FINAL BACHELOR PROJECT BY

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ECKART+
PROJECT REPORT

Industrial Design

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INTRODUCTION

In this part of the report the project is introduced. This is done by giving the context of the project describing the 'Eckart moving light route' and project objective. Furthermore, my interpretation of the assignment (my mission statement) and the project overview are given. Finally, a glossary with frequently used terms is given.

Moving-light-route

moving light route
On October 2nd last year, a 1.8k interactive running and walking path was opened in Eckart, an area in the North-east part of Eindhoven.

triangulum project
The 'moving light route' is part of a smart lighting project in the district; the Triangulum project. This EU funded project is focused on redefining Quality of Life in Smart Cities. Achieving sustainable transformation of the public space by co-creation with citizens. Resulting in a solution for social safety, promoting physical activity and sustainability.

what it does
In the park lights work like a hare, even during the day. They set the pace for running and walking. The lights come from tiles on the ground. They light up in four colors, which indicate four speeds. No separate app is necessary to make use of the lights; you only have to indicate your target at one of the three starting points, and start running!

Project Objective

Within this project designerly solutions will be explored to further develop this moving light route in order to stimulate physical activity in the city of Eindhoven.

Mission Statement

A personal mission statement for this project can be made by interpreting the project objective through my vision;

"Showing how design can enable self-empowerment and through this achieve a better Quality of Life. Within this project focussing on stimulating vitality."

Stakeholder Circles

The stakeholders of the Eckart Park, Triangulum Project and Eckart+ project are visualized through Stakeholder Circles (Bourne & Walker, 2005). It is a means to provide a useful and effective way to visualize stakeholder power and influence. The size of the stakeholder resembles the influence. Individuals have small influence, however as a group they are quite powerful.


Stakeholder Circle: Basic Park

Stakeholder Circle: Triangulum Project

Stakeholder Circle: Eckart+
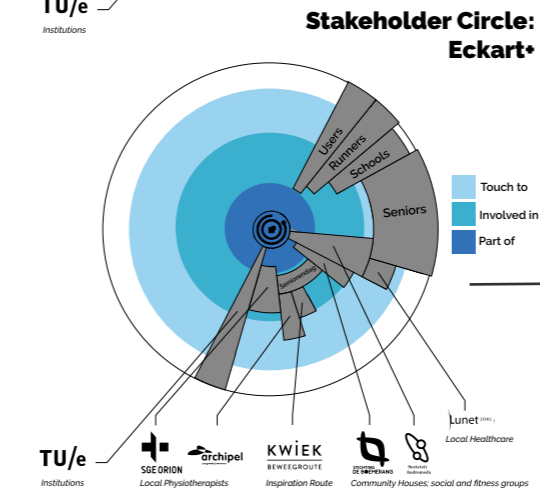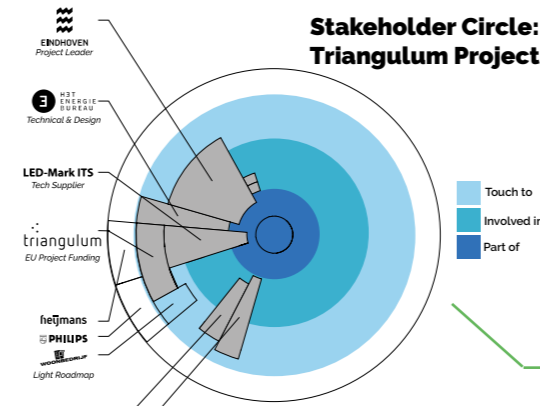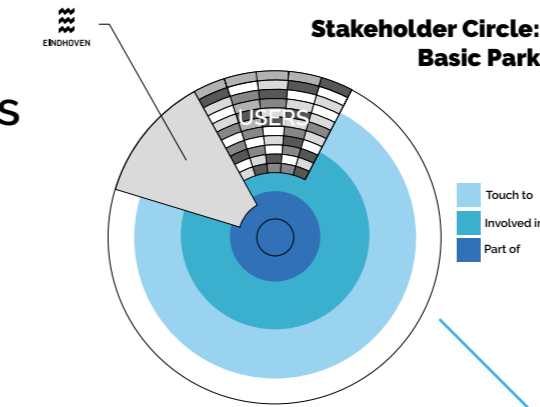
Final Design System

Briefly the final concept is shown. The image shows the three layers of the system; Eckart Park, Triangulum Project and Eckart+ app. These layers form a service-system.

Basic Park.
- Park with **good walking, running and exercise conditions.** Good paths, well maintained. In city, though serene environment.
- Databases with all **street-furniture.**
- **Variety of users.** Municipality, big stakeholder.

Triangulum Project
- A project for a **safer and more sustainable** park.
- Part of the project is the **moving light route**; lights that move with a certain pace to motivate and guide runners.
- Co-creation between residents and Municipality.
- Multiple technical suppliers.

Eckart+
- Stimulating seniors to become **socially and physically active.**
- Location based, easy to do exercises, that make use of existing streetfurniture.
- Using lights to guide users.
- 'Nudging' interaction, by unconsiously guiding users to the same place.
- Shows the local acitvities and physiotherapists.
- **Designed together** with seniors, community centres and health professionals.

Map Eckart Park
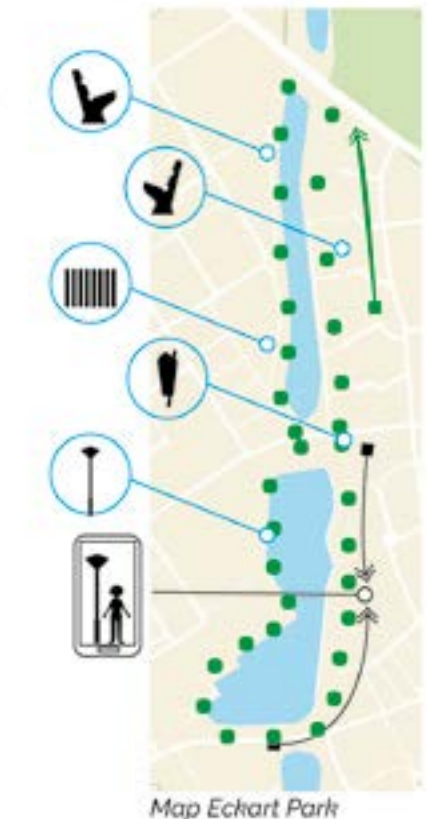
Overview Project

This project, and with that this report, are built up in roughly five stages; Orientation, Analysis, Synthesis, Simulation and Evaluation. To the right you can see an overview of the project process. The colors below indictate the phases of the design process.

PROCESS

First Person Testing
Literature Research
Contextual Inquiries
Social Community mapping

KICKOFF
RUNNERS
2K Opening
IDEATION

Background Research
ANKWIEK BEWEEGGROEP
Lunet
Literature Research
Eckart Plus

ORIENTATION
ELDERLY
SLIM LICHT BRAINSTORM AVOND
Co-Reflection Brainstorm

Observations
STICHTING DE BOEMERANG
SCOPE: activate seniors

Technical Research
CONCEPTUALIZATION
Meetings Physiotherapists
arc SGE ORION
Realizing, Testing, Iterating

ORIENTATION

This chapter shows the gathered background information about the moving-light-route in general. At first a clear definition of vitality will be stated. The orientation will be done by experiencing the park; doing (user-)observations, performing contextual inquiries and 1st person perspective testing. This is followed by a more in depth understanding the technical aspects of the system and determining the target group. The questions that will arise in this phase will be discussed in the last part of this chapter.

Experiencing the park

Thanks to the clear context of this project it was 'experienceable' from the start. The moving light route is a system that is already in place. Though it has to be stated that this project took place in the start of taking the fieldlab into practise, so the system was not operational at times.

In order to find out who the intended users are and what they do in a specific situation three methods were used: (user-) observations, contextual inquiries and 1st person perspective testing.


(User-) Observations

Observations were done by taking pictures and notes at day and night, observing the park and its surrounding area. (fixme) It showed the real life context of the park and part of the city around it, resulting in insights of what could be done with the area (e.g. variety of socioeconomic status). Also observations gave an overview of what kind of users came in the park at certain times, resulting in gaining a wider focus.

Contextual Inquiries

Contextual inquiries were done to gain qualitative information from the users themselves. For runners, this was done in a peer-to-peer form. Asking short questions while running, resulted in short, though personal answers. Questions were asked regarding motivation, running experience and possible enhancements for motivation. This by making use of runner-profiles (Vos et al., 2014) in order to guide follow-up questions about personality. Runners with the fit runner profile were seen the most in the park.

1st Person Perspective

The 1st person perspective testing was performed during a period of three weeks, testing several running apps that on finding out what works and what does not. The apps that were tested: Strava, Runkeeper, Nike+, Endomondo and RunKeeper. A selection was made by choosing apps that score high on behavioral change (Middelweerd et al., 2014) Insights from this were that apps should be easily accessible and work well for a certain type of runner (young novice). They are more goal oriented and not hesitant towards technology.
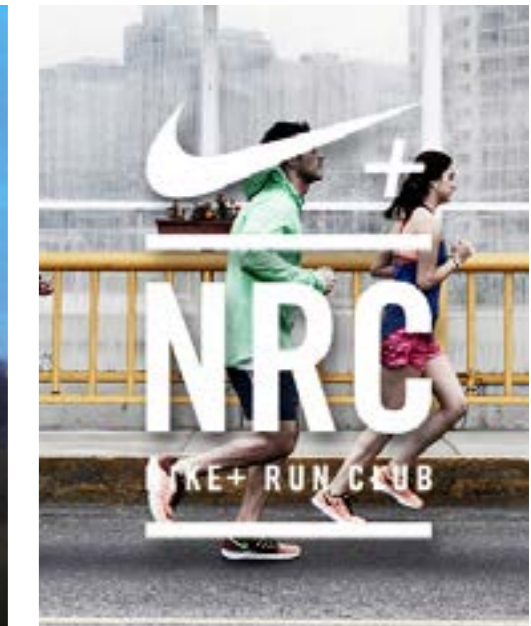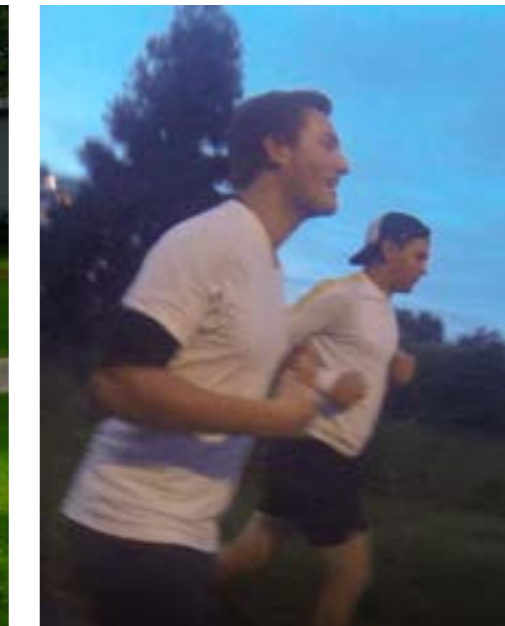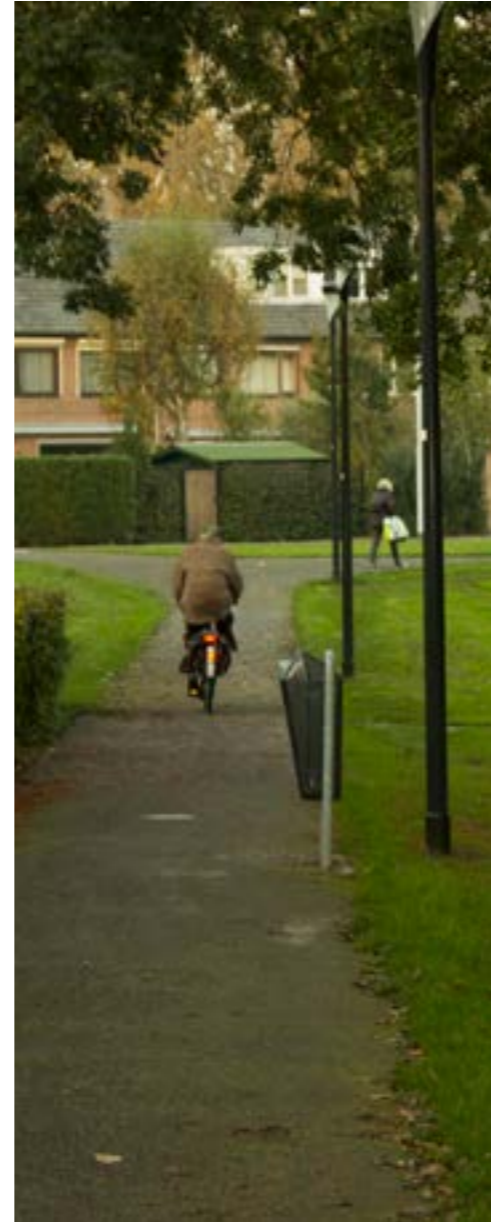
Target Group

The intended use and users of the system were running and runners. The Eckart route is an open experimental landscape, which offers opportunities for multipurpose use. It is important to show that a wide range of possibilities could be there for technology. From the observations in the park it was found that the group of intended users was smaller than the unintended or non-users: dog owners and seniors. Especially seniors are an interesting group since they make the most use of the park (during daytime) and could benefit from the system in a novel way. This group is considered not physically active enough and loneliness is becoming a big issue amongst seniors.

Overcoming these challenges will result in health benefits (see chapter Analysis). Due to the possibility to design for a bigger group that could have more health benefits the Target Group shifted from fit runners to seniors. Demographically, both female and male, seniors (55+) are seen as the target group. They are living in the urban area of Eckart surrounding the park. It is a diverse group with differences in Socioeconomic Status (SES), motivation, interests and values for Physical Activity (PA). This requires solutions that are useful for everyone; they should be affordable and require a low threshold. This will result in a better experience for recreational sports and will prevent dropout. A more specific Target Group will be given later in the next chapter.

Conclusion

Out of the orientation phase a couple questions did arise. These questions are stated below:

1. Why should vitality amongst the target group be stimulated?
2. What are needs and values of the target group regarding physical activity?
3. Who are part of the community or stakeholders within the project scope?

These questions will be answered in the next chapter through analysis. The first question will be answered by qualitative interviews and literature research. The second and third question by Social Community & Stakeholder mapping.

ANALYSIS

In this chapter the arisen questions of the Orientation chapter will be answered. First, through literature research, it will be analysed why vitality should be stimulated amongst the target group. Second, a deeper look is provided into the needs and values of the target group, through a summary of interviews. Third, Community Mapping will be done to map the existing social community and stakeholders to see further opportunities. Finally, Design Brief gets formulated, containing all findings.

Literature Research

Silvering; Social and Physical empowerment of the grey.

Why should vitality be stimulated amongst seniors? Well, our society is 'greying'; the world's population is becoming older. Demographers describe our period as the Age of Aging (Magnus, 2011), shifts in demographics are coming up fast. Population projections show that the percentage of people older than 60 will double from 11% in 2010 to 22% in 2050 (United Nations, 2009). Projections of the Netherlands even show that percentage older than 65 will increase from 19% in 2017 to 26% in 2040 (Stoeldraijer & Duin, 2017). In the area around the Eckart park (districts Eckart, Luytelaer & Vaartbroek) 22,4% of the population was older than 65 in 2010 (CBS, 2008). This shows that the direction for seniors is valuable in the area of Eckart.

With age comes the increased chance of getting chronic health conditions (e.g. diabetes, various kinds of cancer). Frequent physical activity (PA) has shown to lower the risk of these health conditions and even depression (Chodzko-Zajko et al., 2009; Lampinen et al., 2000; Kohlstedt et al., 2013).

Seniors generally know of these health benefits (see needs & values; Crombie, 2004). However, most seniors are not physically active enough to benefit. Of seniors, 25,5% (https://www.ouderenfonds.nl/onze-organisatie/feiten-en-cijfers/, n.d.) does not attain the international exercise standard; 30 minutes of moderate intensity PA (WHO, 2010; Varo, 2003)

Why are seniors not physically active enough? One of the major influences is social isolation or loneliness. Due to the ageing population it is of increasing concern in communities. Loneliness also has a negative influence on health and is a burden to PA (Hawton et al., 2011).

So in order to tackle these big challenges for the greying society, a goal and requirement is stated: social and physical empowerment. Offering access to resources that help to stay healthy and connected to their communities. The proposed positive way to look at aging, with vitality; silvering.

The Age of Aging, National Geographic

Seniorday Doornakkes

analysis

Needs and Values

Through short interviews/ conversations with seniors (n=5) in the park, at coffee hours (n=10) and during a senior day (n=40) the needs and values of the target group got mapped. Open questions were asked in an informal way, so no specific questions were stated beforehand. The aim was to find out their ideal outdoors PA experience. During the interviews notes were taken. These notes were combined, grouped per topic and analysed. Below the key findings of the interviews are put into context with existing literature.

The most important requirements that came up were: safe environment and social activity. Seniors require a safe public space for physical activity (e.g. flat surface, infrastructure). Other research also confirms this: 19,8% of seniors suggests infrastructure improvement regarding PA (Vandermeerschen, p.252, 2011). Most seniors say they would not exercise alone, only 28,7% said to sport alone (Vandermeerschen, p.138, 2011).
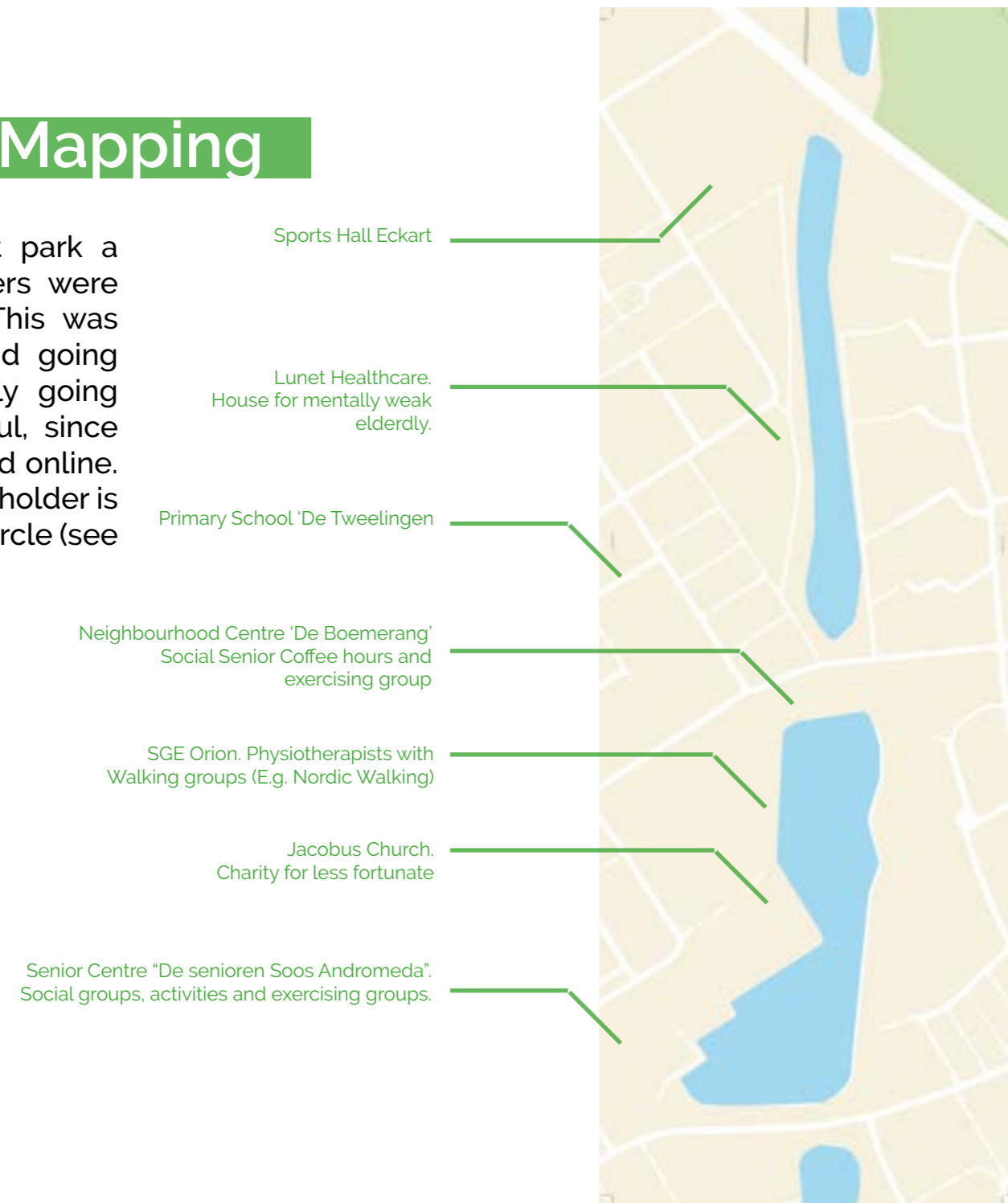
The most mentioned wishes for PA were: preferably outside, close by, non-obtrusive, low threshold and minimum technology. Other studies show that street (55,5%), woods (35,8%) and park (21,6%) are mentioned most as sports location(Vandermeerschen, p.144, 2011) This implies also that most seniors prefer locations in the neighborhood. With non-obtrusive and low threshold is meant that it should not be annoyingly present/blending in and not require too much extra effort and money to access. This implies most for non-sportive seniors with a low Socioeconomic Status (SES).
Seniors can be hesitant towards technology, though there is a shift coming up, for instance for getting information. Amongst seniors under 60, 22% finds information regarding sports on internet, against 1,9% of 75+ year old seniors (Vandermeerschen, p.160, 2011)The most used information source however is socio-cultural institutions (63,8%). To get in touch with seniors these institutions should be the key channel. Therefor the social community got mapped.

Community Mapping

In the area of the Eckart park a few interesting stakeholders were mapped and contacted. This was done by using google and going there in person. Especially going there showed to be fruitful, since not everything can be found online. The influence of each stakeholder is shown in the Stakeholder Circle (see chapter Introduction).

Sports Hall Eckart

Lunet Healthcare.
House for mentally weak
elderdly.

Primary School 'De Tweelingen

Neighbourhood Centre 'De Boemerang'
Social Senior Coffee hours and
exercising group

SGE Orion. Physiotherapists with
Walking groups (E.g. Nordic Walking)

Jacobus Church.
Charity for less fortunate

Senior Centre "De senioren Soos Andromeda".
Social groups, activities and exercising groups.

Priority Target Group

To have a more specific scope a priority target group gets stated: seniors (55+, m/f) that are hesitant towards sports or occasionally sportive(Vandermeerschen, p.306, 2011) This group has a relatively low SES and suboptimal health condition. These seniors grew up in the periods where traditional club sports and to some extend sports-for-all was promoted (Vandermeerschen, p.252, 2011). These generations are less used to unorganized recreational sports (e.g. running). They are familiar with exercising and sports, though require policy attention to motivate and organize sports. The target group lives in the urban area around Eckart park or come to socio-cultural institutions in the area. The priority is also on socially isolated seniors, however in the process the focus will lay on already existing social groups in the community around Eckart.

Design Brief

Problem Definition

The existing moving-light-route in Eckart park stimulates physical activity through interactive lights that move at certain speeds. However, in observations most people that come to the park are seniors, who do not use the system as it is now.

Also shifts in demographics show that today's society is becoming increasingly older, doubling (11%-22%) between 2010 to 2050. With this come big challenges for the aging population. Inactivity and loneliness are considered priority problems to address for seniors.

Design Goal

There is an opportunity here! The Eckart route is an open experimental landscape, which offers opportunities for multipurpose use. It is important to show that a wide range of possibilities could be there for technology. The design goal is to show that the system could be used by seniors in a novel way. This by social and physical empowerment. Making use of existing communities and stakeholders surrounding the Eckart park.

Target Group

Seniors, male and female, of 55 and older. Low SES and suboptimal health condition. Living in urban area around Eckart or coming to local socio-cultural institutions. Hesitant towards sports or occasionally sportive. Traditional club sports and to some extend sports-for-all generation, which requires policy attention to motivate for, and organize regarding, sports.

Requirements

1. Bring about social empowerment
2. Bring about physical empowerment
3. A safer environment: infrastructure suited for seniors and safe feeling.
4. Setting is social activity (could mean making use of existing social communities)
5. Improve experience of recreational sports, preventing dropout.

Wishes

1. Should preferably be outdoor environment
2. Should be closeby
3. Should be non-obtrusive
4. Should have low threshold; usable for everyone (e.g. easy to use, not costly)
5. Minimum amount of technology and technological skill required

SYNTHESIS

This chapter focuses on the synthesis of the obtained knowledge from previous chapters. This is done by designing. Design is not a linear process, it is ongoing. From the start of the project ideation takes place. Through designing you elaborate towards a final concept. This chapter shows the design process; steps taken, what findings have come up and possible solutions to the design problem. This process has roughly three phases; 1. ideation, 2. conceptualisation and 3. Midterm; the final concept.

Ideation; generating ideas

The first phase of the design process is ideation; generating ideas. Starting from the kickoff of the project and taking place continuously. The Orientation and Analysis helps as background information to elaborate ideas more into well developed ideas. A few techniques and methods have been used for different purposes. Each of them will be briefly explained and the relevant findings explained.


1.Pressure Cooker

The project started with a Pressure Cooker; going through a mini design process in limited amount of time. It kickstarts the creative process. Mind Mapping, Brainstorming, Brain Drawing, scenarios and pitching were done in a group of two. From this method possible directions were mapped and some ideas generated.

2.Runners

Together with the Orientation, more converged and specific Mind Mapping and Brain Drawing/writing were done. The envisioned scope of creating a better running experience was discussed with PhD student Daphne Menheere.
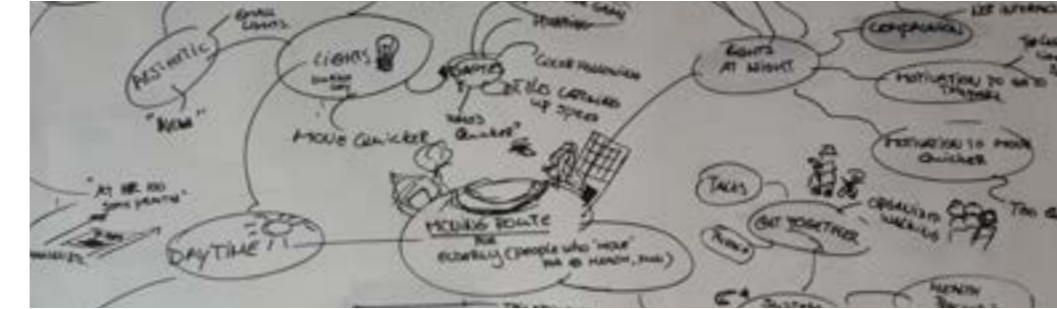
3.Bigger Picture; Diverging

To not be too narrow minded a wider scope of exploring possible use of the open Eckart system; abstracting and seeing it as connected uplighting tiles. Topics such as sharing information, safety, guidance and Physical Education came across. This led to for instance a meeting with a PE teacher.
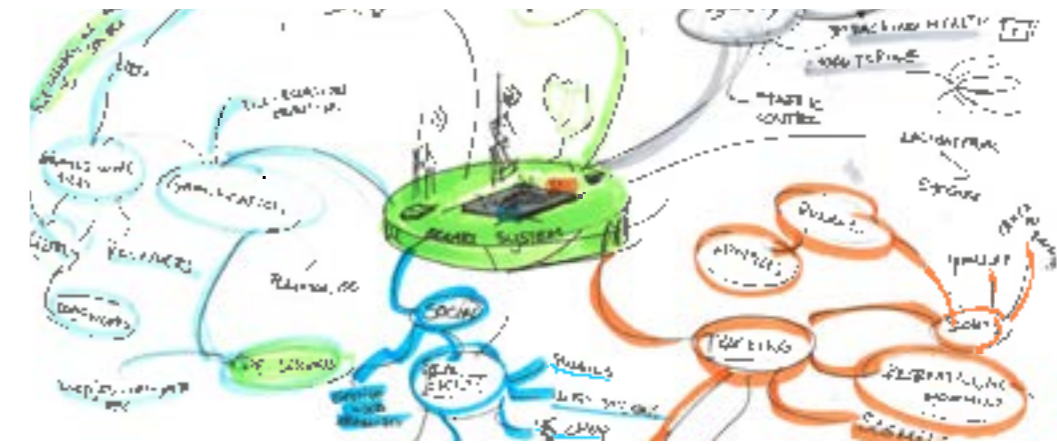
4.Converging to Elderly

Due to findings of the Orientation and sparking interests during the Dutch Health Hackathon focus shifted towards seniors. A summary of these findings: seniors not able to use Eckart system, seniors in the park the most, great health benefits & easy to contact. Selected ideas were discussed and developed further by meeting with members of the existing community (e.g. caregivers). Resulting in evaluating ideas and a well defined Design Brief.

Conceptualisation

The second phase is conceptualisation; developing ideas into concepts, combining different aspects and deciding based on the requirements and wishes. Important within this is that concepts are at a same level in order to compare them. A concept is an idea of which the working principle and further intention are known to such extent that other people could work with it. After evaluating the ideas, four focus directions were determined; Safety, Gamification, Social and Training. These focus points helped to gain momentum in the design process. Converging to one topic and within that topic diverging again. Resulting in more in-depth ideas and solutions.

Concept: Safer Park

Making the park a safer place to exercise and walk. Guiding users with the lights as the way it is now, but with a twist. If someone would be walking the emphasis is more on the light being a companion. Lighting up a walk through a dark park. Also the light would notify if someone would overtake you from behind. In this way you do not get scared and know that someone is getting closer to you.
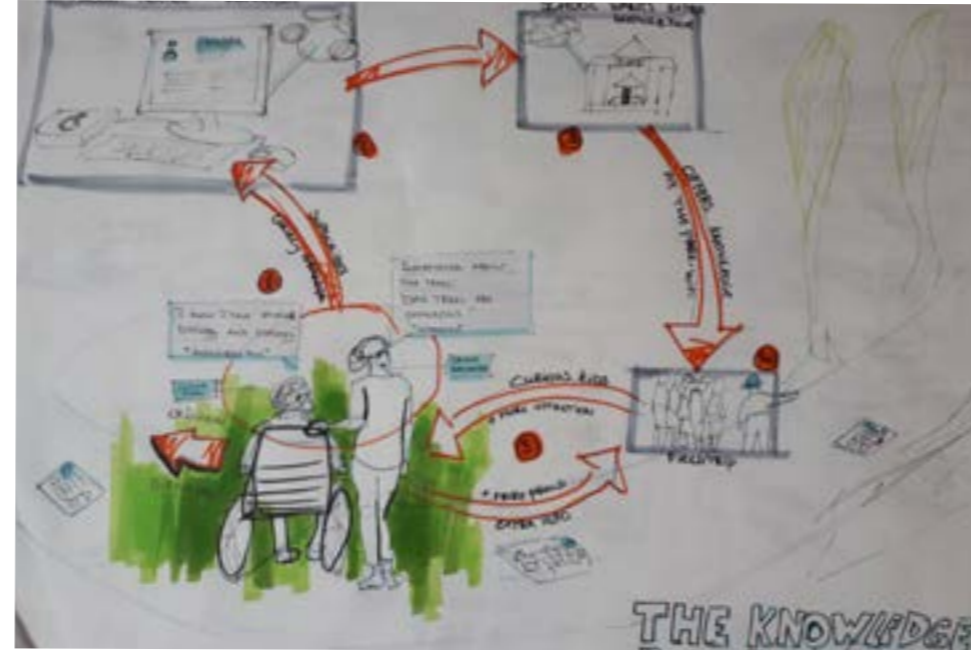
Concept: Social & Smarter

This concept envisions a park more social and beneficial for (lonely) citizens living around the park (e.g. Lunet). A platform that connects people through knowledge and activity. In the park people get access to real life stories of elderly in the neighborhood. If a story sounds appealing and you want to know more you can get the contacts of that person to get in touch with. Also on the platform people who are not walking well could get a volunteer buddy to walk with them in the park.

Concept: Gamification

With tiles in the ground you could do numerous games (e.g. tilehunting). By giving access to games at certain locations you could trigger people to come to the park and with these games nudge physical activity. The focus lays on games. For instance earning enough points to get a reward. Or giving access to games as Sudoku on your phone at a certain place.

Concept: Training

Making the park attractive for PA. This concept makes use of street furniture that is already there to stimulate physical movement. By using the street furniture as exercising equipment you have a new purpose and dimension to something that is assumed to be quite functionless. The lights and system would work as a sort of personal assistant in this concept.

KWIEK beweegroute

Brainstorm Session

As a way of user involvement, concept optimisation and validation of concepts a brainstorming session was organised. Recruitment was done through pamphlets during two events and posters in local community centres. All participants (n=12) were fitting the Target Group profile (av. age 75.7; local residents). As brainstorm method Co-reflection was used.

Co-Reflection

Co-reflection (Tomico et al., 2009) is a methodological approach not based on the sequential (hypothetical-deductive) paradigm, but on the dialectical inquiry (inductive paradigm) between designers and users. The versatile and holistic nature of this co-reflective process makes it suitable for dynamic and unstructured design processes based on different streams of reflection. Within this co-reflection process, there are three phases:
1. Exploration; analyzing the social phenomena. Solid grounding for Ideation
2. Ideation; The constructive ideation process that builds upon the existing concept, triggered by the exploration information. Emphasizing build up for confrontation.
3. Confrontation; motivational vision from designer merging with users aspirations and desires.

Method

At first, participants were asked to fill in some personal questions regarding physical activity, smartphone use and being outside. As exploration, participants were asked to describe their ultimate park experience and share this the with others. In the ideation phase, the moving-light project was explained and with that an open discussion ideas, desires, values and needs came up. Confronting participants with my vision and four concepts was part of the Confrontation. Participants were asked to give positive and negative feedback and other comment in groups per concept . In this way the concepts got validated and elaborated.

Notes, voice recordings and videos were transcribed, coded and categorised (see Appendix FIXME). Relevant for the project were parts that were repeated often, surprising, explicitly stated as important, reminding of something and particularly interesting.

Results

This study shows that for the target group there are still some things not tailored enough to work with the "open" system. Next to the multiple reasons to go to the park, there are also reasons not to go. One being that the route is not for elderly (e.g. still not enough light and speeds are too high). Safety is one of the key elements. This feeling of safety can be enhanced by more overview of the park. Possible ideas are overview of social events and a social app for social walkers. For both individual and group users, movement facilities would be a good enhancement, since these trigger movement and are nice to work with. A good thing to keep in mind is the social, technical and physical barriers for elderly. Especially in using technology and ideas involving internet or apps.

synthesis

Final Midterm Concept

During the Midterm Demo Day the final concept got presented. The final concept Eckart+ is an addition to the existing Eckart moving-light-route. For some seniors this route is too challenging and therefore they do not use it. Eckart+ is a platform that offers easy-to-do physical exercises within the environment (street furniture). Every location would have its own set of exercises; location based exercises. This concept focuses on a soft subtle approach of nudging technology upon the user and stimulates physical activity during daily life.

Feedback during the Midterm was focussed on the story around the concept. It was not visionairy enough. Also the design was not experienceable yet, so next steps had to be 'making'. First small things to test assumptions, carefully keeping in mind the bigger picture. These steps of the process can be read in the next chapter Simulation.

Simulation

This chapter focuses on the simulation of the final concept. Simulating the envisioned use and working principles as close to a 'real' design implementation as possible. The simulation phase started with meetings with physiotherapists to get feedback and information from experts. With this information the concept got shaped/developed in an iterative process of realizing and testing with social/exercising groups and physiotherapists. This process resulted in the Final Design. Finally, a possible business perspective is given.

Meeting Physiotherapists

Now that the scope has reached its final definition, physically activating seniors through location based exercises along the Eckart moving route, experts in the field could be contacted. The physiotherapists Dorien Slaats of health centre SGE Orion (next to Eckart park) and Mariska Haazen of health centre Archipel Eerbrand were approached.

With Dorien possible exercises and ways of displaying exercises were discussed. Mariska was contacted because there is a KWIEK route around senior complex the Eerbrand. KWIEK offers exercise routes that also make use of the public space and street furniture. Exercises are shown as static images on tiles along the route. The discussion was especially on the use of the KWIEK route, the exercises and the Eckart+ project.

A few findings from the meetings:

- Over time the initiative to be active does not lay with seniors themselves anymore, they have to be nudged in a proper way.
- Showing exercises and feedback works best when done at the proper place and time. For example: Having a sign with all exercises only at the start would not work. Also feedback should be given on the moment when it is needed, not afterwards.
- Exercising equipment is more inviting to do exercises with and could be used as help for balancing and stretching.
- Seniors at the Eerbrand do not use the route often. This is assumed to be due to the fact that they walk alone. There are no walking groups. Mariska uses the route with individual clients and does exercises that are good for that specific client.

Bigger Picture

Social, through Physical Activity.

Throughout the project it has shown multiple times that there is a tight relation between social activity (SA) and physical activity (PA). For example seniors will walk to get a cup of coffee with someone (PA for SA). The other way around they are more likely to exercise in company of others rather than alone (SA for PA).

From the Midterm and the above mentioned meetings onwards the focus was on realizing and testing towards a final design. Due to time limitation and the fact that it is less easy to test social effects, not all elements of the concept were developed. SA elements of the concept were not realized and tested in real life. These elements however are key to the goal; social and physical empowerment in the Eckart park. The main goal therefore became nudging SA, through a platform which has focus on PA. A platform that is a combination of (tested) physical activity elements and (not tested) social elements.

Realizing, testing & iterating

In this project user involvement might have been used utilized maximally. Almost weekly the design changes were put to the test with seniors (n= 9-14) from senior centre Andromeda. Visits were made during their "Bewegen op Afstand" hour, in which they have an aerobics class through webcam video calls. By observations and personal/informal chats with seniors extra information was gathered. During visits also small design aspects were tested; color schemes, animations, characters, app-wireframes, icon sizes and overall concept optimisation/validation. This informal setting resulted in engagement and willingness to help and give feedback.

To test outside, a nordic walking group of SGE Orion was visited twice. The four participants were asked to think of exercises themselves first and help explore the parks possibilities. Also the physiotherapist thought along. The result; real life tests and multiple new exercises.

One session with another exercising group (n=7) of community centre "de Boemerang" was to test whether exercise animations were understood and feedback on the concept by an unbiased group. However the drawback of these sessions was that the sessions were still indoors.

Overall a 'large' iteration can not be seen, however the switching between testing and realizing throughout the process can be seen as 'small' iterations. These small components got tested separately and not yet as a whole. This will be discussed in the next chapter Validation.

simulation

Final Design; Eckart+

Eckart+ is a platform that empowers seniors to become more socially active by becoming physically active. The existing Eckart moving-light-route stimulates running through interactive lights that move at certain speeds.

However, most people at the park are seniors, who do not use the route as it is now for numerous reasons. Also research shows that loneliness and inactivity amongst elderly are growing problems. So, there is an opportunity here!

Seniors should and could benefit more from the system in a different way. Communities, sports and facilities should become open to everyone. Eckart+ wants to make the Eckart park a 'social hotspot', 'source of information' and health promoting environment. The platform will be a reason for seniors to come to the park. It will be an opportunity for users to actively search for local activities or have an overview of the users and set up activities themselves. At the end the true step of becoming social and active will have to be taken by seniors themselves. The Eckart+ platform only nudges them into the right direction through stimulating physical and social activity. It empowers them.

Physical Activity

Eckart+ stimulates physical activity by offering exercise routes. By making use of the street furniture the exercises are easy-to-do for everyone. Users set their own goals and time they plan to exercise, the app does the rest. You only have to follow the lights of the moving-light-route. If they start fading at a certain place, then on the app there will be exercises shown. Exercises for that location specific and in the form of moving animations.

Social Activity

The platform has a few social elements. The system guides people towards each other, unconsciously, to nudge new social interactions. Also on the Eckart+ app local activities are shown to give people an overview of activities in the area. Lastly visit information of the park is shown; an overview of peak hours and a live view where people are walking. In order to become effectively physically active, you have to become socially active also!

How does it work?

The platform makes use of basically three parts: database of all street furniture, the moving-light-system and the Eckart+ webapp.

When getting closer to the area around the Eckart park a pop-up comes up to instantly access a stand-alone webapp, no need to download a separate app or google anything. Not even an internet bundle is needed, the app can be accessed by using the Wi-Fi network of the moving-light-system. The only necessary thing is that Bluetooth should be turned on. On Android there is a small standard app called Nearby, which constantly searches for closeby Bluetooth Eddystone beacons. Bluetooth Eddystone beacons can send URLs, so any information. On the webapp all the social elements and exercises can be found.

To make use of the ability of location based information and the moving-light-system as guidance, a some form of native app (conventional app) should be used. A combination of a native app and web app; a hybrid app. The native part is needed to determine the location of the user and sending this information back to the system. The database contains locations of street furniture, in this way the location can be linked to exercises for that specific location.

Business Perspective

Regarding business this final design could have two options regarding what the platform will be.
First option: a stand-alone app, so moving-light-system would not be part of the platform. Instead of a hybrid app, the app would have to be native. The app will have to make use of mobile internet and gps in order to know the location and information. In the second option the moving-light-system is part of the platform and the Eckart+ app is an add-on. To right the two options.

simulation

	Value Proposition	Key Partners	Customer Relationship	Channels	Revenue Streams	Key Activities	Cost Structure
Stand-alone	• Overview of local activities and location based exercises. • An app with animations. Is assumed to offer richer interaction then for instance a handout or sign at the location. • Exposure possibility for advertising locally. • Could show visit information all locations	• Municipality database street furniture • App-developers (android and IOS) • Companies that want to advertise	• Municipality database street furniture • App-developers (android and IOS) • Companies that want to advertise	• App-stores • Online • Word of mouth exposure	• App purchases • In app advertisement • Selling user data	• Improving app • Maintenance app • Maintaining service • Providing updates • Maintaining/improving contact with partners • Improving brand/ concept recognition •	• Expensive native app development • Platform royalties • Marketing (concept recognition)
Add-on	• Same as Stand-alone, except visit information only at route. • Guidance by moving-light-route, making it less obtrusive (could put phone away) • Extra stimulation through lights • Nudging social interactions through route • Open to everyone • No mobile internet needed • Extra selling point for LED-markITS	• Municipality database street furniture • Webapp-developer • LED-markITS (supplier route) • Companies that want to advertise	• Municipality database street furniture • Webapp-developer • LED-markITS (supplier route) • Companies that want to advertise	• Online • Word of mouth exposure • More dense area of users, so could be more targeted	• In app advertisement • Selling user data • Margin on system	• Same as Stand-alone	• Relatively cheap webapp development • Marketing (concept recognition)

Evaluation

This chapter gives a short reflection upon the research and designing that has been done. First by discussing the biggest design choices. Then recommendations on research (explaining the validation test) are given. Finally a personal reflection upon the project is given.

Discussion

Throughout the process choices were made, though a few were quite decisive and not explained enough.

App over handout or sign.

This choice was deliberately made. One can argue that seniors do not use technology yet, though there is an significant increase. The percentage of seniors between 65 and 75 that use a smartphone or tablet has increased from 28 to 60%, from 2012 to 2016 (FIXME). Also the concepts intention is that people walk together, which makes it even more likely that one of them has a smartphone and knows how to use it properly. An app also has a few advantages over a sign or handout:

- More possibilities regarding exercises. A larger amount of exercises could be given, a variety of exercises and exercises could be tailored to someone's needs. One could relatively easy change animations to resemble a different target group.
- Moving images are assumed to explain exercises better than static ones. This results in doing exercises better and therefore should be better for your body. However, research shows that this assumption should be approached carefully. Peels et al. (2014) with research on differentiated effectiveness of printed versus Web-based interventions, suggest a separation of delivery modes. A printed intervention is still more effective amongst older participants. A similar approach is proposed in Recommendations Research.

Focus on physical activity, however the target group does not have focus on this.

Another discussion point is that of the choice to focus in the process more on physical activity rather than social activity. One could argue that physical activity is not one of the key priorities of the target group, why should the project focus on that?

Although the priorities of the target group are not on physical activity, the importance of physical activity amongst seniors is proven. Extra effort should be done in making it easier to use or do for users. This focus in the project led to exercises that are easy to do for anyone, whereas for instance 5-minute workout apps are too hard to do for seniors.

Recommendations

Research

TThe social part of this final design, as mentioned earlier, has not been tested for validation. Do people really come to the park to use the system or need to use of a platform such as Eckart+? This is also where this project is not validated enough and is something that would have needed long-term testing. Nevertheless, assumptions could be supported and the need for a more social community is also mapped.

Therefor the recommendation for further research and projects that are linked to the Moving-light-route are to find out who make use of the system and in what way they make use of it. This was also the intention within this project, however due to hickups of the system no datalogs were there to use. Also these datalogs should be put in perspective with qualitative insights. For instance if users do a whole route or that they start the lights just for the fun of it.

Another thing to test is the difference between hand-out and web based interventions. In the future web based will become more popular due to increase of use, however at this time it could be that printed versions are prefered more. A proposed test is that of a display at the park giving visitors of the park the opportunity to take paper handouts or access it on internet. Hopefully this will give insight on what method could be prefered at this moment and if people are interested in a platform such as Eckart+. Such a test is prepared however has been delayed due to discussion with KWIEK about permission to use animations similar to theirs.

Rondje in het park?
Probeer de Beweegroute Eckart+ hier

Helaas, alle handouts zijn op! Dat is natuurlijk wel een goed teken. Je kan gewoon blijven doorlopen want alle oefeningen staan ook online. Zelfs met bewegende animaties!
Namelijk hier: pleunheeres.nl/eckart/

Reflection

The Final Bachelor Project. The first individual project. The first project where I had the opportunity to deliver a design that relates to my vision and identity as a designer. After a half year of product design during the minor Sports Innovation in Delft and a half year of electives at ID, I was really motivated to start with something where I could determine the direction. First choice squad; Vitality, check. First choice project, Eckart, check. A project where I could co-create with big stakeholders, work with a high-end prototype and large scale user test opportunities. How can that not motivate you to go for it. A challenging project, though one that could help me with achieving my goals for this semester; doing research and a professional business approach.

The outcome: Eckart+. A platform that nudges social activity through physical activity. A concept for seniors, that hopes to empower them and with that hopes to tackle the big challenges of the silvering society; loneliness and inactivity. You can, in my opinion, really see my vision in it. Also the feeling I had at the start of the project of wanting to design something that 'does good' and gets to the edge of social, service and system design.

In hindsight, the beginning (orientation) of the project was the best aspect of the process. Really going out there and having direction and progression in the project. I found out that this user-centered approach is something I find important and interesting to do. Real life contact with your target group gives more valuable insights than envisioning. Shifting scope from individual fit runners to seniors was a

defining decision. In my opinion it was necessary to go for something that was not too obvious and defined already. However with this switch a more complex and diverse target group was chosen for this project. One that is hesitant towards technology and therefore also challenging. The brainstorm session with seniors was characteristic; challenging and satisfying at the same time. Some seniors were sceptical towards the Eckart project, though I managed to motivate them to help in a creative process. Getting appreciated for doing the effort was a satisfying feeling. This feeling of 'doing good', and people being thankful for what I was doing something for them, stayed throughout the project.

The atypical approach of the project was evoking my motivation in the orientation and later on causing a little more insecurity. The Eckart system had hickups in the synthesis phase of the project. This was frustrating since I had to find another way to make my ideas experienceable. This could also be the reason for going for a scope that did not require the system necessarily and could function as an add-on. What did not help was that I myself hesitated to work hands on with technology since I had the feeling I was not confident enough with it. This changed when gaining momentum in the process by quickly realizing and testing weekly with seniors. Therefore I am also proud of myself that I chose to not focus on the social aspects of my concept and develop the physical elements to a greater extend.
The main lesson learned this project is therefore: going out there. This is something I want to try out more from now on. I found out that I do not necessarily need to know

all technical aspects to move on in a project. What helps for me is validating through research and with acquainted knowledge design.

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