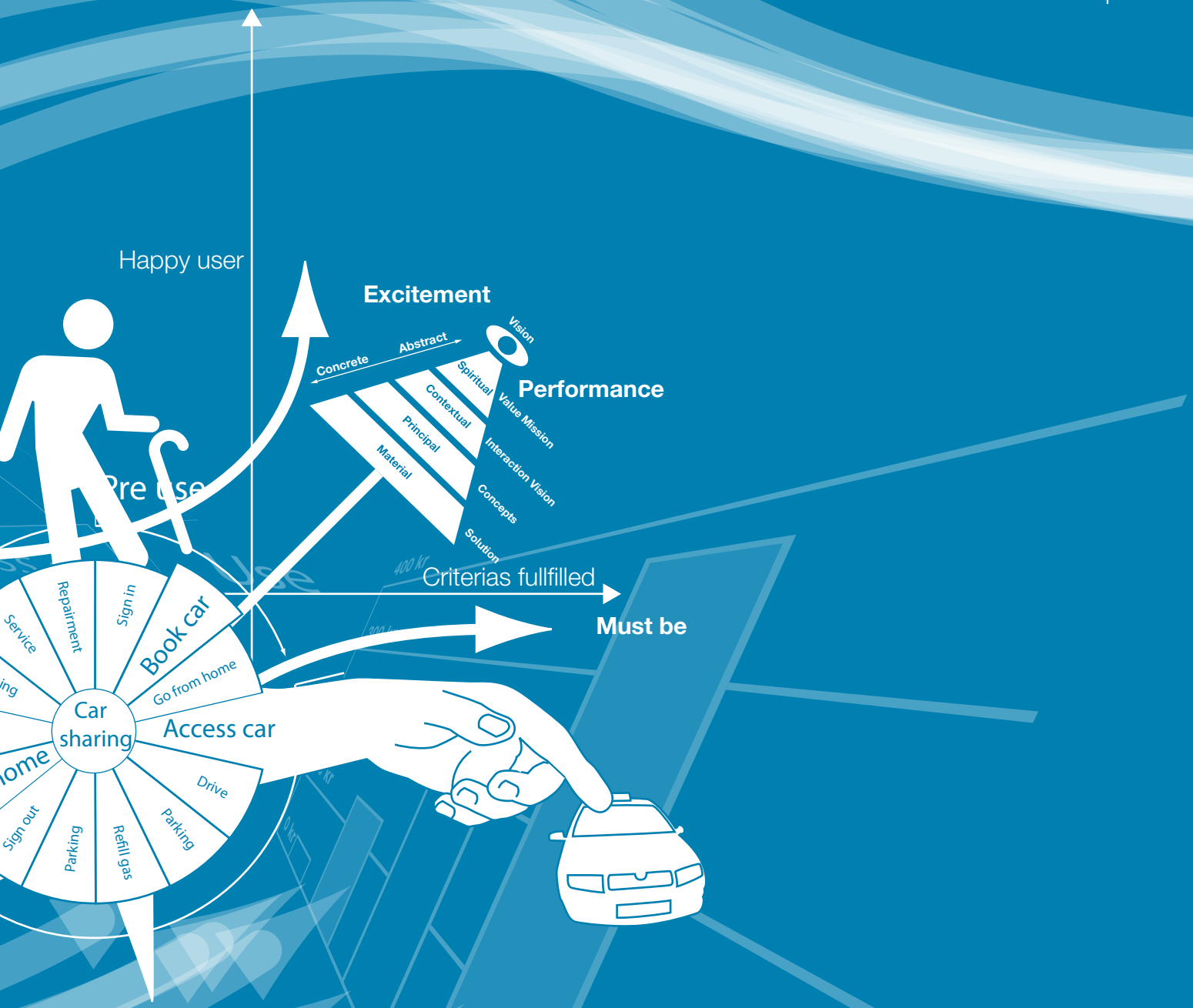
EasyShare

Process report



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Title page

7th Semester

Industrial Design

Institute of Architecture & Design

Aalborg University

Title:

EasyShare

Theme:

Design for the ageing - A Product Service System

Group:

3

Project period:

1. October – 22. December 2007

Supervisors:

Mario Gagliardi / Nicola Morelli

Sven Hvid Nielsen

Pages:

73

Synopsis

This 7th semester project concerns a development of EasyShare, a booking service for Hertz Delebilen in Aalborg. EasyShare is targeted at the elderly.

The first phase, research and development, contains a qualitative analysis of the target group. It reveals various aspects of the life of elderly people and leads to a mapping of transportation needs via personas and use cases. Existing person transport services are benchmarked and a problem statement is created, saying that car sharing is neither accessible nor attractive to elderly.

The second phase, Strategy and Concept concerns the development of concepts and evaluating them by the value and vision-based methodology. A concept for changing the booking scenario of Hertz Delebilen is defined and specified through different criteria for the service and a touch point.

The third phase, System Development, concerns mapping the TO-BE system through methods of analysis. A final product service system is explained and evaluated “as a service” and “as a system” in the product report. It is concluded that EasyShare improves car sharing from the elderly point of view.

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Preface

The group would like to thank the participants of the cultural probe and the people at Aktivitetscenter Sjællandsgade for participation in the interaction workshop.

Reading guidance

The project is documented in two reports; A process report and a “product” report. The process report contains 5 phases. Phase 1, 2 and 3 dealing with the research, strategy and development. Furthermore 2 phases have been added for documentation purposes:

Phase 0:

Formal introduction etc.

Phase 1:

Research and analysis

Phase 2:

Strategy and concept

Phase 3:

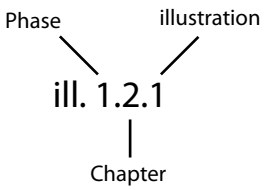
Product Service System development and detailing

Phase 4:

Documentation and reflection

The product report describes the Product Service System in detail.

Harvard style is used for referring to various sources. The list of references and illustrations is located in the back of the report. When referring to appendix, illustrations, diagrams the following format will be used.



Appendix and the report are located on the CD in the back of the report. The CD also contains pictures, videos, sketches and diagrams from the process.

Contents

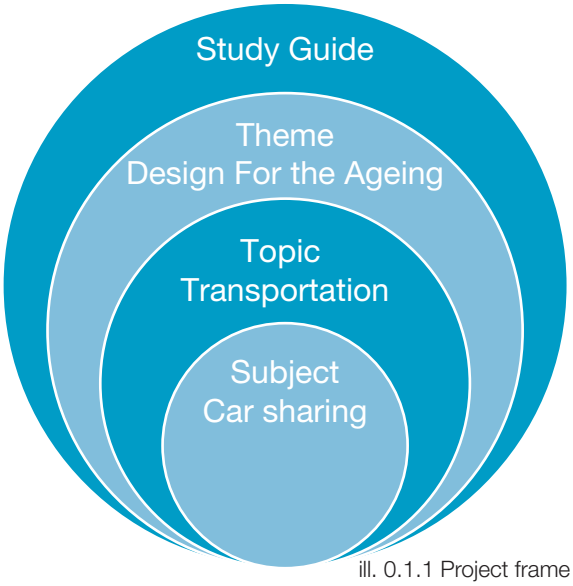
Introduction

The 7th semester project concerns how to design a service for the ageing population. The semester introduces a systemic perspective in which the design activity should be framed. Focus will be at the material and immaterial components and details that are essential for the development of the service and the consumer experience of the service. The main considerations in the project concern an organizational and socio-cultural approach.

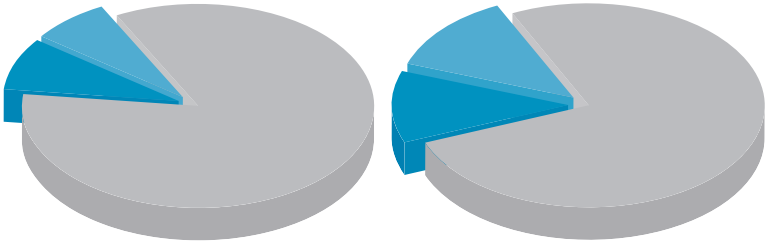
The theme “Design for The Ageing” is relevant according to the fact that the average age is rising and will continue doing so because of better health and condition of life. Today 65-74 year old make up 8,3 % of the society and in 2030 11,4 % as the baby boom of the 60’s reach the age of retirement. The society has to consider how to handle this development, the needs and expectations of the elderly as do designers.

The topic for the project, transportation, was chosen out of interests for development in the public and private transport service.

[Danmarks Statistik, 2007]



ill. 0.1.1 Project frame



Est. population in Denmark (dst.dk)

Age	No. of people 2007	No. of people 2030
0-64 years	85%	76%
65-74 years	8%	11%
75+ years	7%	12%
TOTAL	5447084	5717019

ill. 0.1.2 Percentage of population

Learning objectives

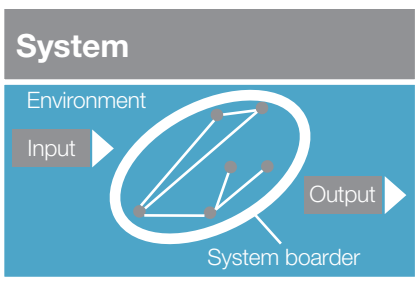
The objective of this project has been defined as the following:

- Gain knowledge about system design by analyzing and designing a system.
- Develop a Product Service System that covers organizational, technical and economic aspects.
- Describe the system from different actors' point of view according to roles, needs and interests.
- Get familiar with methods for designing Product Service Systems.
- Design interactions, taking into account experience, form and function.
- Communicate and represent system aspects using graphical means.
- Apply "global" methods such as "Lerdahl's pyramid model" & "cultural probes".
- Structure an open workflow using Microsoft Office OneNote.
- Improve writing/communicating in English.

Product service system

A product service system (PSS) can be defined as:

A set of elements related to each other on the basis of logical physical or non-physical links that generate mutual dependence. (Nicola Morelli, 2007)



ill. 0.3.1 [White, Stoughton & Feng, 1999]

Designer perspective

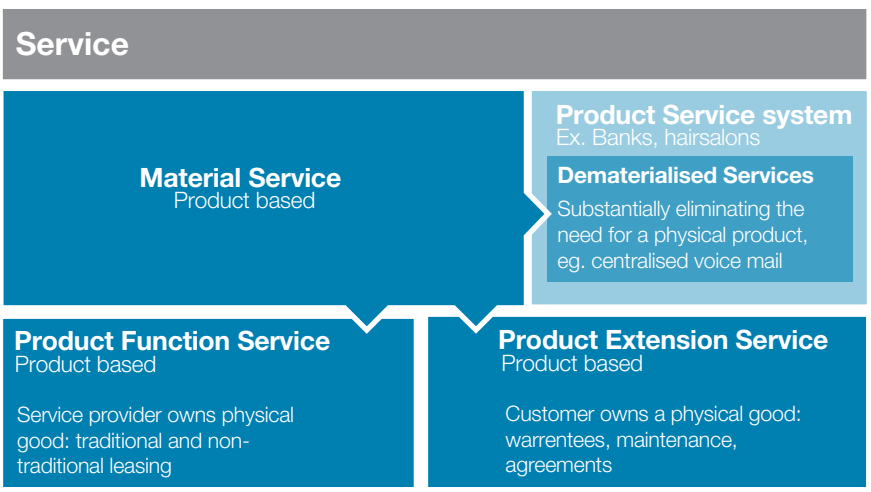
From a designer perspective a product service system is a system which consists of a set of elements and relations, interaction with the environment through a boarder and input and output of the system. (ill.0.3.1)

To be able to design such a system, the designer has to look at the service in a systemic context and understand and control both immaterial and material components of industrial outputs and how the service is used by costumers in their everyday life. The services can be both material and nonmaterial. (ill.0.3.2)

Consumer perspective

From the perspective of the consumer a PSS is a matter of receiving a service without having to own the material products that the service takes into use.

Examples of typical PSS's are libraries, bus transport, cleaning service and food delivery.



ill. 0.3.2 [White, Stoughton & Feng, 1999]

The elderly

To initiate the project a short research of the term elderly is performed.

The research consists of short interviews with elderly met on the street. The purpose is to get an idea of who the elderly are and their physical ability in relation to age to be able to increase the definition of the target group. The age of the participants is noted followed by a loose discussion of their everyday transportation. The result of the initial research is a series of pictures with corresponding age and assigned keywords.

This provides a clear view of the target group and also some of the factors which differentiate the target group. The main factors are for instance health, activity level and age. Insight in how the elderly thought about themselves is also experienced through the short research. The research provides the design team with a base of factors to consider for the further definition of the target group (Appendix 1).

Age: 50	Age: 67	Age: 78	Age: 88
Prefers to walk.	Relaxed	Well Balanced	Slow movements

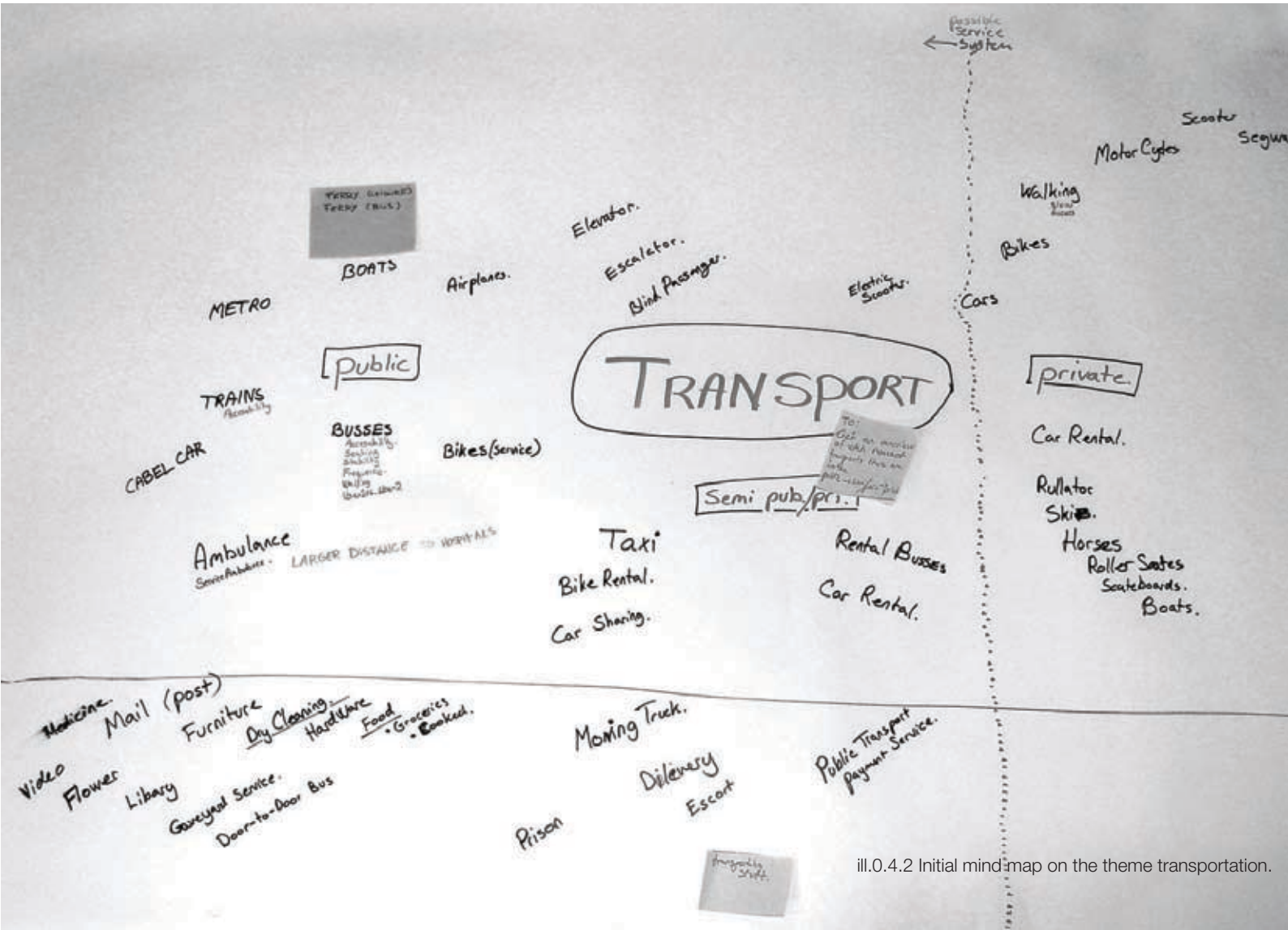
ill. 0.4.1 Some of the elderly interviewed

Transport

As an introduction to transport, a mind map is made to try to cover different types of transportation.

The mind map is made to get a common understanding, within the design team, of the theme transport (types and means). The subjects concerns types of personal transportation to services as delivery services and mass transit systems. Further the mind map is categorized by services (delivery), public transportation (e.g. bussystem) and private transportation (bikes, cars etc.). It is chosen that the project should be focusing on personal transportation (public, semi-public and private).

Personal transportation is evaluated as most suitable for the frame of the semester and also has the most interest of the design team.



ill.0.4.2 Initial mind map on the theme transportation.

Phases

The phase plan describes the objectives, methods and output of each of the phases in the project.

The purpose of the phaseplan is to get an overview of the project and the methods used.

Phase 1: Research and analysis

(1/10 - 22/10)

Objective:

Analyse context (transportation).

Research the elderly (present and future).

Gain insight in social aspects of the target group.

Define main subject for deeper analysis.

Analyse systems related to the subject.

Define main subject for deeper analysis.

State a problem.

Methods:

Brainstorm

MindMap

Contact to users

Cultural probe

Actor diagram

Information and material flow diagram

Personas (target group)

Use cases (analytical)

Output:

Definition of target group

Problem area

Problem statement

Programme for the project

Phase 2: Strategy and concept

(23/10 - 12/11)

Objective:

An overview of the existing system.

Developing a concept for the product service system as well as a touchpoint.

Exploring the concepts – problems and possibilities

A strategy for detailing the concept.

Defining system boarders (where to stop)

Methods:

Lerdahls Value and vision based methodology

Mindmapping

Context/actor diagram

Information/material flow diagram

Use case scenarios (analysis)

Activity map (usercases)

Personas (evaluation)

Output:

Vision for the concept.

The main structure of the PSS concept.

The priority of focus aspects.

System specifications

System criteria

Phase 3: System developement

(13/11 - 20/12)

Objective:

Definition of key relations in the PSS concept

Detailing the key relations.

Name and logo

Implementing the concept in Aalborg

Designing a touch point (conceptual)

Methods:

IDEF0.

Information/material flow diagram.

Use cases (documentation)

Methods related to product design.

Output:

Graphical representation of the concept.

Representation of touchpoints.

Representation of keyrelations.

Concept for a material touch point.

Phase 4: Documentation and reflection

Objective:

Documentation of the process

Documentation of the concept

Process reflection

Methods:

Layout template

Use case scenaries

Diagrams

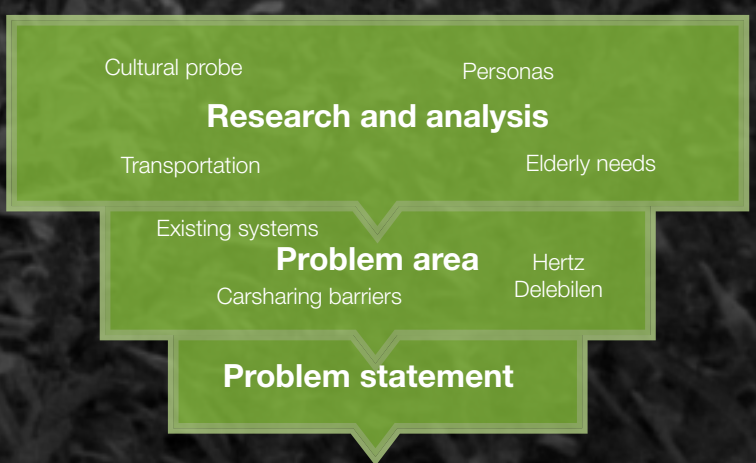
Output:

Process report

Product report

ill. 0.6.1. Phase plan of the project.

Research and analysis



(1/10 - 22/10)

Phase 1 introduces methods and tools in relation to identifying/analyzing the systemic context with regards to actors involved. Further the phase concerns investigation and definition of the target group. This is carried out by cultural probing in order to identify needs of the target group and to get an insight in their lives in regards to transportation. Personas and scenarios are used to identify these needs from use cases.

Existing systems are analyzed through use cases to experience the positive and negative aspects from the eye of the consumer. The research results are summed up and used as a basis for the problem statement.

Cultural probe

To be able to define a target group it is necessary to get an insight in the culture of the elderly besides quantitative data. A cultural analysis of a potential target group is made to gain the insight.

The cultural probe is a qualitative research method which provides the design team with useful information about user habits, preferences and life style.

The Toolkits

The toolkits contain a number of "tools" which the users have been using for a three-day period. Following content make up the toolkit:

Diary: A diary for noting actions and type of transportation during the day.

Map: A map of the city for marking routes and often visited locations during the three days of the probe.

Postcards: Two postcards with questions that appeal to the imagination of the user.

Camera: A disposable camera for taking photos of the everyday life. The camera includes a list of examples of objects to photograph.

The specific tools are chosen in order to make the probe handy and easy for the users to carry out. Also the probes are designed in such a way that general answers are to be given to gain insight in the culture of the elderly and not only the culture regarding transportation. (Appendix 2).

Top cover

Contains information about the contents of the box.

2 x Postcards

1 question

Disposable Camera

Easy to use camera including instructions and examples of what to photograph.

Sweets

Surprise and motivation for the users.

Box

A nice way to hand over the "tools" to the users.

Map over the City

For the user to map often used routes.

Probe participants

The probes are handed out to ten people with characteristics similar to what is expected of the general future elderly. Some probes are given to people in the street who fit the expected target group of the project and some are given to relatives of the design team.

In order to resemble the expected target group, the probe participants has to meet the following criterias.

- Preferably around the retirement age or older
- No major physical disabilities
- A certain level of everyday activity
- Users of all kinds of transportation

Outcome

The expected outcome of the probe is an indication of the everyday life of the elderly and an insight in the elderly life. Furthermore the probes are a tool for discovering areas of interests according to the theme transportation.

It is expected that the results of the probe will be used throughout the project phases when referring to "the elderly".

Pen

For writing in the diary.

3 x Single day Dairy

Diaries for noting the daily activities and use of transport means.

ill. 1.1.1 - Contents of the Cultural Probe

Results of the cultural probe

As this is a qualitative research, this chapter will only summarize the most interesting results from the cultural probes.

Of the 10 probe kits that are handed out, only 7 kits are returned. Unfortunately many participants has not used the map, so the analysis of the results is mainly based on the pictures, postcards and diaries of the users.

The pictures

The photos of the elderly daily life, activities and objects, show that a lot of the participants are capable of handling devices like mobile phones and digital cameras. Furthermore, some participants also enjoy the outdoors and to ride the bicycle. What is characteristic for the homes of the elderly is the collision of things from the early stages of their lives and the newly achieved items.

(Appendix 3)

ill.1.2.1. Picture of a participants phone.

ill.1.2.2. Picture of a participants newest technological device.

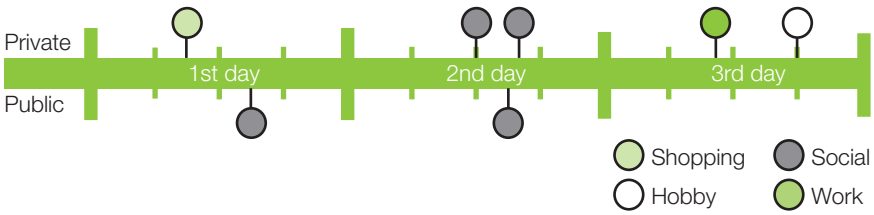
ill. 1.2.3. Picture of a lovely experience.

ill.1.2.4. Picture of a participants transport mean.

Scedules

Some of the elderly use both public and private transportation, while most of the participants only use private transportation. About 1/3 of the activities of the elderly are related to work as some of the participants are not yet retired. Half of the activities are social- or hobby related and shopping is done every 3rd day.

(Appendix 3)

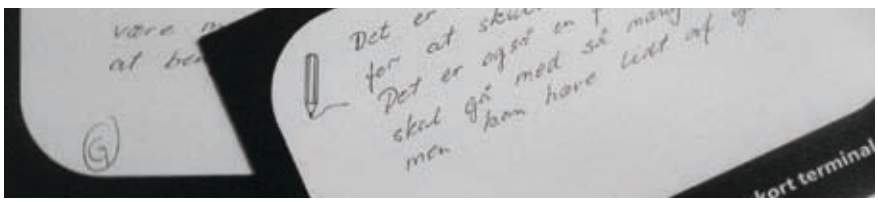


ill. 1.2.5. Scedule that describes the probepaticipants use of public and private transport means in relation to daily activities.

Postcards

Keywords and phrases is extracted from the postcard answers, to be used as inspiration for the project. An example is a participant that dreams about a safer and more automated transportation system which shows that the participant is open to new transport options.

(Appendix 3)



ill. 1.2.6. Answers of the postcards.

Conclusion

The cultural probe gives a deeper understanding of the elderly and thereby a basis for defining the target group. Analyzing actual people adds a more personal feel of the culture of the elderly compared to a more top-down strategic analysis.

Both from the diaries and postcards and visually through the pictures the design team is made aware of objects, situations and problems that are relevant for the project.

Transportation needs

In order to clarify the personal transport service that we have observed suiting the elderly needs, their transport needs are mapped from an elderly point of view.

The process

The cultural probe gives an insight in the needs of the elderly regarding transport. This provides the knowledge to set up what variables that are relevant to the needs of transportation.

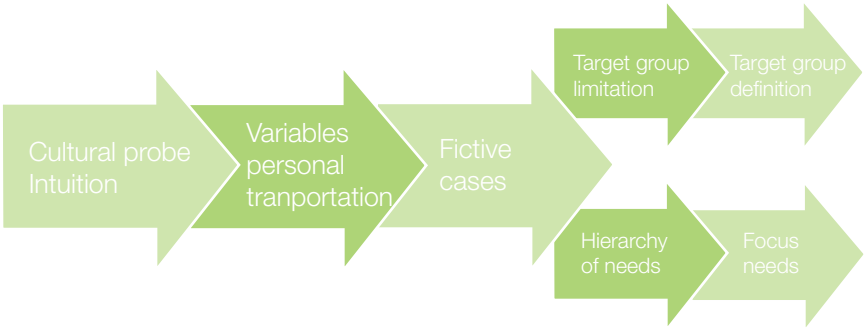
Areas of influence

The needs regarding transportation are found to be dependent on variables according to geographical location, activity level, social network and physical ability. Three fictive cases are used as a frame to generate needs and to define important variables that influence the need of transport. (ill.1.3.2). The cases are chosen from different criteria to evaluate the needs from several different point of views. There is only given one example of the cases.

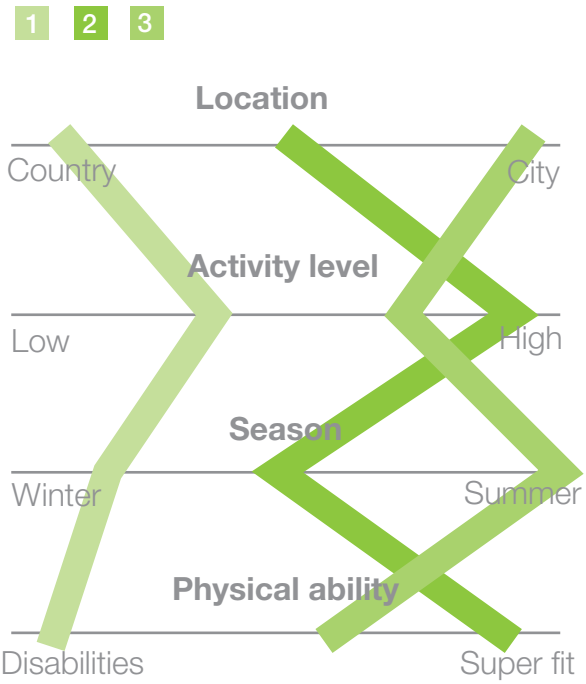
Case 2

Case 2 concerns the persona, Vagn. Vagn lives in the suburbs. He is retired and has a high level of activity and no physical disabilities. He uses his bike whenever possible regarding the weather. An example of his need could be a need for changing means of transport, which makes him need a different mean of transport depending on season. Other requirements for transport include:

- Flexible transportation
- Spontaneous
- Short distance transportation
- Fast transportation
- Control
- Weather isolation
- A change in means of transport according to season (bike, car, bus)
- Parking



ill. 1.3.1. The proces of defining the needs of the elderly and the parallel process of defining the target group.



ill. 1.3.2. Diagram of cases.

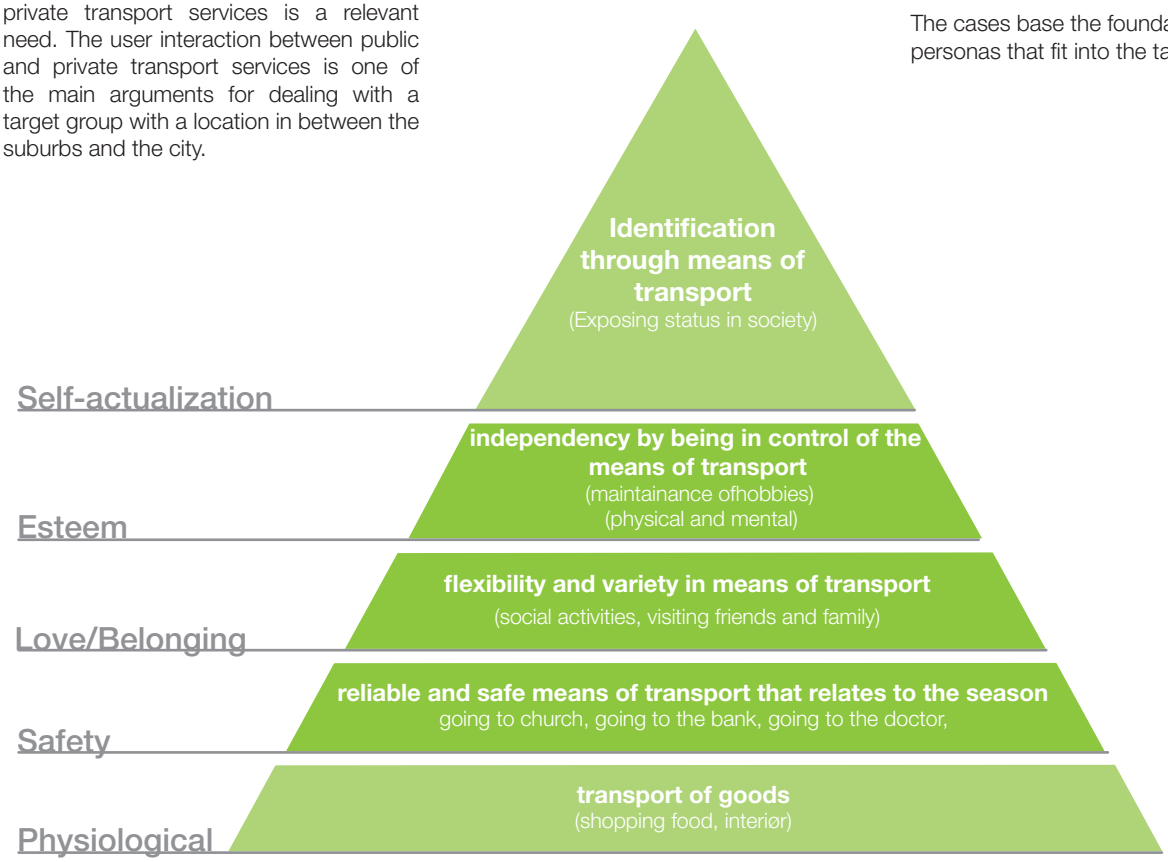
Through the cases the design team becomes aware of that the need of both private and public transport means is less relevant by living in the countryside because people rely on their private car. Whereas when living in the suburbs like case 3 the need of combining public and private transport services is a relevant need. The user interaction between public and private transport services is one of the main arguments for dealing with a target group with a location in between the suburbs and the city.

Categorizing needs

Throughout the cases the design group became aware that the basic need of transport is to get directly to the final destination when needed.

The basic need was further specified through the three user cases. The needs were generalized and categorized according to Maslow's hierarchy of needs. (ill. 1.3.3) Hereby it was possible to choose levels to focus on based on the parallel process of defining the target group.

The cases base the foundation for creating personas that fit into the target group.



ill. 1.3.3. Diagram of the needs of the elderly in relation to Maslows hierarchy of needs.

Maslow's hierarchy of needs

Motive theory, concerning that motivation is the psychological foundation for human acts, is the foundation for Maslow's work.

Maslow's hierarchy of needs is based on principles and assumptions. The assumed needs are based on analysis of human beings, dealing with conscious and unconscious motives for acts. The principles for arranging the needs concerns structuring according to categories of importance and a hierarchic structure where the bottom level of needs must be met before the upper level can be satisfied.

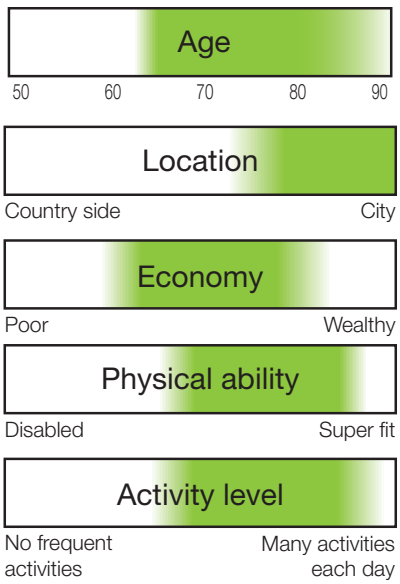
[Jerlang, 1999]

Target group

By looking at the results of the cultural analysis and initial analysis, the characteristics of the target group are defined.

The design team becomes aware of the type of users that seems relevant to work with in terms of their activities, their answers and their familiarity with technology. With inspiration in the participants of the cultural probe the target group is defined by following parameters:

This definition of the target group is not very explicit, but through the parameters, the target needs of the target group are defined.



ill. 1.4.1. Frame of the target group according to age, location, physical ability, economy and activity level.

Personas

Based on the results from the cultural probe, 3 different characters were generated to illustrate the span of the target group.

Katrine Mortensen

Job: Secondhand shop assistant

Civil status: Single

Birthe lives alone in an apartment in the city. Her income is the public pension.

She enjoys a game of bridge in the bridge club with her friends or taking an occasional walks to feel healthy. She still has her driver license although she has sold the car.

She is not fond of technological devices as mobile phones and computers.

Vagn Eriksen

Job: Retired (bank assistant)

Civil status: Widower

Vagn lives alone in his apartment outside the city. His income is his personal savings and pension.

He frequently visits his children, grandchildren and friends or texts them a SMS. He has a car but prefers to ride the bike. He never uses the bus because he has his bike and the car. He enjoys relaxing by reading the newspaper or playing a game of solitaire at the computer.

Jens Vestergaard

Job: Retired (butcher)

Civil status: Married

Jens lives with his wife in a house in the suburbs. Their income is the public pension. His passion is hunting and is a Member of Aalborg's Hunting Brotherhood. He likes their webpage where he buys his hunting cloth and search for hunting information. He usually do the shopping but avoids the city centre because he dislike crowded places and often has difficulties by getting a parking spot.

Personas

Personas are fictive characters that aids the design team in understanding of the target group. By using the personas for scenarios in a realistic context it puts a human face on abstract user data. By thinking about the needs of a fictional persona, the design team may be able to relate to what a "real" person might need.

Personas are used in developing the system by evaluating according to the personas point of view.

Transport

The chapter describes how the subject of "transport" is mapped to create an overview of the current state of traffic in Aalborg.

Aalborg as a case

In the project, Aalborg and its environs are used as a case. This context is chosen because of the size of the city. Aalborg is the fourth largest city in Denmark and has 100.731 inhabitants and the range of transport services available cover most of the possible means of transportation in Denmark.

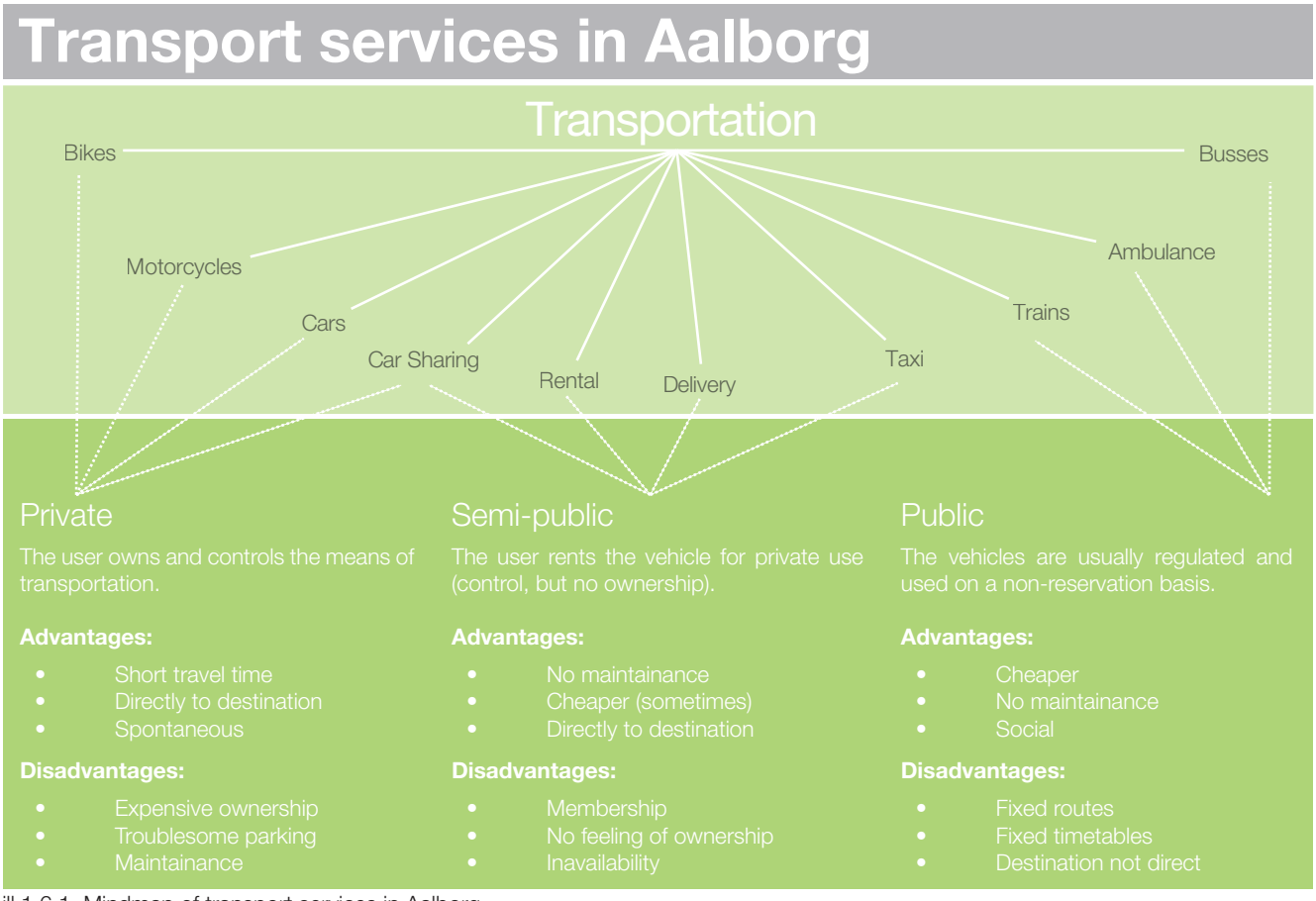
Furthermore, the location also offers the design team an opportunity to explore the services first hand.

[Danmarks Statistik, 2007]

Mapping the transport of Aalborg

The mapping is done by creating an initial mindmap of different kinds of transportation. The subjects listed in the mindmap are categorized and each category is filtered to keep the services offered in Aalborg. The process results in dividing the types of transport into public, semi public and private transport and the positive and negative aspects of the types of transportation are specified. This is done from the elderly point of view, to get an understanding of their current situations, possibilities and environment.

(ill. 1.6.1)



ill.1.6.1. Mindmap of transport services in Aalborg.

Current state of traffic in Aalborg

Recently, a lot of issues concerning the traffic in Aalborg are exposed in the media. (ill.1.6.3).

The main concern is the big amount of cars in the city, which causes queues, traffic jam during rush hours and takes up all the parking bays in the inner city. This is because the infrastructure is not suitable for this amount of private cars.

But the situation also affects public transport, where busses tend to get stuck in queues which make them a less attractive alternative to the private car.

According to a recent survey the bus is one of the slowest options compared to scooter, cars and bikes when navigating through the traffic. The only slower option is walking.

[Termansen, 2007]

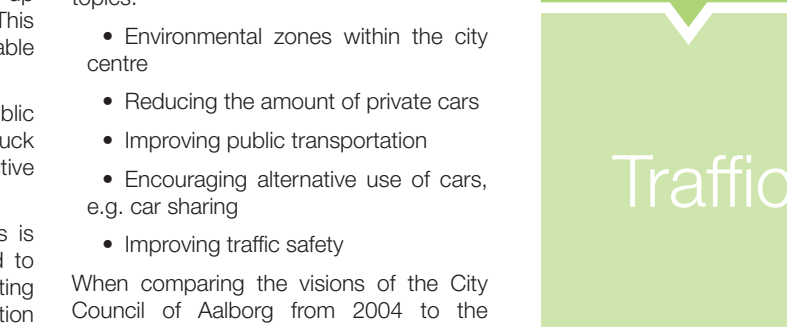
The municipality

During the last 10 years Aalborg has participated in several European projects to become a more sustainable city. In 2004 the City Council of Aalborg presented a Planning and Sustainability Strategy that outlined a vision for sustainable mobility in Aalborg. The vision concerns the following topics:

- Environmental zones within the city centre
- Reducing the amount of private cars
- Improving public transportation
- Encouraging alternative use of cars, e.g. car sharing
- Improving traffic safety

When comparing the visions of the City Council of Aalborg from 2004 to the current state of traffic in 2007, it seems that Aalborg is still relevant case, where further action must be taken before the visions can be reached. (ill.1.6.2).

[Fischer, 2004]



ill.1.6.2. Impact of society and municipality.

ill.1.6.3. Article of survey from Nordjyske Stiftstidende.

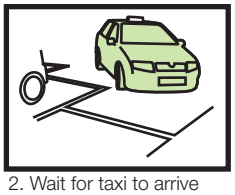
ill.1.6.4. Traffic in the center of Aalborg.

Existing systems

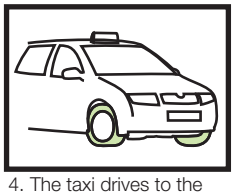
To get an understanding of existing transport systems, three major services were analyzed with step-by-step user cases. This was done to map both positive aspects and shortcomings from the elderly point of view.

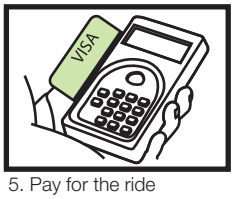
Taxicab


1. Call a taxi

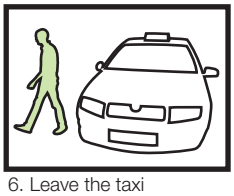

2. Wait for taxi to arrive


3. Describe destination


4. The taxi drives to the destination



5. Pay for the ride


6. Leave the taxi

"Taking a taxi"

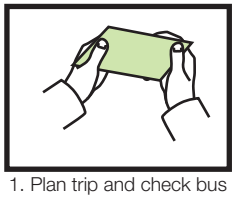
Positive:

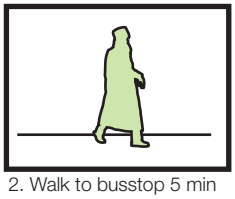
- Easy ordering
- Arrives at the user
- Hired driver
- Comfortable seating
- No planning

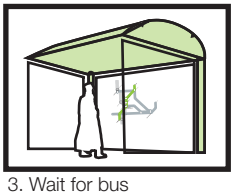
Shortcomings:

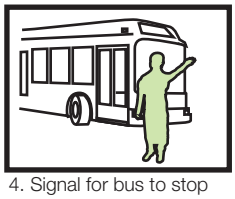
- Expensive
- Unknown price

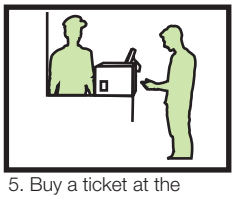
Public bus

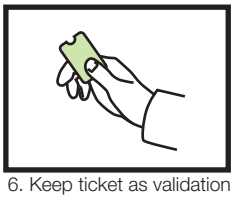

1. Plan trip and check bus departure

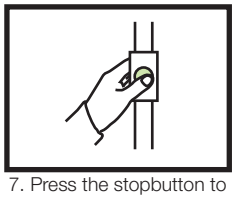

2. Walk to busstop 5 min ahead of departure


3. Wait for bus


4. Signal for bus to stop


5. Buy a ticket at the busdriver


6. Keep ticket as validation for purchase


7. Press the stopbutton to get off at next stop


8. Step out once the bus has stopped

"Taking a bus"

Positive:

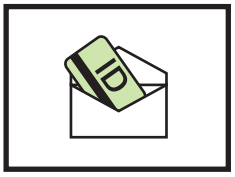
- Cheap
- Fixed price
- Easy payment

Shortcomings:

- Planning
- Distance to bus stop
- Waiting time
- Little personal service
- Requires attention to get on the bus and during the ride

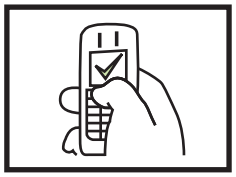
Carsharing

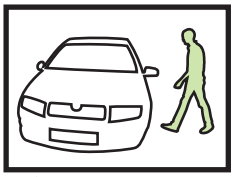
1. Sign up for membership on the homepage

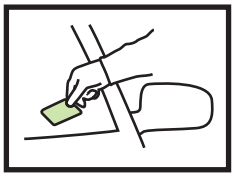


2. Wait for membershipcard


3. Book a car on the homepage

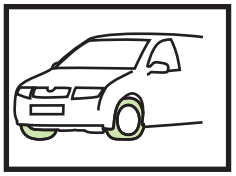

4. Wait for confirmation

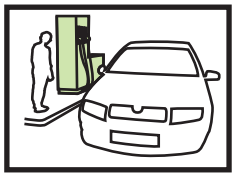

5. Go to the car

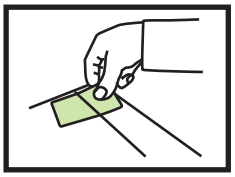

6. Unlock the car using a membership card

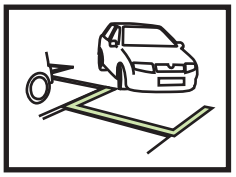

7. Unlock the key using a personal code


8. Start the car..

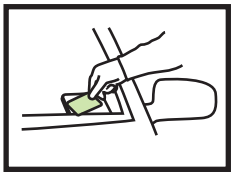

9. ...and head for the destination

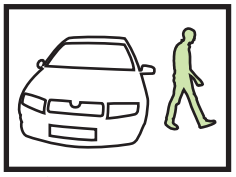

10. Refuel the car in a Shell gasstation..


11. .. and use the free gascard to pay


12. Return the car to the reserved parkinglot


13. Lock the key back in the glove compartment


14. Lock the car using the membership card


15. Go home

“Using car sharing”

Positive:

- Proof of membership
- Easy unlocking
- Control of vehicle
- Easy payment of gas

Shortcomings:

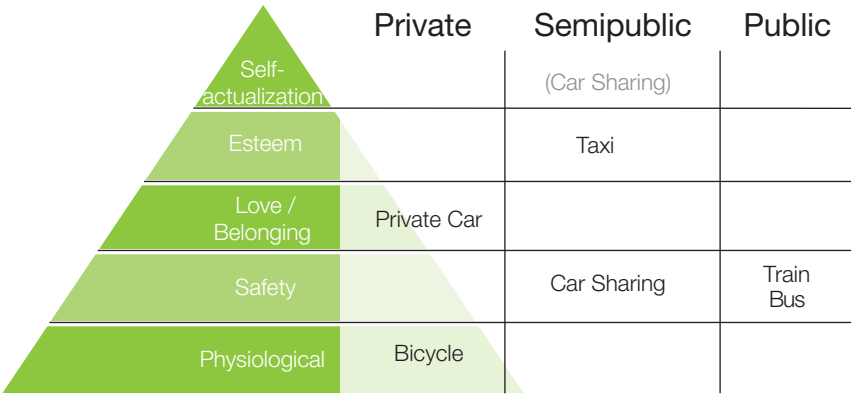
- Troublesome signing up
- Troublesome booking
- Validation before using
- Cars are not always available
- Transport to/from car sharing spots

Benchmarking

The various systems appeal to elderly in different ways, however the needs and economy are often critical factors, so the services will be compared in these aspects.

Need

In order to see how the services relate to the need, they have been arranged according to the Maslow's hierarchy of needs model. The model shows the levels and needs the services fulfil, but also an organising of the different services. (ill. 1.8.1) Car sharing has been placed in both the top and safety level of the model, since it to some users is a way to achieve a greener lifestyle, while others see it as a cheaper way of having a car.



ill.1.8.1. Transport services organized according to Maslows Heirachy of needs.

Economy

Since the prices of the private vehicles vary depending on the type and usage, they are hard to compare to the other services. So in order to do this benchmarking, a case has been constructed based on a persona where a vehicle has been specified and a cost pr. km is estimated.

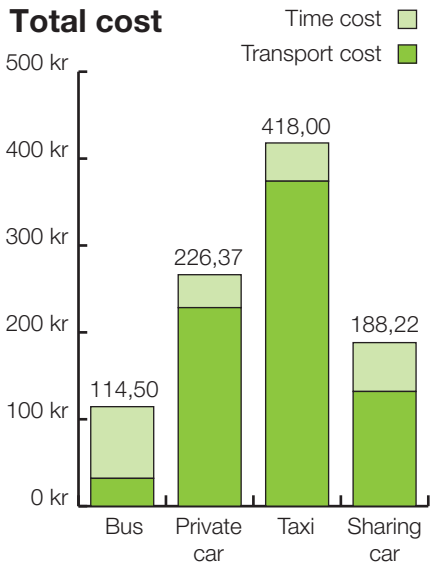
The persona used will be Jens and the case is a shopping trip to Bilka in City Syd and return to the home. He is living at Erantisvej in Nørresundby so the trip is around 24 km.

The available means of transportation are a private car, the public bus, a sharing car or a taxi. The bicycle is left out, since Jens has to buy a lot of groceries and it is raining. (ill.1.8.2)

Since Jens' public pension is 59.424 kr pr. year, his hourly rate is calculated to 36,67 kr when translating the income to a basic work. The time of travel is calculated, based on the results of a similar benchmark of the traffic in Aalborg (Appendix 7).

When looking at the results, it is interesting to observe how the price added by the time cost is influencing the total cost of the bus. However, it is important to keep in mind that the time aspect may not be as important a parameter to the elderly, as it would be to a businessman.

Other aspects such as walking distance to bus shelter or sharing car pickup-spot may also be influencing the convenience of the service, but has been left out due to the difficult of comparison.



Benchmarking				Time Cost		Transport Cost			Total Cost
Transportation mean	Planning time	Travel time	Total time	Hourly rate	Time cost	Unit price	Distance	Transport cost	**Transport + Time**
Bus	20 min	115 min	135 min	36,67 kr.	82,50 kr	16 kr/ticket	24 km	32 kr	**114,50 kr**
Car	0 min	62 min	62 min	36,67 kr.	37,89 kr	9,52 kr/km	24 km	228,48 kr	**226,37 kr**
Taxi	10 min	62 min	72 min	36,67 kr.	44,00 kr	187kr (12 km)	24 km	374 kr	**418,00 kr**
Car Sharing	30 min	62 min	92 min	36,67 kr.	56,22 kr	5,50 kr/km	24 km	132 kr	**188,22 kr**

ill.1.8.2. The price of taking different transprot means.

Problem area

This chapter sums up the important issues from the initial research and frames the problem area that is further investigated.

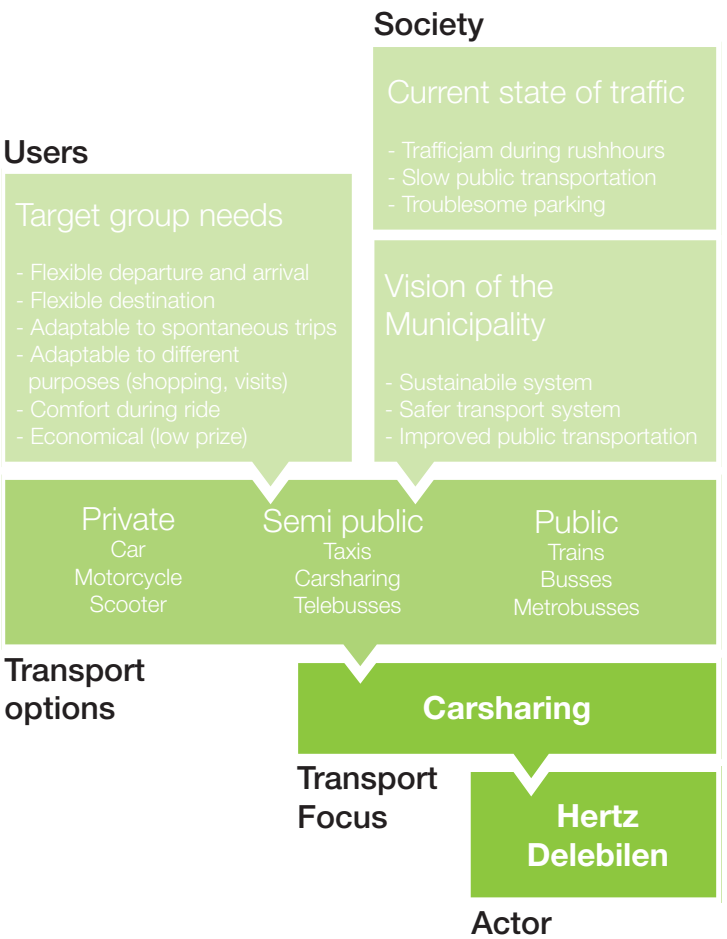
Various topics have been examined. Using interviews and cultural probes, it is found that the target group has specific needs relating to transportation. The service has to be cheap but at the same time more dynamic than what is currently offered by public transportation.

It has also become clear that many of the problems concerning traffic in Aalborg is related to the amount of private cars in the city. The problem can be addressed in various ways, either by altering the infrastructure of Aalborg or creating traffic regulations, but since this project is related to service systems it seems more interesting to address some of the traffic services offered in the city.

The city council of Aalborg has made a strategy that heads towards a safer, more effective and sustainable traffic system, by improving public transport, reducing the amount of private cars and supporting alternative use of cars.

Car sharing seems like an answer to most of these problems and occurs as a potential service for the elderly that have a need of a car, but the car sharing service is currently not used by the elderly. It is an interesting case to examine how cars haring can be made accessible and attractive to the elderly.

The problem area therefore covers an investigation of the car sharing company Hertz Delebilen, which is the only provider of the service in Aalborg.



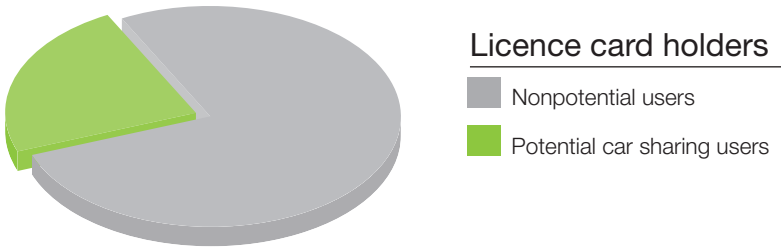
ill. 1.9.1. Diagram illustrating the impacts on transportation and the framing of the problemarea .

Hertz Delebilen

This chapter is a brief introduction to the structure of Hertz Delebilen, the service that is offered to the users and containing main barriers of this service.

Hertz is an American car and equipment rental company. Their Danish car sharing department was established in 1998, in the 15 major cities of Denmark. Car sharing is a relatively new term on the Danish transportation scene. 23% of the Danish driving license holders are potential car sharing-members. (ill.1.10.1) In cities containing at least 20.000 citizens, 17% of the questioned have expressed interest for car sharing.

[Miljøstyrelsen, 2000]



ill.1.10.1. A diagram illustrating the potential car sharing users.

Company structure

The company structure of Hertz Delebilen is a network of different actors, where the user has responsibility for some parts of the service (e.g. cleaning and fueling).

As it is shown in the illustration 1.10.4, the actions have been completely outsourced to the users, so are in direct contact with some of the third party service providers.

The main functions of Hertz Delebilen are to provide and check the cars, support the users and to make sure that the booking system is working.

However, since the actors the user involves are paid by Hertz Delebilen, there is a simple money flow throughout the system, where Hertz Delebilen is mainly distributing the money from the user to the internal and external actors of the system. (ill. 1.10.3)

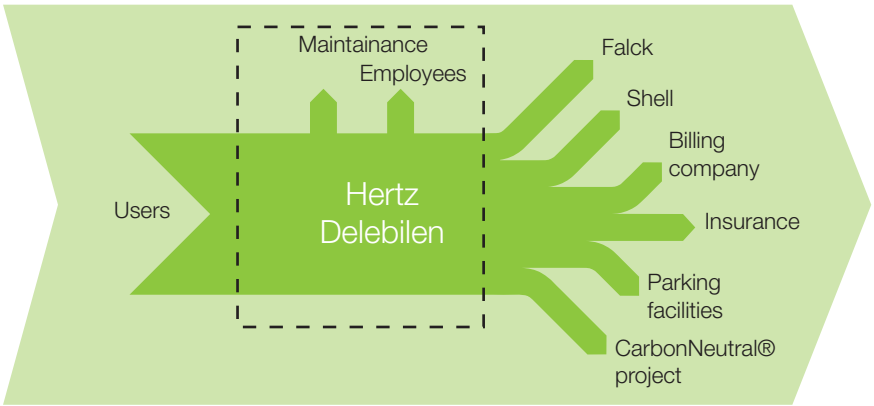
[Hertz Delebilen, 2007]

Features of Hertz Delebilen

Hertz Delebilen can offer their users various benefits such as:

- Two different memberships to offer the users, depending on how much they use the cars.
- A variety of cars to fit the needs of the users, spanning from vans to cabriolets.
- Online booking facility, so the users can plan their trips.
- Reserved parking spaces.
- Service truck that frequently checks the cars, so they are clean and ready to go.
- Gas card in every car, so the users can tank and the bill goes directly to Hertz Delebilen.
- Falck membership included that assists the users if the cars suddenly stops functioning.
- Support by telephone, if the users have any questions or need assistance.

ill.1.10.2. The features at Hertz Delebilen that is included in the membership of Hertz Delebilen.

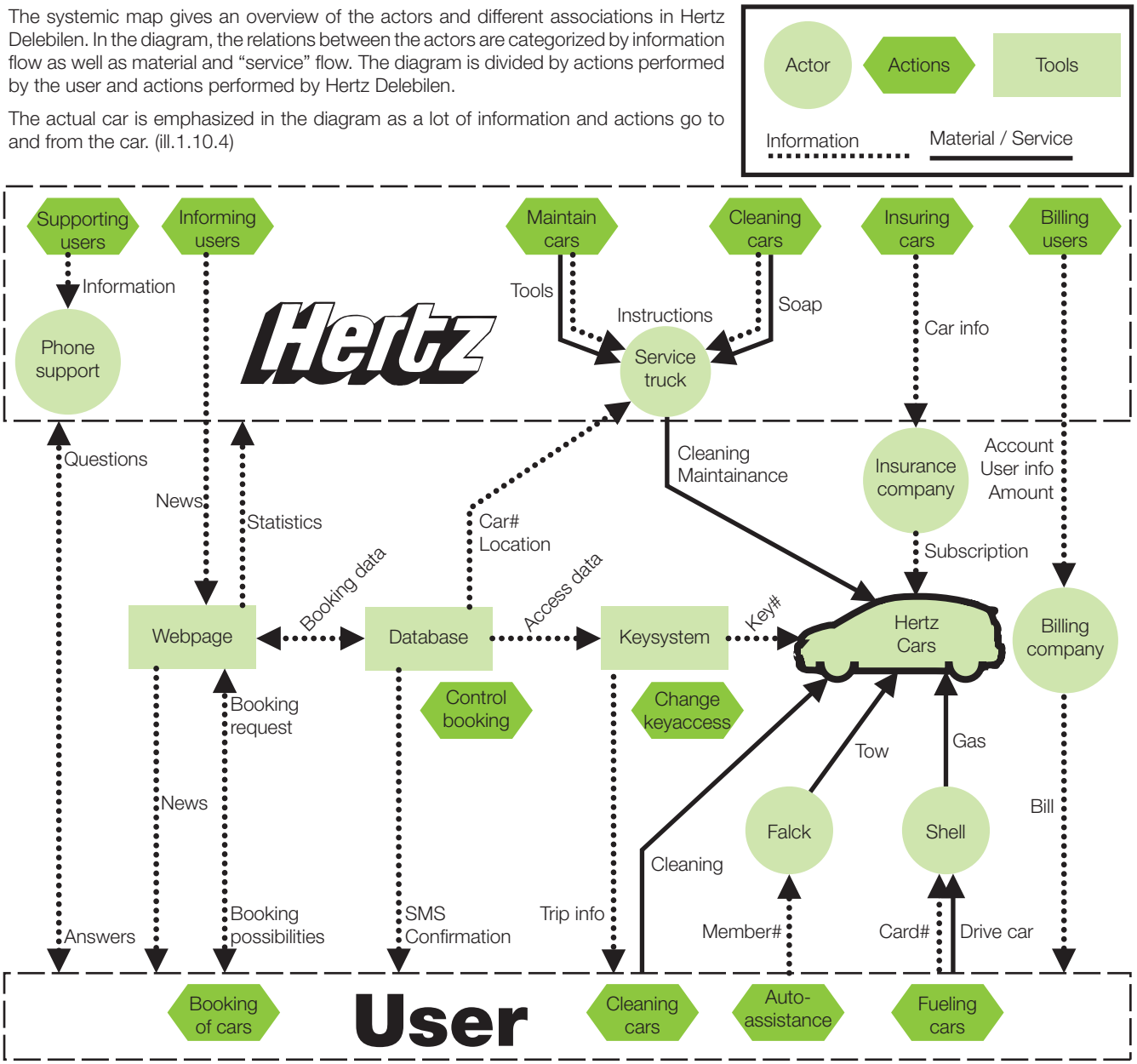


ill.1.10.3. The moneyflow of Hertz Delebilen.

Actor relation map

The systemic map gives an overview of the actors and different associations in Hertz Delebilen. In the diagram, the relations between the actors are categorized by information flow as well as material and “service” flow. The diagram is divided by actions performed by the user and actions performed by Hertz Delebilen.

The actual car is emphasized in the diagram as a lot of information and actions go to and from the car. (ill.1.10.4)



ill.1.10.4. A map of relations between actors, actions and tools in Hertz Delebilen.

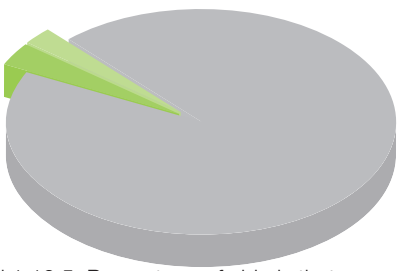
Elderly use of Hertz Delebilen

Since the service is most exposed through their homepage, it is assumed that many elderly are not aware of this option. Furthermore, the procedure of signing up and booking cars takes place on the webpage.

So in order to compensate for this, Hertz Delebilen has made the service available through a telephone booking service that is open 24 hours a day.

They see this as the main area where the service has been adjusted to the needs of the elderly.

However, when questioning the way that elderly book their cars, it is told that they are used to always doing this in advance. (Appendix 4). This means that other things might keep them from using this service. (ill.1.10.5)



Age	No. of people
18-59 years	236
60-64 years	8
65+ years	6
TOTAL	250

ill.1.10.5. Percentage of elderly that are members of Hertz Delebilen.

How many subscribers do you have in Aalborg at the moment?

"Just about 250... Which is not near enough or let me put it this way, not near the goal that we've set to have the system running properly"
(2007, H.P. Henriksen)

Competitors

There are no other car sharing companies in Aalborg besides the Hertz Delebilen at the present moment. This means that the only competitors in this area are the private car sharing clubs, where a couple of people agree on sharing a car. These clubs can apply for grants at the municipality and offer competitive prices but finding private car sharing clubs or establishing a club with nearby neighbors is a lot of work. In these clubs the maintenance and checkups is also something the users have to do themselves and the variety if cars available are often very limited.

Barriers of Hertz Delebilen

Compared to the amount of potential car sharing users, Hertz Delebilen does not have a lot of users. Because of the limited amount of active users, car sharing is currently not a good business. This is caused by barriers not only to elderly but also in general.

The barriers of car sharing can be categorized according to three major themes; infrastructural, economical and psychological. (ill.1.10.6)

The infrastructural barrier is primarily concerning the parking facilities and public transportation system. For car sharing to be attractive to the users, parking facilities have to be placed corresponding to the user needs, both according to destinations and homes of the users.

According to Hertz Delebilen, it can be solved if the system had more users, so they will be able to put more cars in the streets.

The economical barrier is according to the costs of car sharing versus private cars. It is essential that insurance, repairs and other expenses of the private car is also considered. Otherwise car sharing does not seem like an economical benefit. During a telephone interview with H.P. Henriksen, Hertz Delebilen Director of Operation, it is stated that the users of the carsharing is not getting a big economical benefit from it.

The psychological barriers also play a major role. Of the people interviewed in the report of Miljøstyrelsen, it is an important aspect whether interviewed owned a private car. 35% of the interviewed is attached to their car, while 12% are dependent on their car. It shows that the users have a need according to independence and flexibility. There is a need they do not think can be fulfilled by a car sharing service.

Furthermore only a small amount of the citizens in Aalborg are aware of car sharing services. [Miljøstyrelsen, 2000]

General barriers of car sharing

Infrastructural:

- Long distance to the nearest sharing car pickup-spot
- Slow and unattractive public transportation system, to cover the inbetween transport

Economical:

- Car drivers tend to compare only marginal costs
- It is only benefitial when driving less than 15.000 km pr. year
- It can be expensive to get rid of a private car

Psychological:

- It is often considered unhygienic to share with strangers.
- People feel attached / dependent to their cars

ill.1.10.6

Testing Hertz Delebilen

In order to get a first hand experience of the touch points the users are introduced to, a test session of the service was arranged (Appendix 5).

Signing up / Booking

First the design team signs up using a standard formula on the Delebilen webpage. A booking card and user-number is then received by mail. The pincode is send by e-mail.

In order to book the car the homepage is used again.

ill.1.11.1.

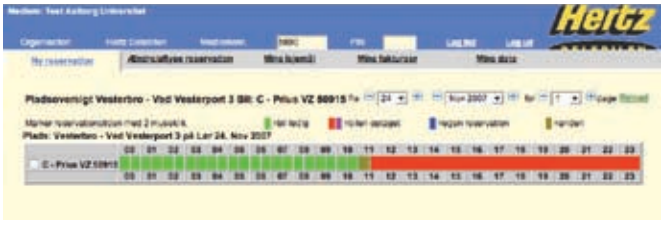
After logging in, the layout of the homepage changes significantly. The first screen is containing news about a new car in the Copenhagen department of Delebilen.

ill.1.11.2.

A reservation is started and 4 different empty schemes have to be filled in on the same page with a rather high complexity. The design team tries to find a nearby car by browsing the addresses.

ill.1.11.3.

A car at “Kennedyarkaden” that is parked at ”2nd parking floor, by the ramp”. It is only possible to reserve it for a limited period because of an existing booking.



ill.1.11.4.

Using the car

The design team then arrives at Kennedy Arkaden, and looks for the car but there is 3 ramps on the floor and the car does not have any obvious indication.

ill.1.11.5.

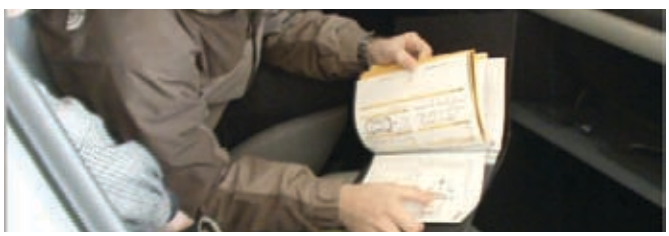
After 5 minutes a Hertz car is located but it cannot be opened since it is the wrong car. Another Hertz car is then located near the ramp, and easily unlocked using the membership-card.

ill.1.11.6.

The lock system in the glove compartment is very confusing, but after some time it is managed to unlock the key and start the car.

ill.1.11.7.

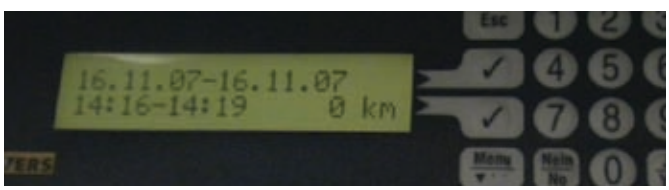
There is an overwhelming amount information to process, especially all the safety precautions are included. There is also a folder with papers to fill out if the user in some way is displeased with the service or damages the car.



ill.1.11.8.

After browsing the files and folders in the glove compartment, the car is locked using the system in the glove compartment. After doing this, the system displays the usage in terms of duration and miles.

The car is then locked using the membership card.



ill.1.11.9.

Choice of subject

The chapter is a brief description of the three system concepts that are considered and the final choice.

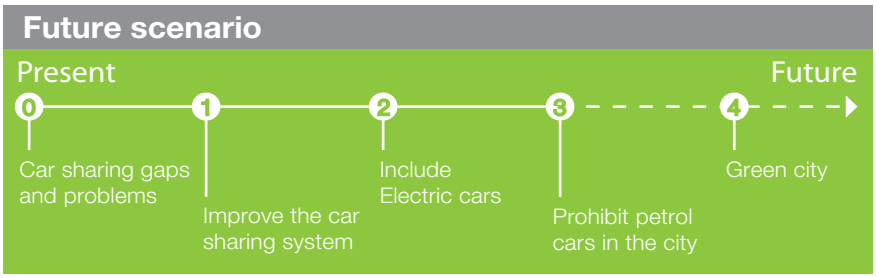
Approach

The approach to the concepts is to create a scenario of a future city with alternative transport systems and no private cars. (ill.1.12.1) Inspiration to the scenario is taken in futuristic projects that deal with the topic as the MIT city car and the ULTra Personal Rapid Transit System.

(Appendix 6)

Future scenario

To be environmental and sustainable are themes that concern most cities. In a future transportation scenario based on the principles of being environmental a possibility is that there are no cars that use conventional fuels. A relevant option is that electrical automated vehicles are the main means of public personal transportation. The scenario is based on the concept ULTra Rapid Transit System that is going to be build in London.



ill. 1.12.1.A timeline showing possible steps towards an environmental city.

Timeline

To relate to the scenario of a future city, the design team creates a timeline of steps for how to implement a similar transport system in Aalborg. Based on the steps of the timeline, concepts for how to achieve the vision is generated.

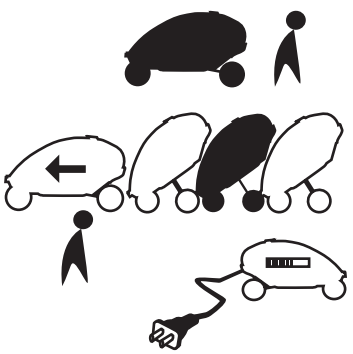
Conclusion

The final choice is to focus at the Concept 2 because it is the first step towards the vision of a green city. By working with the present problems of car sharing, the design team can also examine the problems by questioning the actual target group.

Concept 1 - Booking device

Concept 1 concerns the early steps towards an environmental city. To make car sharing accessible and attractive to the users, the concept is to create a portable device that can be used to book the vehicles.

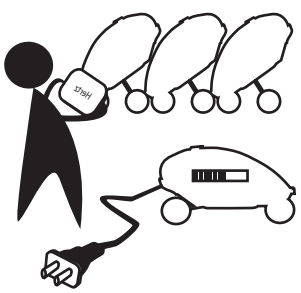
Focus - Step 1



Concept 2 -City Car

Concept 2 relies on the need for an attractive and environmental system. The concept is to design a personal public transport mean - an electrical vehicle for a flexible transport system.

Focus - Step 2



Concept 3 - A holistic system

Concept 3 is a combination of the first and second concept while also taking the other steps into account and trying to distinguish the problems and opportunities. The focus is to make a service for how to book the futuristic city cars.

Focus – Step 4

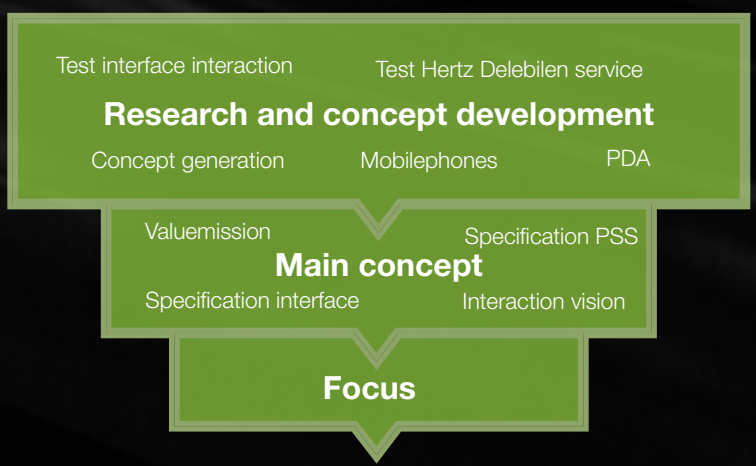
Problem statement

It is found that various procedures of the Hertz Delebilen, such as signing up and booking, is a complicated procedure. The following problem is stated for the project:

How can “Hertz Delebilen” become accessible and attractive to elderly?


rfirmaet
SEN %

Strategy and development



(23/10 – 12/11)

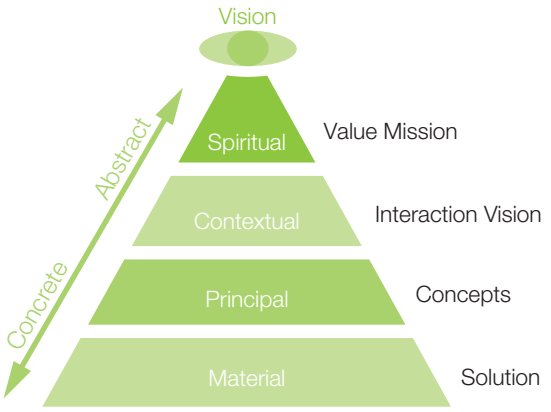
By stating the problem, more specific research of car sharing is performed. Results from the cultural probe are used to generate the value mission and the interaction vision to outline the desired experience, the target group shall perceive through the service. The criteria for the product service system is specified and explored through concept proposals.

Further a test of interaction prototypes is made at an activity centre in Aalborg.

Through the further research and tests the relevant focus of a final concept for the product service system and the product is specified.

The Value and Vision-based workshop

This chapter is a documentation of the work done during the workshop.



ill. 2.1.1. [Lerdahl, 2001]

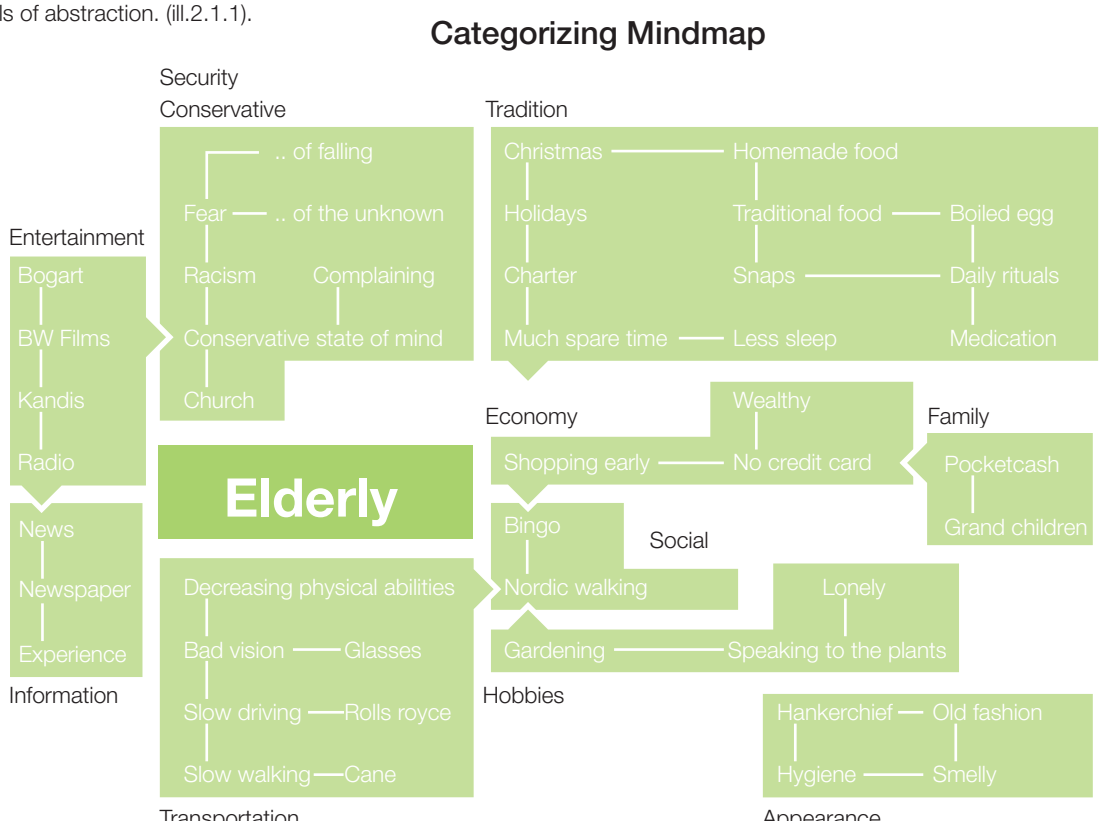
The goal of this workshop is for the design team to create a shared vision for the project, by establishing a value mission and create initial product concepts to form an interaction vision relating to the elderly.

The stages of the workshop are relating to Lerdahl's pyramid model, and by switching between the abstract and the concrete part, the final outcome should be a guiding philosophy and potential ideas, with a consistency between the content at different levels of abstraction. (ill.2.1.1).

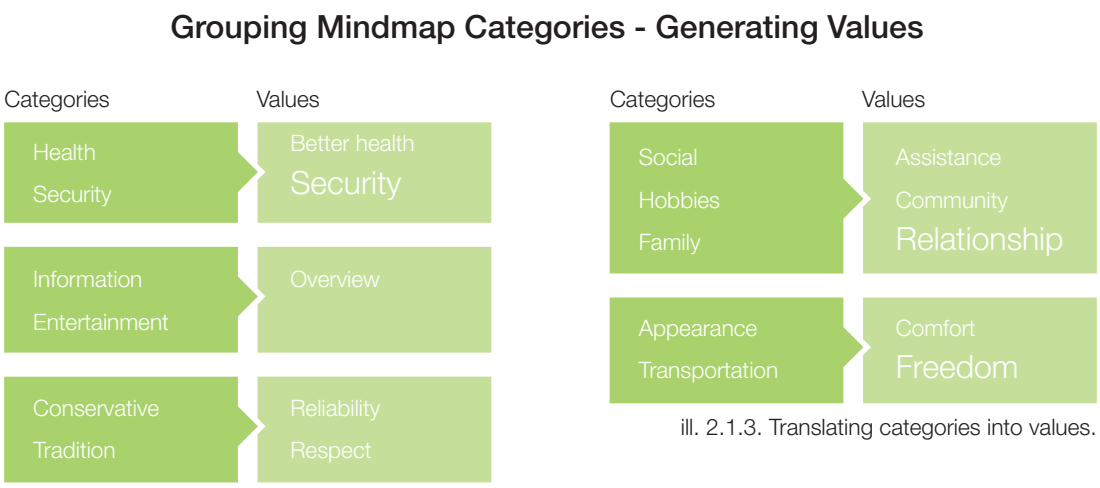
The first part of the workshop works within the top level of abstraction, to create the value mission. The value mission is used to clarify the intention and values which the service should offer the elderly users.

The second part of the workshop is concerning the interaction vision, which is the imagined and desired interaction between the user and the product. It is based in the lower levels of abstraction, dealing with ideas of interaction from sketches and scenarios to deriving metaphors, keywords, images and principles.

The final part of the workshop is a revision of the content, where the interaction vision is used to decide the most useable principles that fulfill the intended values, and creates a coherency between the different layers of abstraction.



ill. 2.1.2. Mindmap of elderly related subjects



ill. 2.1.3. Translating categories into values.

Value Mission

The objective of the first part of the workshop is to determine the value mission. The goal is 3 key values that describe the project main values based on the needs and characteristics of the target group.

This process is started by creating a mind map of subjects relating to elderly, to get a common sense of their characteristics. (ill.2.1.3)

The characteristics are organized in groups to get an overview of the different sections of the mind map. Some of the groups are combined if they are overlapping or closely related. The groups are then used to extract the key values from.

Once the values are generated, the team decides upon three values to work with. The values are selected with regards to the target group and areas of interest to the design team.

To get a common understanding of the values, a series of metaphors are made to further specify the values. The best metaphors of each of the values are described with a single keyword, and if the new keyword seems better it is substituted the original value. E.g. Trust is found to be more precise than Security. (ill.2.1.4).

ill. 2.1.4. Describing values

Interaction Vision

The second part of the workshop is concerning the interaction vision. This process starts in the bottom part of the pyramid by sketching concepts for the service (Brain pool writing). This is a basic exercise to empty the minds and explain ideas instead of keep thinking of them. (ill.2.1.5). After this there is a “what if”-exercise at a higher level of abstraction by creating solutions to different abstract scenarios e.g. “what if you never stopped growing”.

The next exercise is to select the best concepts and assign keywords. The keywords should express how the concepts relate to the user. (ill.2.1.6). The keywords are then categorized and sorted into groups, and the 3 keywords that seemed to describe the most appropriate interaction according to elderly is chosen. In doing this categorization into groups and considering the different keywords, the design team gets a common understanding of how the interaction should be.

To give an understanding of how these words should be interpreted, they are described using both a picture and a metaphor. This describes the Interaction Vision of the service. (ill.2.1.7)

Updating the interaction vision

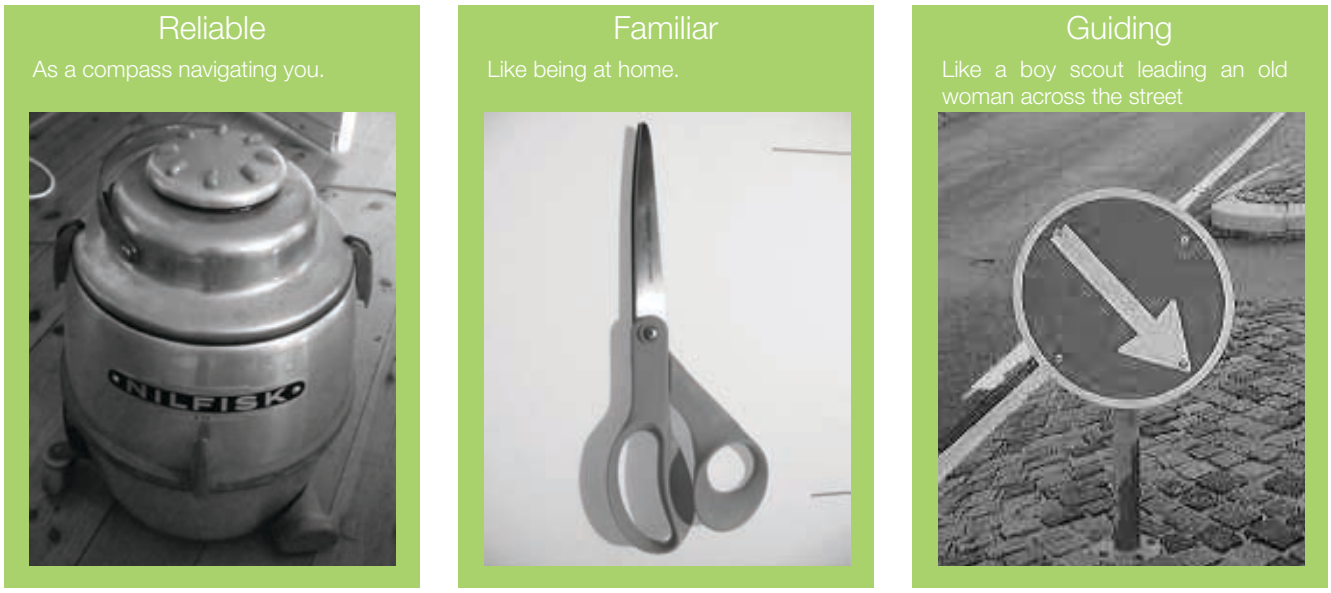
Throughout the project the value and interaction vision is to be discussed at several points. If the service does not work in accordance to the value and interaction vision the service or the visions are subject to change. An example of this is the “guidance” aspect of the interaction vision, which through workshops and further research was experienced a suitable replacement for “flexibility”.

Selecting Concepts

ill. 2.1.5 Piles of selected and discarded concepts.

Categorizing Interaction Keywords

ill. 2.1.6 Catagorizing the interaction keywords.



ill. 2.1.7. Interaction vision described through pictures and metaphors.

Checking for coherence

The words are then inspected according to the value mission, in order to assure coherence between the two top levels. If they are too different, the interaction vision or the value mission must be revised. In our situation there is a clear connection between the top levels of the pyramid model.

Extracting Principles

The 3 keywords are then used to investigate the concepts from the brain pool writing. The concepts that matches the intended interaction vision are investigated for rules for elements, structures and functions that makes it act in accordance with the interaction vision thereby creating a toolbox of principles that can be integrated into future parts of the service and touch points. An example of this is a "virtual person" guiding the user through the process, which we find expressing the "familiar" and "guiding" aspects of the interaction vision.

"Expressing" the values and interaction

At a follow-up meeting for the workshop a scenario play is performed (see video at the appendix CD) to try to express the interaction vision non-verbally through gesticulation and body language.

The value mission is expressed through a single sentence to achieve further definition.

The parents dropped off their children, at the grandparents. (Trust, Relationship, Freedom)

The interaction vision is also expressed through a single sentence.

A boy had a hard time tying his shoelaces, so his mother showed him how. (Reliable, Familiar, Guiding)

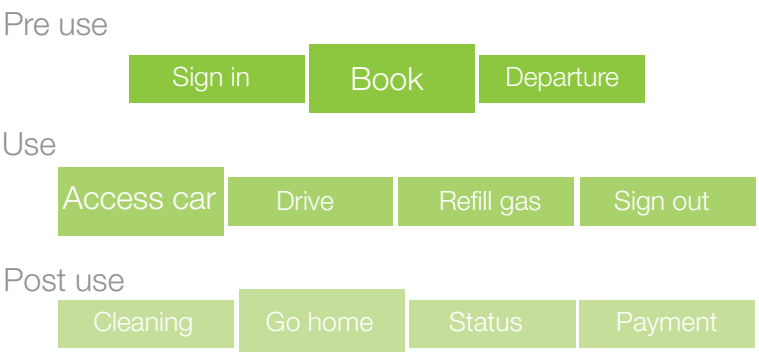
Reflecting upon the workshop

Throughout the rest of the project the value mission and interaction vision was evaluated and used in evaluating different proposals which ultimately aids in defining coherence in all aspects of the project.

Through workshops with elderly, different aspects of interaction problems were experienced, which again put the interaction into a new perspective. This was in particular relevant with regards to technology and interfaces.

Critical points

Knowing the critical points of interaction leads to aspects that have to be taken in consideration when deciding the criterias for the product service system.



ill.2.2.1. The overview of usecases catagorised into pre-use, use and post-use from the user point of view.

The illustration 2.2.1. describes the overview of use cases from the user point of view. The following describtions are based on the interactions between the user and the service system in terms of actors and elements.

Use case overview

In order to get an overview of the pre use phase, it is divided into the following steps:

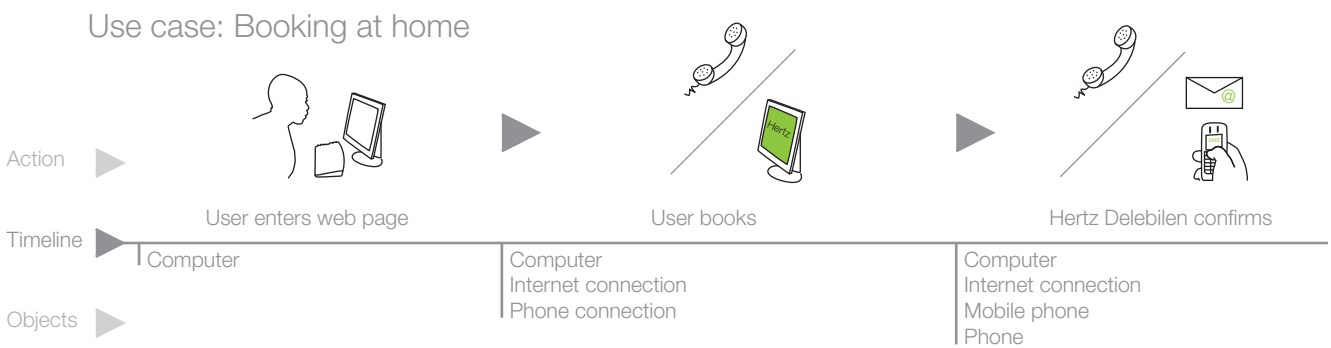
- Sign up for the service
- Book the car
- Get to the parking spot

To identify the critical points of the interaction between the user and Hertz Delebilen in each of the steps of the current service the steps are viewed from the personas point of view.Through testing of the Hertz Delebilen service as a first time user the design team has an insight in the interaction between user and service system, which makes it possible to evaluate the service. The case of getting to and from home from the sharing car is experienced as an important case because of the fact that the user often relies on the public transport.

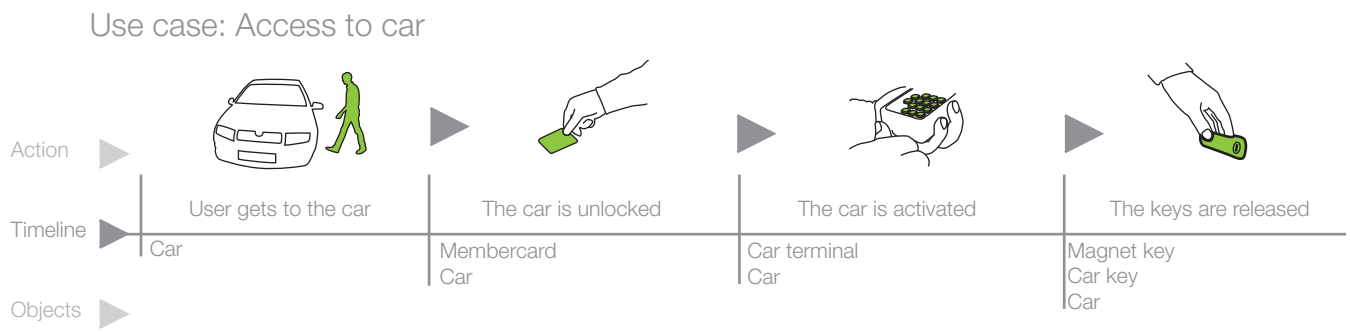
Interaction

The interaction between the user and Hertz Delebilen in the pre use phase is primarily communication through web pages, mail and SMS. The problems in the phase of booking according to the elderly user are that the booking service rely on computer and internet. (ill. 2.2.2).

The use of the internet can be a problem for the elderly because they are not familiar with the computer and the internet and the current webpage interface is complex for the elderly none experienced user.



ill.2.2.2 . The use case of booking from the user point of view and the service system point of view.



ill.2.2.3. The usecase of accessing the car from the user point of view and the system point of view.

When the user is accessing the car he interacts with four objects just to enter the car and get it started. The user has to do several more actions to enter the sharing car than a regular car which can be a complex procedure for the elderly user. (ill.2.2.3).

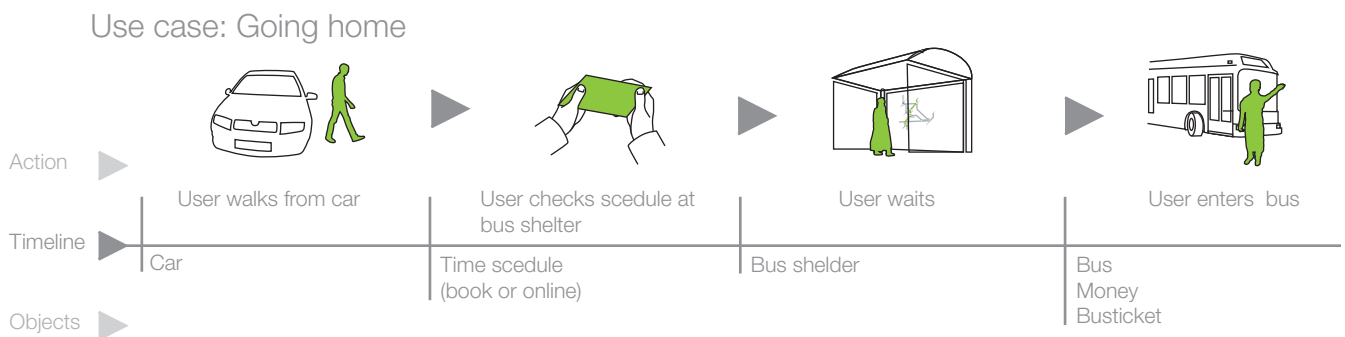
When the user has to go home, the user relies on public transport and fixed departures. Besides the waiting time the schedules have to be checked and the nearest bus shelter has to be located. If the user is not familiar with the locations the trip to and from the sharing car easely can turn to a negative experience. (ill.2.2.3).

The problems are found to be:

- Signing up and booking is mainly available through internet (a computer is needed).
- The dependence of the user of public transportation to get to the car.
- The procedure of locating the car.
- The amount of steps that has to be preformed to be able to start the car.

The critical points reveal aspects of the service that has to be considered to improve the user experience of Hertz Delebilen.

- The procedure of booking has to be accessable to the the elderly user with no experience in using a computer and the internet.
- The procedure of unlocking and activating the sharing car has to relate to the simplicity of entering and starting a private car.
- The procedure of getting to and from home from the sharing car has to be simple and with a minimum of waiting time.



ill.2.2.4. The usecase of going home after using the sharing car from the user point of view and the system point of view.

Specifications

Based on the needs of the elderly a set of criteria for the product service system is listed.

The specifications for the product service system are derived from analysis of Hertz Delebilen, of the culture of elderly, the value mission and interaction vision.

The specifications refer to the experience of the user of the car sharing service. They are listed as must be, performance and excitement factors according to the model of Kano. (il. xx) The must factors are the basal factors that must be fullfilled,when using the service. Depending on how well the performance factors are fullfilled these performance factors increases the experience of the service. The excitement factors does that as well but are market positioning factors that are especially interesting.

The specifications are used throughout the project for evaluating concepts so that the final concept refers to the needs of target group.

[Kano 1984]

Interests

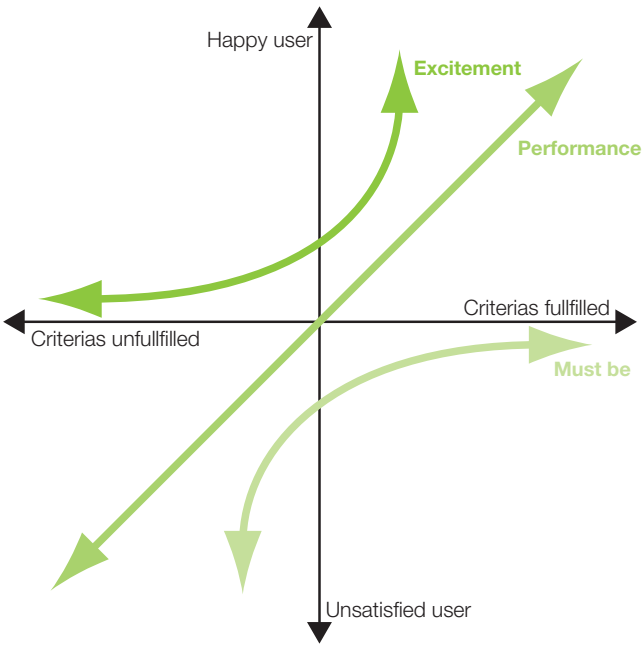
Besides the user point of view there are also requests regarding Hertz Delebilen point of view that has to be taken into consideration. The interests of Hertz Delebilen in the product service system are mainly to provide a good customer service and make a profitable business.

- The user has to sign up and pay for the service.
- The user has to be registered.
- The user has to have a mean of entering the car and the service. (ex. A card, a code).
- The booking service has to be suitable to the existing booking system.
- The booking system has to be adaptable to the system that activates and lock the cars.

Further the municipality can have interests in the booking service in terms of promoting public transportation to decrease the amount of cars in the city and avoid traffic jam.

Grade	Specification
The service **must give** the user access to:	-booking -account information -the reserved car -payment PBS, Giro -phone guidance
The service **must perform** as:	-Easy step by step booking -Guidance pre, during and after use
The service may appeal to **exitment** of the user by providing:	-Access to booking without the use of computer and internet connection -opportunity to book spontaneously. - informations of departure and arrival of public transportation. -navigation in terms of the location of the reserved car

ill. 2.3.1. Specifications from the user point of view.



ill. 2.3.2. Noriako Kano. Model for user preferences.

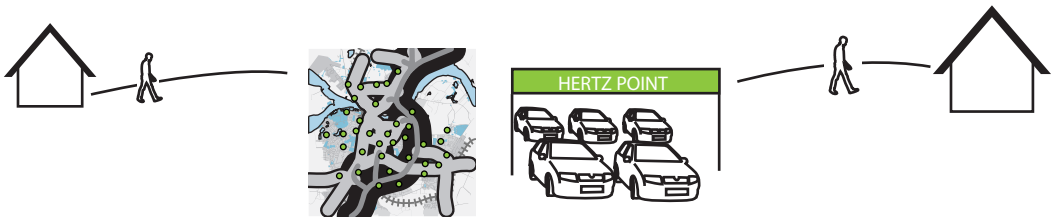
Service concepts

The initial concept development of the product service system is directed at the pre use phase of car sharing. The focus is the sequence of actions before the user enters the car from the user point of view.

The present booking system of Hertz Delebilen depends on an interaction between the user and a computer. The concepts explored in the project also rely on technologies that allow a communication between the user and Hertz Delebilen. The concepts are influenced by the keywords and principles generated at the value and vision based workshop to have the elderly values and perspectives in mind and the criterias for the product service system.

The goal for the concepts is to give the elderly users a feeling of freedom in situations where a car is needed, a reliable service that is easy for the elderly to interact with and a service that is supportive throughout the use of the service.

City booking



From home to Hertz Delebilens terminal.

The terminals are all around the city.

Booking a car from the terminals.

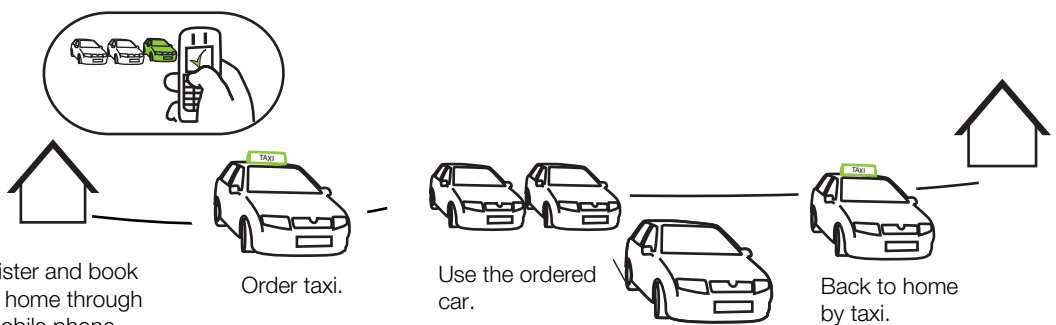
From terminal to home.

ill.2.4.1. Concept 1.

Concept 1

The first concept is a service that provides booking terminals in the city, where the elderly are able to get information, book and withdraw the cars. The interaction point between the user and service is the visible interface at a physical terminal.

SMS booking and taxi service



Register and book from home through mobile phone.

Order taxi.

Use the ordered car.

Back to home by taxi.

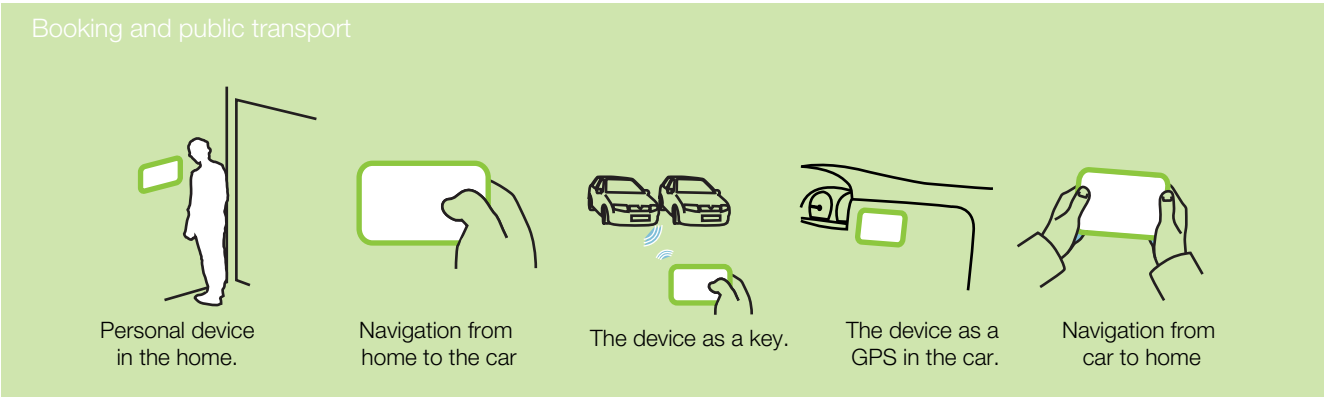
ill.2.4.2. Concept 2.

Concept 2

This concept relies on the fact that many elderly are familiar with mobile phones and the use of text messages. Through a sms service the users require for a car. The service concept includes a Hertz taxi service that brings the elderly to the car. The interaction point is a text template of the mobile phone.

Concept 3

The concept is based on a service that joins services as public transportation and GPS with the Hertz Delebilen service. The interaction point is a portable device (a membercard) similar to a PDA's from which the user is able to book the car, unlock the car and get information about destinations and departures.



ill.2.4.3. Concept 3.

Conclusion

After evaluating the concepts, the booking service of concept 3 is chosen for further development.

Based on the systems that the service takes into use, this concept seems as the most realistic. Concept 1 requires a strict management of moving the cars back and forward between the terminals and a large amount of cars to make the service work.

Hereby, concept 3 also seems to be the best economical solution from the company's point of view since both concept 1 and concept 2 requires drivers and extra cars which make it an expensive solution.

Concept 3 includes features that relate to the Value Mission and improves on the current system. It is a service that "follows" the user around, and gives the feeling of freedom while having a relation to the service.

Name

Throughout the rest of the report, the concept will be referred to by a name, EasyShare. The name is created by conducting a short mind map and extracting keywords. The words are then investigated by combining and discussion in the group. Finally the words are evaluated by the value mission and interaction vision for coherence.

EasyShare is found to be a suitable name for communicating these aspects.

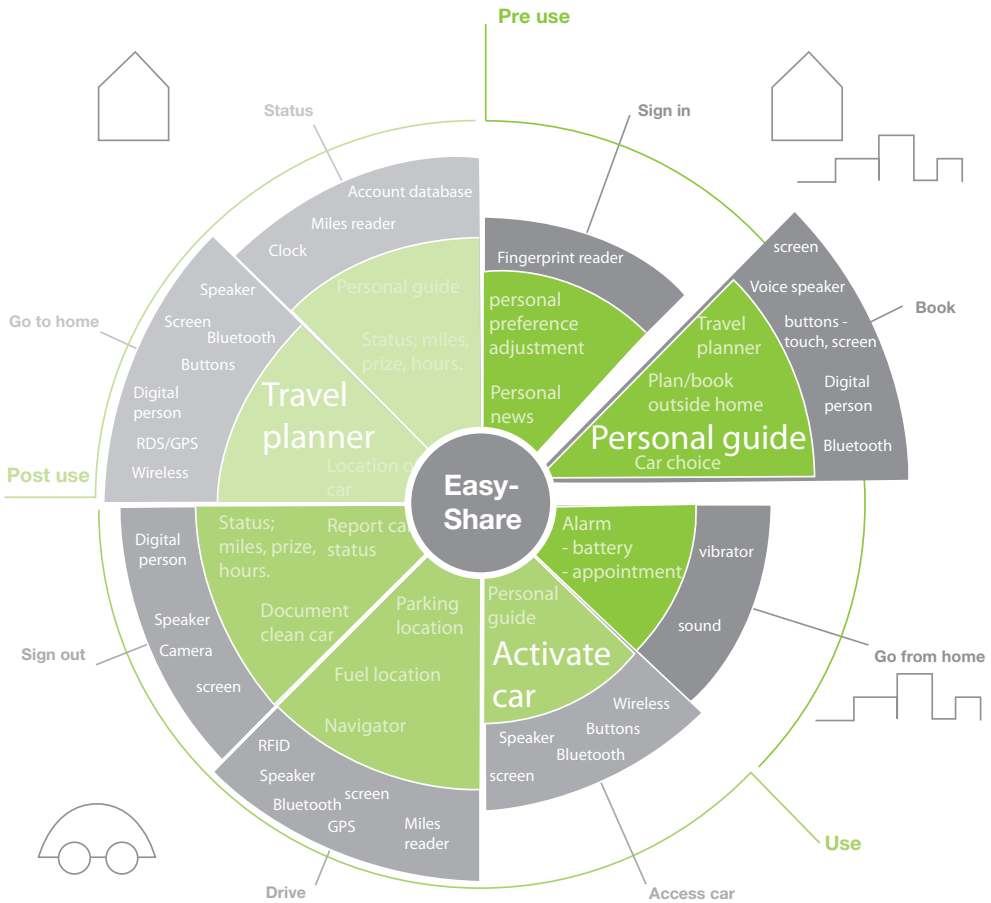
Booking service

A central part of the booking concept is the interaction unit. The functions and features of the device are clarified to explain the interface and unit.

The mapping of the device is done according to the phases of use in the circle diagram. The green areas of the circle describe the functions of the service and the grey areas describe the physical elements that the portable device is going to maintain to be able to provide the service. The circle is a method for separating the functions of the device according to the different steps of use. The diagram creates an overview of the services, which the interaction unit should contain.

As the analysis of the Hertz Delebilen service refers to, improvements can be made according to the interaction between the user and the service in the pre use phase that concerns the booking service.

As the interaction unit is the connection between user and service the visible interface of the device is of main importance. How the elderly interpret objects and icons and understand a graphical layout has to be examined to be able to create an interface that appeals to the intuition of the elderly and make the elderly safe by use.



ill.2.5.1. The diagram illustrate the features and functions of the booking service according to the steps of use.

Interaction

The interaction workshop is a 3 day workshop. The purpose is to get an insight communicating with elderly users in a way that they can understand.

The test product

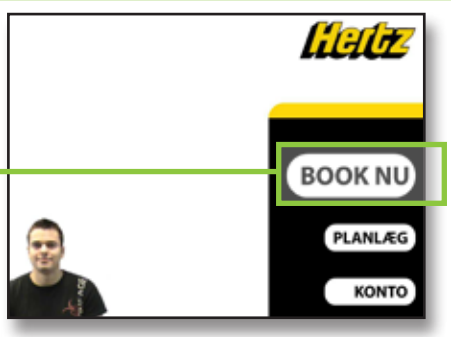
As the concept of the project concerns a booking service that is available through a portable device it is relevant to test how the elderly users react on prototypes of the visible interface. Hereby the design team will gain knowledge on how to design a concept for the graphical layout of the interface.

The prototype of the soft interface can be seen in the appendix CD. The layout of the interface contains simple graphics where contrast, few colors, icons and pictures are used to capture the user attention. The assumption of the design team is that a simple layout with similar objects will appeal to intuition of the elderly user.

ill. 2.6.1. One of the test participants is testing the interface.

Test participants

The interface is tested at the activity centre at Sjællandsgade in Aalborg. The participants have never used a computer and are unfamiliar with the internet. Though the participants have a hard time to understand computers they are used to a cell phone where they use the basic functions as phone call and text messages.



Layering

Highlighting by size - gives extra attention to the “book now”-button.

Also the use of contrasts gives extra attention to the buttons.

It takes the test person some time to understand that the graphic in the left and right side of the interface is buttons.

Combination of text and picture

The test person understood the car selection very quickly, and pushed the picture of the middle car. Pictures combined with a question seem like a good way to communicate options and makes the pictures stand out like buttons.

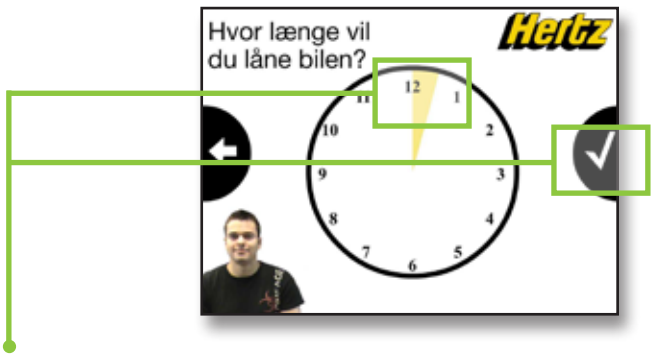
ill. 2.6.2. Conversation with the test participants about the use of phones and computers.

Results

What is to consider especially when designing to the elderly is their fear of the unfamiliar. The experience of the workshop was that to remove the fear of new things the products somehow have to relate to objects from the culture of the elderly.

An example is the cell phone which is new technology to the elderly but they relate to because they are familiar with a regular house phone. However, as they have no relations to computers and the internet they may find this culture and technology difficult to understand.

So in order to get the elderly to use a computer-like product, its appearance has to be closer to the culture of the elderly to ensure that they have an understanding of the product.



Icons

Analogue clock - a picture the elderly are familiar with.

It was easy for the test person to mark the time if she wants to use the car for 2 hours.

The icons used to navigate forth and back are inspired by internet navigation, but the elderly are not familiar with these and have a hard time to figuring them out.

Feedback

The interface is created so the buttons change when they are selected by an increase in scale.

ill. 2.6.3. Illustrations of the interface prototype commented with the respons from the test .

Inspiration

The chapter introduces products with interfaces made for elderly. The inspiration is used during and after the interaction workshop.

The products are mainly from Doro which is a company that produce products that are elderly friendly. Doro is very focused on the usability of their electronic devices, aimed at people with reduced visual capabilities. The focus of the Doro project is the quality of the interface.

By investigating the main characteristics of the interfaces the design team can be aware of principles for interface layout that is successful for elderly.

[Doro, 2007]

ill. 2.7.2. [Emphoria, 2007]

Less elderly friendly

emporia life

Doro HandleEasy

Doro PhoneEasy

ill. 2.7.1. [Doro, 2007]

ill. 2.7.3. [Doro, 2007]

ill. 2.7.4. [Doro, 2007]

Doro HandleEasy

ill. 2.7.6. [Doro, 2007]

Doro Memoryplus

More elderly friendly

Doro HandlePlus

ill. 2.7.5. [Doro, 2007]

General Characteristics

The following design features is found as positive aspects of interfaces targeted towards elderly. The characteristics are used and tested through the interaction workshop and further specified as criteria for the interface.

- Large buttons
- High contrast
- Loud sound
- Sound feedback
- Few easily distinguishable colours
- Soft edges
- Little use of text (Doro)
- Object shaped for the hand
- Ergonomic size

Interface criteria

The chapter describes the requirements for the interface of the product.

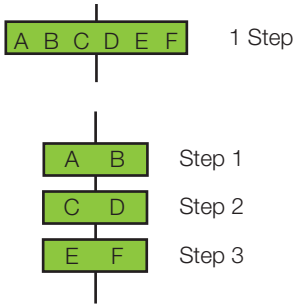
Using Hertz Delebilen can be a complicated task with procedures such as planning or booking, where the users have to consider several different options.

By reflecting upon the interaction workshop, market research (for inspiration) and the structure of the existing booking system some design rules were found for the interface. These rules are inspired by Donald Norman's principles for transforming difficult tasks into simple ones, which is essential for a service targeted towards the elderly.

[Norman, 1988]

Simple structure of tasks

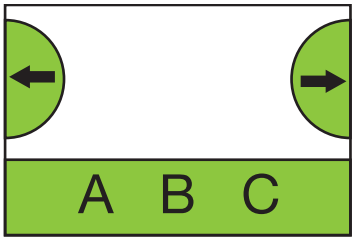
In the current booking procedure at Hertz Delebilen, the user is met by many choices at once. This results in confusion for the user, which could be avoided by restructuring the booking procedure into more steps with fewer options. Donald Norman (1988) describes the importance of the psychology of the user (memory, active processes etc.) and regarding elderly it seems extremely important to keep the process as simple as possible. By dividing the amount of choices into more steps it is sought to fulfill these requirements.



ill. 2.8.1. Choice diagram.

Standardization

It is also important that the system provides a good conceptual model, so it is logical for the user to operate the interface. The interface should have a clear consistency in placement of visual elements (icons, text, pictures etc.) and the controls should be worked in the same way so that the various steps look similar and are operated in a similar way.



ill. 2.8.2. Interface template.

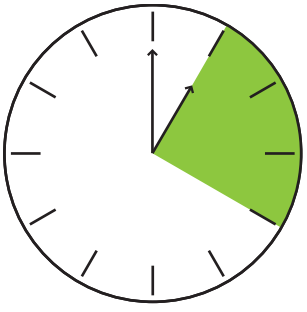
Visual communication

It is very important that the possible actions and options (e.g. pushable button or distinguishing features) are very clearly illustrated.

During the interaction workshop it was observed that actual pictures and regular text worked well while pictograms needed to be adjusted to the "visual language" of the elderly. For instance pushing a picture of the car that needs to be chosen seemed easy to do.

Using references to the usual surroundings of the elderly is therefore a possible way of making clear signals and options could be marked using pictures and traffic signs or other public pictograms. Controls could look like mechanisms they are familiar with, to give a hint on how they should be operated.

The cultural probes contribute in mapping these surroundings, but an actual user testing would be necessary to evaluate the success of the solutions.

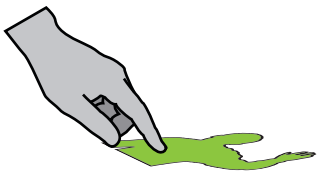


ill. 2.8.3. Using a watch-analogy for time

Mapping controls

Besides illustrating the buttons and their actions clearly, their position on the screen is very important. A big benefit of the touch screen is that it allows for the controls to be located in the areas they control. If possible the buttons should therefore be placed close to actions or there should be a clear analogy between the placement of buttons and the related actions.

If the help button is to be physical on a product, it has to be placed near the part of the screen where the virtual person, who provides the help is located.

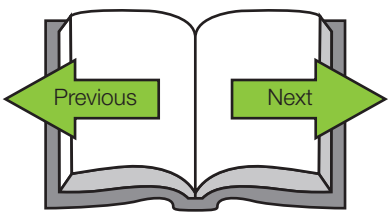


ill. 2.8.4. Controls.

Simplicity by constraints

By keeping the interface simple it should be more intuitive for the users to use.

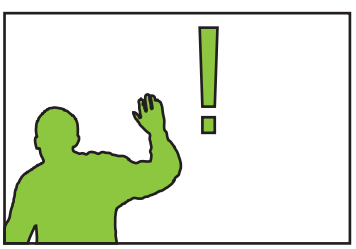
This is done as constraints by limiting the possible options to the essential ones of the respective step. Furthermore it is done by defining the size and placement of the buttons and as well as being very precise in the information given to the users. This could also be done using more cultural based constraints, e.g. by using a sense of direction in the different “pages” of the interface by making it as reading a book. By doing this “progress” would be in the right side of the interface, where an action should be performed in order to get to the next page, and the previous page is accessed in the left part.



ill. 2.8.5.Reading direction.

Accessible knowledge

One of the main design features of the concept for interface is a virtual person that helps the user throughout the process thereby providing knowledge to the user. By allowing this feature to be switched on and off, the design will not seem disturbing when the user has learned the system and a task is becoming routine. Yet, the virtual person can always be activated if a part of the procedure is forgotten.



ill. 2.8.6.Virtual person.

Design for error

When the user does something wrong it should be easily reversed for instance by a “back” or “cancel” button. Browsing the steps should be possible for reaffirmation or change of the information entered, and it should be made clear exactly what and where information is missing if something has not been filled in, without having to start over.

It should also be made clear to the user when an important action has been performed or is going to be performed thereby increasing attention at certain stages and making it less possible to make errors. This increased attention could be obtained by breaking the interface flow, e.g. by introducing a new button for confirming the final reservation.

ill. 2.8.7. Cancel button.

Focus

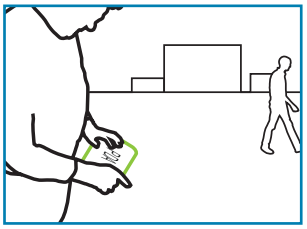
The focus is decided through research, user tests and concept development.

Pre use

Sign in | Book | Go to car

Get info | Booking | Confirm | Plan route | Departure

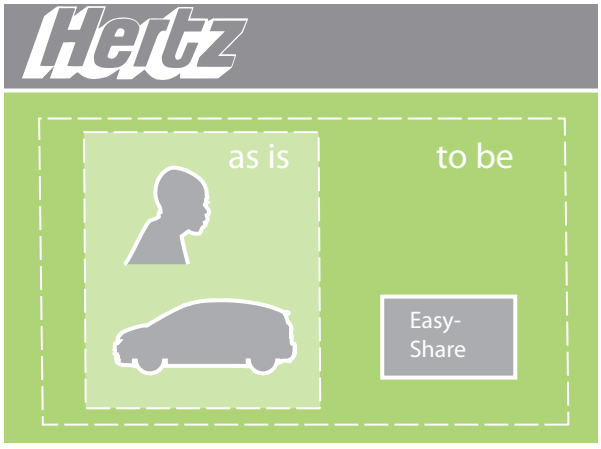
The phase, strategy and concept, concerns a research of values and visions, interaction between the target group and physical product and interface. Further the criteria for the service and the physical product are specified through prototypes, tests and inspiration from interfaces related to elderly. As mentioned in the chapter Critical points p. 40 the most user-related problems occur during booking and getting to the car.



ill. 2.9.1. Focus of the service from the user point of view.

Concept PSS

The name of the service is EasyShare. The goal is to improve the booking service of Hertz Delebilen by the EasyShare service that is available through a portable device (ill. 2.9.2). EasyShare is an extra service of Hertz Delebilen and is targeted at the elderly, who can sign up for this when joining Hertz Delebilen. The intention is that EasyShare will make it simple for the elderly to book a car and go to the location of the car. (ill. 2.9.1)



ill. 2.9.2. A simplification of the Hertz Delebilen service.

Product PSS

The concept requires a development of new software and hardware that manage and join the services of new actors, a route planner service, navigation, wireless data transfer, short distance wireless data transfer and the existing services of Hertz Delebilen. The interface is an important factor in terms of making carsharing available and accessible to the elderly group of the society and the user experience of the service. The visible interface creates the connection between the user of the EasyShare service and the system behind the service. The user-related focus of the development is therefore concerning the interface layout of the EasyShare service.

Alternatives

There are alternative ways for implementing the EasyShare service to Hertz Delebilen. These are to make the service accessible to the users, by allowing them to access the service from their own devices. (ill. 2.9.3-5).

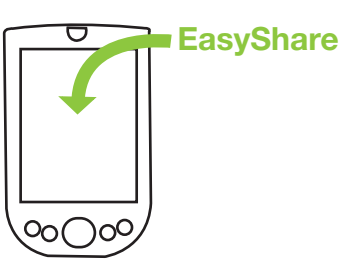
However, these implicate problems according to use and economical aspects from Hertz Delebilen and the users' point of view.

Use aspects

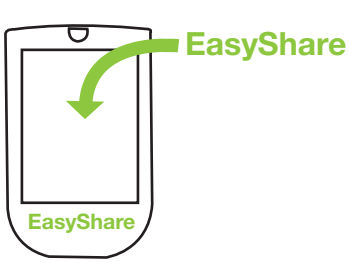
The use aspects of the EasyShare service rely on user-interaction and ergonomics. It is an advantage if the portable device for appeals to the intuition of the user. Also it is an advantage for the user if the device is fitted to the functions in terms of the ergonomics of the physical shape.

Introducing new and extra devices specific for the EasyShare service involves from the user point of view that the user has to carry an extra device and learn how to use it. An alternative use of the mobile phone will solve this problem. It does though involve consequences of interaction and ergonomics by adding a new layer of complexity to the mobile phone. To rely on existing PDA´s that is suitable for the service of the EasyShare will be a potential solution that can benefit both Hertz Delebilen and the user.

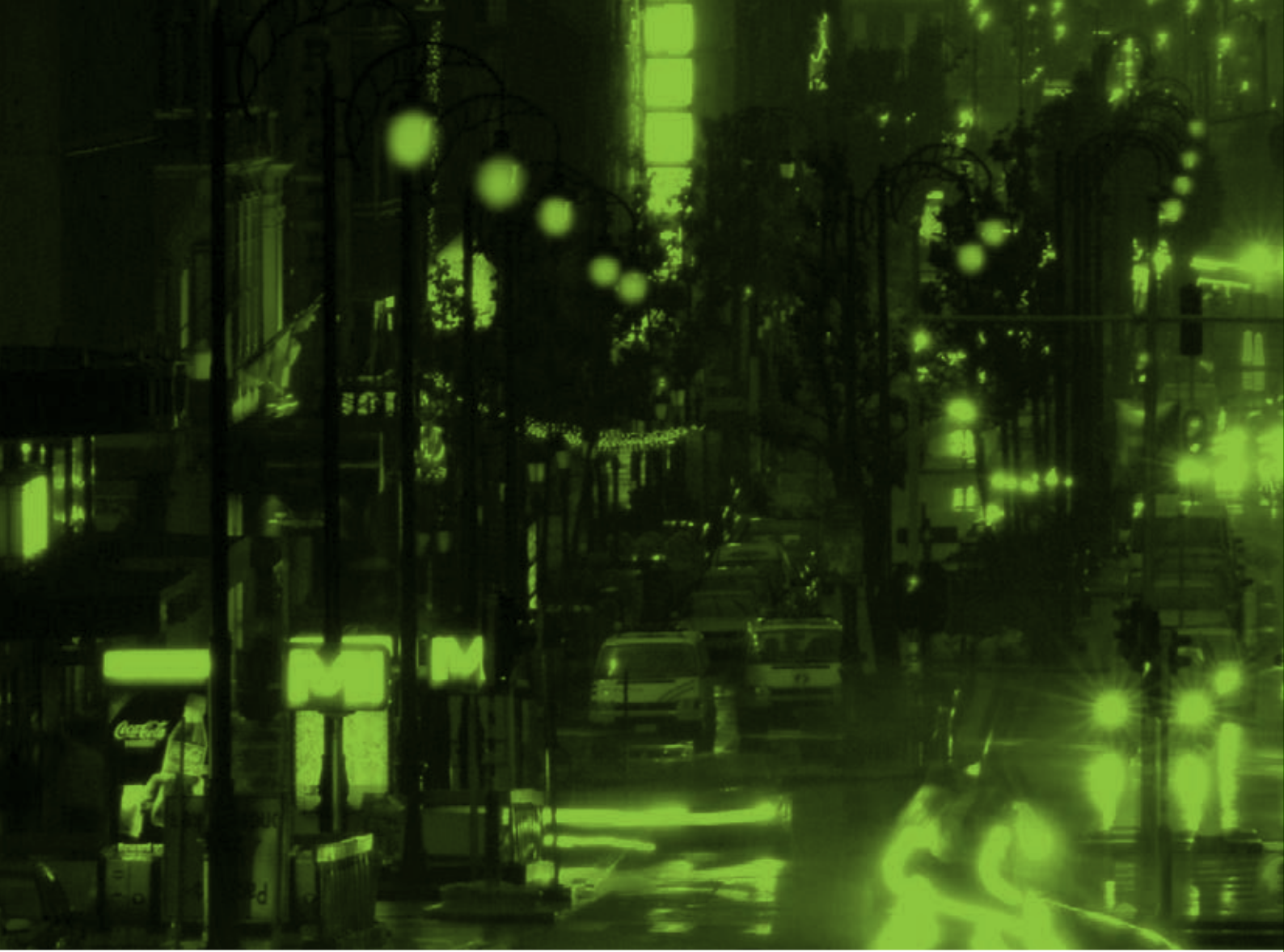
1 ill.2.9.3.To add a new software to mobile phones.



2 ill.2.9.4.To add a new software to existing PDA's.



3 ill. 2.9.5.To add a new software to a PDA developed especially for Hertz Delebilen.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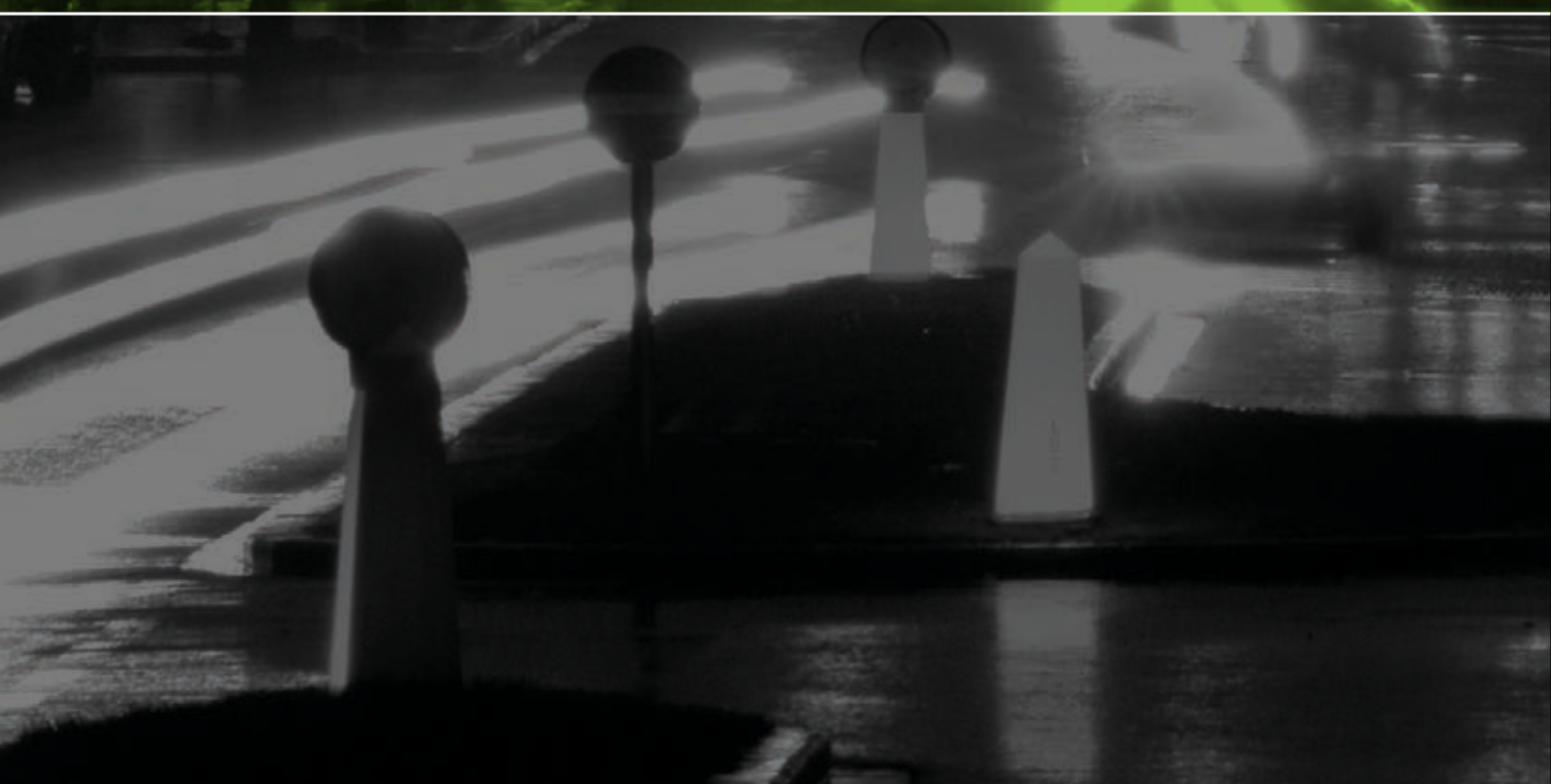
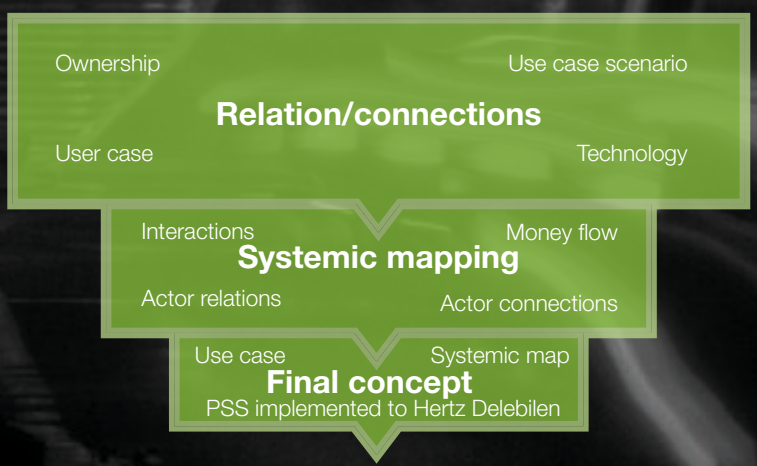


PSS development and detailing



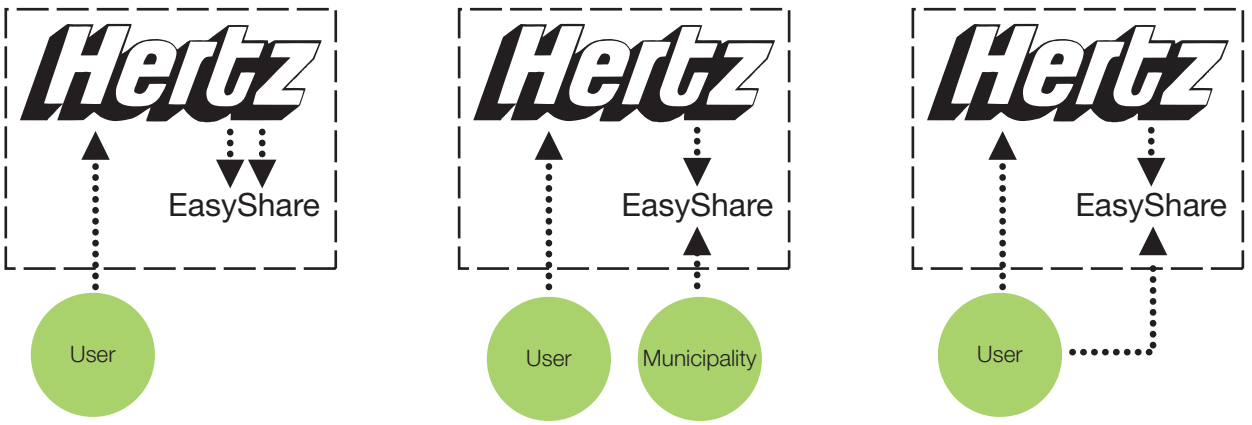
(13/11 – 20/12)

In this phase the concept for the product service system is further developed. The system is explored through actor network diagrams. Furthermore the system is developed through the IDEF0 model by refining according to the structure, the functionality of the system and the relation to the car sharing service of Hertz Delebilen. Exemplary dives are made to demonstrate key relations between the actors and elements. Focus is at the interaction between the user and the product service system and the interaction between systems within the product service system.

Ownership

Three major actors are considered for providing the money for EasyShare; Hertz Delebilen, the municipality and the user.

In detailing EasyShare as a product service system and the visible interface as the product, the attention has to be paid to the actors and elements that make up the product service system.



ill.3.1.1 . Moneyflow in case of Hertz Delebilen, the municipality or the user providing money for EasyShare

Case 1: Hertz Delebilen

By expanding offerings Hertz Delebilen could gain new markets and possibly improve existing solutions.

Advantages

+ Increase number of customers

+ The user does not have need to buy the device

+ The service can be expanded to other departments of Hertz national and international

Disadvantages

- Possible raise in membership costs for the users

- Maintenance costs of the service and product

- High initial costs for Hertz Delebilen

Case 2: Municipality

The municipality could provide a solution for the infrastructural problems by switching more users to car sharing and public transport.

Advantages

+ Low cost for the user.

+ Promotion of public transportation.

+ Relation to policy for environmental cities.

+ The service could evolve to include public transportation and serve as an easy access to public transport.

Disadvantages

- Operational expenses

- Financing other public traffic systems could benefit more citizens.

Case 3: The user

EasyShare has a higher cost, but the user benefits from a higher level of service, making it a viable solution for elderly. The user buys the product from Hertz Delebilen.

Advantages

+ The user gains a high service level

+ The product could be used for other purposes

+ Users in general take better care of owned items compared to rental

Disadvantages

- Possible large initial cost for the user

- The added cost might keep potential users from choosing the service for financial reasons

Economical aspects

The EasyShare service can require both development and production of a platform for the product, consisting of hardware, software as well as the service itself. Considering the size of Hertz Delebilen in Denmark a low number of products would involve a high initial cost to develop both hardware and software, which will result in a high membership cost for the users (removing user motivation for car sharing). The situation is similar when the EasyShare service is adapted to existing PDA's.

A substantial barrier

To develop both new software and hardware seem like substantial barriers from Hertz Delebilen point of view for implementing the EasyShare into Hertz Delebilen. A new software solution in existing cell phones is a feasible solution and considering the development of cell phones (larger screens with touch functionality) this solution can fulfill many of the ergonomic aspects while being economically favorable.

From the system point of view (disregarding production and maintenance of the devices), the involvement in the system is very similar.

Product provider

Making the service accessible from existing cell phones would be a favorable economical solution for both the user and Hertz Delebilen. However Hertz Delebilen will still be in charge of the development of the software to be used.

Regarding who is going to pay for the device for the EasyShare the options are open. Either the user owns the device or can buy or rent it through Hertz Delebilen. Another solution would be to set up a standard for the capabilities of the device and certifying a number of existing devices already on the market. Thereby an external provider (e.g. a cell phone store) could offer "EasyShare enabled" products that could substitute the user's existing products. This solution would provide added value for the user thereby justifying the extra cost of such a product.

Conclusion

The solution for funding EasyShare would probably be a combination of several of the actors. One scenario is where Hertz Delebilen/municipality funds pilot projects in combination with the user. From here the service evolves into a working department of Hertz Delebilen which would probably include a higher cost for the users, but also some benefits.

Modularity

The chapter describes considerations regarding the modularity of EasyShare to be able to clarify the actors for the IDEF0 model according to the interface.

Communication

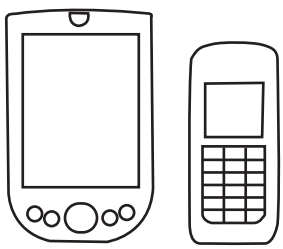
The EasyShare service can be seen as a tool that handles several functions related to communication. It receives user input, converts input to useful data, sends data, receives data and communicates the information to the user.

Means of Communication

According to the target group an important factor is that guiding information can be communicated through sound and video.

A critical function according to the technology of the EasyShare service is therefore that the device is able to display graphics, which can also be used to communicate the options, information and data from Hertz Delebilen in a clear way.

It is critical that the interface is intuitive and easy to use, criteria which can be fulfilled with a touch screen and a clear graphic layout of the booking menus.



ill.3.2.1. Options for the device are for example a PDA or a mobile phone.

Physical Platform

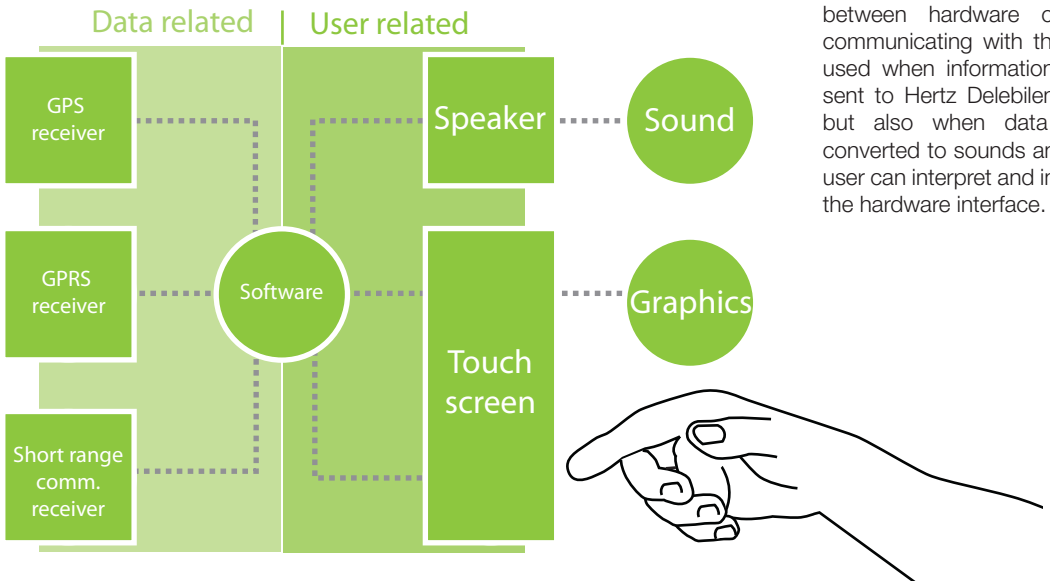
For the device to carry out the functions for elderly, the following physical components are required:

- Touch screen display with high contrast and video capability
- 2-way data communication
- 2-way short range communication
- Speaker
- GPS receiver

These components are defined as the physical platform for the service. The EasyShare system should be able to work on any portable device that has these components. (ill. 3.2.1)

Software link

A model for the EasyShare system is made (ill 3.2.2) to shown how the physical components of the device are arranged according to the user. The purpose is to show how the software works as the link between hardware components when communicating with the user. This link is used when information is converted and sent to Hertz Delebilen and Rejseplanen, but also when data is received and converted to sounds and visual output the user can interpret and interact with through the hardware interface.



ill.3.2.2. The structure of the connections between the interior moduls of the EasyShare device.

Actor Information Exchange

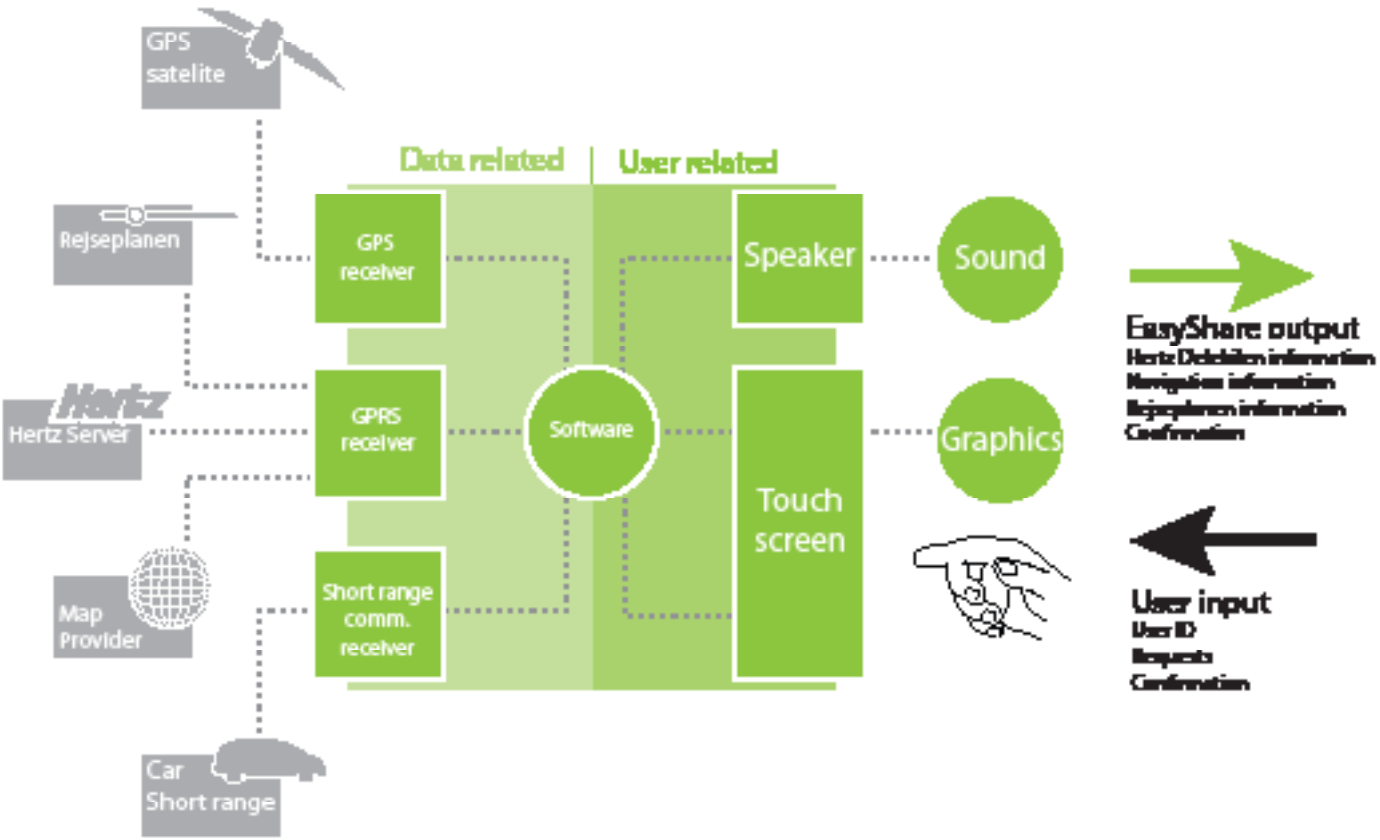
The actors and other external systems (GPS & Cars) are linked to the service by exchange of data through the physical components of the device. This connection has been mapped in relation to the device and the user (ill 3.2.3) to show how the data exchange in the device happens in relation to the user.

The actors and external systems used here can also be considered modules since the only relation between the modules and the device is the data exchange, which makes them fairly easy to replace.

Furthermore, the function they provide can also be provided by other actors.

Wireless data transfer

The data is exchange between the internal and the external modules of the device using wireless connections. To rule out compatibility problems between modules wireless technology is a flexible way of having different units communicate. The main transfer of data happens through GPRS, while short range could be Bluetooth or similar technology which most PDA´s and mobile phones have adapted.



ill.3.2.3. The structure of the moduls in the EasyShare service; the intern moduls of the physical device and the externs system moduls. Besides the GPS connection the connections are a two way communication between the moduls.

Modularization

The chapter describes the modularization of the development process of EasyShare. The intention is to evaluate the modules that can be outsourced.

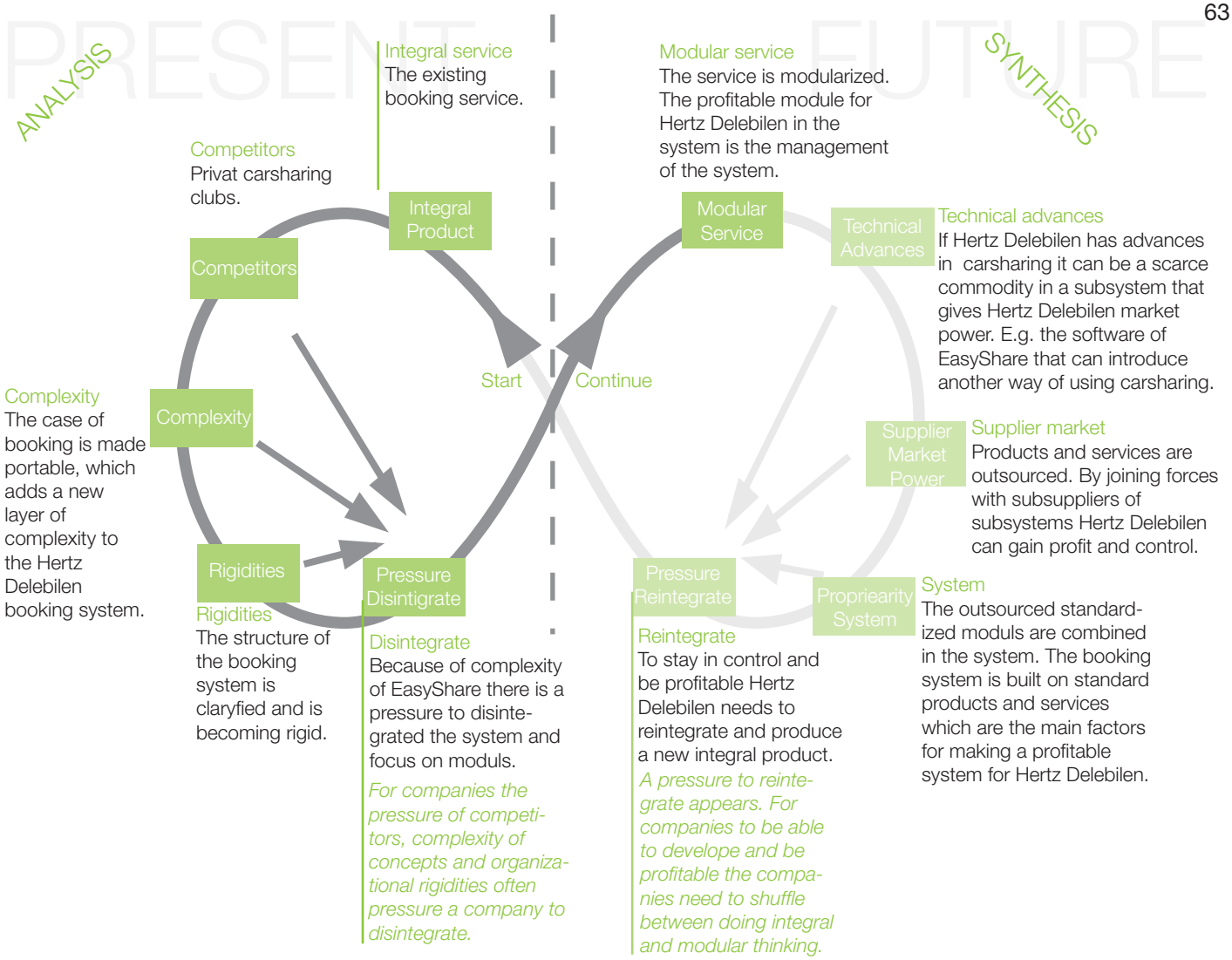
The intention of dividing the EasyShare service in modules is to get an overview of the actors involved to be able to organize and develop the system behind the service.

By modularizing the service, it will be easier to outsource single modules to subsuppliers and thereby increasing efficiency and profit. The modularization of the development process is a model of Charles H. Fine that describes the cycle of a development process of a company. (ill. 3.3.1) The model is based on an empirical investigation with references to IBM and Intel. [Fine. C, 2000]

In the development of the product service system the design team, became aware of the benefits of modularity and to outsource modules. Hereby it is possible to reintegrate new ideas for a booking service and make it a profitable business for Hertz Delebilen on long term. The model is interpreted in terms of Hertz Delebilen and shows the process the design team has been going through. The model also investigates the future steps that Hertz Delebilen may go through to stay in control and have a profitable service.

Outsourcing

Evaluated from the capability, advances and resources of Hertz Delebilen there is a need for outsourcing as many services and production of products as possible. Due to the requirements for the device in EasyShare, there is no need for producing a new device. It means that the sub provider and provider of the PDA and phones for the service can be outsourced to the user and potential providers such as electronic producers or phone companies. Services as providing maps, navigation services, wireless connections relates to existing services as Google maps and Rejseplanen. Existing technologies as GPS, GPRS and Bluetooth for wireless connections is adaptable to the EasyShare service. It means that the only module of the service that Hertz Delebilen has to develop is the software for the EasyShare service device. The future step for Hertz Delebilen will be how to reintegrate the modules of EasyShare service into the entire service system of Hertz Delebilen.

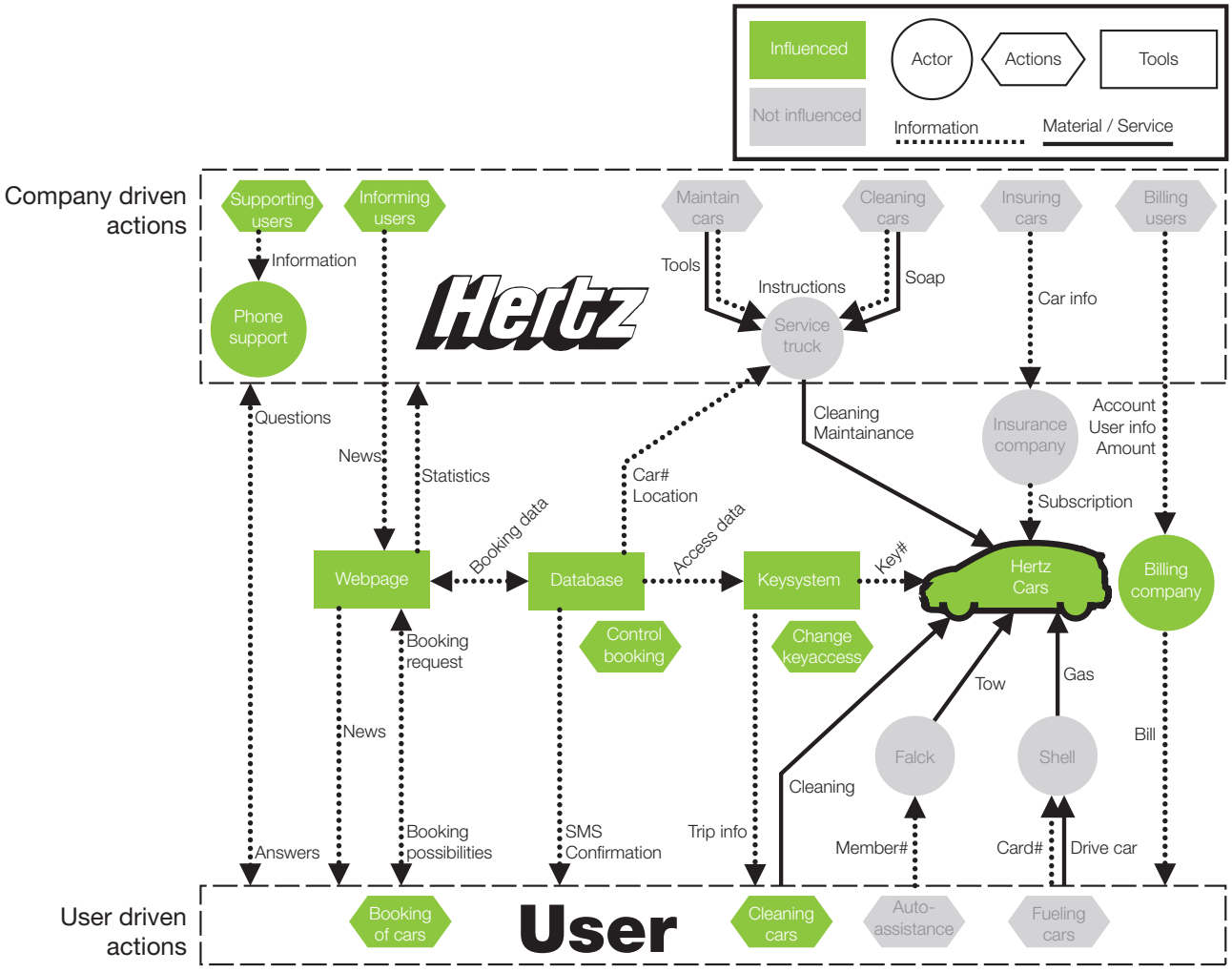


ill. 3.3.1. The diagram shows the process of developing EasyShare as a service. Inspiration is taken in Charles H. Fines Supply Chain Structure model. The interpretation is made from Hertz Delebilen point of view and shows the modules of the development process in the present and what Hertz Delebilen can consider in the future to stay profitable.

System implementation

The chapter describes the influenced areas of Hertz Delebilen when implementing EasyShare.

So far the development of the system has only concerned the specific system of EasyShare. The next step is to implement the system in the existing system of Hertz Delebilen. The illustration shows the existing system of Hertz Delebilen concerning the information and material flow. The highlighted areas are the areas that the EasyShare system will affect. Most of the back office of the system remains unchanged while most of the front office (and sub providers) are affected. To mark out the influenced areas is the first step to be able to map the new relations between new and existing actors.

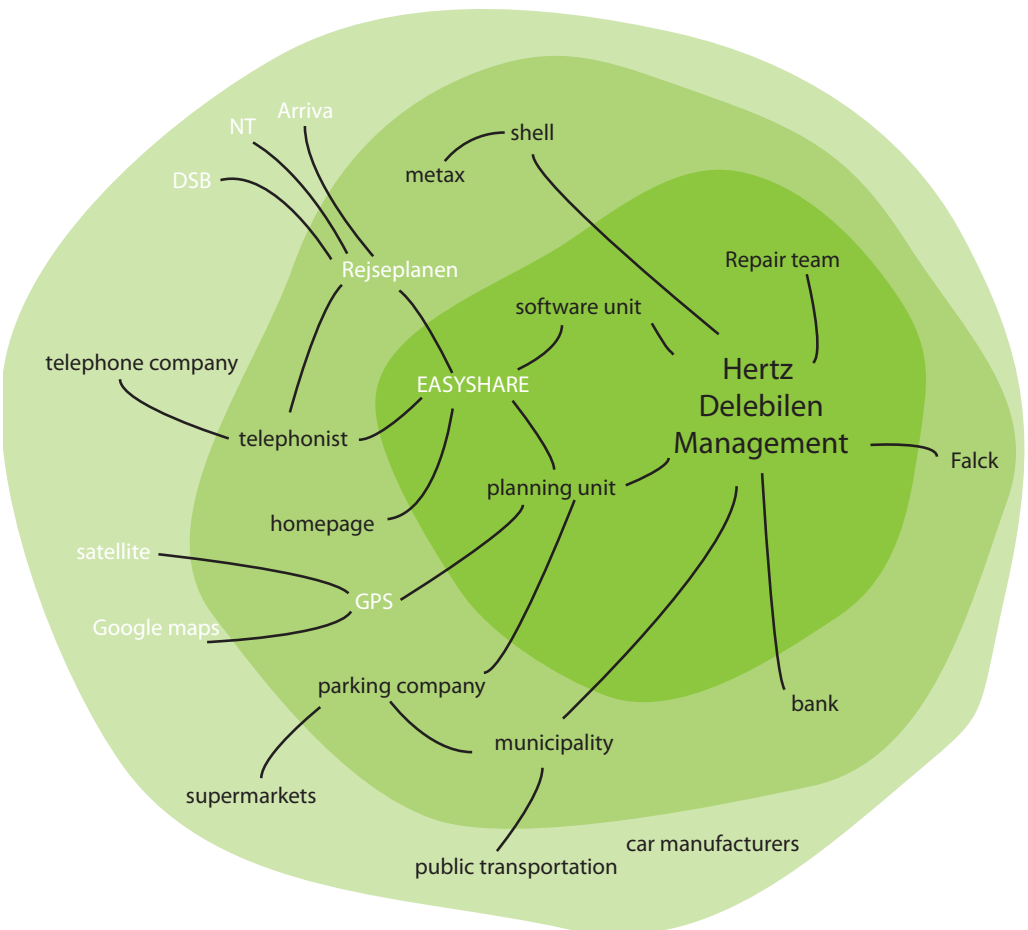


ill.3.4.1. The system of Hertz Delebilen. The green areas are areas that EasyShare is affecting.

Actor network

The chapter describes the actor network of EasyShare implemented into Hertz Delebilen.

By mapping the areas of Hertz Delebilen that EasyShare influences, the connections between the actors of EasyShare can be mapped. The actors are structured in levels according to their relation to Hertz Delebilen; actors/units inside Hertz Delebilen, close related external actors and external actors. The unit of EasyShare is placed as if the EasyShare unit is replacing the existing booking unit of Hertz Delebilen. This may not happen in the near future but is over time the goal. The actor network is the initial step to map the systemic map of EasyShare implemented into Hertz Delebilen, which is described in the product report. Further the mapping of the actors initiates the IDEF0 model, describing the functionality of the interface as the actors influence the possible actions in the interface.



ill. 3.5.1. The actor network of Hertz Delebilen including the EasyShare unit.

IDEF0

The IDEF0 model clarifies steps in regards of information exchange of the booking process in EasyShare. The system is described from the provider point of view.

The intention of using the IDEF0 model is to specify what needs to be accomplished by each step of booking a car through EasyShare. The steps of the interface are in focus as it is through the interface that the service of EasyShare is accessible for the users, mainly consisting of members of the service.

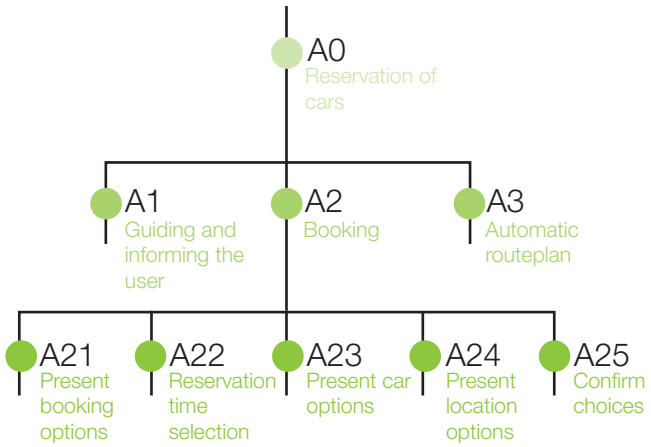
The documentation of input, output, constraints and mechanisms according to each step of the booking are used to make a frame for each step of the interface. A model of the frame is illustrated at illustration 3.6.2.

The IDEF0 model can be used for describing TO-BE and AS-IS. The focus has not been to identify functions that need to be improved (AS-IS), but to describe the TO-BE system of EasyShare (ill. 3.6.3). Hereby the design team gets an overview of the system and an agreement of the functionality of the system. (ill.3.6.1.). The IDEF0 models represented in the report are edited versions of the IDEF0 sketch (Appendix 8).

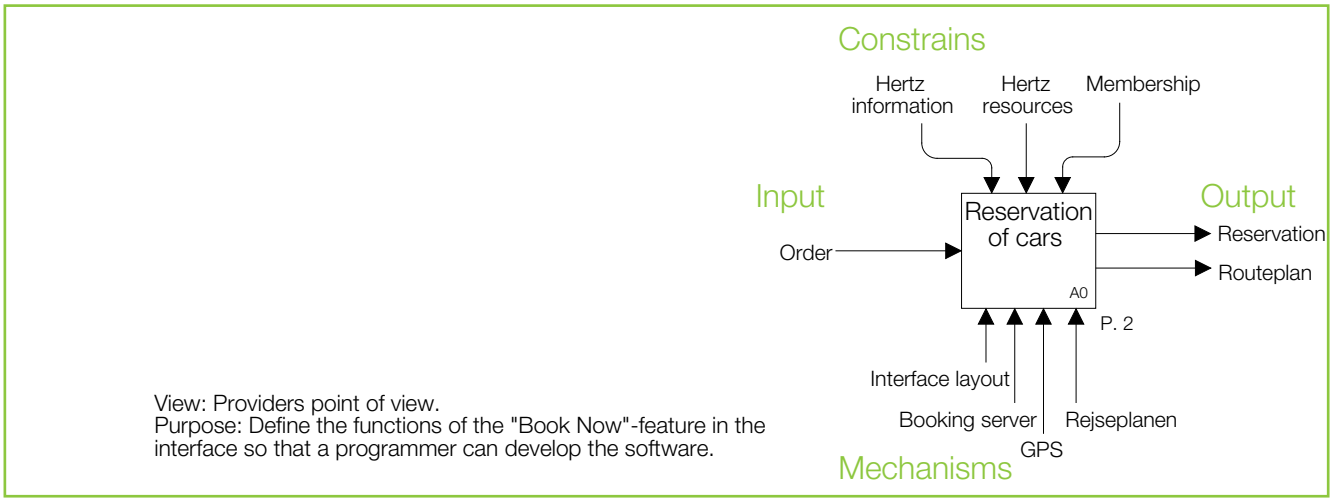
The IDEF0 model uses a specific protocol which allows the model to be used as a check-up tool to be aware of other actors influencing the system to be able to deliver the wanted output.

[IDEF, 1993]

From the creation of the IDEF0, it is clear that the complexity of the system appears in the automatic route planner function. Here new actors are introduced and have to be implemented in the system of EasyShare.

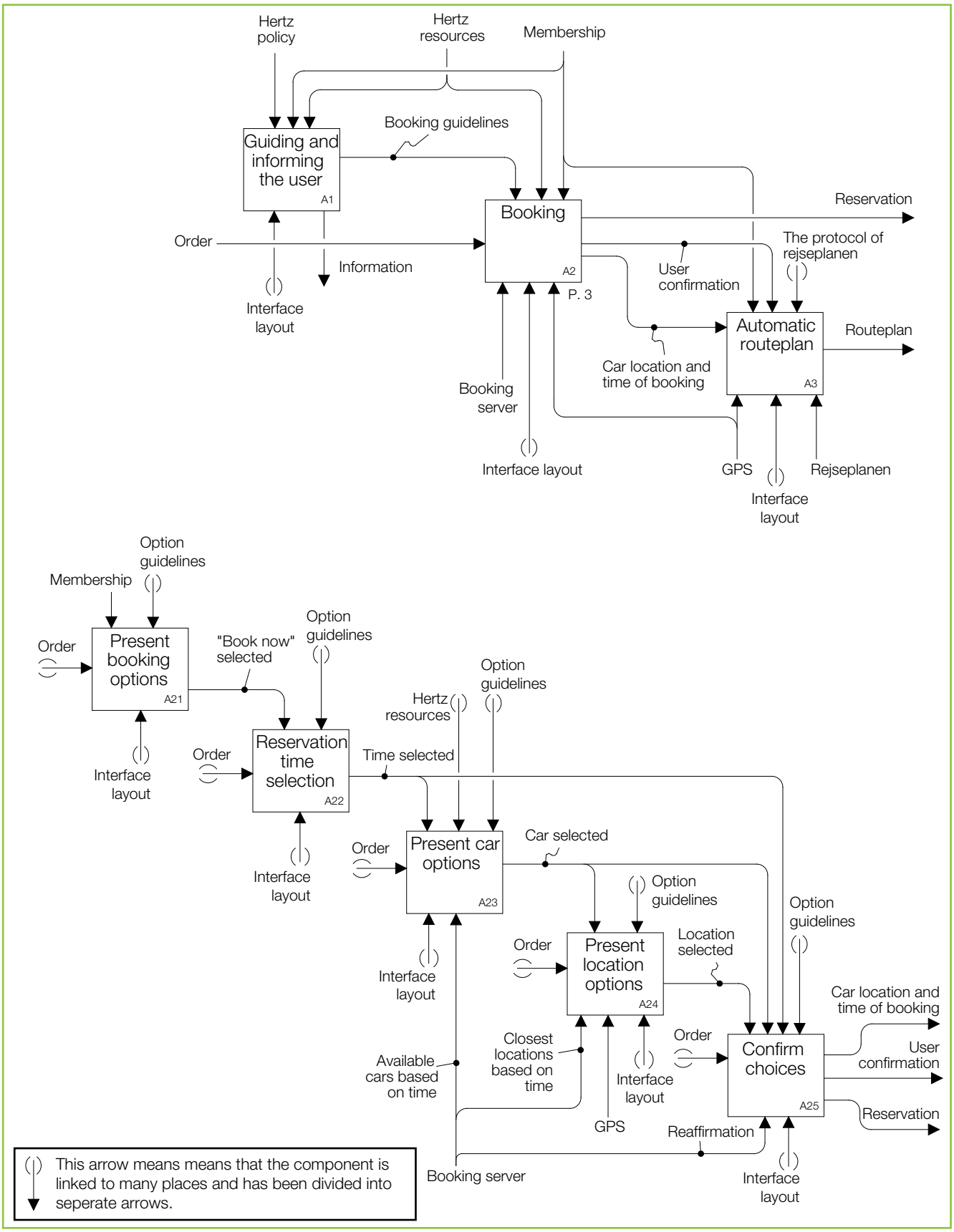


ill.3.6.1. Node tree.



View: Providers point of view.
Purpose: Define the functions of the "Book Now"-feature in the interface so that a programmer can develop the software.

ill.3.6.2. The A0 description of the system.



ill.3.6.3. The A2 and A21-A25 description of the system.

Money flow

Money flow of the different services of Hertz Delebilen including the new actors of EasyShare is described to make the service economically reasonable.

Examining and defining money flow of a service is an important aspect when not dealing with a service system. The money flow is important in terms of making the service stable and profitable for the owner of the service. It also highlights important actors and makes it possible to define their relation.

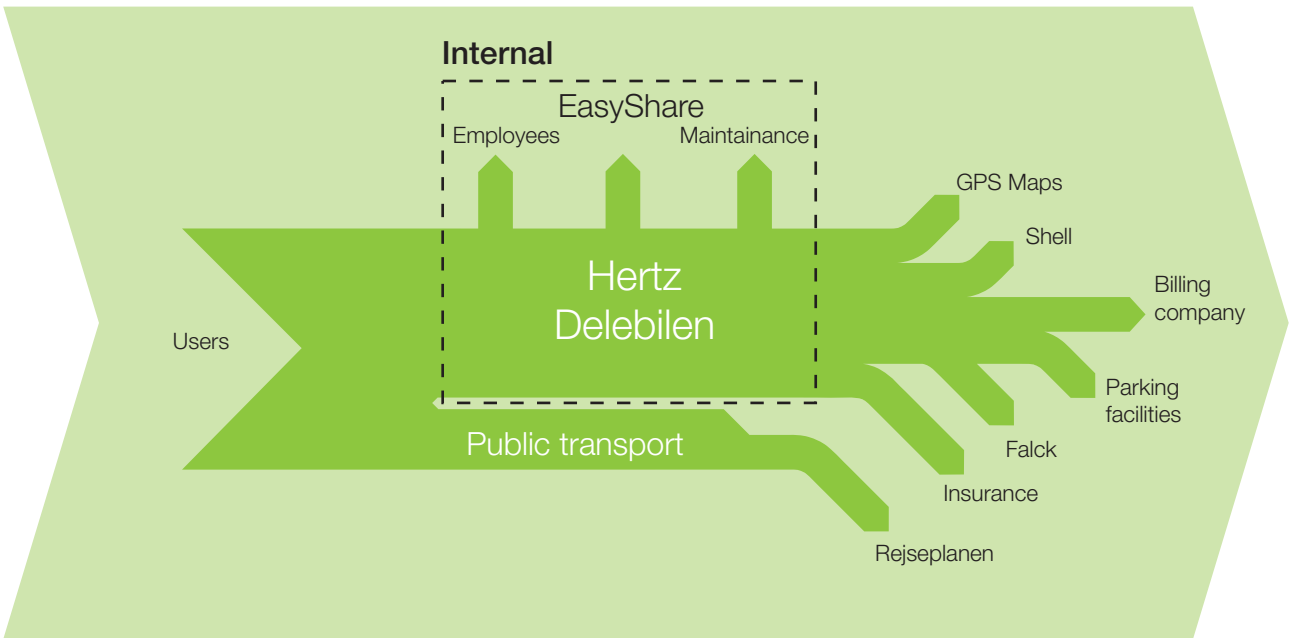
The illustration 3.7.1 shows the money flow of Hertz Delebilen after the implementation of EasyShare. The static expenses to software or hardware are not included as a part of the money flow.

As considered in the "Ownership" chapter p. 56, the municipality can contribute to financing EasyShare as can the user by paying for the special membership of EasyShare. If this is relevant the financing will still go through Hertz Delebilen as a distributor.

Concerning Rejseplanen the service is free for companies to use because it is financed by the providers of public transport. The users are by EasyShare referred to take use of public transportation and are hereby contributing to the public transportation and Rejseplanen.

The service of GPS navigation is free, but there will be expenses for getting the corresponding maps of the area and frequently updating the maps when changes are introduced to the traffic structure of Aalborg.

What is notable is that the EasyShare service is financed by Hertz Delebilen who is distributing all the finances from the user to the services that Hertz Delebilen cooperates with and also the services which the user is in contact with (e.g. Shell). The user only has expenses regarding Hertz Delebilen and if public transportation is needed. Compared to the current money flow of Hertz Delebilen it is only minor changes that is made in terms of that the user may pay more for the membership of the service and that Hertz Delebilen has more expenses.



ill.3.7.1. Moneyflow of Hertz Delebilen inc. EasyShare

Actor matrix

The actor matrix clarifies the motivation for the actors to be a part of the EasyShare service system.

The actors concerned are the close related actors to EasyShare. The essence of the actor matrix is used to describe the main actor's contribution to and outcome of EasyShare in the systemic map in the product report. It is important to evaluate each of the actors by their contribution and outcome in order to argue their interest in participating in the service.

The actor relation matrix is inspired by "Food Delivery Solutions", a report containing illustrative diagrams that explain systems and parts of systems in a successful way. (Manzini 2004). The matrix can be expanded for exploring a deeper layer of the relations by including sub-actors such as the provider of the software, the management of the EasyShare department and the public transportation providers. The matrix reveals that not all of the actors are related, but what is notable is that all of the actors achieve something by being a part of the service. It means that the interests of the actors are fulfilled and that it can benefit them to join the service.

gives to:	Hertz Delebilen	TDC	Provider of phone/PDA	Municipality	User
Hertz Delebilen	-increase of the amount of customers by directing their service at the needs of the elderly	-publicity -costumers -customers -money	-money -publicity through the use of the devices	-oportunity to fullfil their sustanable visions for Aalborg	-access to a car -elderfriendly booking service/membership
TDC	-wireless connection - possibly devices for the service	-to increase the income	-money if they have an intern agreement	———	———
Provider of phone/PDA	-Mobile phone -PDA	- mobile phone -PDA	-expansion of the number of costumers -increase of income	———	-the device for accessing the service
Municipality	-political support -parking spaces -economical support if M. decides to support Hertz	———	———	-to reduce the ammount of cars in the city -develop a green profile	-a decrease in membership costs if M. supports Hertz financially
User	-money -maintenance of the cars (cleaning, fueling)	-money if the device is bought through TDC	-money	-support on the sustainable aspect	-environmental fullfillment -freedom of a car with a minimum of expenses

ill.3.8.1. Actor relation matrix describing each of the actors motivation for contributing to EasyShare.

Reflection

The project is evaluated according to the semester theme, the courses, the process and the result.

The evaluation concerns the theme Design for the Ageing, the topic Transportation and the subject Car sharing in perspective of the courses and the process of developing a product service system. The main focus of the project has been to understand a car sharing system from various actors point of view. A booking service has been developed based on observed problems by Hertz Delebilens existing service and the needs of the elderly segment of the society.

Semester

The process is into three phases; “Research and analysis”, “Concept development strategy and concept” and “Project proposal and development”. However, the phases of the project are not strictly divided because it is not possible to complete a design process without shifting between the phases and redefining the concept.

Courses

The courses throughout the semester have equipped the design team with knowledge and methods to approach the system development.

The representation technique course provided useful methods to express systems and is used extensively through the whole process through diagrams of flow, use cases etc. This is especially relevant on a semester, where it is difficult to explain the development of the system by actual sketches (compared to previous semesters).

The IDEF0 structure is a relevant tool for getting an overview of the functionality of the system behind the service. The culture workshop introduced the cultural probe as a new way of performing cultural analysis and obtaining data from a target group. The cultural probe reveals more qualitative and hands-on aspects of a target group than traditional target group investigations. Carrying out a cultural probe contains a lot of planning and is a time consuming task. The Value Mission & Interaction Vision-based workshop is used to develop principles and extract values as foundation for the service. The workshop has been used throughout the project to check for coherence and eventually end up with a project that corresponds to the intended values and interaction. Finally the interaction at the activity centre, Sjællandsgade provided inspiration and feedback to develop the interface in shape of user testing on actual prototypes.

Process

The process of developing a product service system has mainly been including an insight in actors as Hertz Delebilen and the target group.

Hertz Delebilen

Through test and analysis the design team has been establishing an understanding of Hertz Delebilen from both the elderly user and the company point of view. Hertz Delebilen has been used as inspiration for a service and as platform for the service. Hertz Delebilen has been used in terms of getting information and access to the system. It could have been beneficial if Hertz Delebilen had been participating as a partner in the process so that assumptions could have been confirmed by Hertz Delebilen.

Target group

The target group has been analyzed mainly through a cultural probe. The method has been giving qualitative information about the characteristics, the everyday life and the needs of the target group. The qualitative information has been inspiring for the value mission, an interaction vision and needs of the target group and has been used for a qualitative evaluation of the developed product service system.

Project focus

Unfortunately throughout the semester there have been complications concerning supervision, which at the December 1st has resulted in a change of the main supervisor. It has been frustrating for the design team that before December 1st, the supervision focus was different compared to other supervisors', which also collided at several status seminars. The problem was further enhanced by non-local supervision based mainly on video conferencing – a tool that is not yet at sufficient replacement for in-person meetings.

The problems have resulted in a drastic change of focus from a product oriented approach to a service and system oriented. The illustrations 3.9.1 and 3.9.2 describe the shift in approach for the design team. Both the initial and the final approach have included the development of a product service system but from a different starting point.

This shift of focus has resulted in spending resources on exploring requirements for the physical product of the service, a PDA, through sketches and prototypes and the product service system has not initially been explored on equal terms. The different approaches have been interesting and probably helpful in a complete understanding of the different work methods, but for documentation and overview purposes it has led to many frustrations. An example of this situation is the concept proposals, that relying on a physical product instead of concepts for services.

The result of the process is a product service system where structure and functionality of the service is described through different point of views.

Process reflection

Similar to previous design teams the design team has been experiencing the outcome of the semester as described in the process report of gr.4, 7th semester, 2006 (AD7-ID4 2006):

The approach towards designing a product service system was a challenging task. The previous semester had a more tangible approach towards a physical product. Therefore, the mind for this semester had to shift focus towards the social aspects and interaction between actors in a broader sense than the tangible product-user relationship.

When seeing this project in a perspective it is clear that in the coming semesters a product can not be designed without consider the tangible and intangible products in a product service system. This project has helped the group to realize that products are surrounded by systems and this need to be considered when designing or redesigning a product.

Based on the evaluation of the process the learning goals for the semester seem to be accomplished. However, one of the goals that need to be highlighted is the goal of being able to describe a system through different actor's point of view and to be able to handle actors and their connections in a design process. This goal has been experienced as one of the main aspects of the process and it is a skill that is going to be used in future design processes.

ill.3.9.1 Service based on product.

ill.3.9.2 Product based on service.

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Illustrations

Illustrations of own production are not mentioned in this repport.

Neither are the images that have been distributed under Public Domain or Creative Commons.

Ill. 2.6.1

http://www.doro.com

Ill. 2.6.2

http://www.emporia.at

Ill. 2.6.3 – 2.6.6

http://www.doro.com

Appendix

Cases 1, 2 and 3 from “Transportation needs”

Cultural probe results

Initial work (brainstorming etc)

Interaction test (the interaction product)

Scenario play for the interaction vision

“Final concept” appendix