

Module DB313

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DESIGNING FOR THE USER EXPERIENCE



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INTRODUCTION

This report describes a new and innovative transportation concept for Strukton mechanics. The process and outcome focus on the location of the High Tech Campus in Eindhoven where Strukton Worksphere provides maintenance and emergency repairs.

Through a pressure cooker of two weeks where we emphasized on designing for the user experience, we were able to design the TechGreen Drive. The TechGreen Drive helps the Strukton mechanics to work more efficient by increasing their mobility on the High Tech Campus.

Hopefully this report inspires you to think in new directions.

Yours truly,
Tove, Jeroen, Marlou

TECH GREEN DRIVE



Introduction

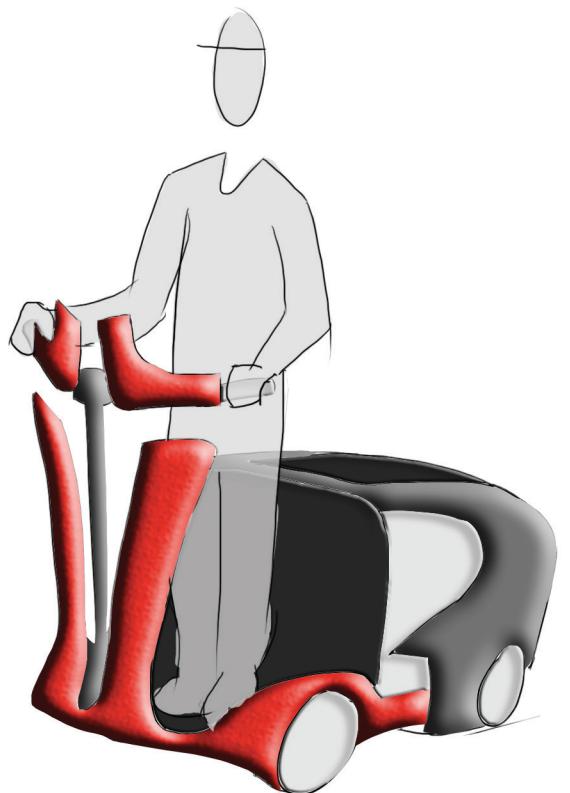
Mechanics are not allowed to park their vans in front of the clients building for longer than two hours. They receive complaints about the vans, which officially need to be in the parking garages of the terrain. However, placing the vans in the parking garages makes it difficult for the mechanics to work in an efficient way since they have to walk back and forth between the clients' buildings and the parking garages for tools. It is more efficient, especially during emergency repairs that can be solved within 10 or 15 minutes, to park the van in front of the clients' building. Otherwise, it takes them up to 45 minutes to drive to the parking garage, walk back to the building, fix the problem, and then walk back to the parking garage. As discovered in the interviews with multiple mechanics, this issue resolves in annoyances from both the client and the mechanics from Strukton.

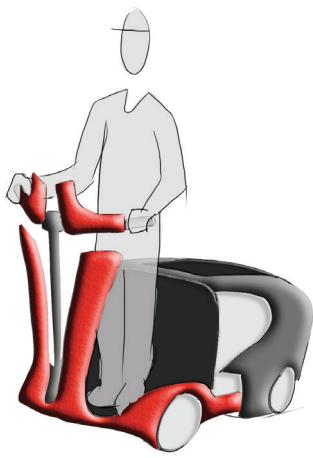
"Actually they send a mechanic away who is trying to help everybody, they make it so hard for us to do our job, mission impossible if you ask me"

Concept description

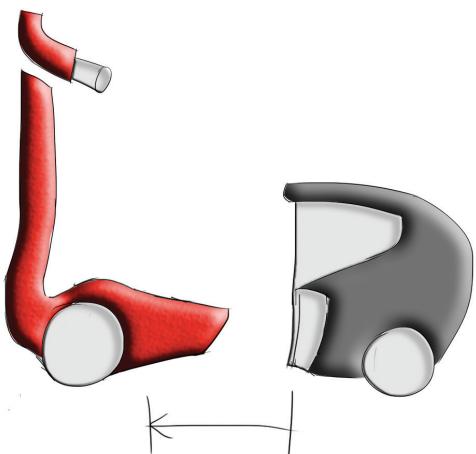
The TechGreen Drive is able to reduce the Strukton vans on the terrain to a minimal. This new transport vehicle enables the mechanics to literally drive into the clients' building with all their tools. When the mechanics miss a required tool or replacement part, they can easily drive back to the Strukton building without having to worry about a van.

The TechGreen Drive exists out of two parts. The first part is the motorised part, a platform with two wheels that mechanics can stand on, steer and drive. The second part is the 'box' to store and transport tools and equipments.

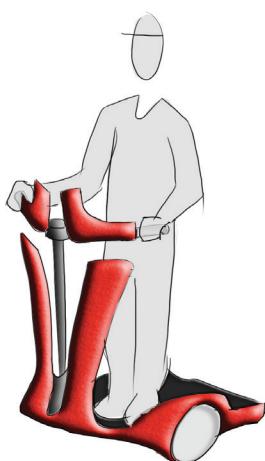




The TechGreen Drive is electric motorised
and has solid tubber tires



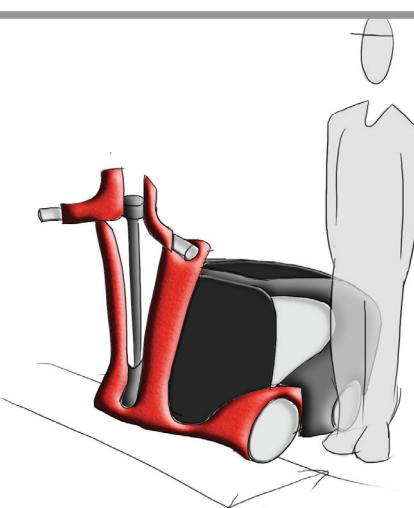
The box can easily be connected and
disconnected from the TechGreen Drive



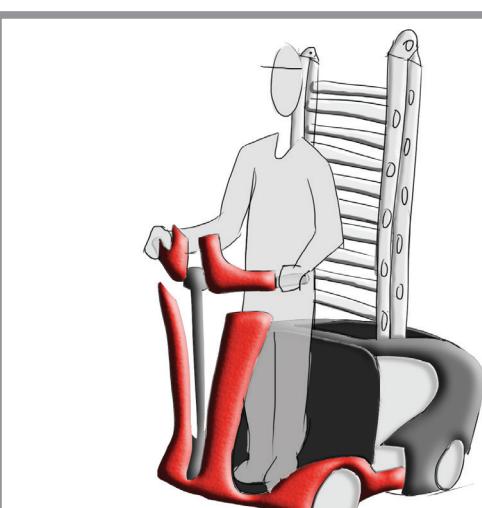
When the box is detached, the drive part
can be used to drive back and forth to the
Strukton building for tools



Retract the TechGreen Drive into the box to
make the vehicle more compact when going
inside a building

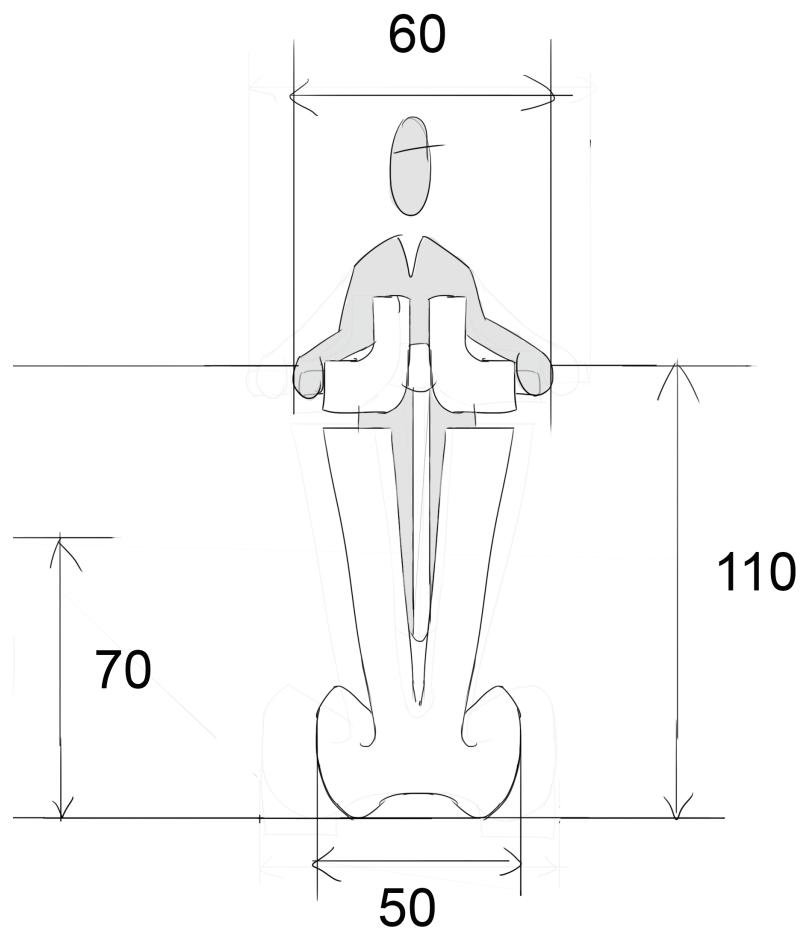
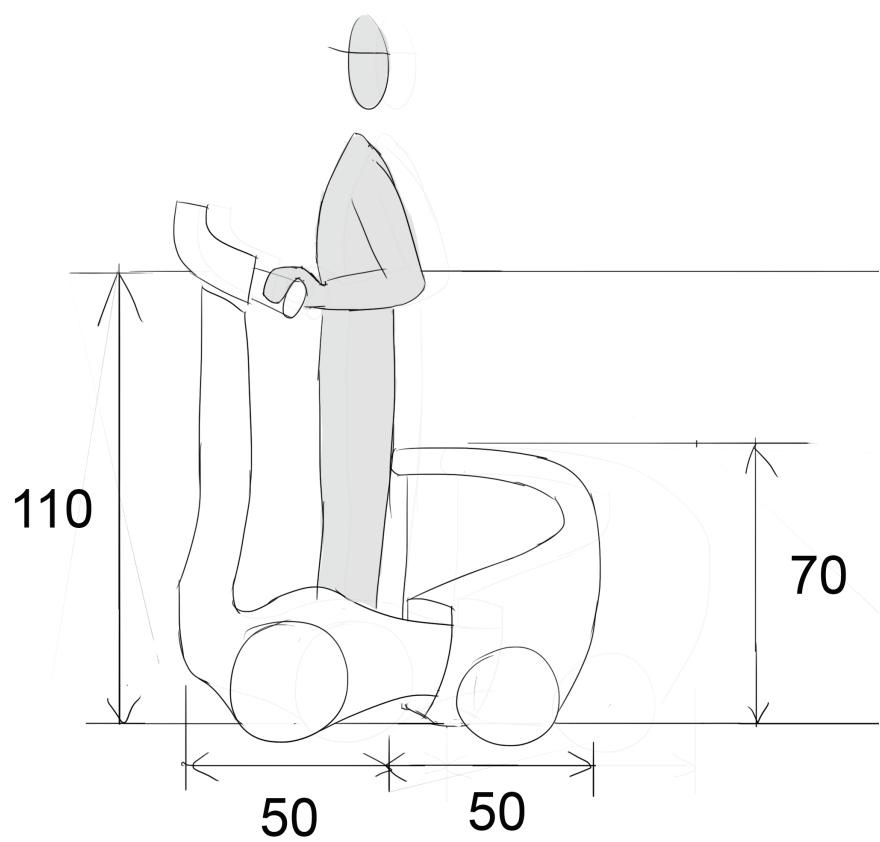


Turn the steer in the other direction to
convert from driving mode outside to push
mode inside.



A ladder can be attached in the back



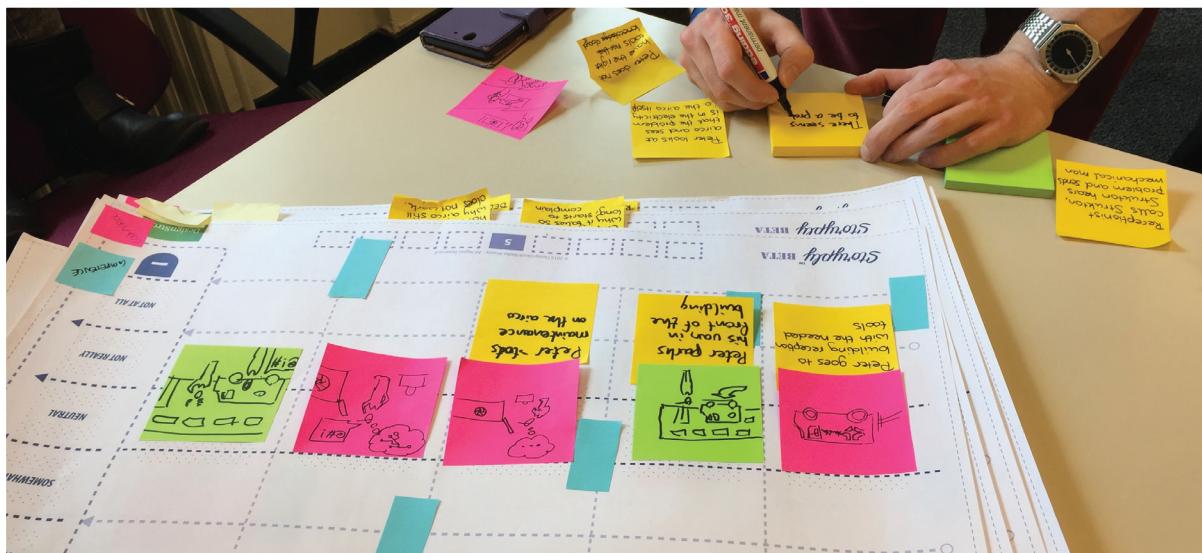


STORYPLY

Storyply is a methodology to develop new ideas for the user experience by having a persona as a starting point. For that persona, a conflict is identified with the consequences, followed by a proposal and a vision of improvement. The storyply methodology enabled to get a better understanding of the possible design scenario's. Before creating the scenarios, a persona was created. Whereas this persona and the first scenario were based on assumptions, it can be seen as a starting point for discussion and it arrises questions for the interviews with the mechanics.

The scenario addressed the problem that mechanics receive a message for a broken airconditioner, but when they are at location the actual problem is in the electricity, rather than a mechanical problem. Due to this, the mechanic did not bring the right tools and has to go back to the Strukton building which is very time consuming.

Within the storyply the main focus was on competence (the feeling that you are very capable and effective in your actions rather than feeling incompetent or ineffective) and control (the feeling safe and in control of your life rather than feeling uncertain and threatened by your circumstances) of the user experience. This gave the outcome of three possible ideas.



STORYPLY

Ideas

- Drone that can be send back to the Strukton office to pick up the right tools. This way the mechanic does not have to travel back and forth with his van. He can wait at location until the drone is back with the needed tools.
- Van that can be altered in size. The mechanic does not always have to drive around with a van if he only needs a few tools. He can make the van bigger and smaller with seperate compartments.
- Application to detect other mechanics. With this app, the mechanics can check if there is another Strukton mechanic nearby who does have the right tools with him. This way the mechanic does not have to go back to the Strukton building, but he can go to his colleague nearby to pick up a needed tool.



INTERVIEW SESSION 1

The goal of the interviews was to see if our assumptions from the Storyply were false or true, and to see how the mechanics feel about their workdays and what other design opportunities can be found. Overall, the mechanics were pleased that their workdays are varied and self-directed, but they expressed irritation and frustration when talking about the communication with clients and the parking of the vans.

When looking at the communication, the main frustration arose from miscommunication and incomprehension from both the mechanics and the clients.

Quote: "A client heard an annoying sound, but me and my colleague heared nothing. Then I don't understand why they call us. I try to stay friendly but sometimes there is just nothing I can do for them."

Quote: "I get tired of doing the same things over and over. Such as switching a button, because the manager of the building does not want to make an effort to have it replaced."

When looking at the parking problem, it became clear that there is a conflict with the needed vans and the concept of the High Tech Campus. Whereas the High Tech Campus tries to focus on environmental friendly and no cars on the terrain itself, the vans are needed for the mechanics to transport their tools from one location to another. The fact that the mechanics are not allowed to park their vans in front of the clients building for longer than 2 hours, makes it sometimes difficult to work in an efficient way.

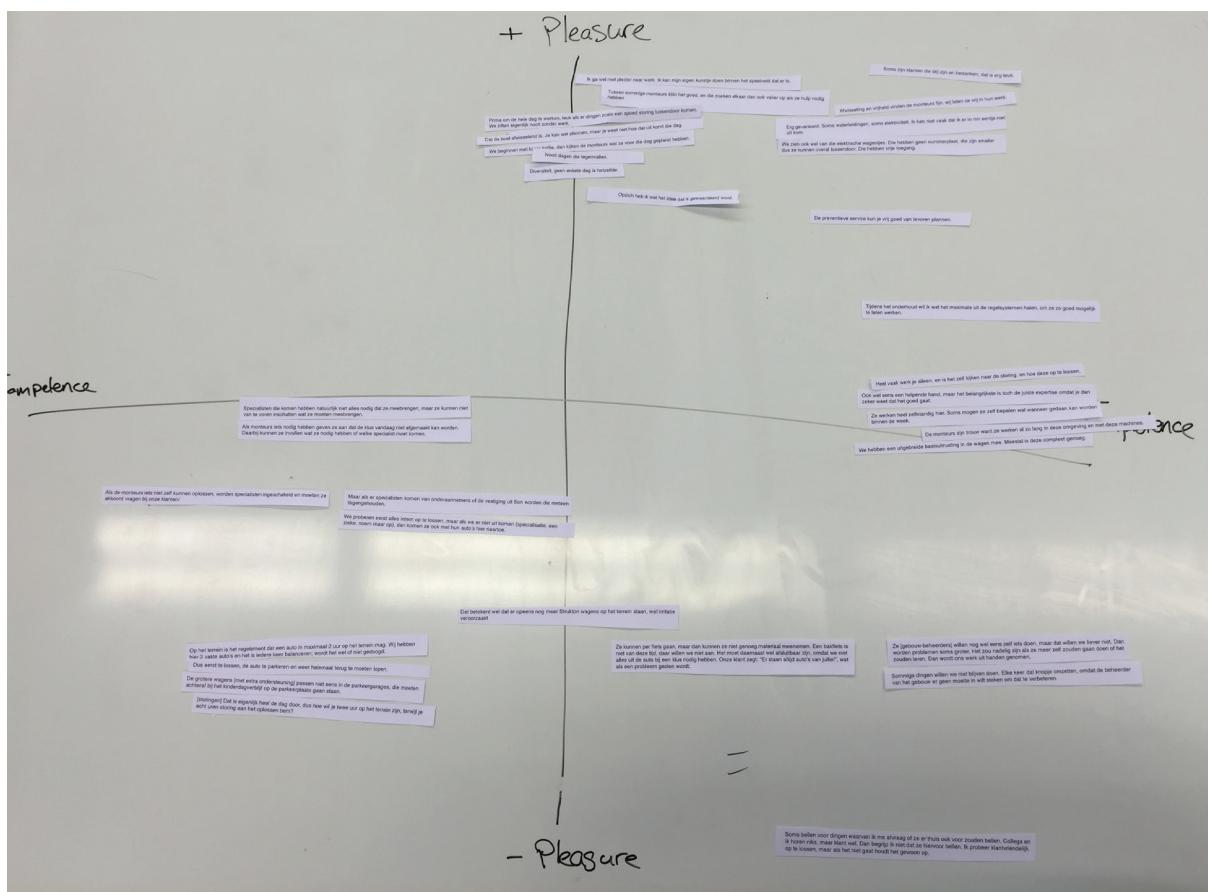
Quote: "We receive emergency repairs throughout the day. How do you want to be on the terrain with your van for only 2 hours, when you have 8 hours of repairing to do?"

Quote: "The big vans don't even fit in the parking garages, we have to park them at the daycare terrain. This can mean that you have a job at the other side of the high tech campus and first have to go and unload your van, then drive to the daycare terrain, and

ANALYSING

All interviews were recorded and transcribed. The relevant parts in the transcriptions were marked, printed and cut. Different themes were created to create an overview of the different relevant aspects of the interviews. The created themes were reviewed to see if there was any overlap or not fitting segments.

When applying the storyply method the main focus was on 'competence' and 'control' of the user. During the interview the importance of the value 'pleasure' as emphasised. For this reason there was decided to focus on the values 'competence' and 'pleasure' for the following analysis. Mapping the data of the different themes within these values gave insight in relevant and interesting aspects to focus on for further ideation.



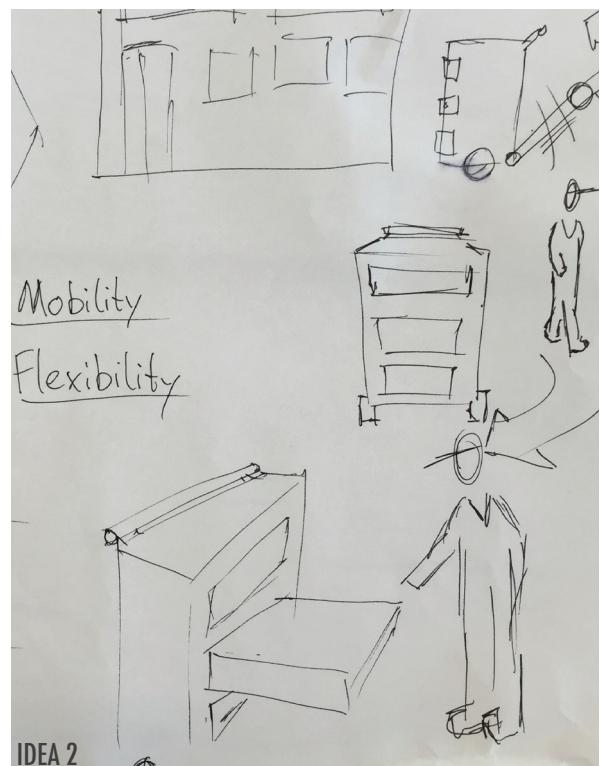
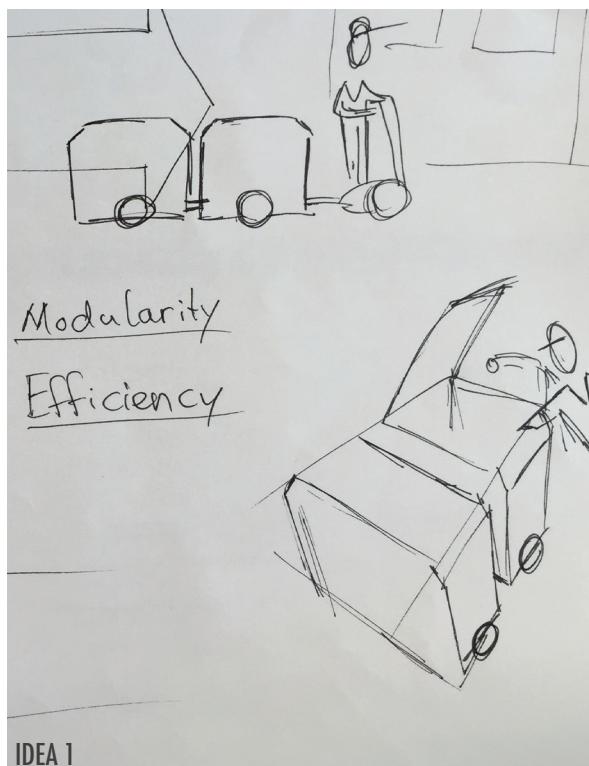
IDEATION

The parking problem of the van was taken as a starting point for further ideation. From an extreme point of view, the ideation went out of the box with solutions such as sailing boats as a transportation. The extreme ideation gave two interesting and suitable ideas to work with.

The first idea was a transformable van that could be altered to the needed size. If there are not a lot of tools needed, the van can become a small size, but when big tools are needed the van can be extended to a large size.

The second idea focussed on a small transport vehicle that can be extended to a train of following wagons with needed tools. This train can be made shorter or longer depending on the required tools for that day.

Both ideas are transport vehicles that work on electricity, which solves the problem that they are not allowed to park vans in front of the clients buildings.



CO-CONSTRUCTING STORIES

After the first phase of concept development, the Co-Constructing Stories method was used to elicit feedback about whether the concept is considered valuable by the target group.

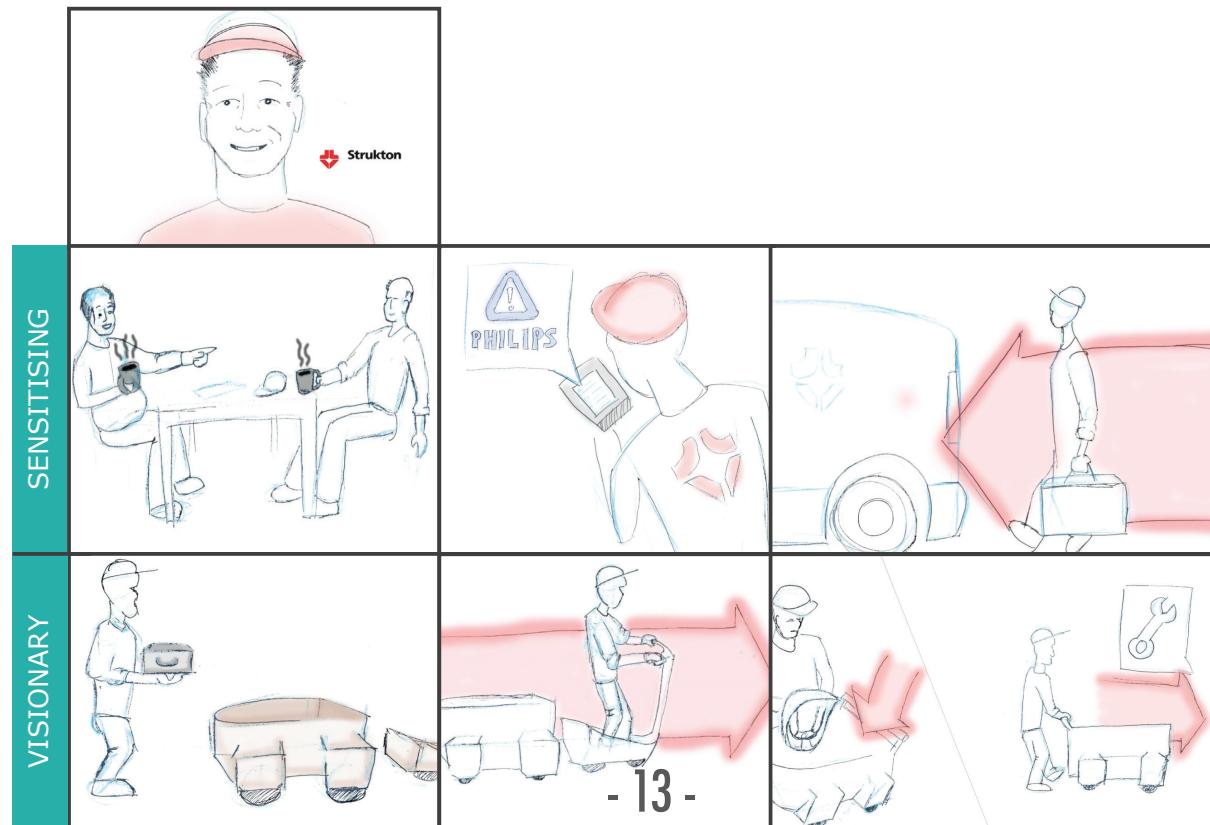
Three research questions were formulated:

- What does the current situation look like? What are solutions for the parking problem and transportation of tools?
- What does the user consider positive and negative about the concept?
- Can the user empathise with the concept and how does he feel about it?

Two stories were created; a sensitising story and a visionary story.

The aim of the sensitising story was to set the stage for dialogue and to trigger stories about the current situation. By means of a storyboard video the context of transport to the location of maintenance was introduced.

The visionary story was a continuation of the sensitising story with the aim to introduce the new concept.



INTERVIEW SESSION 2

The goal of the interview was to gain detailed information about the current situation and to elicit feedback on the concept.

The sensitizing story that was open-ended triggered the user to tell about how things are currently arranged and what kind of problems are occurred. The face-to-face conversation offered the possibility for the interviewer to ask questions to gain information in detail and on a emotional level.

Quote: "We have to be there early, because the garages are full within no time. Fixed spots for us? They don't want to do that. We don't have to count on their support, they tell us: there are enough of your competitors that are happy to take over, we will go to these companies then."

The scenario sketched in the first part of the story was confirmed and completed by the interviewed mechanic. The mechanics always have tools with them. Sometimes it happens that they forget to bring some of the needed tools, which makes it impossible for them to finish the job at that moment. At this moment, they have to drive back with the van to the Strukton office, or they have to finish a job later that they so that they have time to get the right tools in their lunch break. The client is not pleased with the vans on the terrain, and on top of that there is frustration when a mechanic is unable to finish the job quickly. The interviewed mechanic said that he would rather drive inside the building to be as efficient as possible.

"I would rather just drive my car inside the building or up to the front door, solve the problem within 10 minutes, and be done with it."

The showed concept of the TechGreen Drive confirmed that there is a wish from the mechanics to have easier transport on the High Tech Campus. When talking about the emotional feeling towards the concept, the mechanic was enthusiastic and saw a lot of potential. In terms of the look and the feel of the TechGreen Drive the mechanics are more

INTERVIEW SESSION 2

focussed on efficiency rather than the look and feel of the transport vehicle. As long as it is easy to use and helps them to transport themselves and the tools quickly, they are satisfied. They would rather have an ugly car with great wheels and a perfect toolbox, than a nice looking device that is inefficient. This was also confirmed when the mechanic saw the concept and his first reactions were all practical and technical.

"You should think about the technical part, such as the wheels if they are easy to use on public roads. We have toolboxes with castors but they don't move smoothly so we have to push really hard. They are not efficient to use and they are very unhandy."

Analysing

The interview showed that the number one priority for the mechanics is efficiency, which has a big impact on how they experience things during work. They would like to move around on campus in a more efficient way, which will result in more pleasure for the mechanics and less stress and annoyances about the vans. Especially when there is an emergency repair and the mechanics have to be on location to fix the problem within a set time. To enhance the mechanics experience, the main focus should be on the practical level of a good vehicle such as the tires and the movement, rather than the design itself.



CONCEPT DEVELOPMENT

Inspiration

To see what the look and feel of the concept should be, a collage was made with materials and shapes. A mix has been made between the green and technological environment of the High Tech Campus, the brand identity of Strukton, and the functionality and efficiency for the mechanics. This resulted in the TechGreen Drive which has the possibility to transport basic tools to the needed location in an environment friendly way by using an electric vehicle. The vehicle is designed in such way that it can be transformed from a vehicle into a toolbox that can be taken into the building. Due to this, there doesn't have to be a van in front of the building. The driving device can be disconnected from the toolbox which makes it possible for the mechanic to quickly drive back and pick up tools.

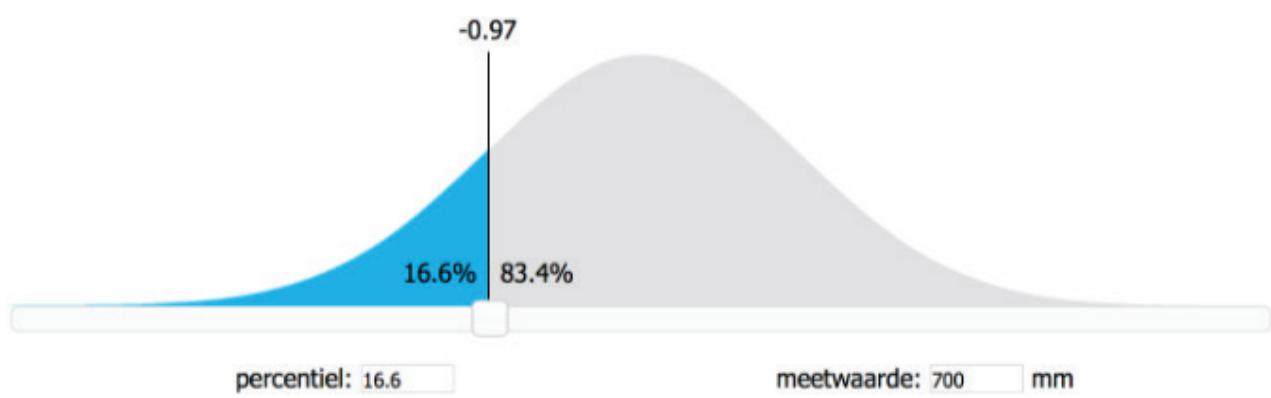
Ergonomics

The ergonomics of the dutch male citizens in the age category of 31-60 years old is taken into account in the concept development. This showed that the elbow height is 110 cm from the ground. The height of the steering wheel is 90 cm so that the arm slightly bends downwards while driving. The functional arm length is 75 cm, which has led to the toolbox being 70 cm deep so that 84% male dutch citizens in the right age category can easily reach to the bottom. This in combination with the hip height of 99 cm shows that there will be no ergonomical problems when taking tools out of the toolbox.

[source: <http://dined.io.tudelft.nl/>]

populatie: DINED 2004 (31-60 jaar), man
maat: 20. functionele armlengte (mm)

mean: 746 mm
standaard afwijking: 47 mm



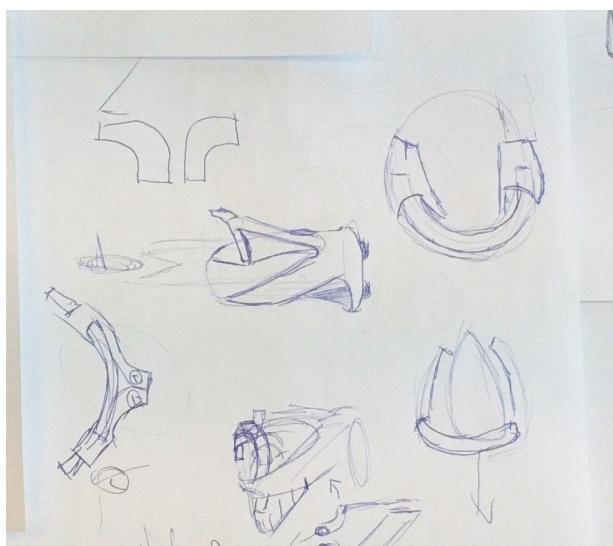
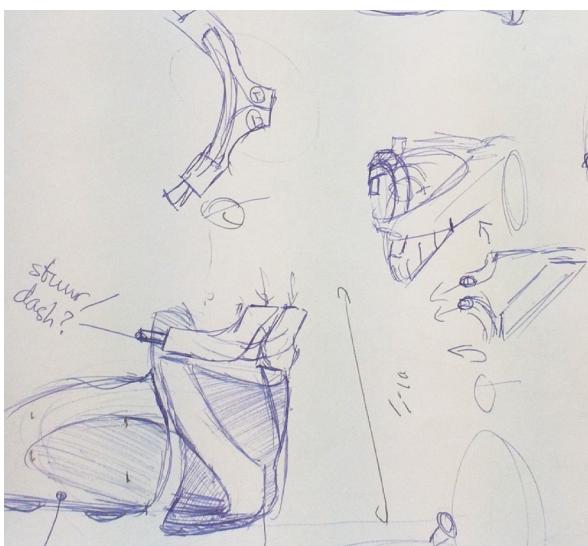
CONCEPT DEVELOPMENT

Experiential needs

The second interview showed that there is a need for vehicles that enable the mechanic to drive back and forth between the client buildings and the Strukton building for tools and equipment. Due to this we made a transport vehicle that enables the mechanics to drive back to the Strukton office while leaving the other tools at the clients location. The TechGreen Drive can easily be detached from the toolbox and used as a fast transport vehicle.

Quote: "A fast transportation is desirable. If I have a vehicle that enables me to quickly go back to the Strukton office for a piece of cable or a clip, that would be useful. Just a small vehicle to go back and forth in an efficient way"

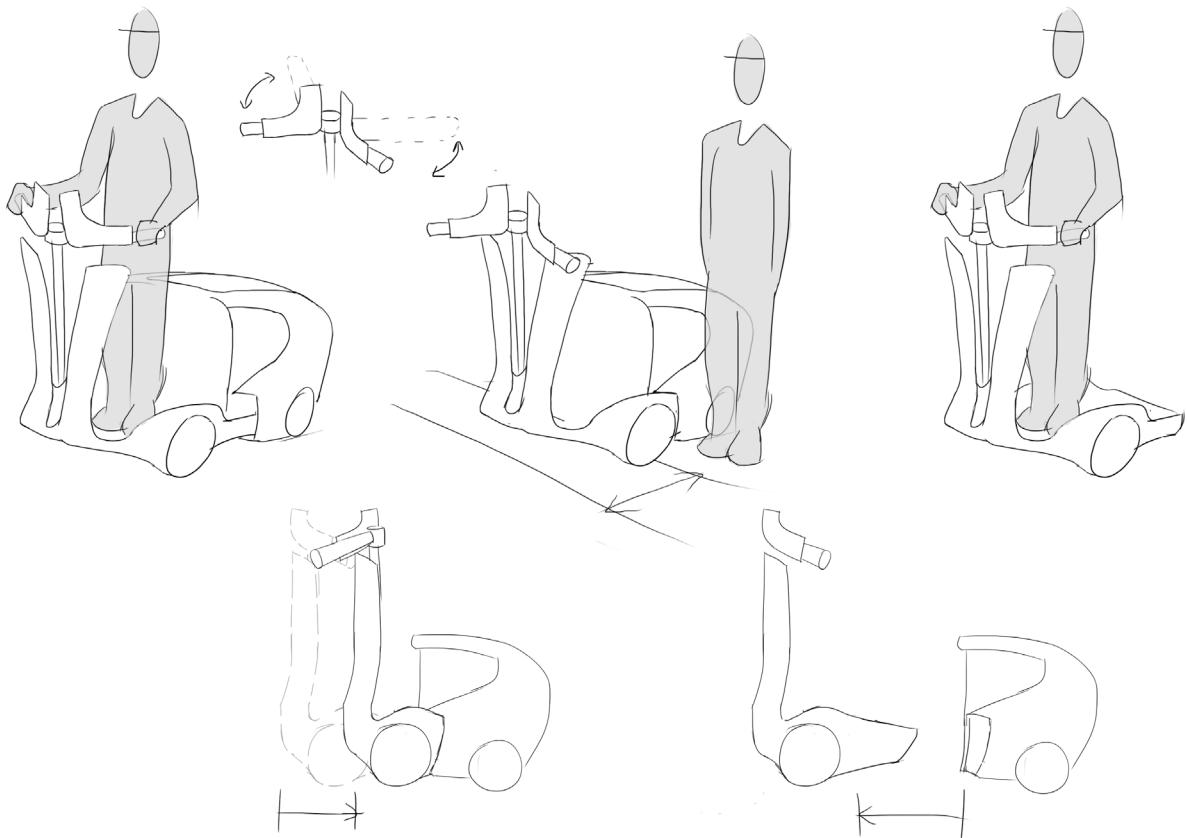
To make sure that the TechGreen Drive does not take too much space and is easy to use within a building, the driving part can be retracted in the toolkit part. This makes the TechGreen Drive more compact. In addition to this, the steering wheel can be altered from driving to pushing. When driving on the TechGreen Drive, the steering wheel is situated on the driving compartment to steer. When the driving compartment is retracted in the toolkit part, the steering wheel can be changed so that the mechanic can push the TechGreen Drive into the other direction.



CONCEPT DEVELOPMENT

Formgiving

The formgiving of the TechGreen Drive is meant to show the identity of Strukton. The logo of Strukton and the colors provided a basis for shaping the driving pod. Although part of the identity is that Strukton is invisible, working behind the scene and solving problems on-sight without too much presence. The type of transportation allows for minimizing this presence, but by showing the Strukton logo rather prominently, it gives Strukton a strong identity. By using organic lines, the form of the pod and the toolbox have a dynamic look. It was decided to leave the "green" image to the technicalities. As it is an electric vehicle, which does not make engine noises, it implies environmental friendliness.



RECOMMENDATIONS

Although a basic ergonomic research was conducted, more information needs to be gathered to see how the mechanics will ergonomically stand and drive on the TechGreen Drive. This can be done through desktop research, but it is recommended to develop quick and dirty prototypes to see how the mechanics stand on the driving pod.

The concept has been developed to a basic level, such as the possibility to charge the green car, the changing of the steering wheel, and the disconnection of the toolbox from the driving part. No technical foundation is yet developed for this.

The third issue is the speed of the TechGreen Drive. As discussed with the mechanics, the maximum speed on the high tech campus is 30 km/h. However, safety issues need to be taken into consideration for the TechGreen Drive and further research is required to see what the maximum speed of the concept should be.