharing service by the year 2025.

9.4 Vision statement 2025

Based on the aforementioned design challenges and environmental value target, a vision statement was defined. The vision statement describes the desired effect that one wants to achieve with the innovation strategy, in a single sentence.

"Realising a personalised, zero emission, corporate car sharing service, with a motivated and knowledgeable community of users."

Phase 3: Develop



During the third phase of the project, divergent thinking was used to come up with multiple solutions for the previously proposed design challenges. The main activity during this phase was the development and selection of solutions.



Chapter 10: Ideation Approach

This chapter presents the ideation process and gives an overview of the idea clusters that were generated as a result. Additionally, the validation process with Greenwheels is briefly described.

10.1 Creative sessions

Two creative sessions were organised with different groups of participants. The goal of the creative sessions was to generate as many solutions for the previously defined design challenges (see page 88) as possible.

One creative session was organised with a group of end-users, while the other session involved a group of design students. During these sessions, participants were stimulated to come up with new ideas using the method of How-Tos (Tassoul, 2006). For more information about the setup and results of these sessions, see Appendix E.

Session 1: End-users

The first creative session was organised with five employees of the Ministry of Infrastructure and Water Management in Utrecht (see figure 34).



Figure 34: Ministry of Infrastructure and Water Management.

All participants had used the CCS service of Greenwheels at least once beforehand. Involving this group of stakeholders was valuable since the participants were able to use their past experiences to generate feasible solutions for the design challenges.



Figure 35: Idea generations using Post-Its.

Session 2: Design students

The second creative session was organised with three Strategic Product Design students and one alumnus, at the Delft University of Technology (see figure 36). This group of participants was selected due to their experience with solving complex problems using brainstorming techniques. This allowed them to come up with creative ideas without focussing too much on feasibility constraints.



Figure 36: Faculty of Industrial Design Engineering.



Figure 37: Design students generating ideas.

10.2 Idea clusters

After the creative sessions were completed, emerging idea clusters were identified for the three aspects of the design challenge (motivation, learning and community building). In total, nine clusters were formulated (see figure 38-40). The size of the bubble represents the relative amount of ideas that were generated within the idea cluster.

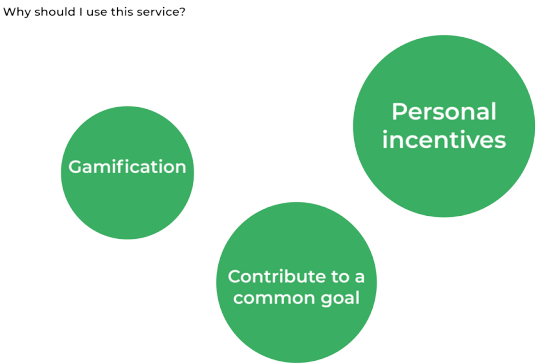


Figure 38: Idea clusters on motivation.

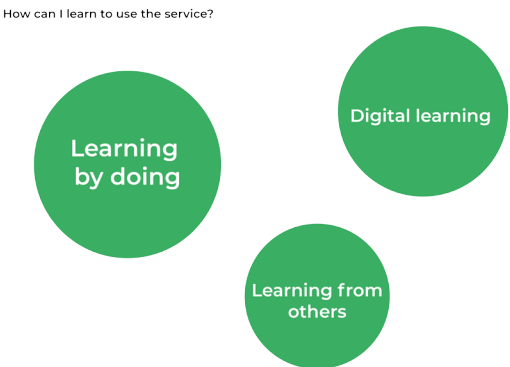


Figure 39: Idea clusters on learning.

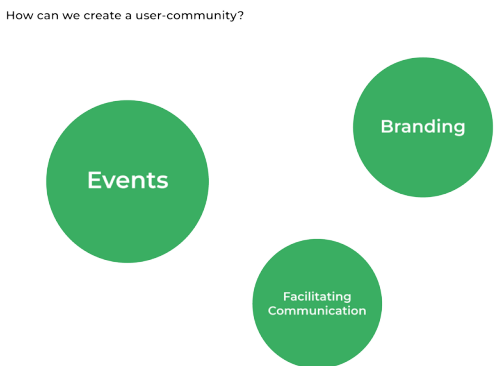


Figure 40: Idea clusters on community building.

10.3 Selecting design solutions

Beside the creative sessions, individual brainstorming took place in order to develop multiple design solutions. In order to validate and improve these design solutions, a validation session was organised with the B2B product manager and sales manager of Greenwheels (see Appendix G). By taking into account the feedback of the participants, three solutions were chosen (see Appendix F). Each design solution contributed to the overall goal of stimulating sustainable corporate car sharing, although they do so by addressing different problems.



Figure 41: Greenwheels office building.

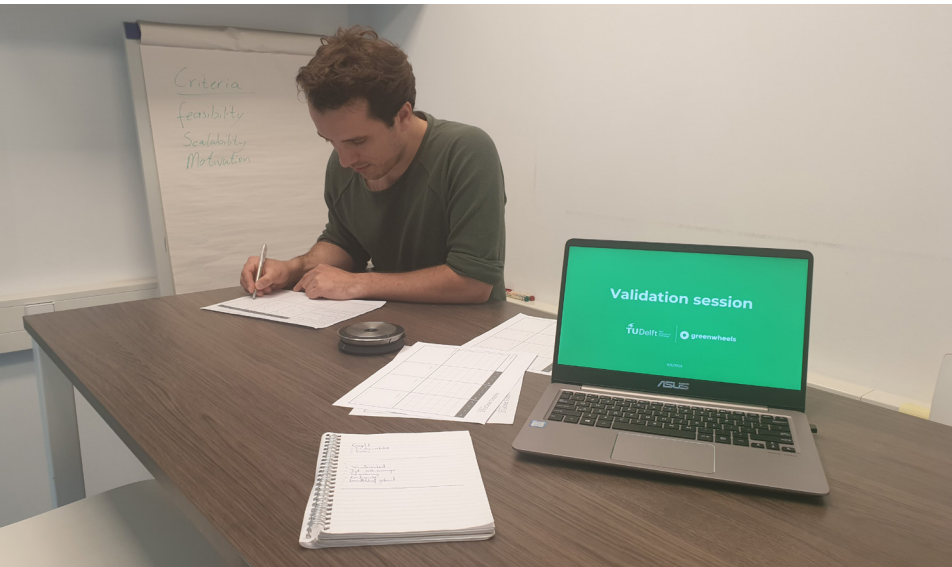


Figure 42: Evaluating the solutions using Harris profiles.

Chapter 11: Design solutions

This chapter presents three design solutions for the previously presented design challenges. First, an overview of the design solutions will be given, followed by a more in-depth description of each one.

11.1 Service improvements

Several incremental improvements were identified for the current CCS service (see Appendix H). These suggestions are based on the outcomes of the service analysis and the interviews with end-users and industry experts (see Chapters 4 & 7). Despite not directly contributing to the future vision, it is important to implement these incremental changes before focussing on design solutions presented in this chapter. This way, Greenwheels will be able to quickly improve the value of the CCS service before stimulating the acceptance and training the end-users.

11.2 Overview of design solutions

An iteration took place after reviewing the outcomes of the validation session. By combining the insights from the first two phases, the creative sessions, the validation session, individual brainstorming, and the future vision, three new design solutions were developed. The design solutions are as follows:

- **Experience Workshop:** An interactive workshop day for training and motivating new users.
- **Unity platform:** An online car sharing platform based on gamification and online learning.
- **Smart Shared Fleet:** Optimising the shared car fleet by utilising smart charging technology, connected car technology and personalisation.

In order to create a clear overview for the origins of these design solutions a visual overview was created. The visualisation on the next two pages shows the stakeholders, insights, sources, and the corresponding design solutions (see figure 43).

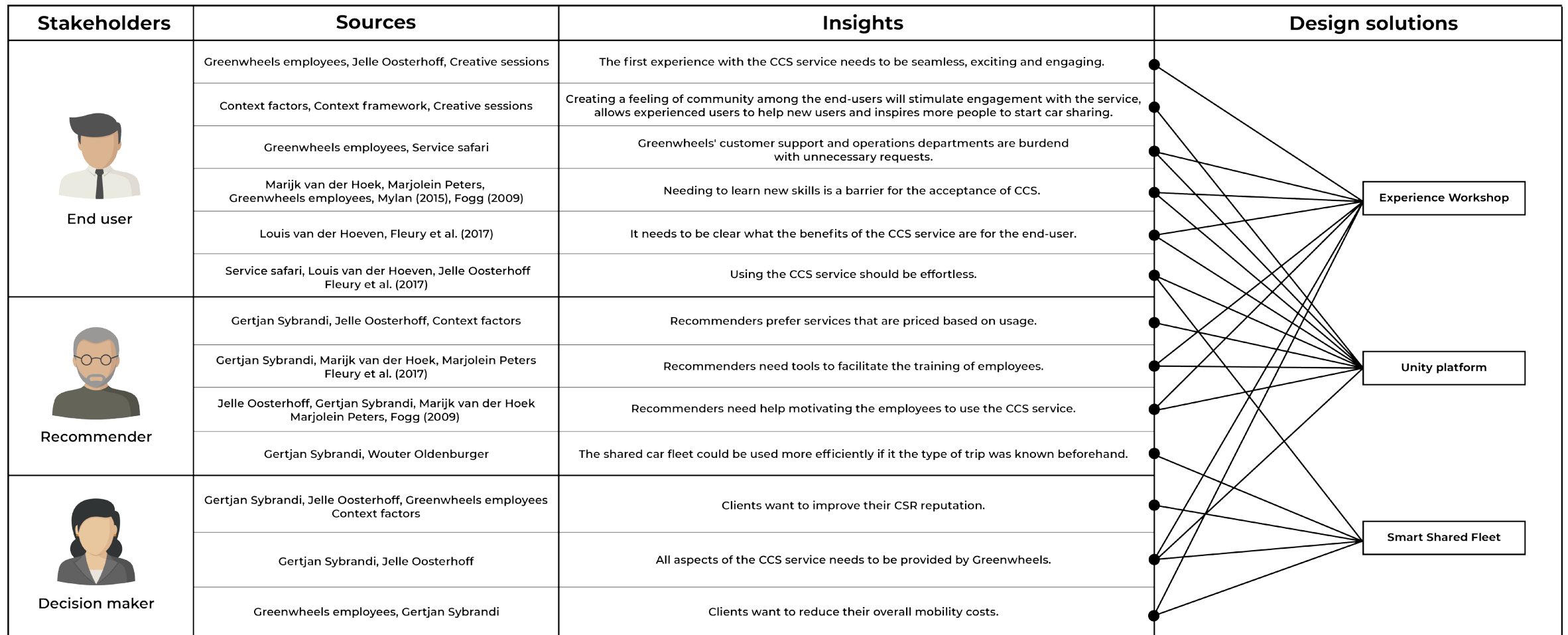


Figure 43: Design solution overview.

11.3 Three horizons

The selected design solutions can roughly be divided into three time frames: (1) short term, (2) medium term and (3) long term (see figure 44). These time frames are based on Greenwheels' capabilities, technological developments and the speed at which relevant trends and developments are evolving. The precise time frames and corresponding actions will be specified at a later stage in the deliver phase (see Chapter 12).

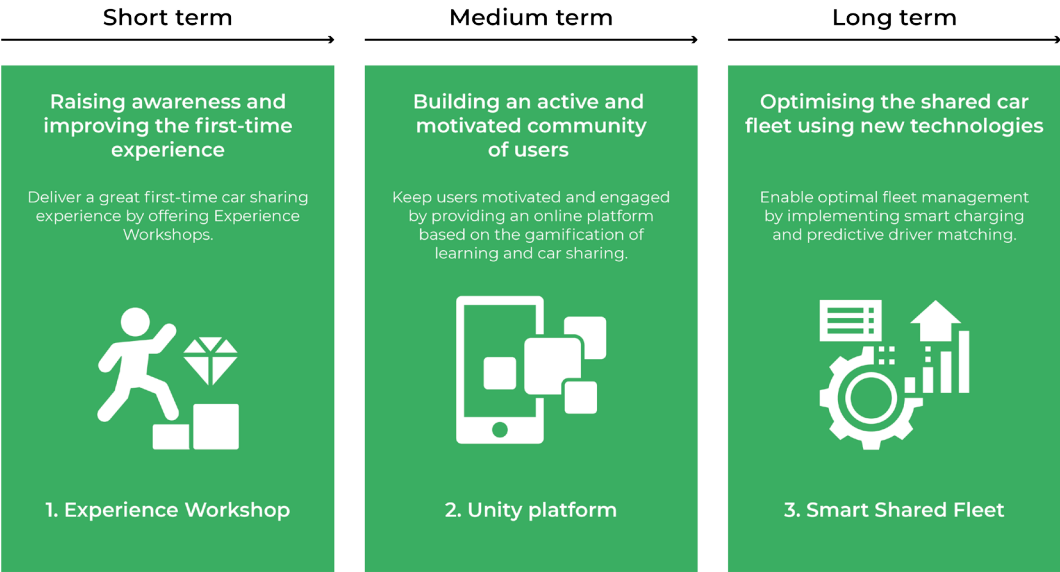


Figure 44: Overview of idea directions.

The selected design solutions (Experience workshop, Unity platform and Smart Shared Fleet) are able to create value individually. However, each design solution builds upon the previous design solution in order to create valuable synergies.

To illustrate how these design solutions fit the overall innovation strategy, the Three Horizons model by Baghai et al. (1999) was used (see figure 45). This model describes three time horizons along which the design solutions will be implemented.

- **Horizon 1:** innovating the company's existing business model by leveraging core capabilities in the short-term.
- **Horizon 2:** expanding the existing business model and core capabilities using new innovations in the medium term.
- **Horizon 3:** the creation of new capabilities and new business by taking advantage of disruptive opportunities in the long term.

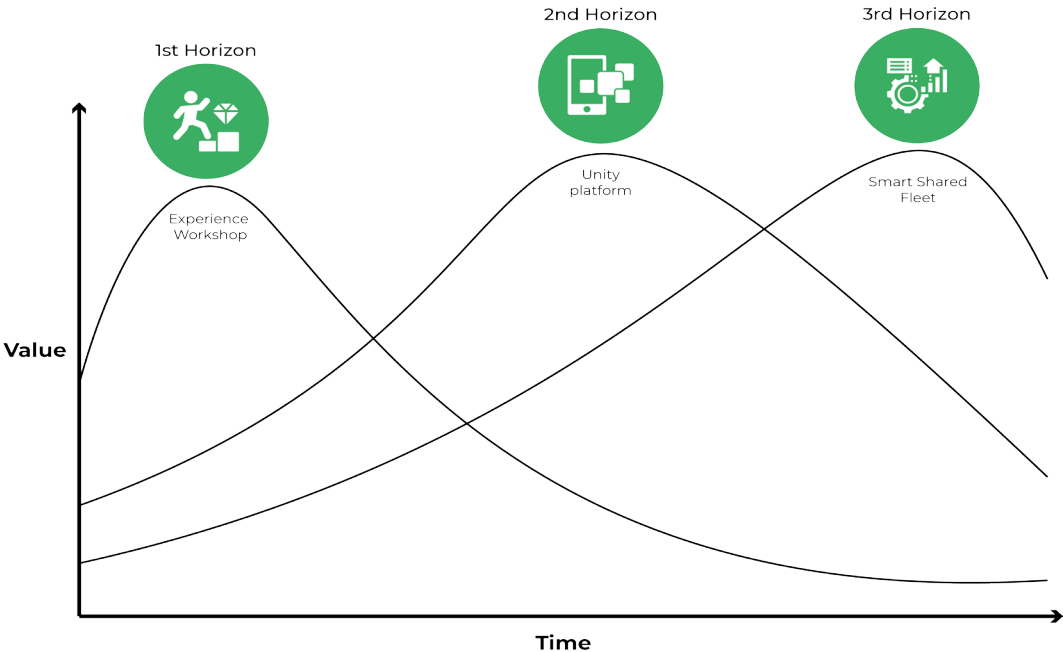


Figure 45: Three horizon model showing the value created by the design solutions over time. Based on Baghai et al. (1999).

Future context framework

By placing the three horizons in the future context framework that was presented earlier in this report, it can be seen that the first two horizons support the design direction of improving the collective experience of CCS, while the third horizon focusses on improving the efficiency of the CCS service trough personalisation (see figure 46).

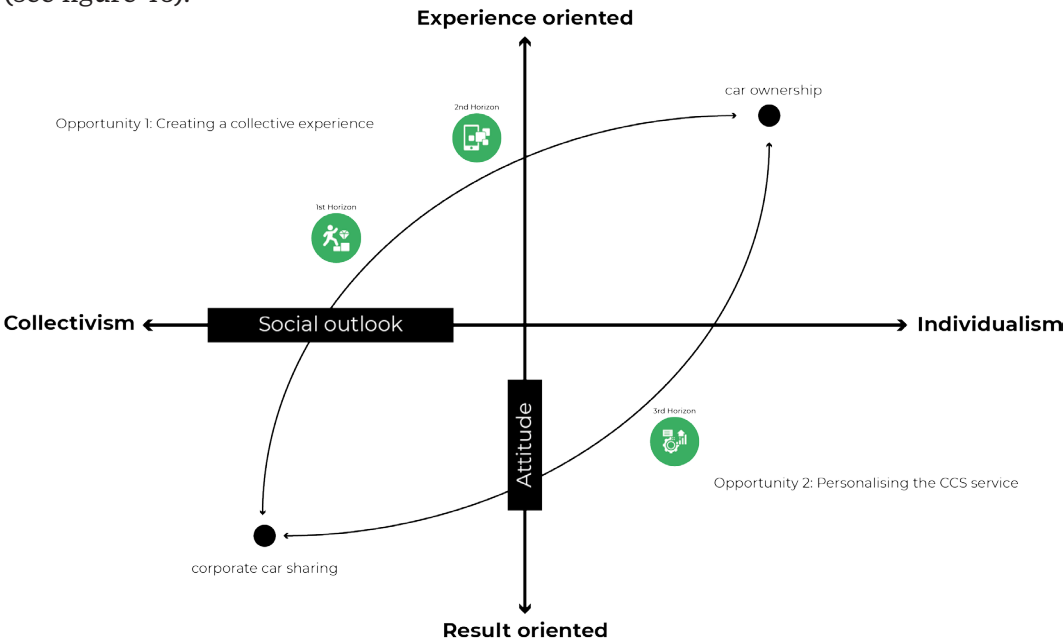


Figure 46: Three horizons placed in the future context.

11.4 Short term design solution

Experience Workshop

In order to familiarise the employees with the car sharing service, an immersive workshop day will be organised multiple times a year. During this workshop, employees learn how to efficiently drive the shared car, how to charge an electric car and how to use the Greenwheels booking interface. Additionally, the impacts of personal car usage and the benefits of corporate car sharing will be clearly communicated to the participants.

The Experience Workshop will consist of a mixture of interactive digital and real-life demonstrations. Participants will practice navigating the booking interface on their own device, after watching a short demonstration by the workshop coach. Additionally, a demonstration of the shared electric car will show the participants how to operate it correctly. The presentation and demonstrations will be video recorded in case some employees are unable to attend. Additionally, if a new employee need to be trained in between two workshops they can watch the video of the last workshop session online.

In order to motivate employees to participate in the Experience Workshop, it needs to be engaging and enjoyable. Therefore, the workshop can be combined with a team building activity. By collaborating with Volkswagen, participants will be able to get an exclusive driver's training at an external location. This way, participants are able to experience the latest (electric) car models of Volkswagen, while improving their driving skills and having a fun informal experience with their colleagues. See Appendix J for an example outline of the Experience Workshop activities.



Value proposition

The Experience Workshop has a different value proposition for each stakeholder. These value propositions will now be discussed.

Value for the End-user

After completing the Experience Workshop, employees will gain access to the fleet of shared cars that are placed at their office.

Additionally, participants will have learned what the benefits of using a shared car are compared to using their personal car. This will be achieved by explaining the 'hidden' costs associated with car ownership such as replacing tires, paying for repairs, depreciation of the car, insurance etc.. Lastly, the Experience Workshop will create value for the employees by enabling them to connect with their colleagues in an informal setting during the team building event.

The Experience Workshop was a great introduction to the car sharing service! Now I feel comfortable using the service, and understand how it contributes to a cleaner environment.



Value for the Recommender

The recommender stakeholder derives value from the Experience Workshop in three ways.

First of all, training the employees will become much more efficient since multiple employees will be trained during a single workshop.

Secondly, Greenwheels will support the recommender by providing the necessary materials for the workshop and possibly one of their specialised trainers as a workshop facilitator. This way, the workload of the recommender will be reduced (see Appendix I).

Lastly, after the Experience Workshop has taken place, the employees will be more capable of solving issues with CCS service themselves, further reducing the amount of issues the recommender has to solve.

The Experience Workshop made my job a lot easier! Since the training of employees became more efficient, a lot of new employees joined our car sharing program while the number of issues was reduced.



Value for the Decision maker

The Experience Workshop mainly provides value to the client by indirectly realising costs savings, reducing the required amount of parking space and improving the CSR reputation of the company through stimulating the acceptance of the CCS service.

Since the Experience Workshop will make the training of employees more efficient, it will also become possible to provide a larger group of employees access to the CCS service. Therefore, fewer employees will have to rely on relatively expensive travel reimbursements or lease cars, reducing the overall mobility costs of the company.

Additionally, the team building activity could improve employee satisfaction and create a feeling of community among the participants.

The Experience Workshop allowed us to use the shared cars more efficiently and with a larger group of employees. This helped us reduce our overall mobility costs significantly.



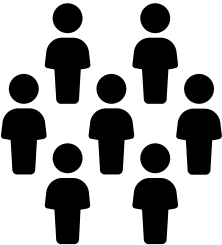
Environmental value

Environmental value is created by the Experience Workshop through stimulating the usage of the CCS service among the employees. Therefore, the environmental impact of organisation will be reduced, since the CO₂ emissions of a shared vehicles is usually lower than the average Dutch car. Furthermore, the environmental impact of the CCS will be reduced since fleet checkers will have to visit clients less frequently.



Social value

Social value is created by the Experience Workshop by increasing the awareness of the benefits of PSSs. Therefore, employees could become inspired by the workshop to start using PSSs more frequently during their daily lives in general. For example, if a participant had a satisfying experience with the Experience Workshop, he or she might be tempted to use a shared vehicle in their spare time as well.



Value creation & delivery

How is the value delivered?

The Experience Workshop features both online and offline elements. For the most part, the workshop will take place at the client location and the driving training centre. Afterwards, the recordings of the workshop will become available online for any employees who couldn't be present.

Resources & partnerships

In order to create the workshop a number of resources need to be acquired and new partnerships need to be formed. These are the following:

- Hiring new staff and teaching the Greenwheels trainers.
- Establishing a partnership with Volkswagen dealerships to offer the teambuilding event.
- Establish a partnership with a video recording company.
- Create presentation slide decks.
- Design and print handouts.

Sales channel

The Experience Workshop will be offered as an extra option when the client first acquires the CCS service. The sales channel will be mainly personal contact through Greenwheels' account managers and third party sales teams (e.g. Pon Business Mobility consultants).

Investments

Naturally, Greenwheels needs to make some investments in order to realise the Experience Workshop. The main investment costs are shown below:

- Salaries of the Greenwheels trainers.
- Video recording costs.
- Teambuilding event costs.
- Development costs for workshop materials.

Value capture

In order to give an example of how Greenwheels would be able to capture value with the Experience Workshop, a pricing strategy and rough estimation of a business case was created (see figure 47 & Appendix K).

Basic	Standard	Premium
€995,- Per workshop	€195,- Per participant*	On request
<div><div>✓ Workshop materials</div><div>✓ Video recording</div><div>✗ Greenwheels Trainer</div><div>✗ Teambuilding event</div><div>✗ Catering included</div><div>✗ Personal coaching</div></div>	<div><div>✓ Workshop materials</div><div>✓ Video recording</div><div>✓ Greenwheels Trainer</div><div>✓ Teambuilding event</div><div>✗ Catering included</div><div>✗ Personal coaching</div></div>	<div><div>✓ Workshop materials</div><div>✓ Video recording</div><div>✓ Greenwheels Trainer</div><div>✓ Teambuilding event</div><div>✓ Catering included</div><div>✓ Personal coaching</div></div>
Choose	Choose	Contact now

*. minimum of 10 participants

Figure 47: Workshop pricing.

The visualisation shows three different versions of the Experience Workshop with varying levels of features: basic, standard and premium.

The basic plan is the cheapest option and only includes the workshop materials and video recording service. This means that someone from the client organisation will have to facilitate the workshop themselves.

Another option is the standard plan, which includes a Greenwheels trainer to guide the session and the teambuilding activity for the workshop participants on top of the basic plan features.

Lastly, the premium plan will include all the features of the standard plan. On top of that it adds a catering service during the lunch break and allows the participants to contact the Greenwheels trainer personally with any questions for up to 3 months after the workshop is given.

Requirements

In order for the Experience Workshop to have the desired effect of training and motivating the end-users, a number of requirements needs to be fulfilled for the main stakeholders. These requirements will now be discussed.

End-user

- If the participants are interested in the driver training, it could have a negative effect on the feeling of community and the motivation of the employees. Therefore, the interest in the teambuilding activity should be determined prior to the Experience Workshop.
- End-users will resist changing their behaviour. Therefore, the workshop should make it very clear why car sharing beneficial for the end-users themselves, for the environment and for our society as a whole.

Recommender

- The group of participants should be large enough to justify the expense of acquiring the Experience Workshop to higher management.
- Communication between Greenwheels and the recommender should be smooth and efficient. If something goes wrong before the CCS service is implemented it will negatively affect the perceived reliability of Greenwheels.
- The video recording of the Workshop should remain in possession of Greenwheels, in order to stimulate the clients to host multiple workshops per year.

Decision maker

- The Decision maker will want to see proof that the Experience Workshop will have the promised effect, in order to legitimise the expense.

Recommendations

In order to achieve the aforementioned requirements as much as possible, Greenwheels should consider the following practical recommendations while designing the Experience Workshop.

End-user

- Conduct a short survey among the employees beforehand, to estimate the number of participants and the interest in the teambuilding activity.
- Include convincing facts and figures about the benefits of car sharing for sustainability and for the end-users personally. For example, highlight the 'hidden costs' of personal car usage such as repairs, tire wear, insurance.

Recommender

- There should be a single person from Greenwheels who manages the communication with the recommender of a client organisation, in order to build trust.
- The video recording should be shared with the client through an online video platform, without providing the video file itself.
- In case the recommender is not convinced that he or she will acquire the CCS service, the Experience Workshop can be offered for free to persuade them.

Decision maker

- In order to convince the decision maker of the value of the Experience Workshop, it will be important to document a number of example cases. This will help Greenwheels demonstrate which results were realised at other clients.

11.5 Medium term design solution

During the next step of the innovation strategy a new CCS platform will be created: the Unity platform.

Unity platform

Explaining the benefits of car sharing and showing employees how to use the service during the Experience Workshop might not be enough to motivate employees in the long run. As the Fogg Behavioural Model (FBM) indicates, people need to have the ability, motivation and a trigger to perform desired behaviour (see Appendix L). Therefore, the Unity platform aims to increase the motivation of employees over a longer period of time by introducing gamification elements and building an active user-community. Additionally, the Unity platform and the current booking application will be integrated to ensure users utilise the platform frequently.

On the Unity platform, users are able to earn points that represent their personal contribution to the overall goal of sustainable mobility. For example, users are able to earn points by driving more efficiently or by car pooling with their colleagues. Communicating these user scores, in the form of leaderboards, will create a competition element between the users, thereby adding a new incentive to make optimal use of the shared cars. Additionally, the platform will feature multiple online courses to help new users become familiar with the platform and the CCS service. These online courses will be based on a series of short videos and tests to improve the knowledge of the users. Lastly, the Unity platform contributes to building an active user-community through a variety of social features (e.g. creating groups, chatting with others and competing against other groups). The features of the Unity platform are described in more detail in Appendix L & N.



What is gamification?

As previously explained, the Unity platform will feature multiple gamification elements in order to motivate the users. In short, gamification can be defined as:

“Gamification is an umbrella term for the use of video game elements to improve user experience and user engagement in non-game services and applications”

- Deterding et al. (2011)

Gamification has proven itself over the last few years by enabling many companies to improve the value of their products and services. For example, the very successful language learning application Duolingo and Nike+ Run Club application both implement various gamification elements to improve their user experience (see figure 48).



Figure 48: Examples of gamification.

Design considerations

It is important for Greenwheels to understand how the gamification elements should be designed in order for the platform to have the desired effect. Therefore, additional research into gamification was performed (see Appendix L). By using the Octalysis framework of Chou (2015), it will be possible to create a satisfying User Experience with gamification. Only adding game mechanics will not automatically result in a car sharing platform that is fun and engaging for users. Instead, gamification aims to "Find out how you want your users to feel. And then look for design features that will empower that feeling. So human motivation first, game elements and functionality later" (Beerda, 2019).

While prototyping the Unity platform (see Chapter 12), I aimed to incorporate this approach by taking into account the eight core-drives of the Octalysis framework (see Appendix L). It is advisable for Greenwheels to use this design framework, or to streamline the design process by hiring The Octalysis Group consulting company. This company was founded by Yu-Kai Chou and specialises in gamification design.

Value proposition

The Unity platform has multiple value propositions. These value propositions will now be discussed for the most important stakeholders.

Value for the End-user

End-users will mainly derive value from this design solution by having an improved experience with the CCS service. The Unity platform solution aims to transform the purely functional activity of car sharing into a fun and engaging experience for the end-users. It does so by appealing to the eight core drives of human motivation, as defined in the gamification framework of Chou (2015).

For more information see page 108 and Appendix L.

Since the introduction of the Unity platform, car sharing became much more fun! I hope my group of colleagues will beat the sales team this month!



Value for the Recommender

The Unity platform will provide value to the recommender stakeholder by helping him or her motivate and educate the employees with less effort (see Appendix I).

Motivated end-users are important, since they will ensure that the shared cars keep being used. The Unity platform therefore increases the occupancy rate and the overall efficiency of the CCS service.

Additionally, educating the users using the online courses and the knowledge database will lower the amount of support they will need from the recommender, resulting in a reduced workload.

Motivating the employees to use the CCS service has become much easier with the Unity platform. It also helps me save time, since I don't have to explain everything to the users anymore. They can just check the online courses!



Value for the Decision maker

The Unity platform provides value to the client by increasing the efficiency of the shared car fleet and the satisfaction of the employees.

The improved user experience will make the CCS service more enjoyable for the employees. Additionally, it is likely that satisfied employees perform better at their job, benefiting the whole company.

Moreover, motivating the employees to use the CCS service will increase the occupancy of the shared cars. Therefore, the shared cars and parking spots will be used more efficiently.

I like seeing how excited my employees are when using the car sharing service. The Unity platform really helped us increase our employee satisfaction within our organisation.



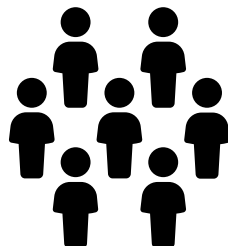
Environmental value

The Unity platform creates value for the environment by stimulating an efficient driving style among the end-users. The platform will provide feedback based on the driving speed, acceleration, stationary usage and average power consumption. Consequently, end-users will receive feedback how they can improve their driving style in order to reduce their environmental impact. Additionally, during this timeframe the CCS service will likely feature electric vehicles, further reducing the environmental impact of the service.



Social value

The Unity platform creates social value by increasing awareness of the environmental impacts of traveling among the end-users. Consequently, employees who use the Unity platform could become inspired to increasingly make use of sustainable travel options (e.g. using public transport, biking, walking or using a shared vehicle) during their daily lives. Furthermore, employees might be triggered to replace their personal car with an electric vehicle after experiencing driving one while using the CCS service.



Value creation & delivery

How is the value delivered?

The Unity platform will be integrated in the current driver application. This application is offered on the app store for both Android and iOS devices. Users of the CCS service will be able to download the application on their own device directly. After logging in, the application determines whether it deals with a corporate or consumer account and adjusts the interface accordingly.

Resources & partnerships

In order to develop the Unity platform a number of resources need to be acquired and new partnerships need to be formed. These are the following:

- Partnerships with software development companies.
- Partnerships with a video animation company.
- Integration with MIND mobility hardware (See Appendix H) and connected car hardware developed by car manufacturers.
- Integrating the booking interface and the Unity platform concept.

Investments

Greenwheels needs to make some investments in order to develop the Unity platform. The main investment costs include:

- Software development costs.
- Salary of Unity platform content manager.
- Hardware and software integration projects.

Value capture

Currently, the pricing strategy of the exclusive CCS service is based on a fixed monthly fee per shared car regardless of its usage.

However, during the second innovation horizon, a new pricing strategy will be introduced. The new pricing strategy will be based on a monthly fee for each employee who gains access to the service. This fee also includes an amount of free travel distance. When a user surpasses the included amount, an additional fee is charged based on a fixed price per extra kilometre driven.

Implementing this pricing strategy has the following advantages:

- It will differentiate the CCS service from competing car leasing services.
- Clients don't want to pay for shared cars that are idle.
- Further efficiency improvements will benefit Greenwheels directly, since fewer cars will be needed for the same number of users, thus lowering the overall operational costs.

Because of the new pricing strategy, Greenwheels will become responsible for providing an adequate number of shared cars in order to meet the mobility needs of the client. However, Greenwheels will be able to more accurately determine the optimal ratio of drivers and shared cars after implementing the service improvements and Experience Workshop. Therefore, the pricing strategy will not be changed before the second horizon.

See Appendix M for a rough estimation of the business case for this new pricing strategy.

Requirements

In order for the Unity platform to have the desired effect of training and motivating the end-users, a number of requirements needs to be fulfilled for the main stakeholders. These requirements will now be discussed.

End-user

- Understanding how to design the gamification elements in order for the Unity platform to have the desired effect on the end-users.
- The content on the Unity platform should be kept up-to-date. Meaning that the challenges and courses should be updated regularly and new content should be added periodically.
- End-users still want to have the option to contact customer support when the online courses, knowledge database and instant support chat-bot don't provide a fitting solution to the problem they experience.

Recommender

- The recommender might be hesitant to let Greenwheels decide the number of cars that will be placed to meet the mobility demand of the users. Therefore, Greenwheels needs to clearly explain to these stakeholders how they will deliver on that promise.

Decision maker

- Decision makers will want to know how the new pricing strategy benefits the client organisation.
- The decision maker will want to know how the CCS service will have a positive effect on the organisation before approving the purchase.

Recommendations

In order to achieve the aforementioned requirements as much as possible, Greenwheels should consider the following practical recommendations while designing the Unity platform.

End-user

- Design the gamification elements according to the eight motivational drives proposed in the Octalysis framework (see page 108 and Appendix L).
- Greenwheels could hire the Octalysis consulting group to support the development of the Unity platform.
- Hire a content manager for the Unity platform.
- Greenwheels should try to reduce the number of customer support requests as much as possible. However, an option to call with customer support employees should still be available.

Recommender

- Greenwheels needs to determine what the maximum number of users per shared car is for each client. This could be achieved through starting a number of pilot projects and by gathering usage data from the Unity platform.

Decision maker

- Emphasize that the client will no longer have to pay for shared cars that stand idle. They will only pay for the number of users and for the (extra) usage of the cars.
- Guarantee that there will be an adequate number of shared cars available for the employees. The network of public shared cars will be available for free if all exclusive cars are taken.

11.6 Long term design solution

The third part of the innovation strategy are the long term design solutions. These design solutions support the development of a Smart Shared Fleet. This section will explain what the Smart Shared Fleet concept is and which design solutions support it.

Smart Shared Fleet

It is expected that the corporate car fleet in the Netherlands will change drastically over the coming years. In 2025, more than half of the corporate cars will rely on some form of electric power (VMS Insight, 2018). This expected growth can largely be explained by the increasing amount of affordable EVs that will be introduced to the market over the next few years (e.g. Driving Electric, 2019), and several economic incentives introduced by the Dutch government.

At the same time, car manufacturers are incorporating new connectivity technologies into their cars, which enable the transmission of data over the internet at any time. These cars, also known as 'connected cars', enable increasing amounts of data about the car's usage and the driver's behaviour to be gathered. By utilising these huge amounts of available data, it becomes possible to radically improve the efficiency of the CCS service, thereby realising a Smart Shared Fleet.

The design solutions that support the development of this Smart Shared Fleet can be divided into three elements: data analytics, driver matching and smart charging. These design solutions will be explained in more detail on the next page.



Data analytics

The Unity platform and the shared car will both gather large amounts of data about the driver's travel behaviour and the status of the car. This data can then be used to develop a predictive algorithm. The algorithm will be able to predict the required availability of the shared fleet at any moment in time.

Driver matching

Additionally, by predicting the type of trip the user will make, it will become possible to select the most suitable vehicle for them. The prediction algorithm will use the real-time availability, location and battery level of the shared cars in combination with data from the user's calender to determine which shared car fits which end-user.

Smart charging

The third aspect of the Smart Shared Fleet is a smart bi-directional charging system. This system will maximise the usage of renewable energy and lower the total costs of charging the shared electric cars. Bi-directional charging enables EVs to be used as an energy buffer for the electricity grid. This way, the vehicles can be charged when there is a surplus of renewable energy (i.e. solar and wind energy), and discharged when there is a shortage of energy. By doing so, it becomes possible to make a profit on the energy that is returned to the network. Of course, the shared EVs cannot be fully discharged if users still need to make trips. Therefore, the Smart Shared Fleet system monitors and predicts the amount of energy that is needed and makes sure that there are always enough shared cars available for any last-minute reservations.

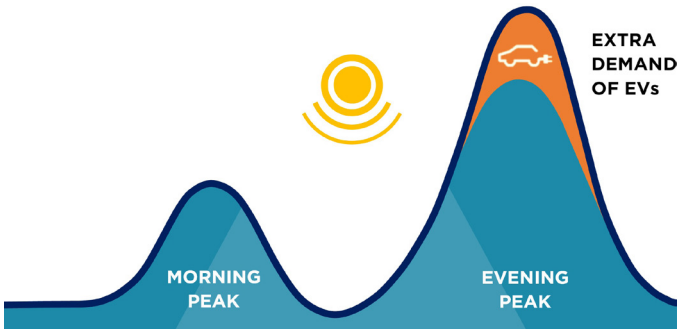


Figure 49: Energy demand without smart charging. Source: Amsterdam Vehicle2Grid (2019).

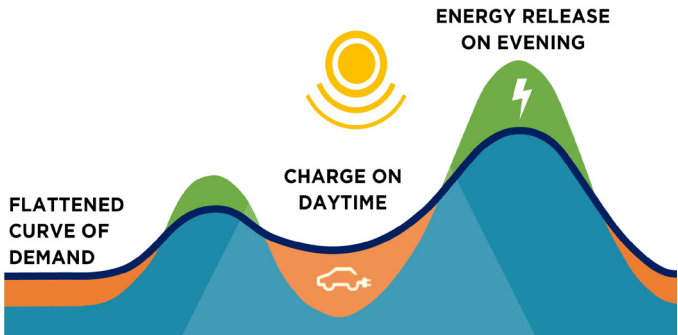


Figure 50: Energy demand with smart charging system. Source: Amsterdam Vehicle2Grid (2019).

Value proposition

Different value propositions for each stakeholder are created by realising the Smart Shared Fleet. These value propositions are as follows.

Value for the End-user

The main value of the Smart Shared Fleet for the user will be the Driver Matching feature. Because the system automatically selects a compatible car for the journey that the user wants to make, users will face less vehicles that need to be recharged during their journey. Consequently, end-users will increasingly trust the CCS service and have a smooth experience while using it.

Value for the Recommender

The Smart Shared Fleet creates value for mobility managers by optimising the usage of the shared car fleet automatically.

Using the predictive algorithm, the Smart Shared fleet will match the mobility needs of the end-users with the available energy in the shared cars as closely as possible. Therefore, the recommender is supported in increasing the efficiency of the shared fleet, resulting a lower workload.

The Smart Shared Fleet automatically finds the most suitable car for me which saves me a lot of effort.



The Smart Shared Fleet helped us optimise the fleet of shared cars. My job has become easier since the systems automatically ensures there are enough shared cars available for the users.



Value for the Decision maker

The Smart Shared Fleet provides value for the client organisation by reducing the energy costs of charging the electric cars. Since the battery levels of the cars will be closely matched with the expected travel demand of the end-users, it will become possible to charge the cars when energy prices are low and return energy to the grid when prices are high.

Additionally, in case the client company generates renewable energy itself (e.g. solar panels on the office building), it will become possible to store the surplus of the locally produced energy in the cars, instead of retuning it to the grid. Thereby realising additional costs savings.

The Smart Shared Fleet helps us reduce the electricity bill every month.



Environmental value

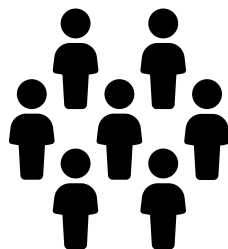
Implementing the Smart Shared Fleet concept creates environmental value by supporting the production of renewable energy. By using the electric cars as an energy buffer, it will become possible to stabilise the supply and demand of the energy grid (see figure 49-50).

Additionally, the environmental impact of the CCS service will be lowered by using renewable energy to charge the electric cars compared to using energy generated from non-renewable sources.



Social value

The Smart Shared Fleet concept supports the transition towards a zero emission mobility service. Therefore, it significantly contributes to reducing air pollution, by lowering the amount of particulate matter that is emitted to the atmosphere. Consequently, the Smart Shared Fleet creates social value by supporting the realisation of a healthier society.



Value creation & delivery

How is the value delivered?

The Smart Shared Fleet consists of two elements: the smart charging points and the fleet management system. The smart charging points will be placed at the client location by a specialised installation company. The new fleet management system will be provided online as a software update.

Resources & partnerships

In order to develop the Smart Shared Fleet, multiple resources need to be acquired and new partnerships need to be established. These are the following:

- Partnership with a data analytics company.
- Partnership with energy companies.
- Partnerships with charging point installation companies.
- Driver matching algorithm needs to be integrated in the booking process.

Investments

Greenwheels needs to make some investments for developing the Smart Shared Fleet system. The main investment costs include:

- Development costs of the predictive algorithms.
- Software and hardware integration projects.

Value capture

The Smart Shared Fleet concept creates value for Greenwheels through third party commissions. Charging point installation companies will pay a small fee for any customers that is referred to them. Additionally, clients will pay a percentage of the realised energy savings to Greenwheels. Unfortunately, estimating a realistic business case is currently not possible for this design solution, since there are too many unknown variables.

Requirements

In order for the Smart Shared Fleet to have the desired effect of improving the efficiency of the CCS service, a number of requirements needs to be fulfilled for the main stakeholders. These requirements will now be discussed.

End-user

- End-users might not like receiving a car which is not fully charged. Therefore, Greenwheels will need to communicate why they received that particular shared car for their journey.
- Greenwheels will need to comply with the extensive privacy regulations in Europe while offering the Smart Shared Fleet concept.
- Some end-users might not trust the predictive algorithm, for example when they have to make last-minute reservation that isn't added to their calendar. Therefore, Greenwheels should consider a method for bypassing the predictive algorithm in special situations.

Recommender

- The recommender will want to know what efficiency improvements can be expected from the Smart Shared Fleet concept.
- Recommenders still want to have an option to manually overwrite the fleet management system to make exceptions for special situations and to feel in control over the shared car fleet.

Decision maker

- The decision maker will want to know how much the Smart Shared Fleet concept will be able to reduce the energy costs of the company.
- The decision maker will want to know if the investment in the smart charging points is worth it.

Recommendations

In order to achieve the aforementioned requirements as much as possible, Greenwheels should consider the following practical recommendations while developing the Smart Shared Fleet concept.

End-user

- Greenwheels should explain why the end-user received a particular shared car. This can be done by showing the estimated energy required for their journey in combination with the available energy in the shared car.
- Greenwheels will need to research which privacy laws are applicable to this concept and ask end-users for permission to use their data.
- Certain end-users should receive a "priority" status, allowing them to override the driver matching algorithm and be able to choose the car they want.

Recommender

- Calculate the expected efficiency gains of implementing the Smart Shared Fleet and show them in the fleet management dashboard of the recommender.

- Include an option for recommenders to assign end-users a "priority" status on the fleet management dashboard.

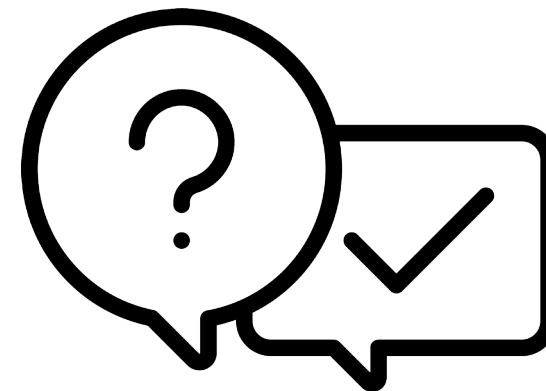
Decision maker










- Estimate the amount of energy costs that will be saved by implementing the Smart Shared Fleet, based on pilot projects and savings at other clients.
- Be transparent about the business model behind this concept. The client will need to understand that their interests are aligned with Greenwheels' interests.

11.7 Design solution summary

On the next two pages a summary overview is provided of the design solution details. Each design solution is discussed by asking the following questions:

- Who will be involved with the design solution?
- What needs to be developed to make it work?
- What will be achieved by implementing the design solution, based on the triple bottom line approach?



	Experience Workshop		Unity platform	Smart Shared Fleet
				
 Who is involved?	Mobility manager of the client organisation Employees who are unfamiliar with the CCS service Greenwheels trainers Video production company Volkswagen dealerships		Mobility manager of the client organisation Software development companies MIND Mobility End-users	Mobility manager of the client organisation Charging point installation companies Software development companies Data analytics companies Energy companies
 What is developed?	Hiring and training Greenwheels trainers Partnership with Volkswagen dealerships Partnership with video production company Instructional videos Slide deck Handouts		User Interfaces Driving score feedback integration Gamification elements Referral system Online courses Hardware integration	Integration with fleet management system Driver matching algorithm Bi-directional charging points Energy price monitoring system
 What is achieved?		Promoting the benefits of using product-service-systems over ownership	Raising awareness of the environmental impact of travelling	Contributing to a healthy society by supporting the transition to zero emission mobility
		Reducing environmental impact of business travellers by increasing the acceptance of CCS	Promoting an efficient driving style among the end-users	Supporting the storage and usage of renewable energy
		Extra revenue stream for Greenwheels	Capture value by offering a subscription and per-per-use business model	Extra revenue stream through third-part commissions

Phase 4: Deliver



In the fourth and final phase of the project, the chosen design solutions were translated into an innovation strategy by creating a detailed tactical roadmap. Additionally, the Unity platform was conceptualised in order to provide a tangible example of the innovation strategy.



An aerial photograph of a winding asphalt road that snakes through a dense forest. The trees are in peak autumn foliage, displaying vibrant shades of orange, red, and yellow. The road has white dashed lines and a few cars are visible traveling along its curves. The overall scene is captured from a high angle, looking down on the landscape.

Chapter 12: Roadmapping

Within this chapter, the innovation strategy is translated into a tactical roadmap in order to present the necessary implementation steps for realising the desired future vision.

12.1 Time pacing

The first step towards creating the tactical roadmap was placing the previously defined horizons into concrete timeframes. This was done by estimating the technological development time, progression of trends and developments, and Greenwheels' capabilities.

First horizon: +1-2 years

The first horizon creates value for Greenwheels and its customers by offering an additional service along with the CCS service.

From a technological point of view the design solution proposed within this horizon should not provide many obstacles, since the required technology is readily available. Additionally, the trends and developments that support the design solution within this horizon are already present and realising the solution lies within Greenwheels' current capabilities.

The timeframe indication of one to two years takes into account that the CCS service should first be improved by implementing the suggested service improvements (see Appendix H) Furthermore, Greenwheels needs to create workshop materials such as slides, videos and handouts, hire and train new staff to facilitate the Experience Workshops and establish close partnerships with MIND mobility and Volkswagen dealerships, in order to provide the fleet management dashboard and the teambuilding activity.

Second horizon: +2-4 years

The second horizon of the innovation strategy creates value for Greenwheels and its customers by offering a new car sharing platform: the Unity platform. In order to realise the Unity platform, cars need to be fitted with compatible telematics hardware, in order to send and receive the necessary data. Over time, this process will become easier, since an increasing amount of cars will contain the required hardware straight out of the factory.

Another obstacle for bringing the second horizon to the market is the development of the Unity platform itself. The gamification elements, user interfaces and back-end solutions need to be carefully designed in order for the platform to achieve the desired effect. Therefore, additional research has to be done, pilot projects need to be setup and user-testing needs to be performed.

Additionally, a content manager needs to be hired, who will manage the online courses, the car sharing challenges and the functionalities on the platform. Therefore, a timeframe of two to four years is estimated for the second horizon to become fully operational.

Third horizon: +4-6 years

The third horizon creates value for Greenwheels and its customers by making CCS more efficient and sustainable.

The reason that this horizon is placed further in time is both due to technological limitations and the developing customer demand.

Bi-directional charging technology is already available, however, it is currently only being used in a limited number of pilot projects. Furthermore, the share of renewable energy sources first needs to grow over the coming years before supply and demand issues will become a real issue.

Currently, it is not economically viable to invest in a system that would try to leverage smart charging in order to make a profit by selling energy back to the grid because the price for selling energy to is currently very low. Consequently, the demand for such as system is not yet present. However, as energy prices will start to rise and renewable energy sources make up for an larger share of the total energy market, it is expected that the demand for this system will quickly increase.

Beside the smart charging aspect of the Smart Shared Fleet, the driver matching system will need to be developed as well. As of now, there are no software systems yet that can accurately predict the usage of a shared car fleet, in order to optimise the distribution of cars to end-users. However, there is already a demand for this type of solution, since it would enable the an efficiency increase for the shared car fleet.

The development of the Smart Shared Fleet system lies outside of Greenwheels' capabilities. Therefore, new partnerships need to be established with data analytics companies and electric car charging station manufacturers.

By taking into account the previously described considerations, a time frame of 4 to 6 years is most realistic for this innovation horizon.

The driver matching system could potentially be introduced within four to five years, while the charging system will take at least six years to be introduced since the market demand first needs to increase.

Vision 2025

The future vision created in this design project is the end goal of the innovation strategy, which is therefore placed in 2025.

12.2 Tactical roadmap

The previously discussed design solutions and their corresponding time pacing build up to the overall tactical roadmap. The aim of this tactical roadmap is to inform the management team of Greenwheels about the necessary implementation steps for realising the desired future vision.

It does so by presenting a comprehensive overview of the main value propositions, the value created for different stakeholders, the features of the design solutions, the required technology and data streams, the changes to the business model, and the internal and external resources that are needed.

Through this design roadmap the innovation strategy has been made explicit and actionable, thereby supporting internal communication and the alignment of different departments within Greenwheels.



Chapter 13: Conceptualisation

This chapter shows the process of prototyping user interfaces of the Unity platform in order to create a tangible example of the design solutions proposed in this graduation project.

Before creating a prototype of the Unity platform, the Octalysis framework (Chou, 2015) was used to determine a balanced set gamification elements. By using this framework it was possible to stimulate the intrinsic and extrinsic motivation of users through including both positive and negative gamification elements (see Appendix L).

Sketching

The first step towards creating an actual prototype of the Unity platform was the design of the user interfaces (UIs) by making quick sketches. Wireframes were used to draft the layout of the most important interfaces (see figure 51).

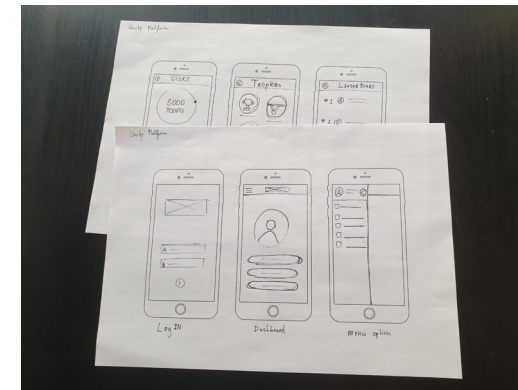


Figure 51: UI sketching.

Digital prototyping

After the most important user interfaces were translated into sketches, digital prototyping was used to create a high fidelity, interactive version of the prototype (see figure 52).

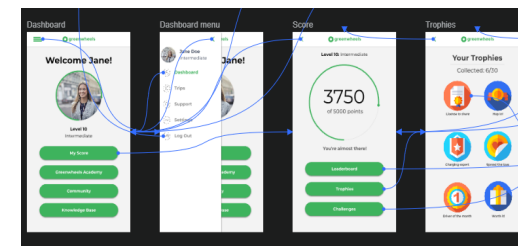


Figure 52: Designing the digital prototype.

The main interfaces of the digital prototype will now be presented. For an overview of all interfaces, see Appendix N.

Home screen

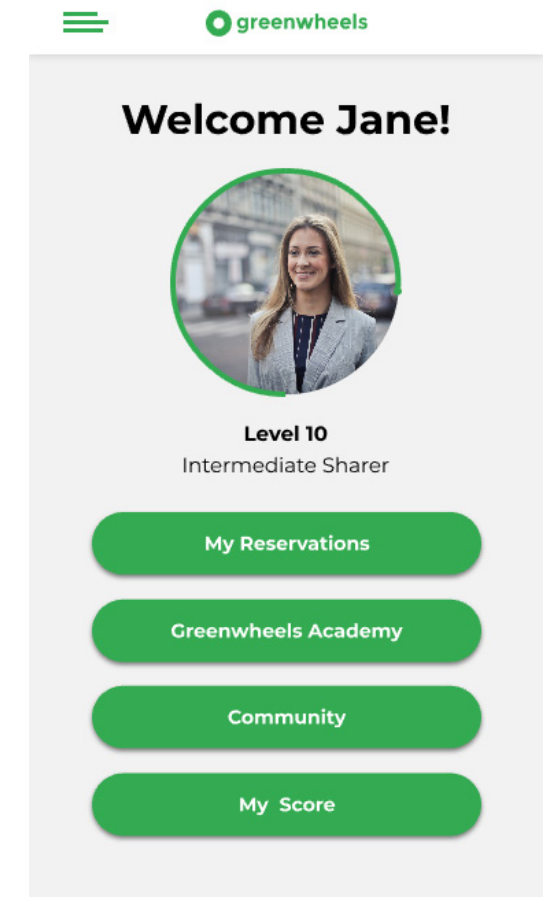


Figure 53: Home screen interface.

The home screen interface will be the first thing the users see after logging into the Unity platform. The interface clearly displays the user's score and the main features of the platform: My reservations, Greenwheels Academy, Community and My Score. By logging in daily, users will receive an increasing amount of points.

Reservations

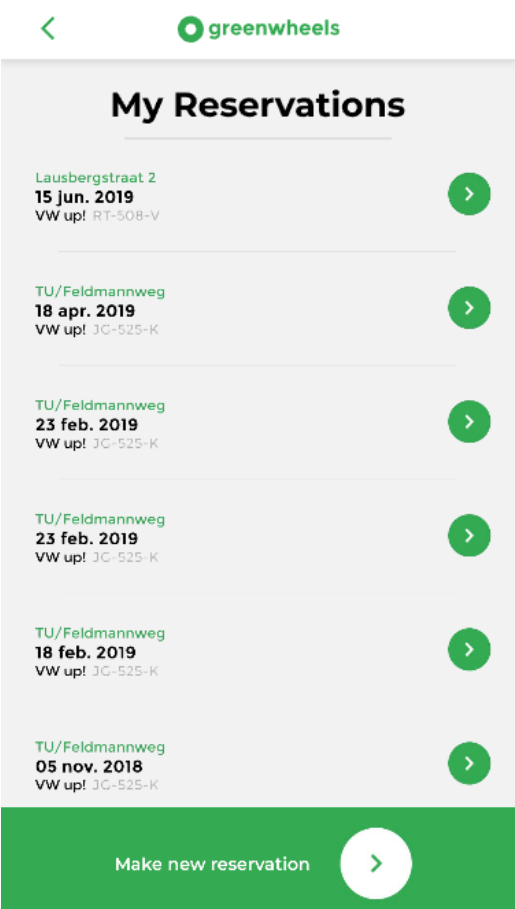


Figure 54: Reservations interface.

This interface gives the user an overview of the past reservations. On this page, users are able to make new reservations and can navigate to feedback on each past journey.

Driving feedback

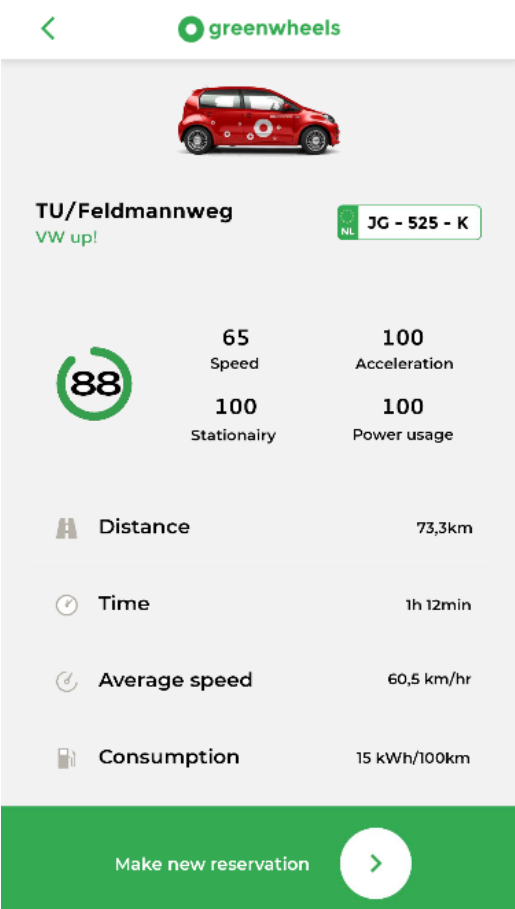


Figure 55: Driving feedback interface.

The driving feedback interface shows how efficient the shared car was used, based on four parameters. Additionally, this interface provides a summary of the trip details.

Greenwheels Academy

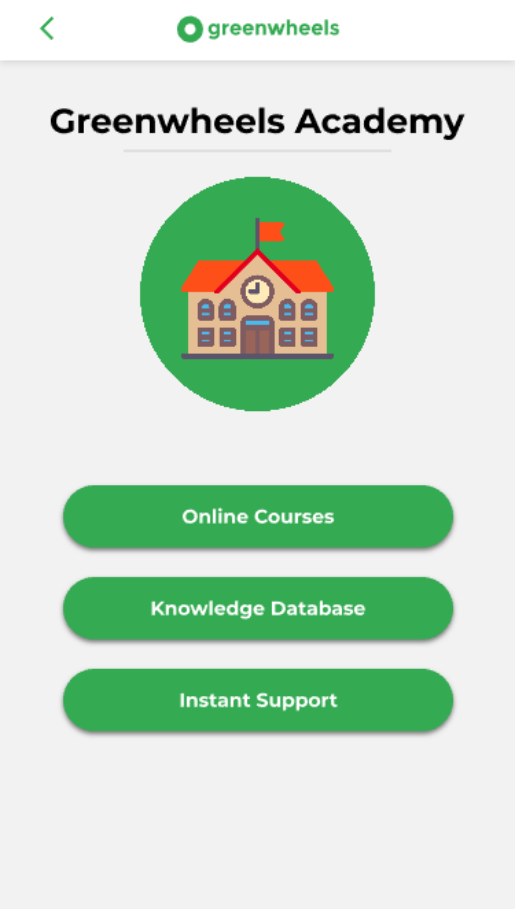


Figure 56: Greenwheels Academy interface.

The Greenwheels Academy offers users the opportunity to learn more about the platform and the shared car. Additionally, users are able to contact an support chatbot, in case they are unable to solve an issue themselves. If the chatbot is also unable to help the user, it will still be possible to contact the customer support desk by phone.

Online courses

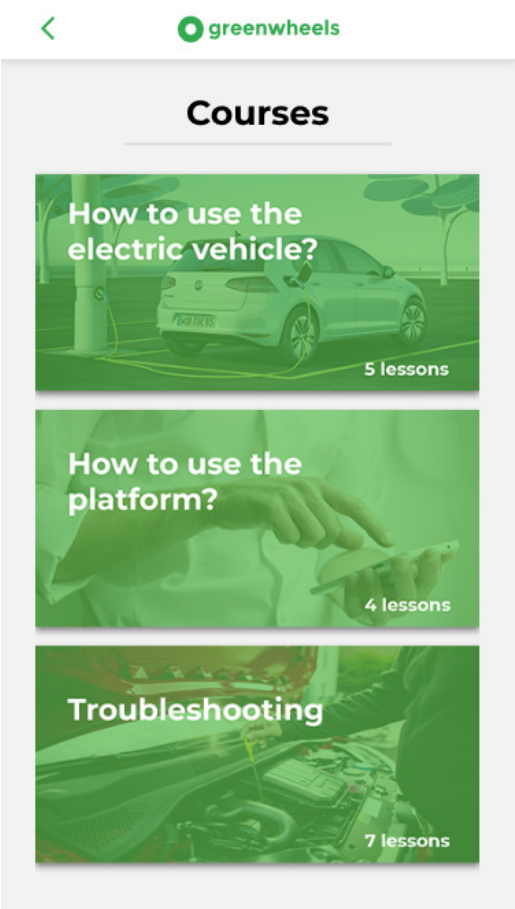


Figure 57: Online courses interface.

This online courses interface gives an example of the courses that will be provided on the platform. Users are able to enroll in a course and follow along with several video lessons.

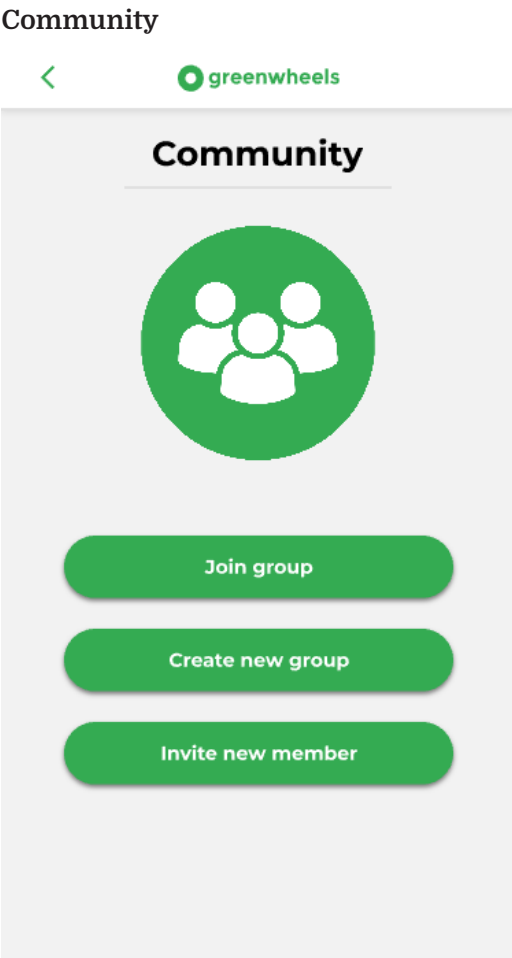


Figure 58: Community interface.

The community feature of the platform allows users to create and join groups. Within a group the users are able to chat with each other and to start challenges against other groups. Including this feature will stimulate the intrinsic motivation of end-users (see Appendix L).

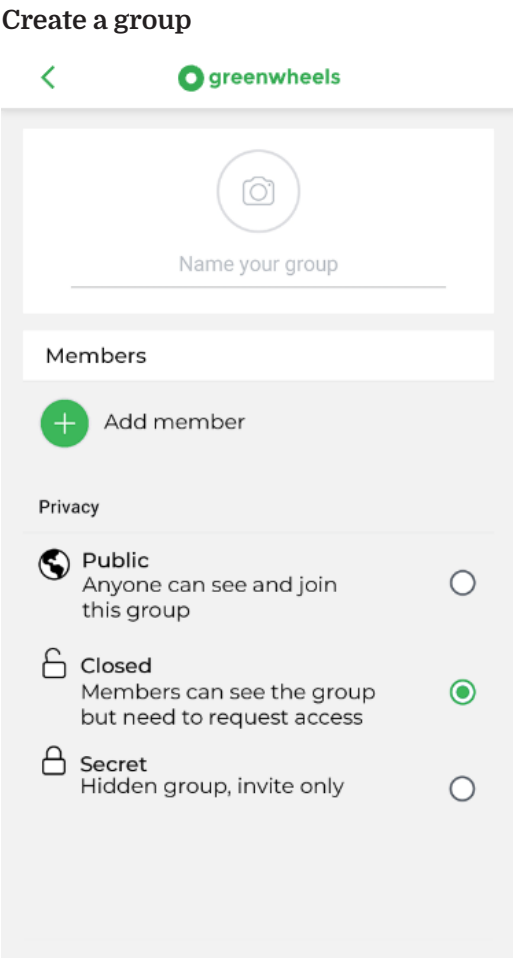


Figure 59: Group creation interface.

This interface shows how a new group can be created. The user is able to invite other employees, name the group and can choose which privacy settings he or she wants the group to have.

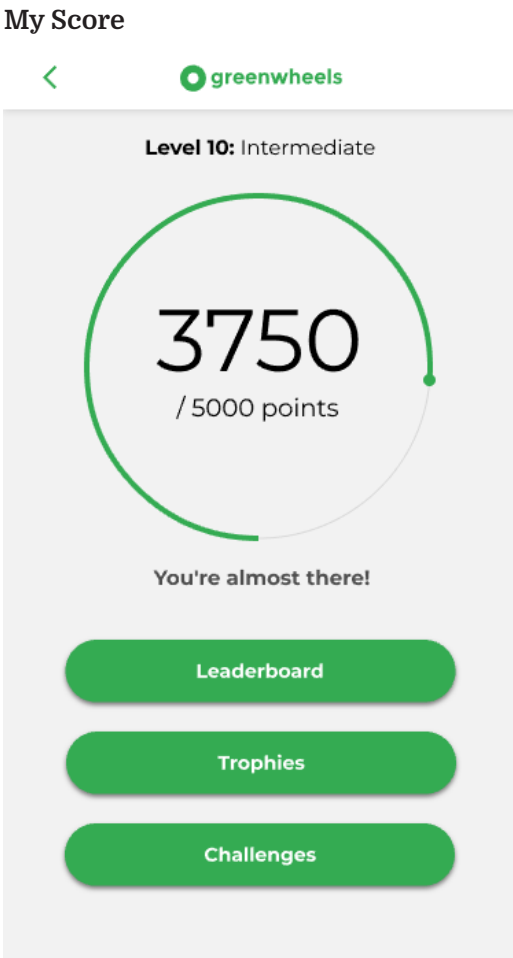


Figure 60: My Score interface.

Users are able to inspect their score in more detail by navigating to the "My Score" interface. Here they can see how many points they have gathered so far and which level they are. Additionally, users can explore three sections related to their score: (1) the leaderboard, (2) their trophy page and (3) challenges. The point-gathering features will stimulate the extrinsic motivation of end-users (see Appendix L).

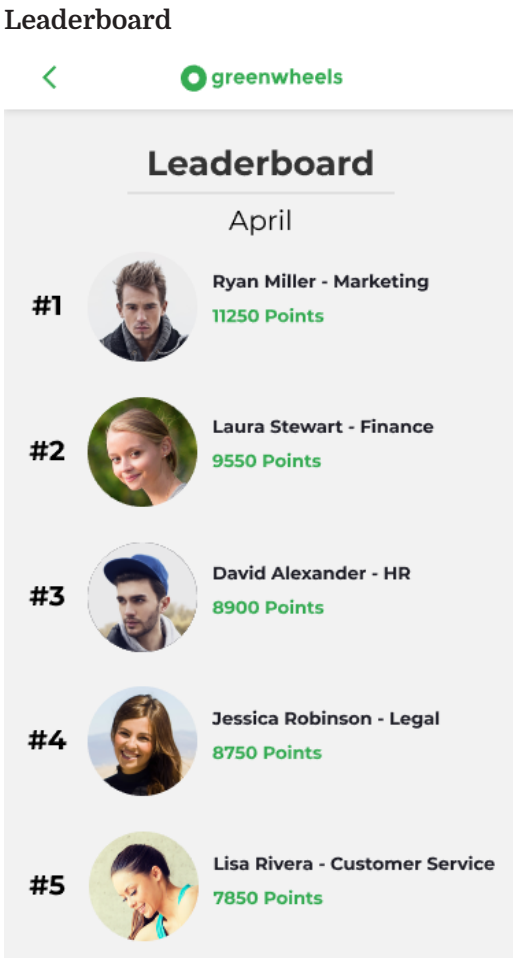


Figure 61: Leaderboard interface.

The leaderboard gives an overview of the five highest ranking users of the month. It shows the amount of points they've gathered, their name and the department or group they belong to within the Unity platform.



Chapter 14: Conclusion & Discussion

This chapter highlights the main outcomes of this graduation project by answering the initial research questions. Additionally, the implications of the outcomes are discussed from different perspectives. Lastly, the limitations of this project are reviewed and suggestions for future research are given.

14.1 Main outcomes

The research questions stated at the beginning of this thesis have already been answered indirectly throughout the four phases of this graduation project. However, this section aims to conclude this thesis by providing a clear and explicit answer to each research question.

RQ1: What are the current car sharing needs of corporate customers in the Netherlands?

Since the CCS service is offered to organisations instead of individuals, the needs of multiple stakeholders have to be considered. During the discover phase, the three most influential stakeholder types were identified. These are: the end-user, the recommender and the decision maker. The following needs were considered essential for each stakeholder:

End-user

- Needs to be motivated in order to use the CCS service.
- Needs to become familiar with the booking interface and shared car in order to use the service correctly.
- Needs to have a satisfying first-time experience with the service in order to keep using it afterwards.

Recommender

- Needs tools to make his or her job of managing the fleet of shared cars easier.
- Needs help motivating the employees to use the CCS service.
- Needs tools for training new users to use the service correctly.
- Needs options for making the company's car fleet more sustainable.

Decision maker

- Needs help improving the CSR reputation of the client organisation.
- Is looking for opportunities to reduce mobility costs.
- Needs every aspect of the CCS service to be provided by the service provider.

RQ2: What will the world of corporate car sharing look like in the Netherlands in 2025?

In order to answer this question, a large number of context factors were taken into account (see Chapter 8).

This research resulted in four different future scenarios along the dimensions of social outlook and attitude. The social outlook dimension shows a collectivistic future world on the one hand, and an individualistic world on the other hand. The collectivistic worldview is supported by the increasing accessibility of electric vehicles, the rise of collaborative consumption and increasing societal demand for CSR. The worldview of individualism is supported by the fact that living in a large city is only available for an elite group of people. Additionally, people are increasingly living inside their own personalised bubbles due to digital media usage and personalised products and services.

The attitude dimension shows a worldview which is mainly focussed on the experiences and a worldview focussed on results. Within the experience oriented worldview, products and services increasingly adapt themselves to the context and provide users with an optimal experience by taking emotions and human psychology into account.

A contrasting worldview is found as well. This is a future scenario where products and services are becoming increasingly focussed on efficiency. Functionality is all that matters. Results need to be optimised, regardless of the experience of the user. This worldview is supported by technological innovations such as Artificial Intelligence (AI), digital manufacturing and personalised online marketing.

Considering these future scenarios, two design opportunities were identified:

- Improving the experience of CCS service by creating a feeling of community among the end-users.
- Improving the efficiency of the CCS service through personalisation.

RQ3: What will be the role of Greenwheels within this future context, and how will it get there?

By taking into account the research outcomes from the first two phases, a vision statement for the year 2025 was created. This vision statement describes the goal for the CCS service in a single sentence:

"Realising a personalised, zero emission, corporate car sharing service, with a motivated and knowledgeable community of users."

In order to turn this vision into a reality, an innovation strategy was created. This innovation strategy incorporates three different design solutions, spread across different timeframes.

The design solutions will now be described briefly.

Experience Workshop: An interactive workshop day for training and motivating new users.

Unity platform: An online CCS platform based on gamification and online learning.

Smart Shared Fleet: Optimising the shared car fleet by utilising smart charging technology, connected car technology and predictive algorithms.

Next to developing these design solutions, an implementation strategy was created in the form of a tactical roadmap. This roadmap shows an actionable step-by-step approach for Greenwheels to successfully introduce the proposed solutions.

Lastly, a prototype was created for the Unity platform in order to demonstrate a tangible example of the innovation strategy created during this graduation project.

14.2 Implications

This section presents the implications of this graduation project. The implications will be discussed from an academic, managerial, design and sustainability perspective.

Academic implications

This thesis contributes to the existing body of literature by investigating the relatively unexplored topic of CCS. Little is currently known about the determinants of CCS acceptance, despite being a promising solution for a large number of the social and environmental issues our society is currently facing.

The research conducted during this graduation project adds value by presenting a clear overview of possible determinants influencing the acceptance of PSSs and CCS services. Moreover, this graduation project builds upon the research outcomes of Fleury et al. (2017) by creating practical solutions for improving the effort expectancy and performance expectancy of end-users.

Managerial implications

Furthermore, this graduation project creates value for managers who are active within the car sharing industry and managers who are engaged with sustainable PSSs. It does so by presenting several future scenarios and concrete CCS service concepts that can be used as a source of inspiration.

Most of all, this graduation project creates value for the company Greenwheels. It does so by presenting a variety of internal and external research insights. Based on these analyses, multiple design solutions were created to make the CCS service future proof.

The implementation of these design solutions was summarised in a tactical design roadmap until the year 2025. Lastly, this thesis and the included visualisations create value for Greenwheels by supporting internal communication and alignment.

Design implications

This graduation project contributes to the field of Strategic Product Design in two ways. First, this thesis showcases how a variety of design methods and tools (e.g. ViP method, value proposition design methodology and service design tools) can be adapted and combined within a single design project. Secondly, this graduation project aims to inspire other designers to take responsibility by contributing towards sustainable development. This was done by showing how designers need to take into account social and environmental value creation beside financial value creation.

Sustainability implications

This graduation project had the goal to stimulate sustainable development by increasing the acceptance of the CCS service and the sustainable value that is created while using the service.

The first horizon of the innovation strategy mainly supports the acceptance of the CCS by raising awareness and stimulating employees to start using the service.

The second and third horizon focus on increasing the sustainable value that is created while using the service through promoting an efficient driving style among users, increasing awareness of the environmental impact of travelling and by supporting the production of renewable energy.

14.3 Limitations

As with any study, there are a number of limitations associated with the research performed during this graduation project. This section discusses which limitations were present and how they could have impacted the reliability of the outcomes.

Limited availability of literature

A wide range of literature has been published on the topics of PSSs, sustainable business models and consumer behaviour. However, it is currently unclear to what degree the findings of these studies can be applied to the specific context of CCS. During the literature review only one academic article was found that specifically investigated the determinants of CCS acceptance among employees. Due to this lack of available literature, valuable determinants could have been ignored during the design process.

Interviews

The semi-structured interviews that were conducted mainly involved current clients of Greenwheels and companies that were associated with Greenwheels in some other way. Because of this sample selection, the outcomes of the interviews could not be representative for the overall market. Additionally, due to time and accessibility constraints, only a limited amount of people were interviewed. This could also have negatively affected the reliability of the findings.

Partnerships

In order to realise the innovation strategy, Greenwheels is dependent on establishing various partnerships (e.g. with car manufacturers, software development companies, smart charge point installation companies).

However, this project did not identify which companies should be involved specifically. Regardless, it is likely that Greenwheels will be able to quickly establish the required partnerships due to their existing partner network and the support of Volkswagen and Pon Holdings.

Validation of business cases

The financial viability of the design solutions needs to be calculated more accurately. The costs and revenues were difficult to estimate during this project, since they are dependent on a large number of different factors. Therefore, the two business case examples presented in this thesis should be regarded as no more than a ballpark estimate.

Design iterations

During this project, multiple iterations took place with regards to the future vision. As a result, the creative sessions and the validation session were executed with a slightly different future vision in mind. Therefore, it is possible that redoing the ideation process with the newly defined vision statement would result in a somewhat different result. However, due to the time constraints of this project it was not feasible to redo this part of the project.

Motivation of end-users

The design solutions presented in this thesis aim to motivate the employees to start car sharing based on various research insights. Regardless, some users might still not be sufficiently motivated to change their behaviour. In this situation, Greenwheels will have to shift the focus of their promotional efforts more towards the recommender and decision maker stakeholders since these stakeholders have control over the mobility policy of the company.

14.4 Future research

Based on this graduation project, a number of interesting future research directions were identified.

Determinants of CCS acceptance

As previously stated, there is a lack of literature investigating the determinants for CCS acceptance. Therefore, additional qualitative and quantitative research should be performed in order to identify which factors influence the acceptance of CCS among different stakeholders.

Market demand validation

The research conducted in this graduation project found that there is a significant market demand for the proposed design solutions. However, additional research is needed to validate these findings. Preferably, an extensive quantitative study should be conducted in order to estimate the market demand more accurately.

UX/UI refinement

This graduation project presented a relatively simple prototype of the Unity platform as an example. However, additional customer research is needed to fully develop the UX and UI designs necessary for the design solutions. Furthermore, extensive user testing should be conducted to validate and refine these designs.

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