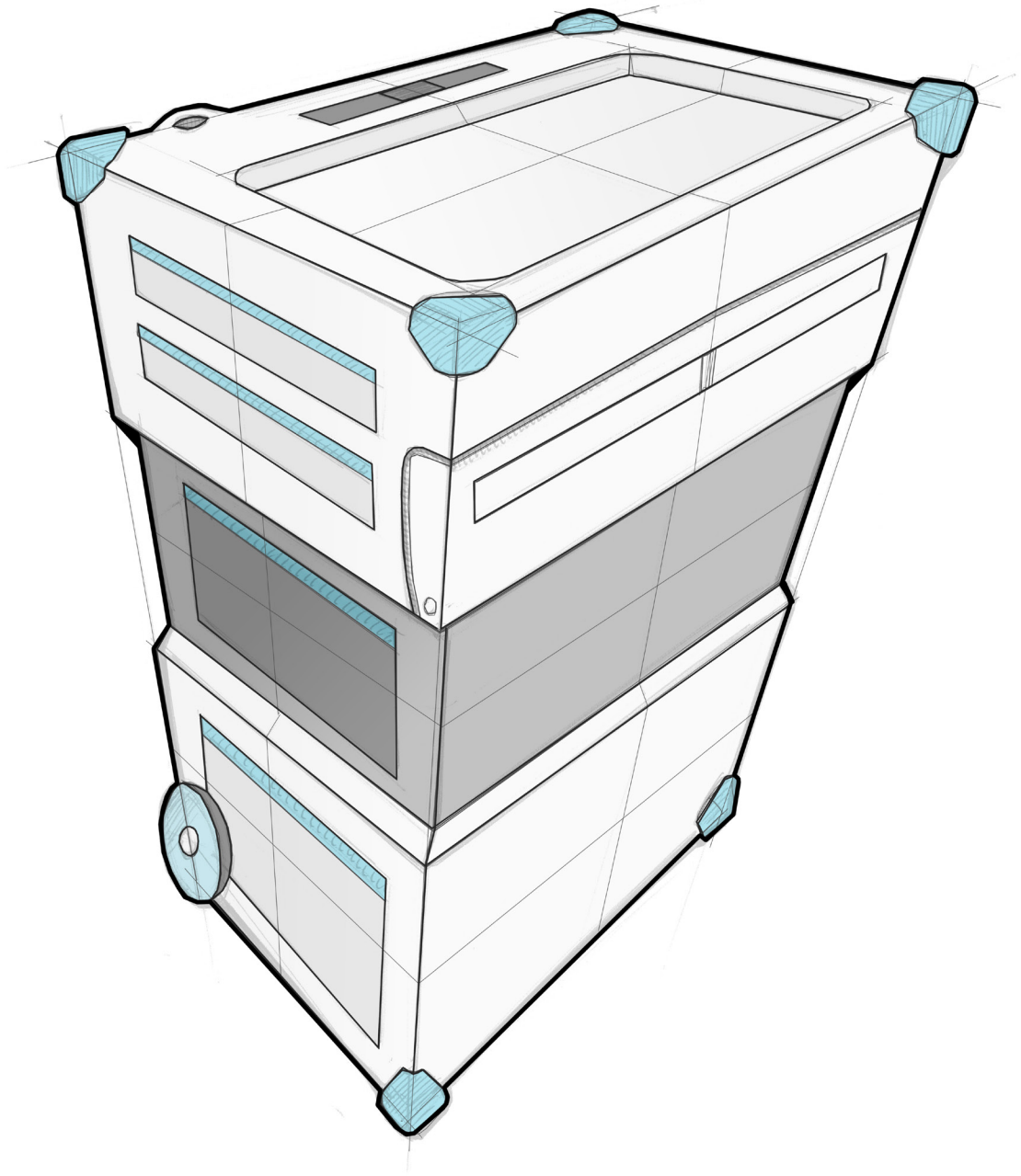


# Designing for the User Experience



Yannick Brouwer S119479

Bart de Klein S101635

Bram Rutten S140795

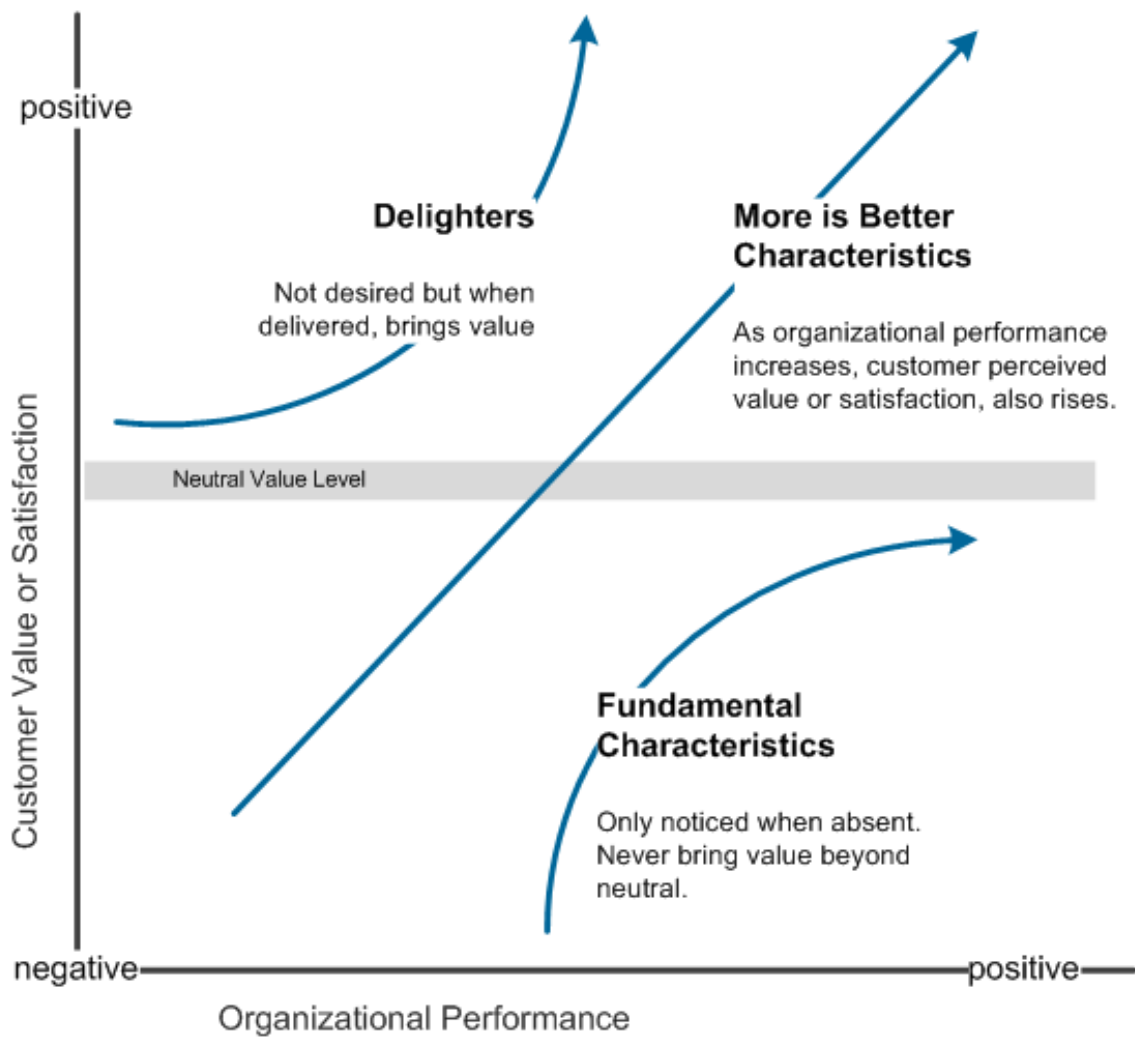
# Client Briefing

On the first day of the module, Sjef Wijnen from Strukton Worksphere gave the briefing for the design case. Strukton is a Dutch company specialized in infrastructure, construction and installation services. In his presentation he explained the highly competitive market space the company is in.

The construction and installation markets are conservative markets, where a group of large companies offer practically similar services. To differentiate from the competition during procurements, in the past years the companies have mainly focused on decreasing their pricing. Over the years, the bottom of this business model has been reached. As a result of this, Strukton is looking for new differentiators to stand out from the competition.

To illustrate the situation, Sjef used the model of customer satisfaction by Professor Noriaki Kano. In this model, services and features are divided in basic, performance and excitement factors. When basic factors aren't addressed properly, they become dissatisfiers for customers. When a company addresses performance factors properly, they will work as satisfiers for the client. Like the competition, Strukton has always focused on these factors, it's what clients expect from such companies. According to Wijnen, Strukton wants to focus more on the excitement factors; delighting customers by offering better or additional services compared to the competition.

For the design case, the students had to work for Strukton Worksphere on the High Tech Campus in Eindhoven. Strukton Worksphere, one of the 5 subsidiaries of Strukton is focused on facility management and the servicing of technical installations in buildings. By means of various user-centered design methodologies, the students had to design a solution that improves the work of Strukton's service employees and simultaneously increases Strukton's innovative character and visibility to clients on the High Tech Campus. In other words, the project would act as a case study that could be used in communication to potential future clients to address Strukton's additional services; Strukton's excitement factors.



Kano Customer Satisfaction Model from "Attractive quality and must-be quality" (1984).

# Storyply

The Storyply methodology concerns the practical outcome of the doctoral design research that Berke Atasoy has been conducting at the Eindhoven University of Technology. The Storyply workshop was a session that facilitated the integration of storytelling in the design process. The goal of this workshop was to envision user experiences within the scope of the project. Its setup consisted out of multiple steps which helped participants in storythinking and -telling, resulting in user experience based concepts.

The input of the workshop was derived from the design brief of Sjef Wijnen. The two main areas that implemented in the workshop were the mobility of the Strukton service mechanics and the image of Strukton Worksphere towards their clients. The overarching theme of the envisioned experiences in the workshop was 'Empowering client relations through maintenance.'

A cast of characters was created in order to determine points of tension. The main character is Peter, an office manager at Philips Research. Supporting characters are a Philips researcher named Florence, a general manager at Philips, Henk the mechanic from Strukton Worksphere and Sarah, an office employee at Strukton Worksphere. Peter is motivated to create a comfortable work environment; things just need to work. Points of tension for Peter are bureaucratic struggles, planning of secondary tasks and his mission to make sure that everyone is comfortable.

The context of the experience was set. The experience takes place at Peters department in an office with cubicles with adjacent labs. People involved are colleagues and an external delivery guy. The office is fitted with artificial lighting and climate. There is high tech and specialized equipment within the adjacent labs.

After the characters and context were determined, the points of conflict were identified by means of a scenario. The scenar-



An open notebook with handwritten notes and a pen resting on it. A yellow sticky note is attached to the left page.



io starts with a broken ventilation system. Subsequently, Florence notifies Peter about the bad air quality in the lab and Peter calls Sarah about this problem. Peter meets Henk and explains the problem, whereafter Henk fixes the problem and leaves a note, that appeared quite hard to understand, behind. As a result of this, Peter has to ask Florence whether the problem has been fixed.

So what are the consequences? First of all Florence has to take time to explain the problem to Peter. After that, Peter has to explain a technical problem to Sarah without technical knowhow whatsoever. Subsequently, Henk arrives at the location to fix the problem, but has to go back for the right tools, because the problem definition was not accurate. In the end, Henk writes notes in technical language and leaves them at the main desk which subsequently loses it. As a result of all this, Peter has no idea how the problem has been fixed and what the actual problem even was.

After the identification of the conflict and its consequences, a first proposal was created. In this proposal, Florence has a tool to notify Peter quickly from a distance. Either Sarah or Peter checks the technicality before planning the jobs, so that Henk knows what the problem is and has the right tools with him right away. In addition, Henk is facilitated in writing an understandable maintenance note and dropping it of at the right place. Finally, Peter receives an understandable note about what has been done.

But how has the proposal improved the original situation? Both Florence and Peter feel independent and effective while passing through the problem. Next to this, there is a clear problem definition for everyone through which Henk is able to fix the problem efficiently and in time. Henk communicates his findings in clear and understandable language to the client. Hereby, Peter feels secure, competent and in control regarding the solution of the problem.

The concepts that came out of the first proposal were as follows:

- Tags in the building for identifying the problems, so that Henk will have the right tools with him in first instance.
- Central planning for the client and Strukton.
- Central understandable feedback notes in the form of a platform that facilitates better communication for all involved parties.

The workshop was helpful in creating a detailed context of the problem and to communicate this. Going through the steps, forces you to think about how people relate to each other and the context you put them in. By telling stories you get to play with the different user experiences, which helps to imagine and think from the user's perspective. The developed stories were nonetheless based on assumptions about the involved characters and their problems. As a result of this, it became clear that the stories did not match the actual workflow of the users, after having spoken to them later on in the design process.

Broken

Air - Suction  
Installation  
(ventilation)

Autonomy

Independence

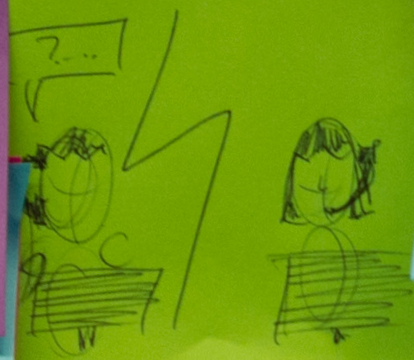
Competence

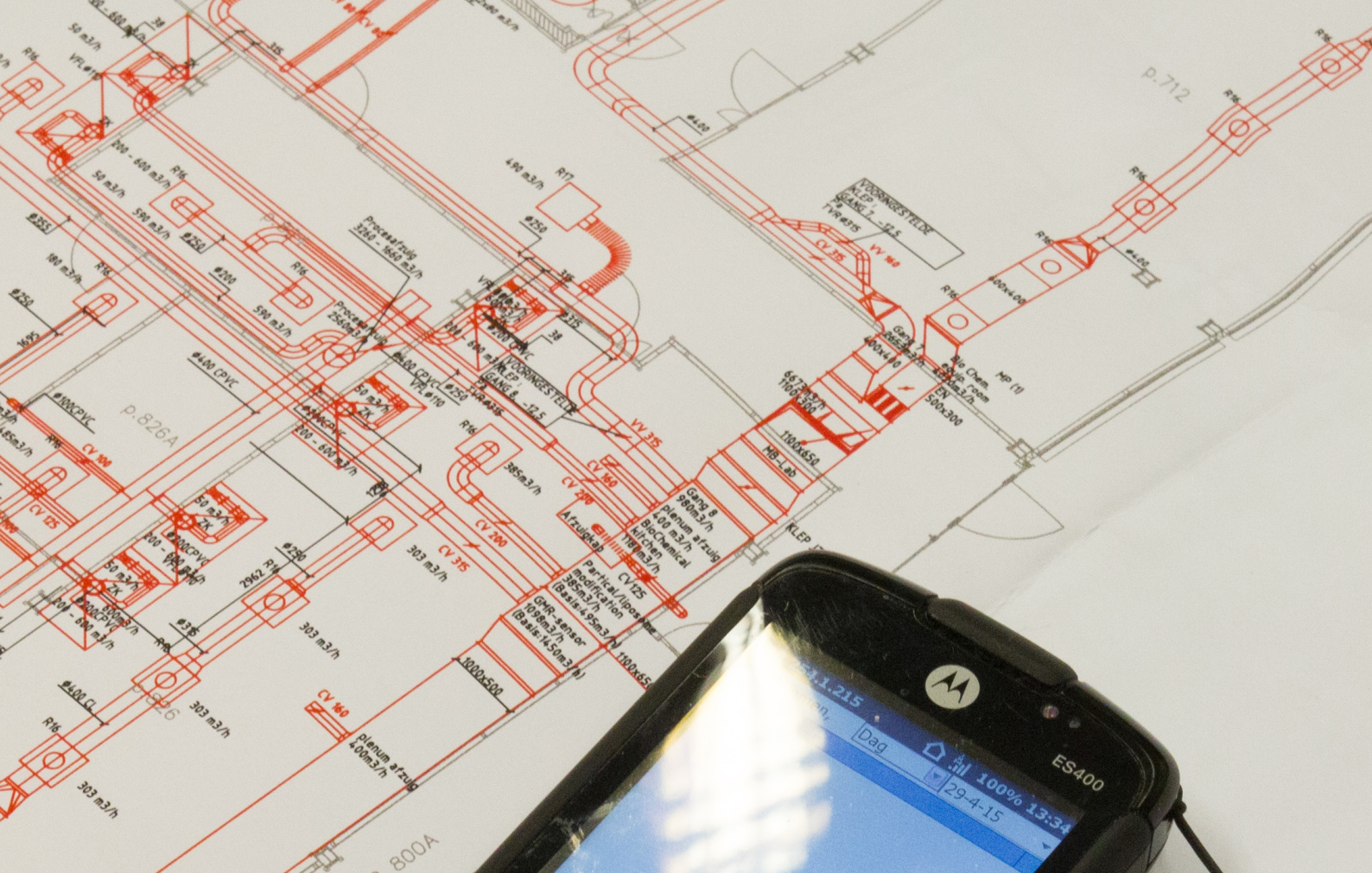
effectance

Florence  
notifies Peter  
about the  
bad air  
Quality  
in the  
lab

Peter calls  
sara about  
an air quality  
problem in the  
lab.

Peter meets  
Herb and  
explains  
the problem







# Interviews Strukton

To learn more about the daily work of Strukton Worksphere on the High Tech Campus, two service technicians and one planner were interviewed. The individual interviews each lasted for approximately 30 minutes. The service technicians had respectively 19 and 29 years experience on the High Tech Campus and it's precursor, the Philips NatLab.

During the interview we learned more about Strukton's organizational structure on the campus. The technicians are divided in electrical technicians, mechanical technicians and precision measurement system technicians. The company makes use of a "System Control and Data Acquisition" platform called iFix, to be able to read and control values of different systems in the buildings and on the campus in order to get automated notifications when certain values exceed a threshold, indicating a system failure. Tasks can come from both human notifiers as well as from automated notifications. These tasks are managed in a task management system that can be addressed from the PDA by the technicians. When they finish a job, they can sign off a task and continue working on a new task.

The service technicians indicated that solving and optimizing technical challenges is what they love most in their job. The employees have a high level of flexibility in choosing their tasks and it was expressed by both technicians that this was something they really valued in their daily workflow. Other aspects that were addressed were the high degree of autonomy, variation in their daily tasks and clear communication within the team and as well as with local management.

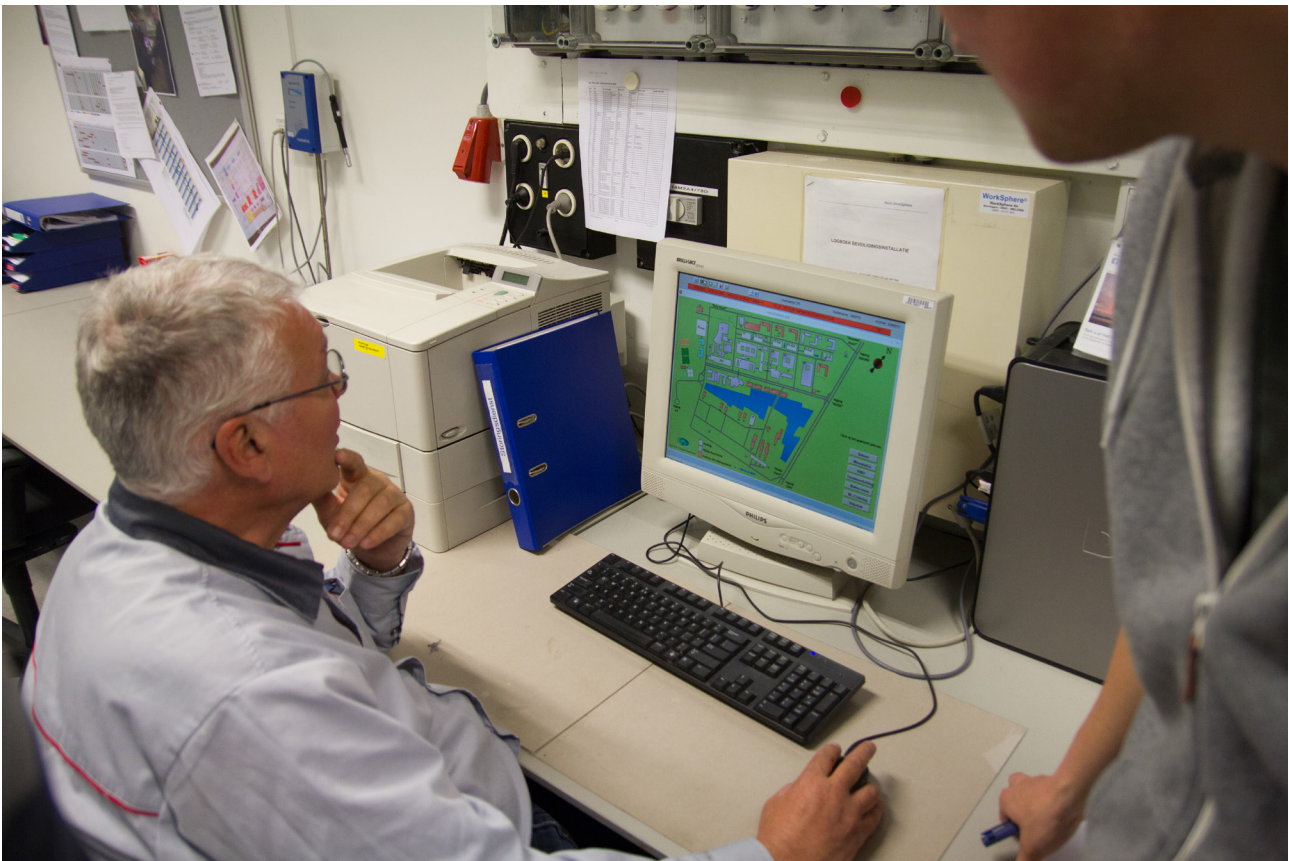
As mentioned in Sjef Wijnen's initial briefing, the area of mobility was a broader-based desire within the company. One of the technicians mentioned it as being the biggest "handicap in the job". It has

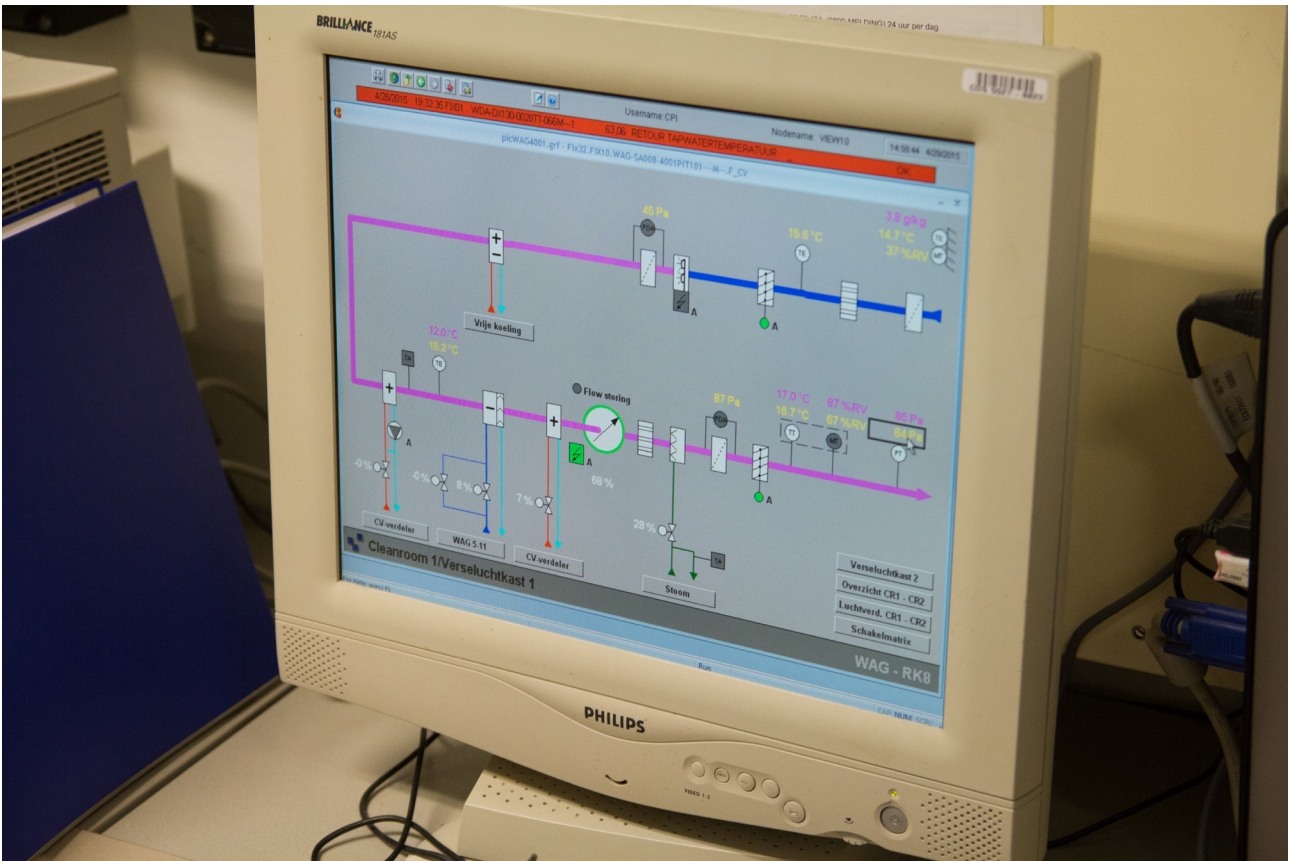
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*We gebruiken gewoon een karretje, twee wieletjes er op, kistjes er op, laptop er op, en daar gaan we er mee naar toe.*

to be stated though that the service staff was already informed about the focus on mobility within the design brief. Opinions therefore could be biased in that direction.

An important learning experience for the team was that design doesn't necessarily have to start from a problem definition. In a central group discussion with all the teams of the module, it was expressed that Strukton's workflow on the campus was functioning very well. The service technicians were very experienced and they had access to advanced tools which support their daily work. In other words, there were no big problems found. Designers are often focused on finding "problems" and addressing those problems. Especially in case of designing for an improved user experience, a design process doesn't necessarily have to start from a problem definition.





# Data Analysis

Handwritten notes on a blue sticky note.

Handwritten notes on a blue sticky note.

Planning

Multiple strips of paper with printed text and highlighted sections in yellow and red.

Handwritten notes on a blue sticky note.

Handwritten notes on a blue sticky note.



Mobility

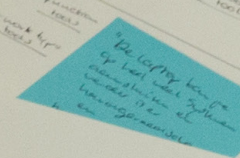
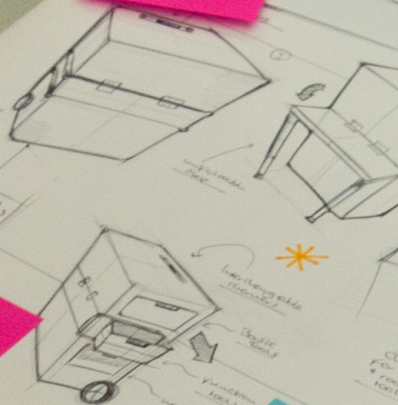
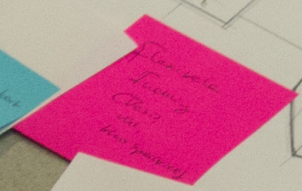
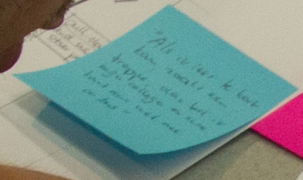
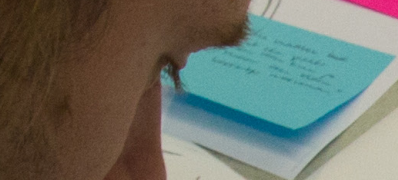
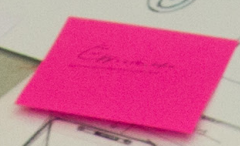
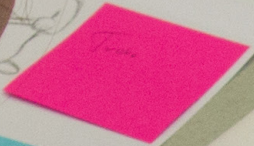
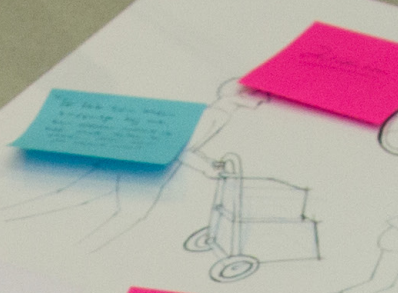
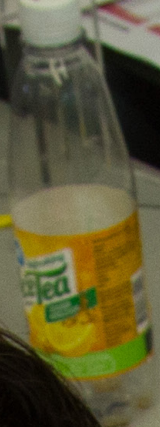
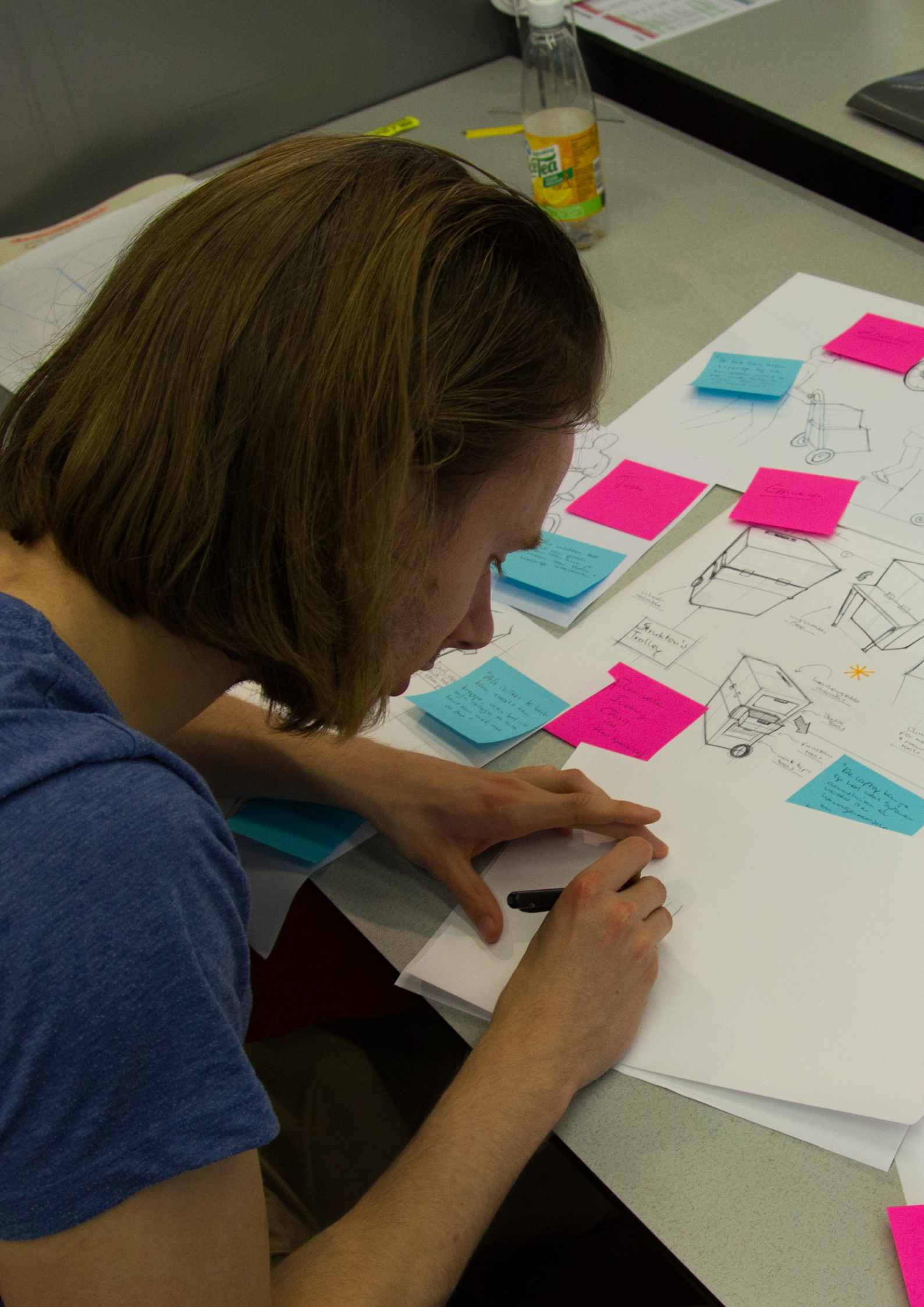
Workload

Internal communication

Organizational structure & planning

The qualitative data was analysed by means of affinity diagramming. Open coding was used to find different categories in the data. The categories derived from our analysis were (Translated in English) :

Technician Workflow, Repair Service - Day, Repair Service - Night, Organizational Structure & Planning", Mobility, Internal Communication, External Communication and Client Communication.



# Concept Development

After the client briefing and the interviews done on-campus, the project focus seemed to have split goals. At one side there was the business perspective, improving client visibility and brand image to increase distinctiveness for Strukton as a brand, and at the other side there was the employee perspective that is mainly focused on increasing mobility for the technicians. Although the business objectives were clearly related to the user experience, putting too much focus on this direction would not meet the teams' objectives for the module. As discussed in the lectures, validation of radical innovations with users can be complex because users are not always able to relate to the proposed concept and context, therefore it was chosen to focus on incremental innovations closely related to the context. To increase the opportunities for user research and validation in the module, it was decided to focus in detail on improving the tools for the service technicians.

The technicians mentioned that the vast majority of jobs was addressable by bike, but in some cases it was a bit clumsy to bring all tools with them. To increase the mobility and flexibility of the technicians, a flexible and representative tool case was developed that could be snapped on the bike. The goal in the concept was to find the optimal balance between a limited handkit on a bike and a "full service van" that is needed for only a small part of the jobs.

In addition to the smooth connection of the tools and an accessible way to get the tools, the tool case can be expanded to be used as a stair. This solution can in some cases limit the need for taking additional stairs and therefore limit the time the van needs to be used on-campus. Other advantages of this new proposal is it's relatively low investments costs compared to developing a new van. In addition, this type of custom bike differentiates more compared to a traditional van in terms of company visibility. Another important issue it addresses are the complaints that Strukton currently parks their vehicles prominently in front of buildings.

Sjef Wijnen's original idea was to use a new and innovative van to increase the visibility and brand image towards clients. While asking around on-campus, it was noticed that many people didn't know the exact role of Strukton and could not really remember their van. From personal experience, the design team started noticing the different service technicians and vans on the TU/e Campus only since the module. Therefore the team believed that customer engagement is more important than "innovative branding" to create customer delight. From the interviews with the technicians, it was learned that the technicians are open for conversation, but that the current amount of engagement is not really high. Therefore the concept was created to trigger campus residents to engage with technicians by cheerful texts on workwear and the toolcase. In the design teams opinion, the new workwear can function two-fold, in case of actual engagement, technicians can share their knowledge with residents. In other cases the workwear informs residents about Strukton's capabilities and is a fun delighter that gives Strukton a more open and friendly character.





Canada



vragen over  
uw klinicaat  
?  
Tik hier



Strukton



# Contextual Inquiry

To learn more about the work and approach of the service technicians and their use of tools, a contextual inquiry was arranged. The team was able to follow a 23 year old service technician who operated on the High Tech Campus without his own vehicle. During the contextual inquiry the technician performed a task which concerned the extension of a coax connection to an adjacent room in the same building as Strukton's office is positioned.

For this job the technician needed to get his portable toolbox and a ladder from the depository and load them onto a cart. "The ladder is a temporary solution" said the technician, "the standard ladders we use can be folded into smaller packages." According to him, the minimal requirement for the average technician is a toolbox with hand tools and a ladder with 4 steps to reach the ceiling. However, even better would be a ladder with 6 steps for tasks which require to open the ceiling.

One of the advantages of the contextual inquiry was seeing how people used and customized their tools. In this case, the technician had made special fittings to his toolbox to have easy and quick access to his screwdrivers. He prefers having multiple screwdrivers over a multi-tool with custom inserts because conventional screwdrivers has a large set of functionalities, for instance to pry lids from sockets. For transportation across the campus he had purchased a little electric scooter from his own budget in order to be more flexible. "I don't like to cycle everywhere, because then I'm already tired before I start my job at the client's office". The technician raised another issue about mobility on the bike: "When there is no vehicle available, technicians sometimes have to carry parts in a plastic bag over their shoulder on a bicycle. This is far from ideal, as technicians often have to travel over the campus for several minutes."







A person wearing a dark jacket and blue jeans, walking away from the camera in the hallway.

A person wearing a dark jacket with the logo "Strukton" and "Werkplaats" on the back, pushing a blue cart with red bins in the hallway.

CAUTION  
WET FLOOR  
OPGEPAAST  
NATTE VLOER

Strukton  
Werkplaats

# Co-Constructing Stories

From the different briefings, research activities and design steps, two opportunity areas were derived. These opportunity areas were increasing mobility for service technicians and increasing customer engagement between Strukton and campus residents, as covered by the two concepts.

In order to validate these two directions, and thereby the concepts, two specific research questions were formulated:

*How could an improved user experience in mobility improve the work of a Strukton technician?*

*What is the perspective of a Strukton technician to a more open character towards residents of the High Tech Campus?*

How could an improved user experience in mobility improve the work of a Strukton technician?  
What is the perspective of a Strukton technician to a more open character towards residents of the High Tech Campus?

The Co-Constructing Stories session consisted out of two scenarios. The first scenario concerned the workflow nowadays and only covered the activities until the moment the service technician had to grab his toolkit. Subsequently, the interviewee subsequently had to finish the story in order to empathize him or herself with the situation and the user. Therefore, this first scenario is called the sensitizing story. The second scenario concerned the envisioned workflow with the tricycle, newly designed tool case and workwear integrated and covered all activities. After presenting this scenario, an open discussion

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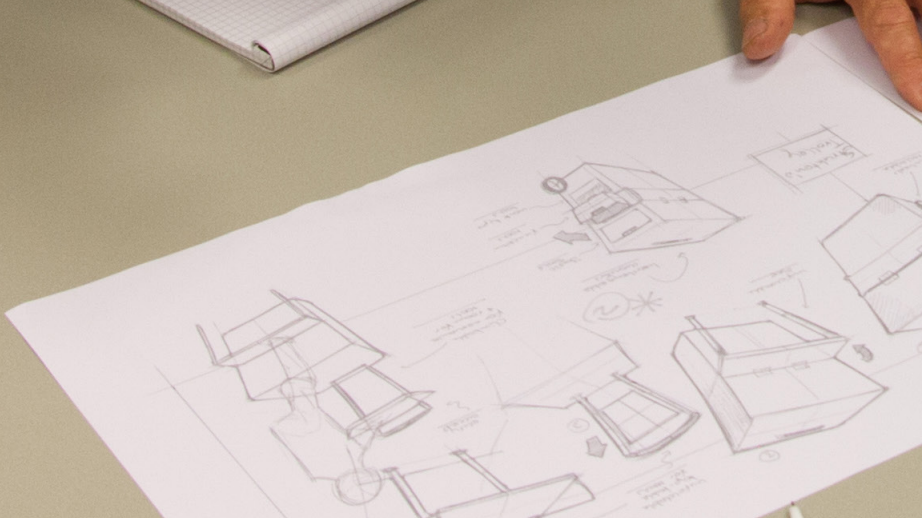
*In het ene gebouw zitten bijvoorbeeld creme kleurig witte stopcontacten en in een ander gebouw zilverkleurig. dat is erg onhandig voor de dienstverlening.*







*Special Package*  
**GAA STRA**  
WIND DIRECTION : 60 DEG  
WIND SPEED : 34.0 K



was performed. This second scenario is called the visionary story. The interviewee for the Co-Constructing session was Arno, a general manager of Strukton's department at the High Tech Campus who also worked for an extensive period of time in his life as a service technician.

The sensitizing story helped to set the context for further inquiry. Arno the technician explained, that some parts of our sensitizing story were not accurate. The first thing to do in the morning is to check for disruptions that arose in the night. It is then decided who is going to do which jobs. In this decision is considered whether to send a technician with or without a vehicle.

The visionary story additionally helped to further identify the issues related to the concepts and helped answering our research questions. Arno liked the idea of the Service Technician 2.0. "It is do-able, I like the practical approach, here and now. The bike should be electric, because a tricycle is heavier to propel and then there is the trolley mounted up front." Arno mentioned that the bike should be equipped with some additional storage space. "What happens when I need to go back for some more tools? Suppose I have already unloaded the trolley from the bike and quickly want to go back to pick up some tools. I need extra storage space on the bike to carry all specific tool or part. Next to this, technicians want their equipment to work. A bike that is hard to propel, will not be used." In addition, Arno addressed the current parking issues on the High Tech Campus. "The client sees our vehicles parked in front of their office and ask themselves whether that is really necessary. Some technicians think that the customer should be happy that we are there, but that is the world upside down; we are still a service providing company."

From analyzing the results of the Co-Constructing Stories session, it appeared that the daily workflow of a service technician would benefit from an improved mobility workflow, or a better user experience concerning the mobility, in this case achieved by the tricycle and newly designed tool case. In addition, Arno pointed out that service technicians would support a more open character towards the residents of the High Tech Campus, which is in the design case's scope facilitated by the new workwear for Strukton.

Based on the insights derived from the Co-Constructing Stories session with Arno, an affinity diagram was created consisting out of quotes from this session, as well as out of points of interest obtained during the contextual inquiry. Mapping of these insights and points of interest resulted four different affinity categories. The first three categories concerned the general positive validation of the two concepts. The last category consisted out of possible points of development for further integration in the two concepts. Looking at the affinity diagram from a holistic perspective, user experience is, within the scope of the Strukton design case, more related to usability instead of feelings and emotions as from a general design point of view; usability is experience.

### *Sensitizing Story*

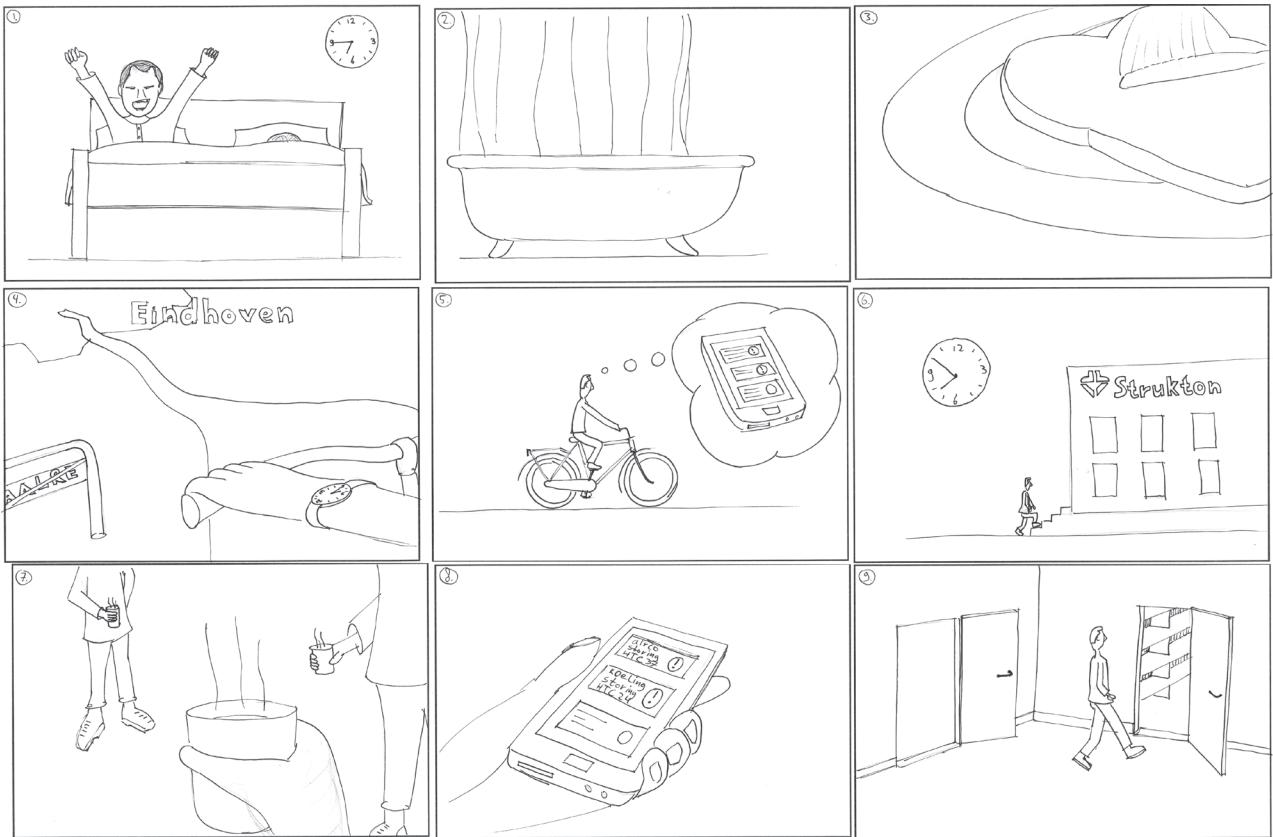
Henk is 54 years old, he has been employed on the High Tech Campus for more than 23 years as a service electrician. He wakes up at a quarter past 6. After a quick shower and a cup of coffee, he prepares his sandwiches and leaves the house at 7 o'clock. From his residence Waalre he bikes to the High Tech Campus. While on his bike, he rethinks what tasks of the day before still have to be done. It's twenty past 7 when Henk enters the Strukton office. Together with his colleagues Hans and Jaap he drinks his second cup of coffee of the day. After quickly checking the information system and discussing tasks, he stores his lunchbox and gets his PDA. After checking the notifications he decides which tasks to do in the morning. He puts away his PDA and walks to another room to get his tools.

### *Visionary Story*

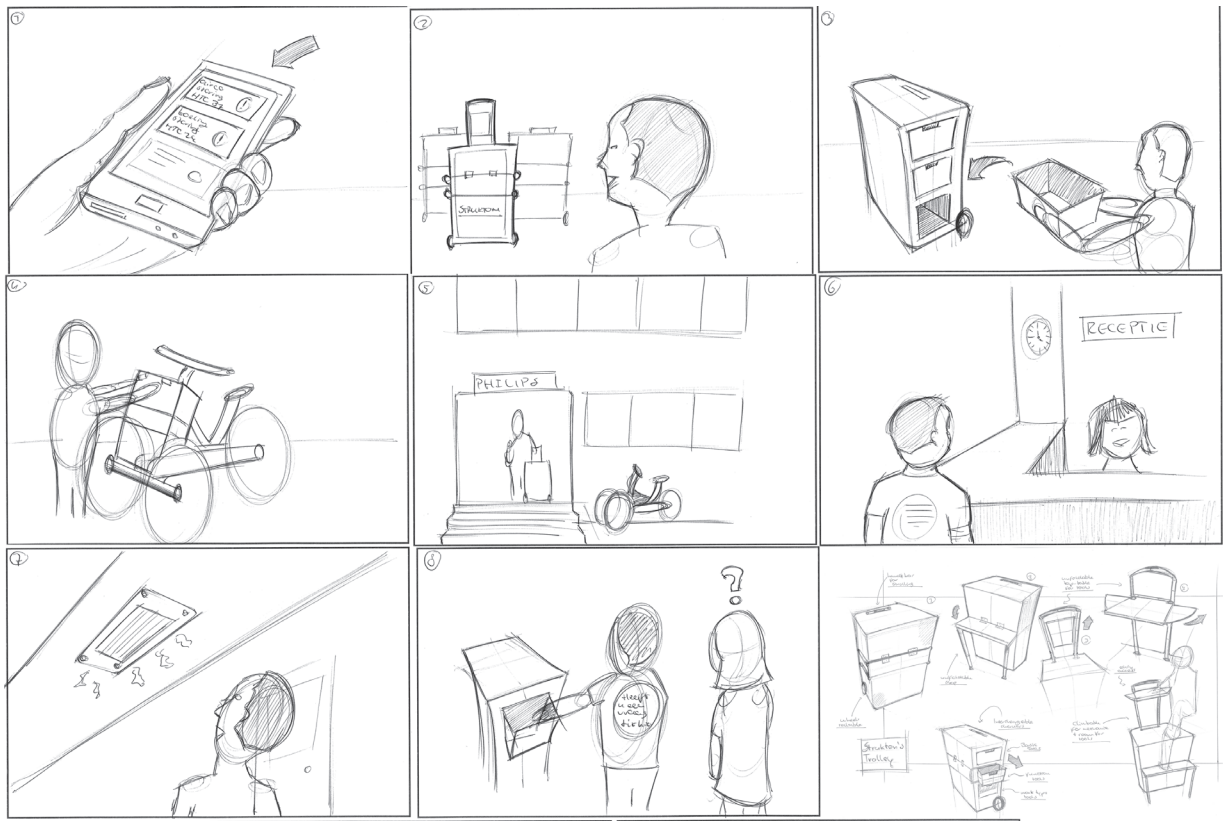
Henk is at his work and takes the smartphone. He decides which tasks he wants to finish in the morning. Repairing the airco and repair a cooling installation. He gets his personal toolcase, the drawer with basic tools and electro-specialized tools are pre-mounted. From a central locker he gets the specific drawer for repairing airco units. His laptop is fully charged and pre-mounted in the designated laptop tray. He rolls the toolcase outside and clicks it with one smooth movement on the bike. Arrived at the location, he unlocks the toolcase off the bike and rolls it in the building. Once inside, he checks in at the frontdesk and reports that he needs to repair an airco unit at the third floor. He takes the elevator and notices that the airco unit is hanging close to the ceiling.

While Henk is picking his tools, one of the residents of the building asks a question about the buildings climate, triggered by the text on Henk's back. Henk explains that the building only has a top cooling, which means that the indoor temperature can never be altered more than 5 degrees compared to the outside temperature. After helping a client and giving an additional service, the resident is happy and Henk continues working on his job.

He picks up his tools and expands his tool case so it can be used as stairs. He expands the handle to a little tabletop which he can use to put his tools on. He starts and repairs the airco unit. After the job, he reports back the status to the front desk and leaves the building for his next task.



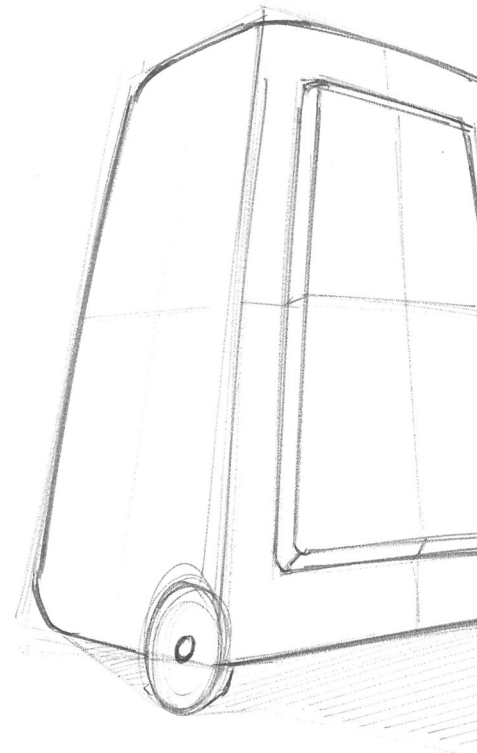
Sensitizing Story



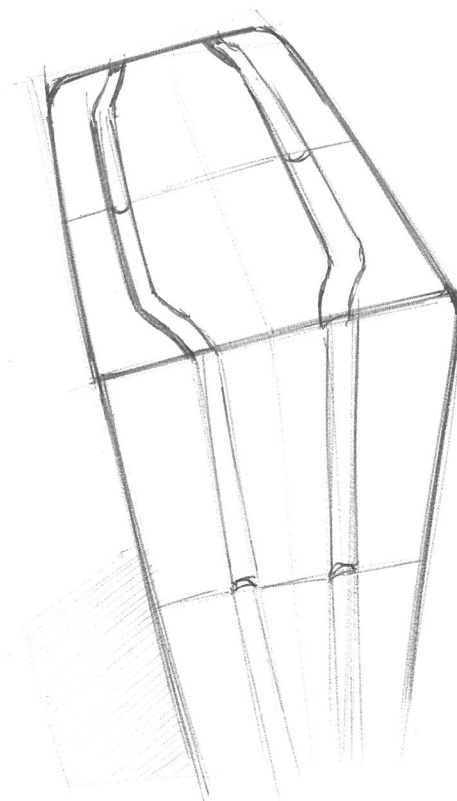
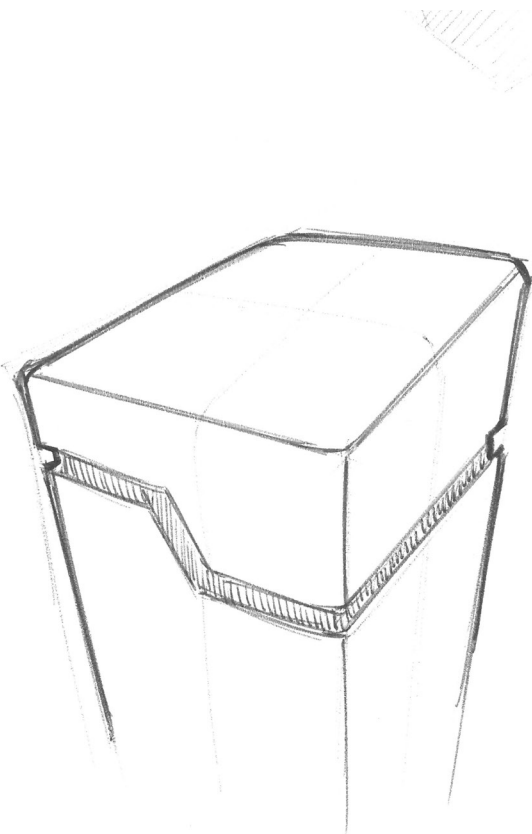
Visionary Story

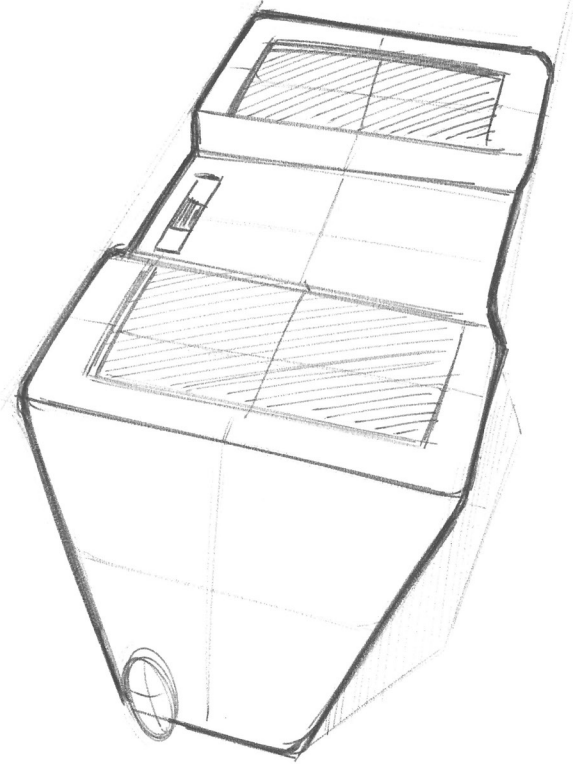
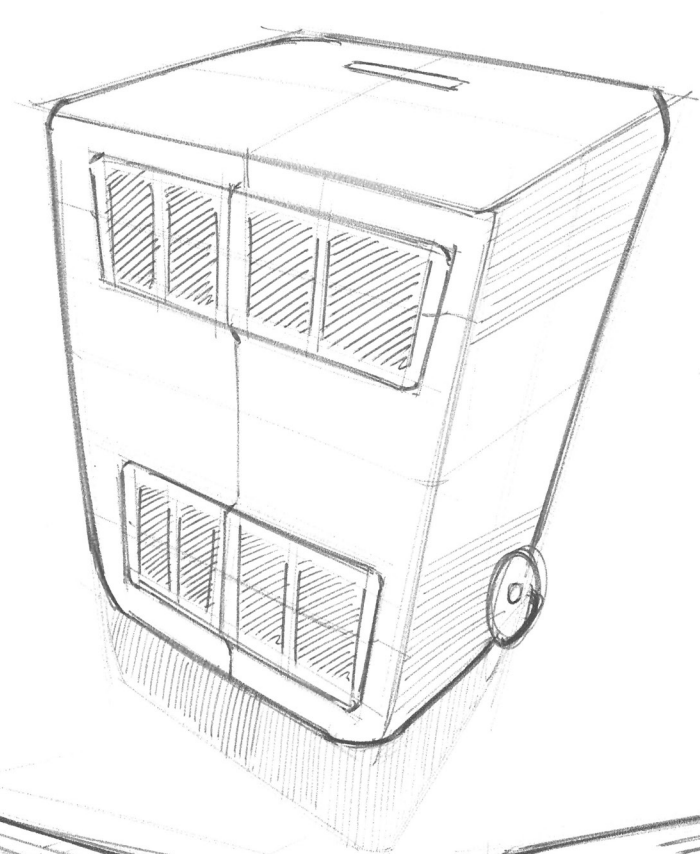
# Fine-Tuning Concepts

After the affinity diagramming session, based on the Co-Constructing Stories session and the contextual inquiry, the possible points of development regarding the designs were analyzed concerning their integratability within the current concepts. A set of selected improvements were implemented in the designs in order to enhance their overall usability and thereby the user experience. In the end, this resulted in the final design.

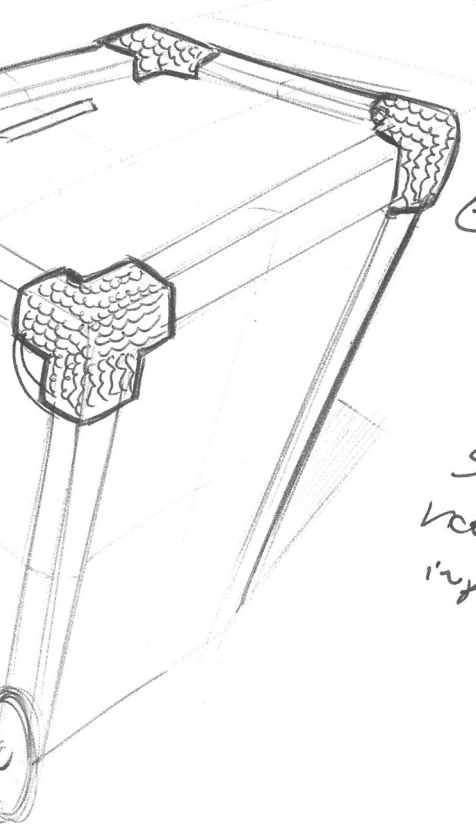


Shape  
Exploration  
- futuristic  
- eye-catching  
- "cool" - futuristic

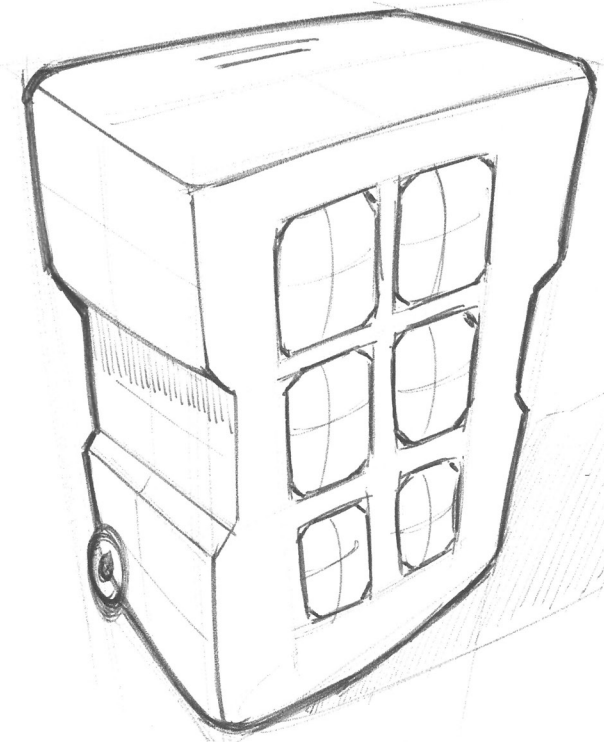




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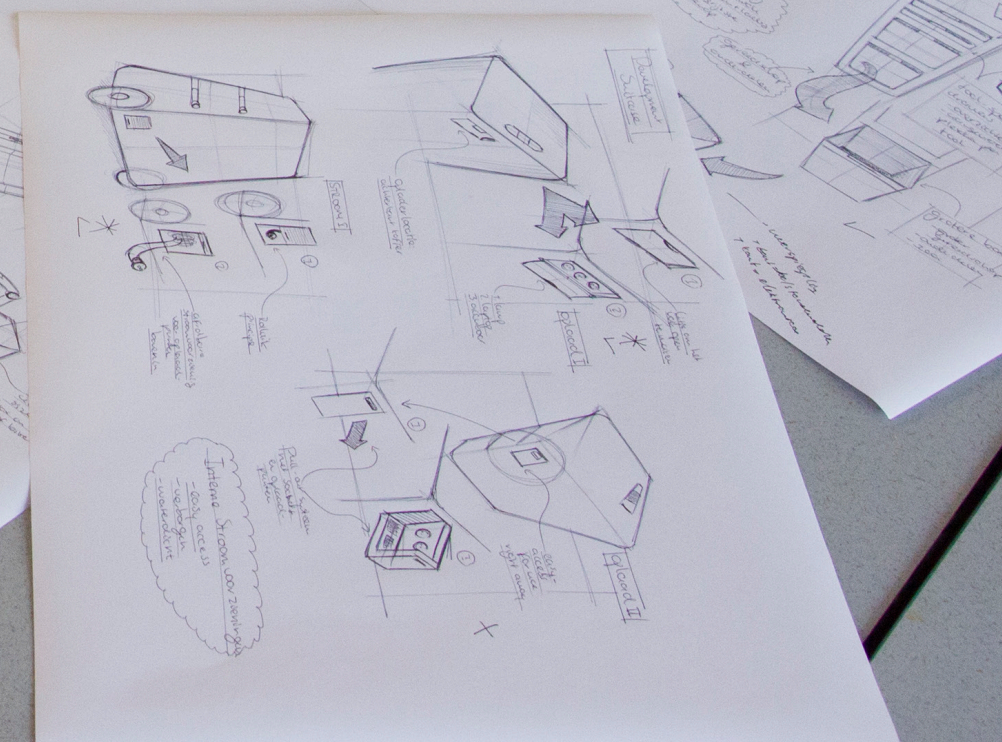
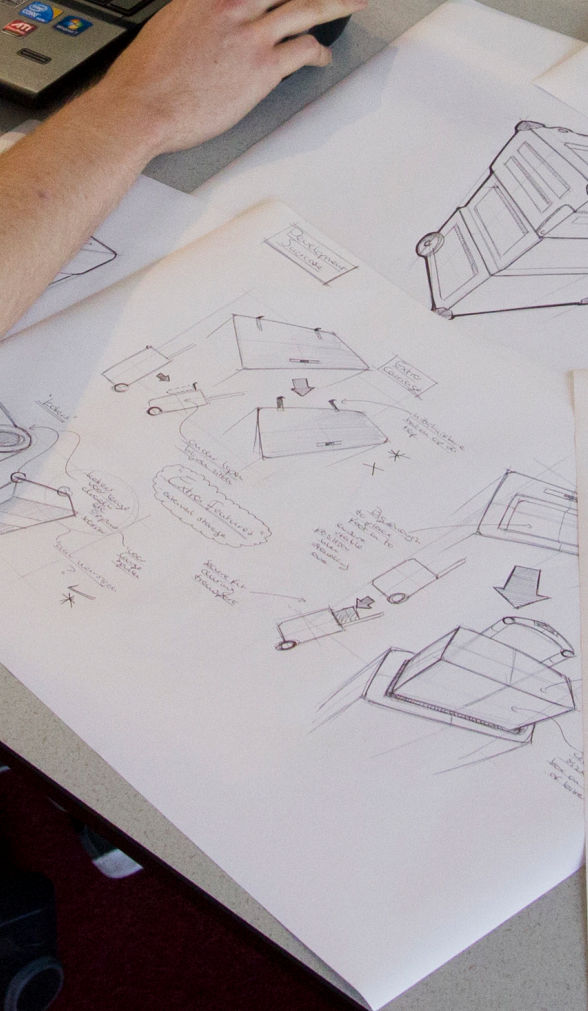
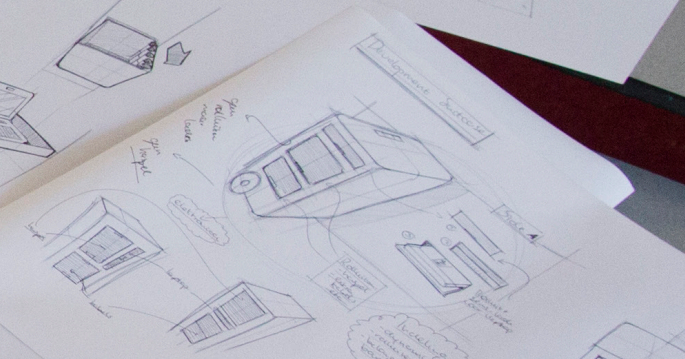
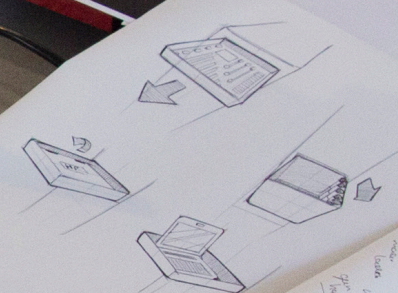
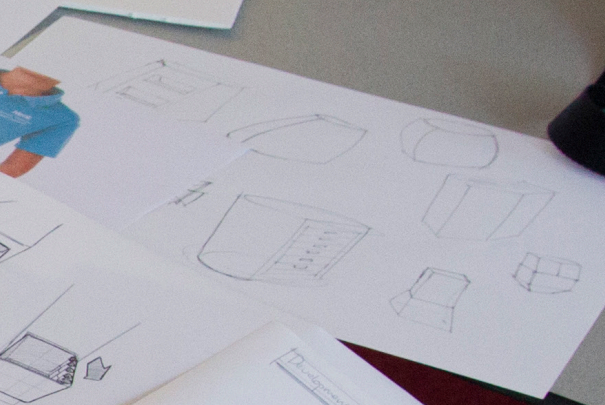
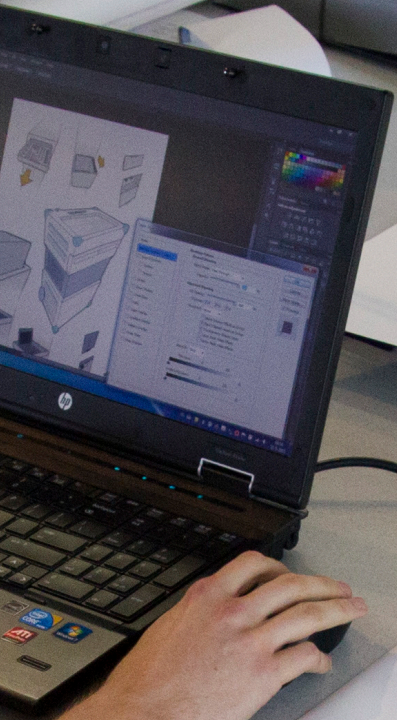


Stoet  
voetjes  
inplenaalern.









# Final Design

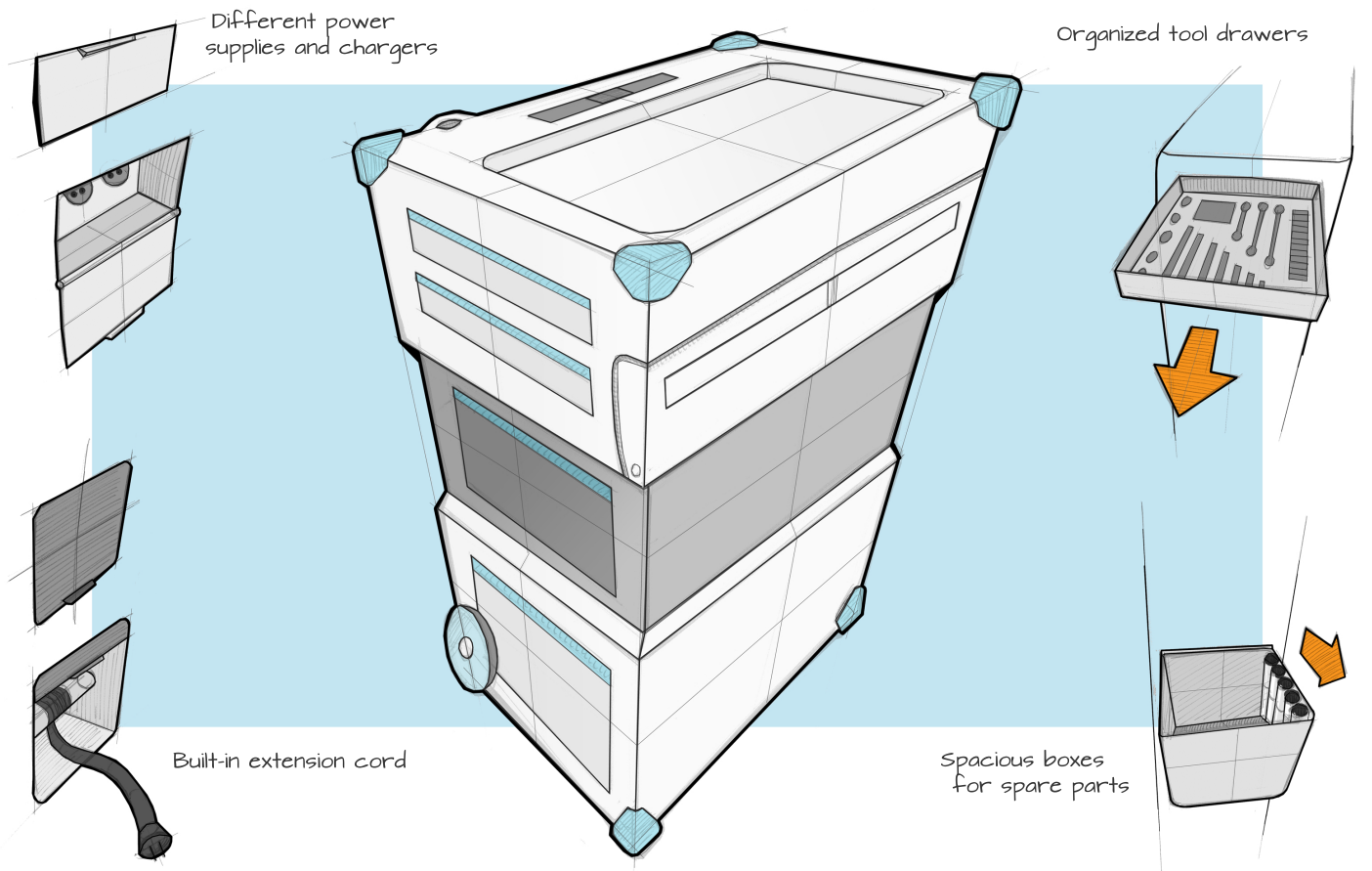
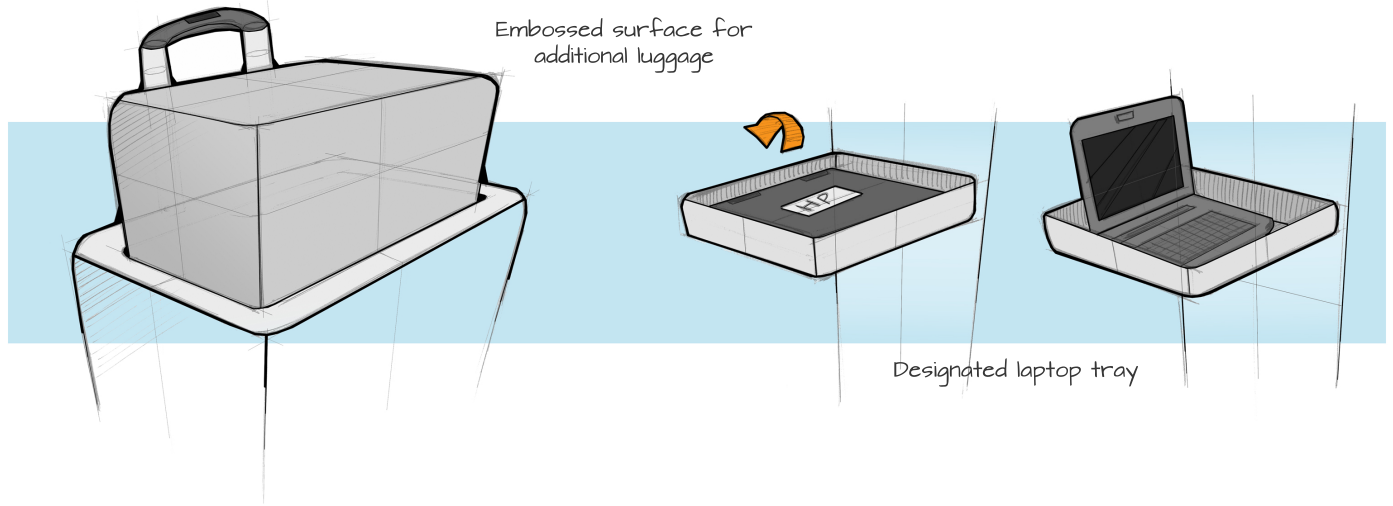
The final design consists of the Strukton Servicekit, a custom tricycle to transport this Servicekit and new, distinctive workwear. Together we call this the Service Mechanic 2.0.

The Strukton Servicekit is a personal piece of equipment for the technician, that strongly influences the daily working experience of this technician. Within the design of this tool case, the need for a solution that fits the needs of the user and a flexible layout was leading.

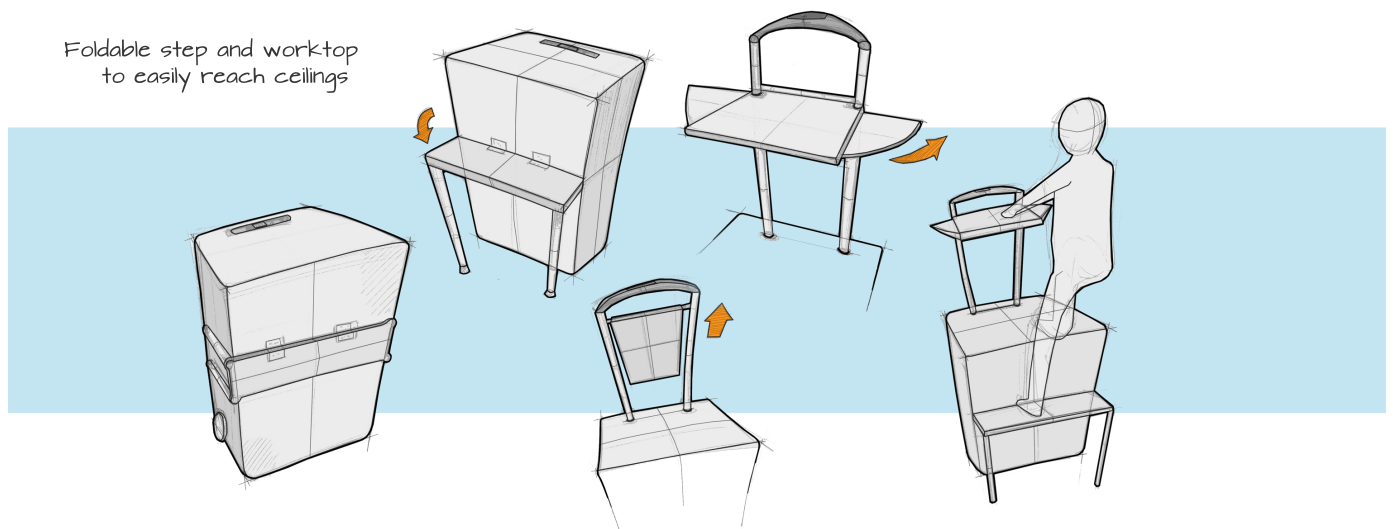
The tool case is well organized, so “the technicians do not have to take out all their tools and lay them out on the desk of a client; that is not professional.” The Strukton Servicekit has got a designated laptop drawer. “The laptop and phone are nowadays almost more important than the basic hand tools.” To keep all these electronic devices charged there is a built in extension cord and multiple power outlets. Spacious boxes for spare parts are integrated, but there is always something you have to bring that does not fit inside. Therefore, the top of the Strukton Servicekit is fitted with an embossed surface for additional luggage. To reach the ceilings, the Strukton Servicekit is equipped with a foldable step and worktop.

The tricycle is equipped with an easy to use mechanism to lift the Strukton Servicekit onto the bike. The extra weight of the unit is compensated with pedelec support, so technicians “like to drive it and will be fighting for using it.” The tricycle will boost the new image towards the clients; instead of an obtrusive van, only the bicycle is parked in front of the client’s office.

In addition, the new workwear encourages the client to make contact with the technician. This improves the relation between Strukton and the client. Due to this extra service the client now knows what the technician is working on and why. Next to this, the workwear creates a distinctive image by adding subtle humorous elements to the visibility of Strukton on the campus. At last, together with the tricycle and the Strukton Service kit, the new workwear ensures a distinctive brand image for Strukton in comparison with their competitors.

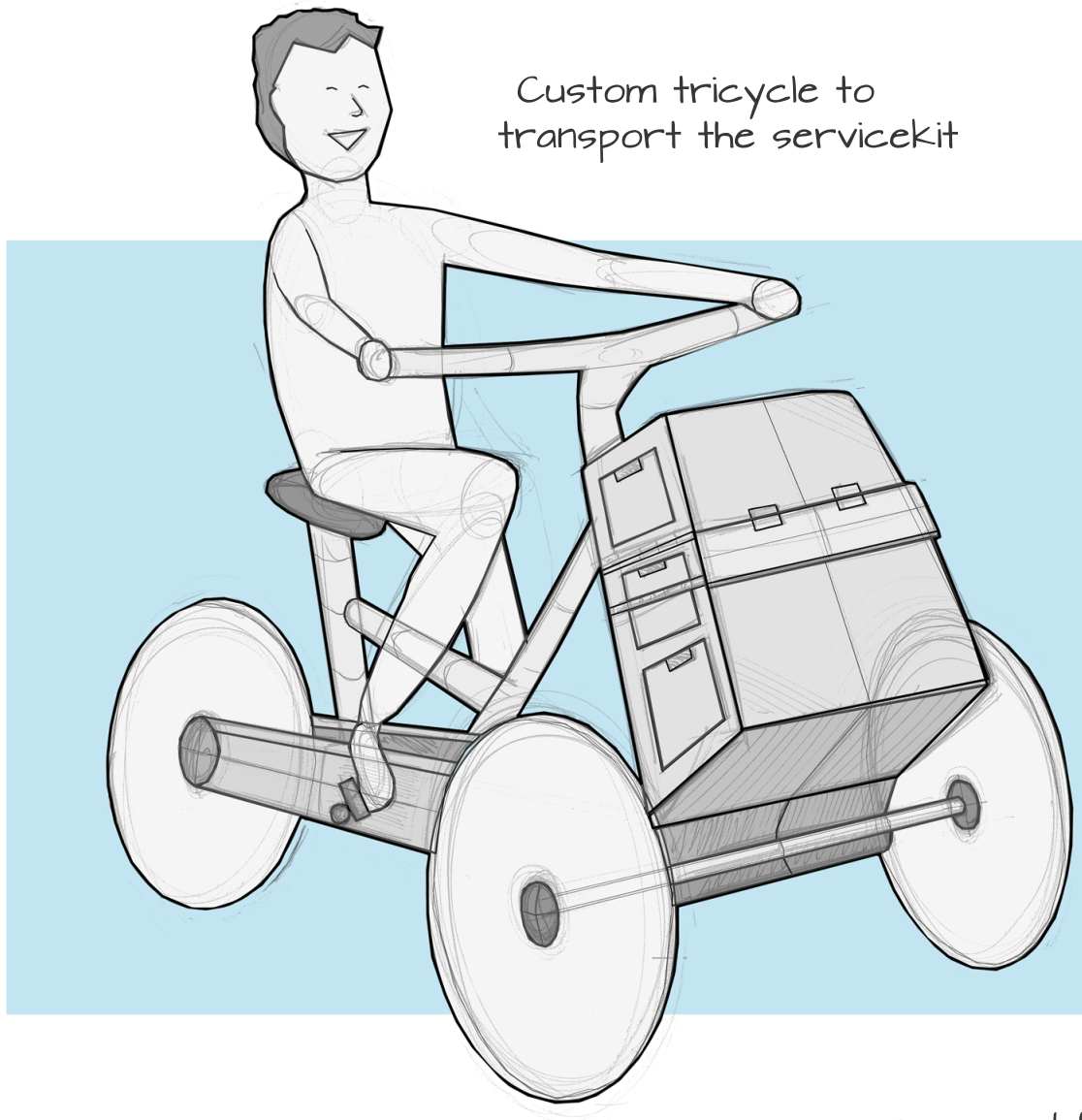


## “De Strukton Servicekit”



# “De Servicemonteur 2.0”

Custom tricycle to transport the servicekit



Open and friendly  
new workwa



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ear