Designing for Everyday Life

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INTRODUCTION

According to Hassenzahl people do not only appreciate functionality, but they do also appreciate the experience of a design. In some cases, ease, efficiency and automation is less important than the emotional impact of a design. [6]. "Experience Design asserts design to not just be about products, but about the experiences they deliver". According to Roto et al. "The field of UX deals with studying, designing for and evaluating the experiences that people have through the use of (or encounter with) a system" [9]. Designing for the user experience is becoming an increasingly relevant topic in the field of Human Computer Interaction. At the moment there is relative less information available for how to design for the user experiences and this is one of the topical challenges.

This study will focus on design principles for user experience in the context of everyday life. Furthermore, this study will elaborate on the actual challenge of; how to design for experience. In order to do so, a focus on behavioural patterns found in our own daily lives is used. For this, we first focused on behavioural patterns found in our own daily lives. With the insights gained from the analysis of our daily lives, design alternatives were shaped to improve the user experience of a daily activity brought up during the earlier analysis. The reason to choose an activity that is part of our own lives is based on Smart, P. [13] where Smart explains that in order to truly understand the user the designer should not just study the user but stand in the shoes of the user.

During the analysis of the daily life, sport was a recurring conversation topic. For a lot of people sport is a common everyday activity to stay healthy. Although for many others there seems to be a gap between intention and behaviour, people willing to sport, but who are not always doing so. The goal of the design was to bring across the experience occurring when performing sport activities. Reliving this experience could then be used to reduce the gap between intention and behaviour. These insights were later on implemented in the design called 'GoSport'. First the design is evaluated based on a list of heuristics generated by the designers. After evaluating the design on heuristics, the design was evaluated by some users via co-construction story sessions. Based upon the gained insights, a tool is proposed which can be used by other designers to support their process when designing for the user experience. The tool helps the designers with analysing the data generated by user-evaluation sessions, which is collected when evaluating a design regarding to the user experience.

FABRIC OF EVERYDAY LIFE

To gain more insight in the behaviour of everyday life all four researchers acted as participants. Each participant captured one day in pictures followed by a group discussion. This discussion, in combination with theory, led to several insights and conclusions.

Approach

In order to explore behavioural patterns in everyday life, we have executed a personal diary log by using pictures as means of capturing data [14]. This way of capturing data could be more profitable to create insights in the user its daily life, than using Time Use diaries. The reason for this is that pictures could give insights that the user itself was not even aware of [14]. The participants were asked to capture one day of their daily lives in a series of self-made pictures. The aim of these pictures was to be able to reflect in retrospect on that particular day. There were no set requirements on the amount, quality or content of the photographs. Each participant created a printed collage with all the pictures they made (in chronological order).

Figure 1. A day in pictures

Based on these collages each participant was interviewed for 15-20 minutes. The interview started with a short summary of a day from the participant's own perspective, followed by questions from the other three participants. Within these group discussions there were no specific roles (or time slots) assigned. This enabled us to ask follow-up questions and to react on

one-another. However one person was assigned (per slot) to make notes of the most valuable discussion points. This setup was repeated four times, one discussion for each collage.

Insights

The pictures enabled the participant to recollect certain emotions and thoughts that occured while taking pictures. By discussing the pictures in detail and interviewing the participants some statements could be made about human behaviour in everyday life:

Context dependent

Behaviour is context dependent; the influence on predicted future behaviour is also context dependent. The context itself can be divided in different categories such as people, locations and tools/objects. We can take lunch as an example. When surrounded with friends, you are more likely to partake in a more elaborate lunch than if you were to be alone. This also applies for objects. At work, it is not likely you will prepare your food on the spot. One argument for that is that you do not have the same kitchen tools as at home. Future behaviour can be predicted based on past behaviour, but the accuracy of the predicted behaviour is greater when it takes place in the exact same context as the behaviour shown in the past [7].

Automation

Based on the discussions we had we noticed that a lot of our daily actions are automated. These actions require little or no thinking which makes them blend into our daily lives. For example travelling to the university. Most people just go by bike because this is the obvious choice, they started traveling by bike most likely because it was the easiest option the first time, and once they do most people don't think about how to travel to university anymore, they just take the bike because they always do. A controversy activity would be photographing your entire day, when you are not used to it. The participants tend to forget to take pictures when other activities are getting in its ways. This means that we tend to stick to our routine which is the 'easiest' option.

Past behaviour

Routines are based on past choices and their outcomes [7]. We observed this through various instances of our everyday life. For example when parking your bike at a certain place. If you come back later and realize your bike has been stolen there, you will most likely avoid this parking spot in the future.

Personal dependency

The exact same choice in action can have different meanings for different people. For example, a participant used the bike for his morning commute. This decision was made on the fact that he doesn't own a car, which leaves him using his bike most of the time. His mother used her bike for her commute too, even though she owns a car. She chose the bike because it's a healthy alternative. This can be supported by the theory of Planned behaviour [1]. The theory states that attitude toward behaviour, subjective norms, and perceived behavioural control, together shape an individual's behavioural intentions and behaviours. It relies on the fact that intentions contribute to the result of certain behaviour.

Different interest

From the pictures we could see that participants tend to take photograph of elements that are important or relevant to them. Since there were no specific requirements for the photographs, we can observe differences in the focus of the pictures. For example, one participant mostly photographed objects, while another captured mostly spaces. This can have valuable information about the perception/ focus of the participant.

Conclusion

The participant generated photographs helped us form valuable insights about our everyday lives. It shows that behaviour and future behaviour prediction are heavily dependent on the context. Based on this the statement is made that numerous activities and choices in our lives are automated which requires little effort. Next to that, we observed that routines are based on past behaviours and outcomes. Literature research enabled us to link these insights to existing theories.

As a result, these insights formed different design implications that contributed to the designs. There is shown that routines can be automated which requires less effort. A trigger might be needed to deviate from this automated behaviour. For instance, a trigger to perform sports when this is not part of your daily routine (yet). Being part of a group can result in empathic episodes, where an individual might feel compelled to exercise because of being part of a group. Especially if the members of that group, for instance a soccer team, is dependent on the presence of the individual.

DESIGN

Sport was a recurring theme in the everyday life of the different participants. Therefore it was decided to design for leisure activities, specifically activities for physical well-being. In relation to sports came several insights from the analysis; "I will experience more pressure and thus motivation to be present at the training when other people are dependent of me being present, or if others are expecting me". This insight, of experiencing more motivation when there are others, is in line with one of the basic psychological needs according to the self-determination theory, namely: relatedness [10].

 "I will be more motivated to perform sports when I see a direct result of exercising." and "I train (and eat healthy) because it is important for me to be in good

physical shape". These insights insinuate that people train to become better at it or to reach personal goals. These type of motivations are in line with the psychological need for competence and autonomy. People are more intrinsically motivated when they can interact proficiently and are able to self-regulate their behaviour [10].

"While and after boxing I feel more satisfied and happy." and "After I went training I feel better and more relaxed." These feelings can be explained by the fact that physical activity stimulates endorphin release. With high endorphin levels, we feel less pain and fewer negative effects of stress, which makes us happier human beings [2]. While we like the training itself and the feeling afterwards, all participants recognized the feeling of reluctance to go before training. This reluctance often leads to not going at all, especially when training is not part of a (weekly) routine or when busy with other activities.

Based on these insights two interesting design directions arose, which focus on the period before one decides to perform sports. The first direction focuses on triggering empathic feelings towards your friends as a motivation to exercise. The second design direction focuses on creating a community of like-minded in order to create the opportunity to train together. Below a scenario of use is formulated for the different design iterations, one for each design direction.

Design Iteration 1
Lisa is at home finishing the dishes after dinner. In her periphery she notices her SoSo (Social Sport) hub gently lighting up. She glances at her smart-watch to see that her friend Sophie is going to the gym in 30 minutes. A few seconds later the light intensity of SoSo increases. Apparently her friend Emma is joining Sophie as well. For a moment she thinks about whether she will join them or not. She does have to read another paper before tomorrow, but does she really need the whole evening for that? Another notification: her friend Rosa will be there as well. She hasn't spoken to Rosa in a while. There is a 'bodypump' class tonight, they do work in duo's a lot. She will be able to read her paper tonight. She double taps her watch to notify her friends and runs up the stairs to grab her stuff.
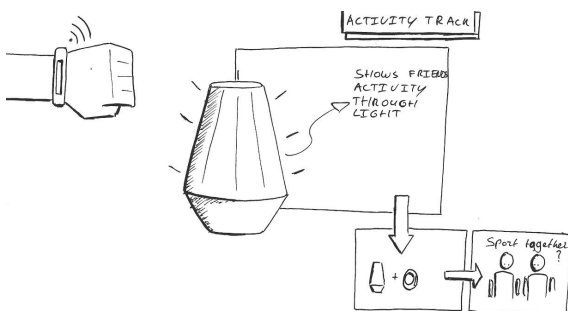

Figure 2. Social Sport Hub 'SoSo'

SoSo is a hub that can be placed anywhere in the house. This hub will interact with existing fitbits or sport watches. If one of the user's friends decides to work-out the hub will light up softly. The hub can be used by friend groups, sport teams, people from the same sportclub and so on. By using an associate app users can assign different colours to each group. If more people from the same group will go training the hub will shine brighter. The hub connects easily with already existing sport watches or fitbits. In this way people do not have to change anything in their habits.

Design Iteration 2
Jos has joined a group of people from the same neighborhood who are all running weekly. They don't have fixed moments, but everyone can indicate when he/she is going for a run that particular day and others can join them. A person will be informed if someone else is going/planning a moment for that day, by getting a message on a Fitbit, smartwatch, smartphone, etc. Today, Jos is just starting his Netflix account, but feels his Fitbit buzzing. He rotates his Fitbit to him and sees Ella is going for a run in a while. Jos can join by moving his Fitbit upwards or decline by moving it downwards. Jos decides to join Ella, closes his laptop and is putting on his sport clothes and running shoes. When he is getting dressed, the Fitbit buzzes again and when looking at it Jos sees Martijn will join as well. They meet each other at the regular meeting point in the park and will run together.
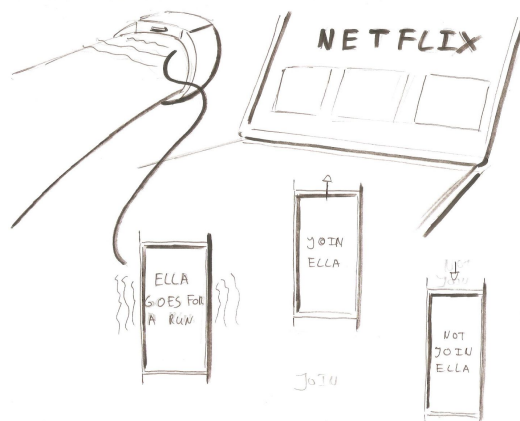

Figure 3. Online Sport Community

The 'Online Sport Community' is a platform were individual athletes can find fellow athletes to sport together. It could be perfect for people who are running, cycling, fitnessing etc. Athletes can find fellow athletes by using an app on their mobile phone, which preferably is connected with your sportwatch or smartwatch to increase the convenience and lower the threshold for receiving the message. In this way athletes do not need to already have a group to work out with, they can easily find people interested in the same sport and level.

Final Design
After the first design iterations, the designs were evaluated. This led to the realization that the designs were too much designed with as focus to solve a problem and were mainly designed out of usability. With as result, that the created experience was a result of the design. To really design for an experience we believed that the design had to be a result of the experience. In other words, the focus should first be on the experience, and the design is build around this, to realise the experience.

To do so, first is thought of what the actual experience is when performing sports. Before exercising most people feel reluctance before performing sports, but once they are working out, they are glad they went. Based on this insight the design is focusing on how to let people experience this feeling of exercising on beforehand. The positive experiences diverted from experiencing an adrenaline boost, emptying their head from stressful thoughts and having a chat with your fellow athletes, should come back once using the design.

The smartwatch 'GoSport' is designed to let the user re-experience their best sport experiences. During a workout, the device automatically captures the best experiences by measuring differences in heart rate.When you scheduled your next work-out, the device will, on beforehand start vibrating and playing a fourteen second video. This video is taken from your own point of view during the best experience of your workout. In combination with the video the device will simulate the heart rate you had during that particular moment in time. Once the video is finished the user is free to share it with his or her friends, to remind them of their workout, and to motivate them to workout again as well.
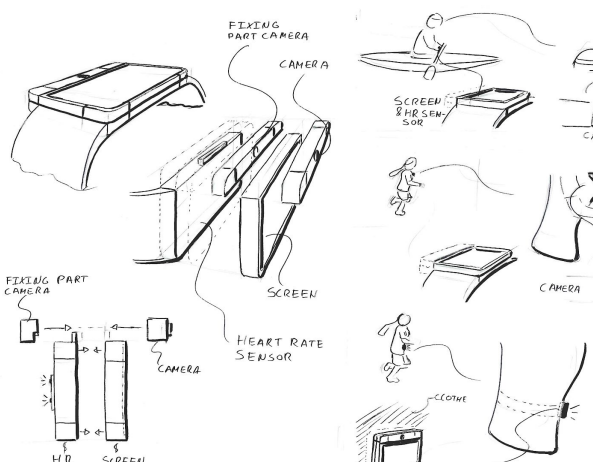

Figure 4. The Sportwatch 'GoSport'

The product is divided in three main parts which can be placed based on the user's preferences. The device exists of a camera, a heart rate sensor and a screen

(fig.4). Additionally, besides capturing the video and heart rate, the device is able to capture audio as well. The user is able to switch the audio on or off once the video. Furthermore, the user can also decide by themselves to activate the capture function throughout their workout.

Ben Shneiderman believes designers must address three almost equally important goals; provide the right functions, offer a good functionality and reliability, and implementing fun-features. Additionally, he mentions that "Joyful sensations often come during physical activities such as entertainment, recreation, or sports", and that fun is often a social activity. When creating heuristics for designing for enjoyable interfaces important criteria are: challenge, curiosity and fantasy (related to emotion and metaphor).

Target group
The device is mainly intended for student having a gap between the intention and behaviour in relation to sport. People who are willing to exercise, but are not doing it (as often) as they would like. The product is not only focused on personal use, but tries to stimulate friends as well by offering the opportunity to share the experience-snippet. Although the project is focusing on students, the target group might be bigger than that.

Scenario
Lisa just finished mountain biking with Jeroen. After doing so, they plan another mountain bike session for next week. The following week Lisa is done with her tasks for the university and went home. Lisa had a heavy day at the university and is not sure if she still wants to mountain bike anymore this evening, and is considering to cancel the workout. When making dinner, she feels her Gosport buzzing, looks at her smartwatch and sees the most exciting moment Lisa and Jeroen had during their previous workout. Additionally the GoSport starts vibrating on the rhythm of her heartbeat during the sport experience shown in the video. She suddenly feels the urge to sport again by the re-experience she just got.

Figure 5. GoSport showing the video of Lisa

The design is not only trying to motivate the owner of the device. By offering the ability to share the

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experience with others, the devices tries to stimulate doing sport with friends and to build a community. People in a community or in an inner-group are more likely to feel empathy for the other [17] In this case, people are probably more likely to work-out when others are going as well and will stimulate all the athletes of the community as well.

HEURISTIC EVALUATION

According to Hassenzahl the WHY needs are the essence of experiences [6] . These 'why' needs are focused on the utility of a design, the focus is on the activities - people satisfying a need. Since the core of our current design is about the experience we believe the heuristics should focus on this need satisfaction. Hereby we refer to the six basic human needs: autonomy, competence, relatedness, stimulation, popularity and security [1].

• *Autonomy* (I can do what I want, the way I want it) - our design offers different way of use depending on user preference (as shown in figure 4). Furthermore the user can decide what he wants to share, with who and when.

• *Competence* (I'm good at what I do) - the goal of our design is to stimulate people to train more. By training more people will become more experienced in the sport they are training for and therefore become more competent. The need for competence is thus not satisfied in the interaction with the design itself but in the performance of sport.

• *Relatedness* (I feel close to the people I care about) - on the one hand our design stimulates to train together, which can result in more time with your friends and therefore more relatedness. On the other hand the capturing and sharing offers the possibilities to see things from another perspective and thereby increase empathy to one-another.

• *Stimulation* (I experience new activities) - the randomness (a random moment in time close to the moment you intended/ planned to work-out) of receiving video snippets in combination with heartbeat-based vibrations can be experienced as playful and trigger curiosity.

• *Popularity* (I have impact on others) - In a way our design offers a possibility to stimulate your friends (and the other way around). Furthermore training more, will lead to a better physical shape, which could lead to recognition of your new 'improved' behaviour.

• *Security* (I'm safe from threats and uncertainties) - Our design only shares information with the people you add to your community on the moments you decide to share them. In that way it creates a safe environment to capture and share information.

Next to these 'Why' layer of the experience the 'What' and 'How' were layers considered as well. We created heuristics for these layers as well, but observed that these layers were less relevant when thinking of the user experience. Although they are essential elements of creating a successful design as well. 'What' is about the usefulness of a design, the focus is on actions; people pursuing a goal. Within our design the goal, which can be reached by the users, is to train more. Based on our personal experiences we often experience a gap between sport intention and -behaviour. During the user evaluation this 'gap' was acknowledged by other students as well. According to Ajzen this gap can be caused by either internal or external factors. Such as available resources, willpower, opportunity and dependence on others [1]. Therefore we can conclude that other people can influence the gap between intention and behaviour. Which implies that the functionality of our design tackles a relevant goal in a meaningful way.

'How' is about usability, the focus is on the interaction; people performing a task. With our design people can perform a few tasks: measuring heartbeat; capturing heartbeat; capturing videos; receiving videos and sending videos. A complete evaluation of the usability of our design is not yet possible, since a more detailed development of the different functionalities is needed. However the low- threshold for capturing (automatic based on heartbeat) and the modularity of the design are beneficial for the usability of the design. Furthermore we decided to use known interactions for activating capturing (double tap), sharing (swipe), sound (toggle switch), and play/pause (tap). Since these interactions are similar to widely used products such as snapchat, youtube and existing smartphones they are more likely to be experienced as highly intuitive.

USER EVALUATION

In order to evaluate our design proposal we created and conducted co-constructing storytelling session, as proposed by Buskermolen and Terken [5]. In total we conducted nine 30-45 minute sessions, which were all audio recorded.. All of the participants were deliberately chosen to be student to fit the required target group. Although the design was meant for students who had the intention to exercise more but did not actually do it, not all participants fit this persona. From the sessions we wanted to assess whether students do experience a gap between sport intention and behaviour, to what extent our design can reduce this gap and to what extent the design has the ability to be integrated into the everyday life of students.

Approach

The session consisted of two main phases; the sensitization phase and the envisioning phase. The session started with presenting the participant a storyboard about two people exercising together.

Afterwards, they plan to go again next week at the same time and place. But on the day of the planned activity, one of the people has deadlines. Which brings this person in doubt. From that end point, the participant of the sessions was asked how the scenario would continue and what they would do in a similar situation? Afterwards, more questions were asked to sentensize the user to help them remember their past experiences. Which helps them recall specific instances related to sensitizing scenario. The sensitizing part was planned to take up for about 15 minutes.
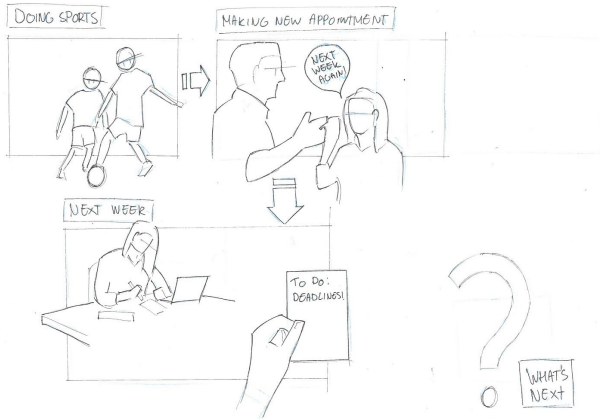
Figure 6. Sensitizing Scenario

After the sensitizing, an envisioning scenario was presented by a second storyboard. This scenario was similar to the previous storyboard but now including our design proposal. In the last scene a person's smartwatch pulsates and shows a video of the most exciting moment of the person and his/her friend at that moment they were working-out together. Afterward the participant wa asked the question how the scenario would continue and what the he/she would do in this scenario.
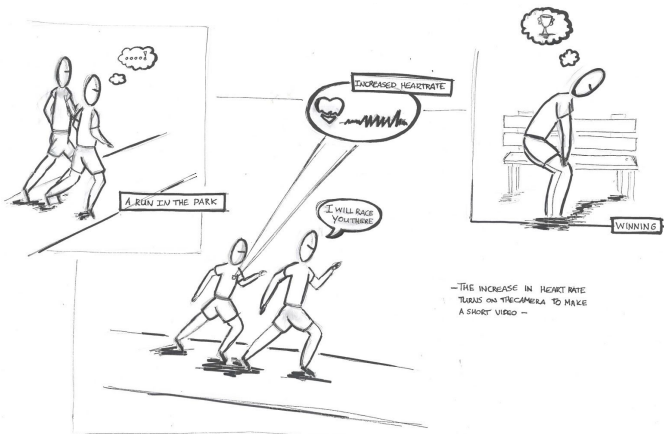

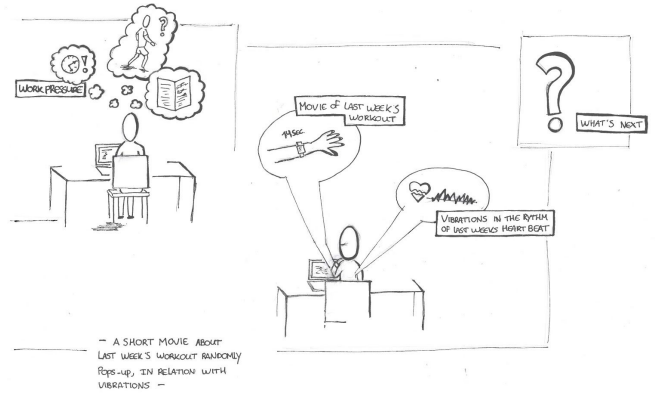**Figure 7. Envisioning Scenario part 1**

Figure 8. Envisioning Scenario part 2

Followed by more questions to evaluate the new experience of the design. The envisioning part was planned to take up for about 15 minutes. After envisioning the user, the user was asked for which sports he/she could imagine the product would fit. This was done by presenting the 'cycling, running ,and canoeing as examples, and the user could draw alternatives in the blanco boxes (fig. 9).
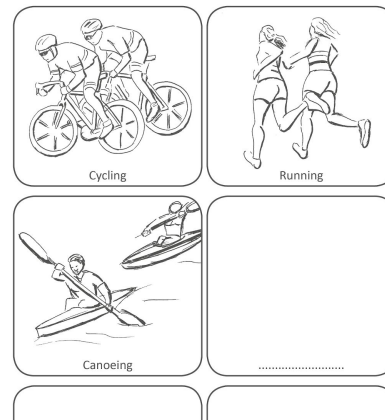

Figure 9.Templates

Outcomes

The sessions have been transcribed through intelligent Verbatim transcription [16]. This meaning that not all spoken words have been transcribed leaving the result more valuable. From the interview quotes were generated from the nine participants. These collected quotes were then used to apply in a thematic analysis[4].

All quotes were collected and divided over meaningful clusters selected by the researches. During this process some quotes were rendered unusable and discarded as they did not contribute to the clusters. These are the chosen themes: priority, sport feeling, future considerations, motivation/stimulation, social aspects and planning meeting/routine. The overview of all the quotes and analysis can be found in Appendix 2.

Insights

In most of the cases people didn't want to perform sports when they had an important deadline. The deadline had priority in that situation. The moment for stimulating people was not ideal. In general they would find it more worthwhile to get stimulated when they have time, as mentioned by participant 3: "(P3) Als ik geen zin heb en wel tijd heb, dan is een product dat je motiveert perfect." Besides, they were not only positive about getting a video about the previous time they worked out, but they also like to relive the positive experiences again.

"(P1)Het beeld op het juiste moment/kritische moment binnenkomt kan helpen motivatie. Het ligt aan wat voor gevoelens je gerelateerd hebt aan sport. Ligt ook aan de inhoud van het beeld dat weergeven word. Als het een negatieve ervaring is, kan het misschien tegen werken."

Do 'students' experience a gap between sport intentions and behaviour?'
Most of the students did have a gap between intentions and behaviour, but not everyone. Some persons were already quite motivated to often perform sports. One person even founds working out more important than studying. "(P1)Ik zou sowieso gaan sporten. Vaak in deze situatie gezeten bij m'n studie. Kan mijn team niet laten zakken. Dus je gaat gewoon altijd sporten. Als ik echt niet kan dan meld ik me af. Ik kan me er druk om maken, maar laat het me niet beïnvloeden." The reasons why persons in the end didn't perform sport were diverse. Some persons just didn't want to. One of the participants, went mainly when he had to be on campus. When he didn't go to the campus, he didn't go to the gym as well. In the summer he went less as well, since the changing rooms were to warm which made him sweat after working out.

"(P4) In de zomer fitness ik minder vaak. Vooral doordat de kleedkamer net een sauna is. Wat ervoor zorgt dat je bezweet in de bus zit en thuis komt. Ook omdat er dan minder school is, bijvoorbeeld door zelfstudie. De afstand naar de sportschool is te groot. Je gaat niet zomaar naar Steenwijk. De drempel is daarvoor te hoog."

To what extent can our concept decrease this gap between intentions and behaviour?
Most of the participants had the feeling they would be stimulated by experiencing the exciting moment they had previous time they performed sports. They also mentioned they would workout more, but this is context dependent. One person did not live close to the gym, he mentioned it would be more effective if he would had lived closer.

Some participants explicitly mentioned sharing being a source of motivation for others as told by participant 3: "(P3) Het delen kan een motivatie zijn voor anderen. De ervaring van het filmpje, geluid en hartslag zegt meer

dan woorden. Dus ik denk dat de kans groter is dat anderen ook gaan."

To what extent can our concept be integrated into the everyday life of students?
Most persons did not complain about the wearable. Although some would not wear it the entire time. One participant mentioned he didn't want to get disturbed when he is working on a deadline and would maybe take it off. Another person would probably take it off when he had a special activity, like going to somewhere where you are not able to perform sport. As mentioned before, most of the users did not want to work-out when they had an important deadline. Most of them also didn't want to get a message to stimulate them to do sport, since this was not the right moment. The moment of getting the message could differ per user, since it depended from the user's daily life. One person would like to get the message shortly before going, because he would feel extra motivated just before he went.

EVALUATION TOOL

The tool is designed to find the design's key elements making most impact on the user its fabrics of everyday life. The tool has two main topics, autonomy and community. In relation to these topics some keywords are important that could enrich the user its everyday experience and could create barriers. This is to be filled in by the designer based on the Co-constructive story session that took place. Beneath these keywords a few questions are asked that could help the designer get into a certain context to fill in the tool themselves. These questions are thus a starting point for the designer's evaluating process. The tool is to be completed in relation to the concept the designer is developing. The tool is designed to fit any design that involves a form of user interaction. In appendix 3 the tool is shown as filled in for the concept described in this paper, based on the outcome of the co-constructing stories also described earlier in this paper.

Based on the sentences filled in under the barriers and enrichment the designer could analyze which elements of the concept he or she developed are of importance. In the outcome of the tool added in the appendix conclusions can be drawn about the importance of relatedness/connectivity in relation to this specific concept. This conclusion would be based on that most sentence filled in under enrichments are positively related to the feeling of connection. Additionally, the outcome of the tool could let the designer iterate on the level of pressure in which the final design would trigger by the user. This would be because currently based on

the sentences at barriers and enrichments there is a small balance in which the trigger created by the design will fulfil the user's wishes without creating barriers.

Figure 10. Evaluation Tool

DISCUSSION

In the process of both developing and evaluating our design the potential user was in the centre of attention. According to Verganti user-centred processes can only lead to incremental innovation [15]. However we do believe our design proposal is quite radical in the sense that it uses heartbeat to trigger a camera and that it introduces a 'new' way of triggering motivation to workout. We believe that there is a difference between user-driven and user-centred design. User-driven is driven by what users can tell you about what they want and will therefore lead to incremental innovation (in contrast to design-driven design which leads to radical innovation). User-centred design as defined can lead to both incremental and radical designs depending on the designer's way of working.

When comparing our work to the different transformation paradigms, as presented by Philips, we believe it's traits are most similar to characteristic of a knowledge economy [3]. The core of this paradigm is facilitating peer-to-peer communication and creating meaning through connecting people. Our design is build upon the idea that people can 'inspire' each other (to work-out more) by literally sharing experiences with each other. On top of this one could argue that the design is in line with the transformation economy. Since the use of our design can trigger a lot of small behaviour changes which, in the end, could lead to one big change of behaviour in society. Each user is part of a small community, consisting of the people he/she (wants to) workout with. If all members of these communities manage to motivate each other to workout more, this will lead to a society of people who do more sports (and will therefore be healthier).

Limitations

From the co-constructing story telling sessions we could observe that most participants were acceptant to the concept. Ideally this group of participants consisted mainly of early adopters, since the early adopters are considered by many as "the individual to check with" to validate a new idea [8]. However during this user evaluation we were not able to take this into account, since we had not enough data about the adopter category of our participants. Therefore we do not know what type of adopter the participants were,which might have influenced the reliability of our findings.

As the evaluation tool helps understanding key elements in the fabric of everyday life, it is important to consider it's limitations. First of all, the tool focuses on the aforementioned themes; autonomy and community. This was a result of the nature (community and sports) of the created design. It is important to be aware that the tool may be less relevant for designs and concepts that have little or no relation to these themes. We can also discuss that the tool is more efficient for designs that require user interaction, because for such designs it is interesting for the designer to project the user experience.

CONCLUSION

The research was based on finding design principles to ease the process of designing for experience. We first looked at our own daily lives throughout a picture diary log. The insights generated by this diary log are used as basis for a design direction. A heuristics evaluation is conducted around the design direction and given literature on experience design. From this a final design concept is made which could be evaluated throughout co-constructing story sessions. All together this led to a design evaluation tool, to support designers in evaluating and analyzing the outcome of user-evaluations, in relation to user-experience design.

The reflection on the user diary log resulted in a new interpretation of handling the design process. Whereas designers are used to find an "experience as result of the design", user-experience design should be the other way around, "Design as a result of experience". This finding underpins the usefulness of the "Why" heuristics, which needs are the essence of experiences, and are focused on the utility of a design. Looking at the outcome of the heuristic evaluation there is a clear link between the design and the needs of the "why" heuristic, more concrete, the need satisfaction represented by this heuristic. Creating this link enables the final design concept to act within this area of "design as result of experience" by supporting the designer to in creating a design that is build around the satisfying needs of the user.

The evaluation tool is designed to show the underlying satisfying needs of the user. It is clear that the tool is specifically effective for design concepts with significant user interaction, for which the goal of the designer is to actually design for the user experience. If

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either of this is not the case than the tool won't act to its potential.

When reflecting on the goal of this process; 'finding design principles to ease the process of designing for experience' there are some insights formed based on the described process that could support designers in successfully designing for the user experience. The first step would be realizing that the design itself should be as result of an experience. This is elaborated further in the ideation phase described in this paper, where clearly the design concept created with this insight is more accurate for user experience design than the first two design iterations, which are based on the opposite, "experience as result of design".

Additionally, elaborating on the "why" heuristic could add sufficient value to the experience for which a concept is designed. Putting effort into analyzing the six basic human needs; autonomy, competence, relatedness, stimulation, popularity and security [11] will help the designer in understanding what the user's satisfying needs could be in relation to his or her design concept. The evaluation tool designed is created for supporting this same understanding. Where the basic human needs in relation to the "why" heuristics could create insights before a possible user test, the evaluation tool will support this based on the outcome of a possible user test.

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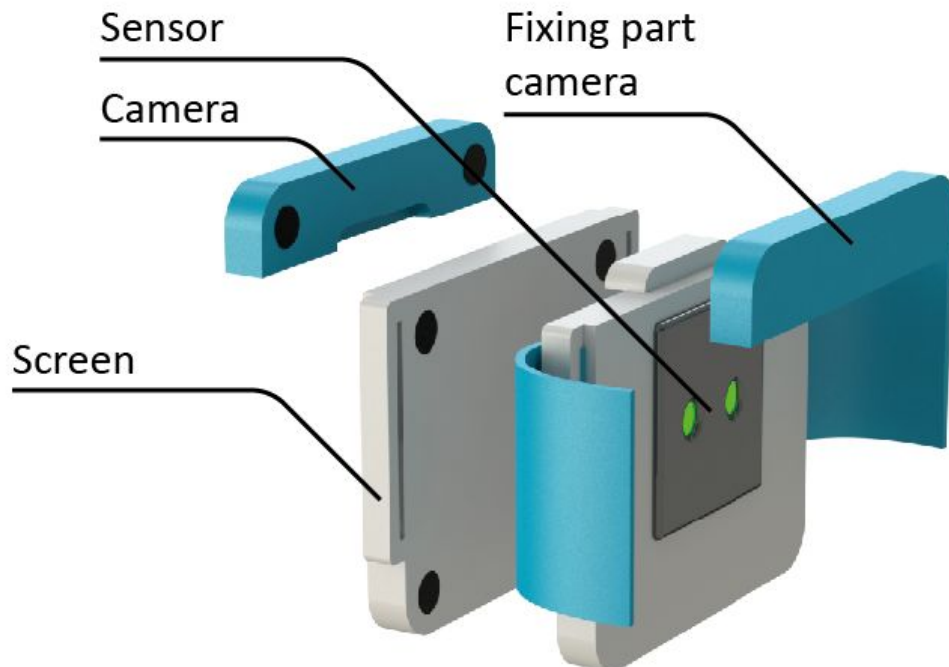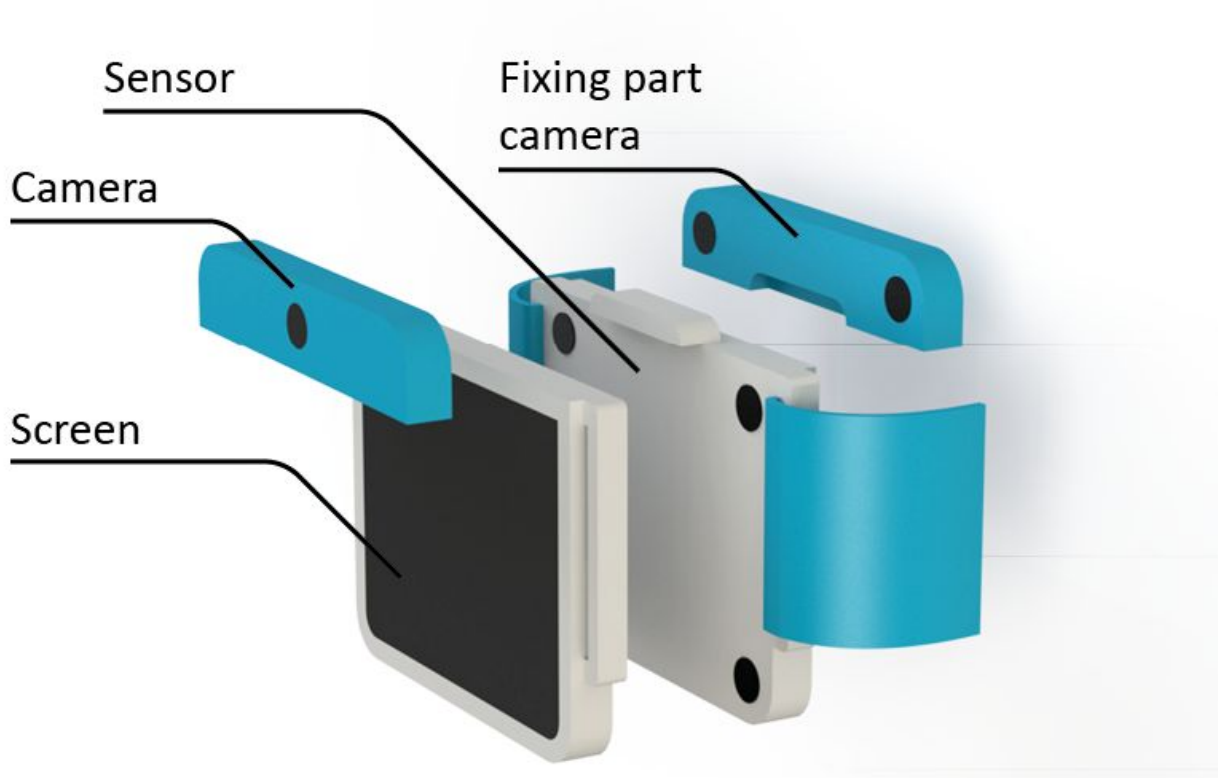
APPENDIX 2 - THEMATIC ANALYSIS

Priority

(P1)Ik zou sws gaan sporten. Vaak in deze situatie gezeten bij mn studie. Kan mijn team niet laten zakken. Dus je gaat gewoon altijd sporten. Als ik echt niet kan dan meld ik me af. Ik kan er druk om maken, maar laat met niet beïnvloeden.

(P2)Heb het vaak als ik eenmaal ga sporten ben ik super gemotiveerd. Maar als ik ff niet ga dan dan ga laat ik het sneller vallen vallen. Dan zeg Ik doe het morgen wel en bedenk wat smoesjes.

(P2)Had een afspraak voor een training. Heb ik geskipt omdat een vriendin me vroeg of we iets gingen doen. Vind ik gezelliger. typerend gebeurt vaker. Ik ga geen vriendin afzeggen voor sporten, vriendinnen zijn gezelliger dan sport. Op dat moment maakt het me niet uit. Later baal ik er wel van. Ik moet eigenlijk gaan maar is moeilijk om het op te pakken. Heb het gevoel dat ik op ieder moment kan sporten maar niet afspreken met Mn vrienden dus dan zeg ik het spoten eerder af.

(P3) Ik plan er omheen. Als ik druk ben plan ik niks in.

(P3) Soms zijn er belangrijkere dingen dan plezieren dan moet je je daar op focussen.

(P4) Volledig focussen op deadlines en dan pas kijken of er nog iets kan. En als je een afspraak niet kan nakomen dan verzetten.

(P5) Ik zou sowieso gaan sporten, afspraak is afspraak en ik vind sport belangrijker dan studie.

(P5) Ik ga het liefst alleen sporten zodat ik de vrijheid heb om het in te plannen in het verleden vaak 'teleurgesteld' doordat andere af zeiden of zo.

(P6) Ik heb op dit moment heel veel verschillende activiteiten in mijn leven die allemaal tijd kosten, waardoor ik vaak niet de tijd besteed aan sporten (minder belangrijk).

(P7) Handbal dan ga ik altijd + ik sport bijna iedere dag op school, vaak heb ik nog een andere intentie (soms tennis, soms zwemmen, soms kracht) dan afhankelijk van deadlines en andere activiteiten of ik wel of niet ga.

(P8) Ik denk dat sporten bij mijn geen hoge prioriteit heb omdat ik het wel wil maar uiteindelijk het nooit doe

(P9) Als ik al een keer heb afgezegd die week ga ik een tweede training sowieso wel.

Sport Feeling

(P1)Van te voren opluchting dat ik weer kan gaan sporten ook al ben ik moe. Als ik er eenmaal ben ben ik blij. Tijdens is conditioneel zwaar maar is mooi om bezig te zijn. Geeft voldoening om het te doen.

(P3) Als ik wel ga is het wel leuk, maar vooral achteraf. De drempel is dan hoger"

(P3) Als ik geen zin heb en wel tijd heb, dan is een product dat je motiveert perfect.

(P3) Nuttig gevoel na het sporten. Je bent wat aan het doen. Het is gezonder voor je en bent sociaal bezig.

(P4) Als ik het druk heb ga ik eigenlijk ook altijd, want het is ontspanning.

(P6) Het gevoel verschilt per sport; bij squash vind ik het echt leuk is ook spannend; yoga is meer ontspannend geeft rust in het hoofd; kick-boxen zijn we niet zo goed dus is meer struggle dan leuk, ga vooral voor de gezelligheid.

(P7) Tijdens het sporten ben ik vooral bezig om het zo goed mogelijk te doen, ik wil het altijd beter doen; het maximale er uit halen. Ik sport vaak om te winnen.

(P4) Vrij gevoel, denk aan minder dingen. Agressie sla je er uit in de oefeningen. Je moet natuurlijk wel ergens je agressie kwijt om woede uitbarstingen te voorkomen. Na het sporten voel ik me moe en rustiger dan voordat je er naar toe bent gegaan. En je voelt je relaxter.

Future Considerations
(P6) Ik ga vooral sporten omdat ik het leuk vind en met andere, ik zou liever de momenten opslaan dat we het meeste plezier hebben (lachen) dan de meeste inspanning (hartslag).

(P7) Hartslag gaat pas omhoog na de inspanning; op die manier zou je dus altijd de momenten capturen dat je uitgeput bent. Het zou beter zijn om te capturen op basis van adrenaline of endorfine o.i.d.

Motivation/ Stimulation
(P1)Ik skip nooit training. Soms is de gedachte er wel dat ik gewoon moe ben en wil slapen. Maar haal me zelf altijd over om te sporten.

(P1)Het beeld op het juiste moment/kritische moment binnenkomt kan helpen motivatie. Ligt aan wat voor gevoelens je gerelateerd en sport. Ligt ook aan de inhoud van het beeld. Als het negatieve ervaring kan het mss tegen werken.

(P2)Ga vaak naar groepslessen, motiveert me. Als ik alleen ben neiging ik sneller te skippen.

(P3) Komt wel voor, dan is het ook leuk, want het is sociaal en je wordt dan gemotiveerd door anderen. Niet eens pushen, maar gewoon het feit dat er iemand wel gaat en het je vraagt.

(P3) Het delen kan een motivatie zijn voor anderen. De ervaring van het filmpje, geluid en hartslag zegt meer dan woorden. Dus ik denk dat de kans groter is dat anderen ook gaan.

(P4) In de zomer fitness ik minder vaak. Vooral doordat de kleedkamer net een sauna is. Wat ervoor zorgt dat je bezweet in de bus zit en thuis komt. Ook omdat er dan minder school is, bijvoorbeeld door zelfstudie. De afstand naar de sportschool is te groot. Je gaat niet zomaar naar Steenwijk. De drempel is daarvoor te hoog.

(P4) Ik vind het wel leuk om de situatie met je gevoel of memorie te delen. Dat heeft wel wat, je ziet wel dat er al veel gedaan wordt met delen, maar met hartslag, camera positie vanuit iemand anders of uit jezelf, kan ook meer stimuleren.

(P5) Als Fysiotherapeut vind ik het belangrijk om zelf 'in vorm te zijn' ik heb een soort schema voor mezelf: ik train vier dagen op rij iedere dag een andere spiergroep en de vijfde dag neem ik rust en dan begin ik weer opnieuw.

(P6) Vroeger zat ik op voetbal toen ging ik altijd, je ging voor je team; was onderdeel van routine.

(P7) Naar de handbal training ga ik altijd, ik kan ook heel boos worden als andere er niet zijn. Je traint samen om wedstrijden te winnen en wil als team zo goed mogelijk worden.

(P9) Ik ben gemotiveerd altijd te sporten tenzij het niet anders kan wegens deadlines, werk gaat voor

Social aspects
(P1)Kan mensen niet laten zitten en het ontspant me dus doe ik werk daarna wel.

(P1)Ben ook echt een teamsport persoon. Sociale voldoening om met ze te zijn. Vaak daarna moe maar voldaan.

(P2)Als ik afspreek met iemand is het makkelijk, dan skip ik het niet zo snel omdat ik hem/haar niet wil teleurstellen. Samen sporten is voor mij wel echt een motivatie.

(P3) Altijd samen sporten, want anders is het niet leuk.

(P3) Komt wel voor, dan is het ook leuk, want het is sociaal en je wordt dan gemotiveerd door anderen. Niet eens pushen, maar gewoon het feit dat er iemand wel gaat en het je vraagt.

(P4) Meestal fitness ik alleen. Dan ben ik minder afhankelijk en het kost minder tijd, want wanneer je samen bent dan wissel je meestal af. Zowel met machines als me dumbels. Met de groep is het wel leuker, omdat je je socialiseert. Meer grappen en minder serieus. Dat is niet zo erg als het maar zolang het niet ten koste gaat van de oefening.

(P4) Ik vind het wel leuk om de situatie met je gevoel of memorie te delen. Dat heeft wel wat, je ziet wel dat er al veel gedaan wordt met delen, maar met hartslag, camera positie vanuit iemand anders of uit jezelf, kan ook meer stimuleren.

(P5) Ik vind het leuk om ervaringen te delen via bijv. instagram en te ontvangen, dat is iets wat ik nu ook al soms doe (als je bijvoorbeeld een nieuw gewicht kan of een nieuwe oefening).

(P6) Ik zou zelf niet heel erg de behoefte voelen om dingen te delen, maar ik zou wel meer getriggerd zijn om te gaan als ik 'de motivatie' van andere ontvang. Niet zozeer omdat dat bij mij iets oproept maar meer omdat ik dan weet dat de ander graag wil gaan.

(P9) Training kan ik niet zomaar afzeggen omdat ik daar bij moet zijn voor anderen

Concept
(P1)Ik zou heel benieuwd of het de juiste werking heeft op mij. Lijkt me heel interessant hoe het werkt. Ik zou het wel dragen uit nieuwsgierigheid. Terugkijken lijkt me ook echt leuk ook al heb ik niet echt motivatie nodig

(P3) Als ik geen zin heb en wel tijd heb, dan is een product dat je motiveert perfect.

(P3) Het delen kan een motivatie zijn voor anderen. De ervaring van het filmpje, geluid en hartslag zegt meer dan woorden. Dus ik denk dat de kans groter is dat anderen ook gaan.

(P3) Ook als je niet gaat sporten is het filmpje ook leuk. Bijvoorbeeld een mooie goal met voetbal of een personal record bankdrukken. Dat is leuk om terug te kijken. Je beleeft het weer opnieuw.

(P3) Als je met iets dringends bezig bent en als je echt geen afleiding wilt. Maar je kan er ook voor kiezen om het product af te doen en weg te leggen.

(P3) Tijdens het dagelijks leven zou ik het wel om doen, maar met speciale activiteiten, zoals pretpark of bij drukke of belangrijke bezigheden hoeft het niet en zou ik het af doen. Vijf a zes weken ben je echt heel druk in het jaar met school en deadlines, maar die andere weken zie ik geen reden om het niet te dragen.

(P3) Ik denk wel dat het de motivatie verhoogt en ik denk dat ik met dit product meer zou sporten. Met dit product denk ik dat ik vaker alleen ga, maar ook vaker samen, want het motiveert hen ook.

(P4) De verleiding van het herbeleven wordt groter. Hoe leuk het ook is als de deadline niet af komt dan moet je het gewoon niet doen, je krijgt er later spijt van. Weet niet echt of het een stimulans is. Ik denk het wel, want je wordt getriggerd. Als het alleen voor sport is wel, want anders verleiding te groot.

(P4) Als je niks te doen hebt of 's avonds niks te doen hebt dan kan het stimuleren. Kan ook helpen als je deadlines hebt, omdat je dan even iets anders hebt. Als het in een paar uur af moet en je weet dat je door kan, dan niet sporten. Maar wel als je net genoeg tijd en je weet dat je meer gefocust wordt wel werkt.

(P4) Ik vind het wel leuk om de situatie met je gevoel of memorie te delen. Dat heeft wel wat, je ziet wel dat er al veel gedaan wordt met delen, maar met hartslag, camera positie vanuit iemand anders of uit jezelf, kan ook meer stimuleren.

(P4) Zelf activeren van film is ook positief. Als je niks mist van de leuke dingen als je het goed gebruikt. Bepaalde notificaties uitzette, dus geen bericht als je echt niet kan.

(P4) Voordat ik naar school ga heb ik al besloten, gezien reistijd. Maar voor mensen die geen of weinig reistijd hebben, inclusief mezelf, zou het nuttiger zijn. Moment van sturen bericht net voor het sporten, als je er naar toe gaat. Uitgaande van dat je al wil.

(P4) Niet per se de wil, want ik ga het sowieso doen, maar wel meer gemotiveerd. Je wordt er na toe gedreven op een leuke manier. Je doet het wel sneller.

(P4) Meer geschikt voor sporten met meerdere personen. Helpt het inspireren van anderen. Anderen motiveren en als anderen ook meer zin hebben is het voor jezelf ook weer leuker. Je wilt geen ongemotiveerd persoon bij je hebben. Je stimuleert elkaar.

(P9) Ik heb niet opeens minder deadlines door dit concept, maar ik zie wel in hoe dit concept bijdraagt wanneer mensen sport missen uit luiheid

Planning meeting / routine
(P3) Geen vaste planning, gewoon wanneer zin. Vaak impulsief, op dat moment zelf. Maar met voetbal weet je het wel van te voren. Voetbal is wel routine

(P4) Met anderen is plotseling. Alleen is routine, elke dag wanneer ik naar school ga, maandag tot en met donderdag.

(P4) Voordat ik naar school ga heb ik al besloten, gezien reistijd. Maar voor mensen die geen of weinig reistijd hebben, inclusief mezelf, zou het nuttiger zijn.

(P8) Dit concept zou voor mij meer toevoegen wanneer ik meer routine heb, en zeker wanneer ik meer geroutineerd sport.

APPENDIX 3 - COMPLETED EVALUATION TOOL

		💡 Enrichments	🚧 Barriers
Autonomy	**Location** Is the design flexible/ portable? Does the design need resources? Does the shape fit the aimed context?	Design is easy to take with you and can be worn in different ways regarding to my preferences	The design is dependent of WIFI and it most likely needs to to be charged
	Time Do the interactions fit current routines? Can it be used for a long(er) period? Are certain functionalities time-bound?	The design does not influence my routine Maybe it will make me stick to my routine better	I think the design will only work if I already have a routine to sport on certain moments
	Priority Do the functionalities fit user's priorities? Is the user able to change setting i.e.? Are the functionalities multi-interpertable?	The design helps me stick to my training schedule	The design ight make me focus on playing sports while my deadlines might have higher priority
Community	**Competition** Does the design stimulate (peer)pressure? Does it measure and show data i.e.? Can users see certain rankings or scores?	If I feel my friends sport I feel more motivated to workout as well	I feel pressured to workout when I now my friends are working out as well, even tough it does nit fit my schedule
	Connectedness Can users contact or add other people? Are users able to share information? Does it stimulate a feeling of belonging?	It feels nice to share working out with my friends, it makes it more fun	
	Dogmas Which dogmas relate to what you design? Is the intended behaviour in line with ..? Do you intend to create new dogmas?		It feels that if you don' workout you are not being healthy