



# Midterm Report

## M1.1 Slow Technology for Personal Health

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# Introduction

## Slow tech - uncommon technology

Have you heard of slow technology before? Neither did we when we started this project at the Vitality Squad. In consumer electronics retail, slow technology is not yet found by us. But it has a lot of potential regarding offering reflection (Odom, et al., 2019), occurrence of memorable moments (Odom, et al., 2014) and it has the ability to change the connection between owner/user and the device (Wakkary, Desjardins and Hauser, 2016). We were all inspired by this new way of using technology and we wanted to learn about it and work with it.

But what does slow technology actually mean? Slow Technology is not a new technology on its own. It is a new way of implementing technology as we know it today. This new implementation is connected to slowness, hence slow objects. By slow is meant an object that reacts way later than initiated or an object that is only active for a couple of times a month, instead of every moment of every day. It is a contradicting technology movement regarding the always available technology nowadays. People are used to constantly relying on the technologies they have and that those technologies work and react quicker and quicker. Slow technology is more like a pet or a child with its own will, so it seems.

In this report you will follow our journey in discovering this new way of technology and how we designed MOOORA, a motion-triggered lamp that lights up with a delay of a whole day or week. It is ghosting your routine of the past to guide you in finding a work-relax balance and creating a healthy winding down routine. Having a proper routine helps with for example, recovering from work and making yourself ready for the next working day (Zijlstra & Sonnentag, 2006; Scott, 2020). In the current 'always on culture' employees find it hard to stop working. Today's work involves connectedness but this also has a negative effect on the boundary between work and the non-work domain (Derks, van Mierlo, & Schmitz, 2014). Winding down from work into your private life was usually distinguished by going back from work by car for example. Now that we are asked to work from home, this routine and barrier vanished completely. And it reveals that there might not have been a proper winding down from work at all. Supporting healthy winding down routines can help restore the balance between professional and private life.

MOOORA is designed as our midterm prototype and is the first physical iteration of our slow technology for personal health. During this first part of our design process we found a problem context for which we wanted to design: finding a balance between work and private life. For this context we made our first design which will be iterated upon more after the midterm.

# Related work and benchmark

## Introduction to slow technology

Slow technology is a term introduced by Hallnäs and Redström (2001). They define it as “*a design agenda for technology aimed at reflection and moments of mental rest rather than efficiency in performance*” (Hallnäs and Redström, 2001, p. 201). A more concrete description is given by Fass (2012), who says “*Slow technology is a way of thinking about human artefacts that emphasises speed of operation, pace of consumption and the length of time taken to obtain results*” (Fass, 2012, p. 1). This agenda is accepted and elaborated on by others, for example by expanding the notion of temporality of data as a result of spaceless, placeless and formless nature of data (Chen, 2020; Odom et al., 2019; Vallgård, 2014). This is a logical result in a society where efficiency and growing digital content creation are key phenomena, as illustrated in a variety of research on slow tech (e.g. Odom, et al., 2014; Odom, et al., 2019).

According to Hallnäs and Redström (2001) the difference between fast -and slow technology can be described as taking away time (fast tech) and supplying time (slow tech). They argue that we need to get time for reflection, rather than compress it.

## Slow technology designs

Numerous studies emerged applying the notion of slow technology. These include the table-non-table (Wakkary, Desjardins and Hauser, 2016), Olly (Odom, et al., 2019), Slow games (Bertran, 2014), Long Living Chair (Pschetz and Banks, 2013), FutureMe (Odom, 2015) and Photobox (Odom, et al., 2014).

Interesting is that most of these designs include reflection directly or as a result of other main qualities. For example, table-non-table’s main focus is “purposeful purposelessness”, i.e. having a clear function (supporting objects, note taking) without a clear end goal or purpose. Slowness is included by slow movements of the table which can ultimately lead to reflection of the layout of your home and placement of the table (Wakkary, et al., 2016). Note that this reflection is only possible when time is given to reflect on the position of the table-non-table. If it were fast, it would never be “in the way”. For this reason, it makes sense to use slow tech to design for reflection as a key quality.

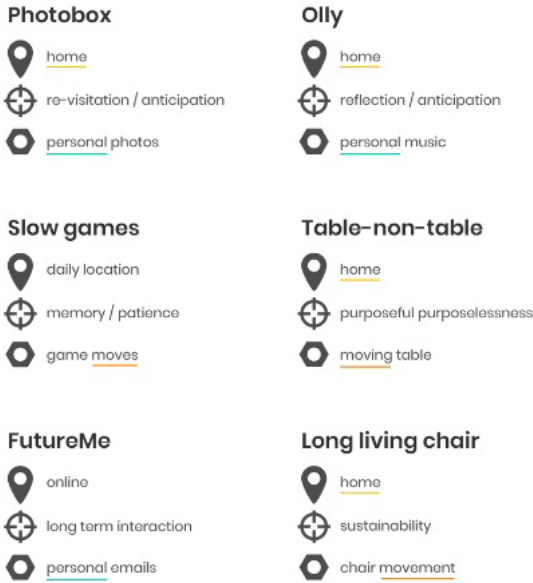
## Deficiencies in application domain of slow tech

Each of the designs described above focus on specific qualities of slow technology. Most, if not all, designs are actually research artefacts. There are hardly any slow tech products on the market. Are these qualities just not suitable for commercial use? Fass (2012) suggests a possible explanation for this phenomenon, namely changing users with long lasting technologies that inhibit long lasting relationships with this technology. While this could be a reason, it is also not unlikely that the gap between fast -and slow technology is simply too big to be accepted by consumers before the technology is disposed of. This hypothesis can be derived from the recurring “trajectory of appreciation” (Gaver et al., 2016), from frustration to acceptance (Odom, et al., 2014; Odom, et al., 2019).

Additionally, slow tech has widely been researched within the context of everyday life, where it can sustain a more permanent role than some fast, self-conscious products (e.g. Wakkary, et al. 2016; Odom, et al., 2019; Pschetz and Banks, 2013), though no application or research of slow tech within the (personal) health domain was found.

This suggests an opportunity for implementation of commercial slow tech in the domain of personal health.

### Slow tech benchmarking



Graph 1

### Personal health

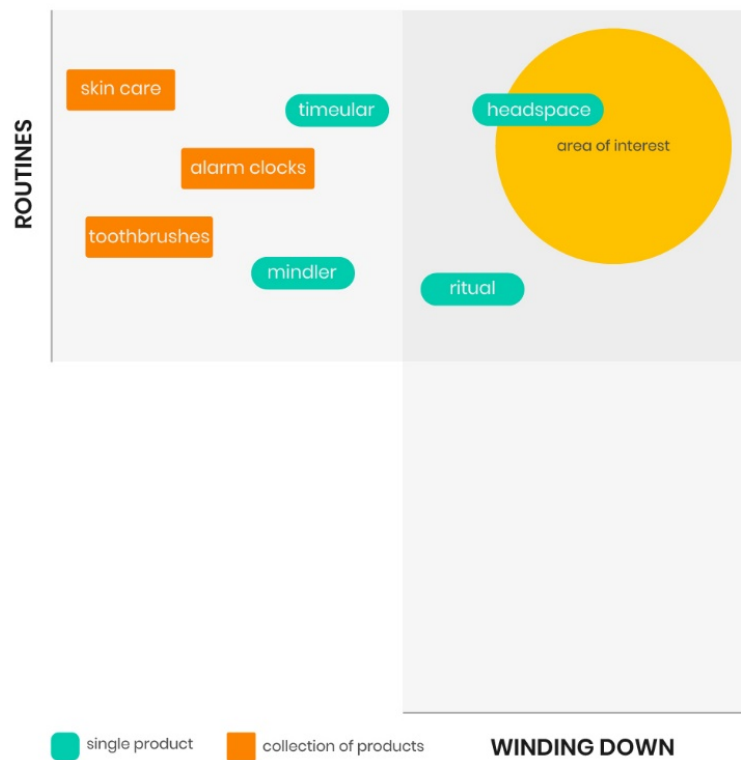
Our interest within the scope of personal health was drawn to routines or rituals, specifically in the domain of winding down after work or before bed. The reason being, routines need to be established over time (Gao, 2012; Scott, 2020), and therefore seem suitable for a slow tech intervention (Gao, 2012). Having a wind down routine benefits your health in multiple ways. Most relevant here are improving your sleep quality (Scott, 2020; Walker, 2018) and mental recovery from a workday (Zijlstra & Sonnentag, 2006; Scott, 2020).

As explained more elaborately elsewhere in this report, the goal of MOOORA is to *evoke reflection about wind down routines for restoring and supporting a healthy work-relax balance*. Using reflection within personal health is not new. Gao (2012) uses reflection, rather than persuasion, as a way to achieve behavior change. This approach is similar to that of MOOORA, although the application domain differs.

## Wind down - and routine designs

Focusing on similar application domains as MOOORA include Ritual (Houhgton, 2020), Headspace (Headspace inc., n.d.) and Mindler (Ferreira, Soares, and Branco, 2019). Striking is that these products are all apps. A tangible example is Timeular (Timeular, 2015), though it's still connected to an app. Other products, related to routines, include skin care, toothbrushes and alarm clocks. However, these do not focus on wind down routines at all or offer very specific wind down routines, while these are highly personal (Scott, 2020). This explains the gap in products aiming purely at winding down (see graph 2).

## Wind down routines benchmarking



Graph 2

# Design process

## Discovery and Explanation

### Personal Routines

At the beginning of the project, we got introduced to Slow Technology in the context of personal health. Since slow technology is an unfamiliar domain, literature was required to understand its qualities. Next to that we looked at its benchmark, which is discussed in the chapter 'Related work and benchmark'.

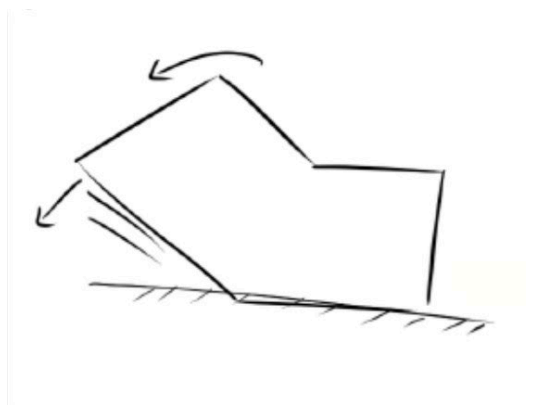
To find inspiration, we tracked our own daily routines in a diary study, but realized that this was quite time consuming and privacy sensitive. This way of writing down routines was very intense. Therefore, doing something like this to get data from participants will not work very well in this way. For ourselves it did raise awareness and reflection about these activities. This analog way of making a diary helped with having a moment of reflection at the end of the day or in-between activities. Moments of rest seemed like an opportunity for improving mental health

Having a direction like this might be interesting for our project. We will be using the insights from this diary activity as a start for our ideation. Using it to enable our design process; data enables design.

### 100 Sketches challenge

Further ideation was done by means of sketching. From a total of 106 sketches, we identified five main themes: Art for reflection, Awareness for work breaks, data gathering, slowing down the user, and togetherness. Two of the sketches, both part of the awareness for work breaks theme, evoked an interesting discussion.

We identified the main slow qualities of these ideas and came to the conclusion that BLOQ, the abstract moving object, was most interesting as it was most mysterious and allowed for reflection on routines.



BLOQ

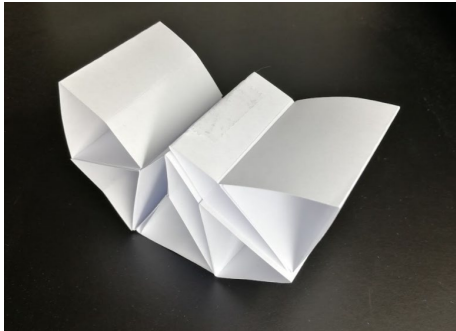


Yoga Friend

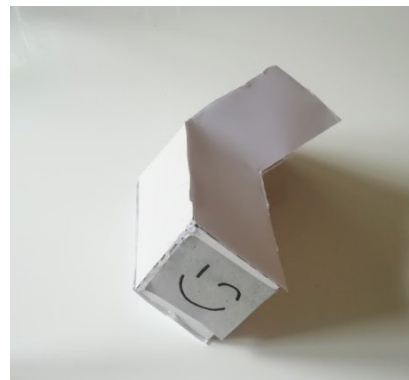


## Lo-Fi prototyping

After performing the 100 sketch challenge, our next step was to make lo-fi prototypes. After the 100 sketch challenge we came to the conclusion that it turned out to be very difficult for us to integrate slowness in our concepts. By making lo-fi prototypes, based on the two concepts we picked, we explored different ways of interaction in which the core was based on slowness. Below are some of the results of the lo-fi prototypes.



7 Lo-Fi prototypes



The true strength of slow tech is in a match with the application area, which we did not have yet. Therefore, before going into more depth regarding slowness of the concept, the context of use was specified. We did this by analyzing our own daily lives again, and took inspiration from literature about sleep (Walker, 2018), work (Scott, 2020) and routines (Scott, 2020).

## Postponed user study

At the same time as making the lo-fi prototypes, we also set up a (hybrid) diary study. But later on we came to the conclusion that it would be better for now to focus on the development of a fully functioning prototype. In this way we could use the prototype together with (parts of) the hybrid diary study to collect data about the influence of the prototype on the behavior of the users.

**WOENSDAG 23-09-2020**  
WEDNESDAY 23-09-2020

**Wat heb je vandaag gedaan tussen dat je wakker is gegaan of dat je wakker bent geworden en je opstaat?**  
*What did you do today, between your morning alarm or waking up, and getting out of bed?*

**Hoe is jouw dag begonnen nadat je bent opgestaan vandaag?**  
*How did your day start after getting up?*

**Hoe is jouw (werk- of studie)dag vandaag begonnen?**  
*How did your (work- or study) day start today?*

**Hoe is jouw (werk- of studie)dag vandaag geëindigd?**  
*How did your (work- or study) day end today?*

**Hoe zag jouw dag eruit nadat je klaar was met werken of studeren of je activiteit vandaag?**  
*How did the remainder of your day look like after work/studying/the day activity?*

**Hoe en wat heb je gegeten als avond eten?**  
*How and what did you eat for dinner?*

**Wat heb jij gedaan voordat je bent gaan slapen vandaag?**  
*What did you do before going to bed today?*

Participant	Items total	Food	Nonfood
Participant 1	31	17	14
Participant 2	13	7	6
Participant 3	40	16	24

Creative qualitative diary study ideas (Hanington & Martin, 2012)

Initial diary study page example

## Context Decision

As mentioned above, we have come to the conclusion that it is important to define a concrete problem and a context in order to start designing a prototype. After a brainstorm and discussion with the group, we decided to define a combination of sleep (Walker, 2018) and the always on culture (Scott, 2020) as the starting point of the problem and context definition. The following description was used as a new starting point.

“Working from home is different from working at the office. The routines to end a work day change, making the dividing line between work and relaxation at home very thin. A clearer separation of work by means of an "after work ritual" would possibly help to improve sleep and productivity. Because people normally ride a bike or drive a car between work and home, this was seen as an "after work



ritual". However, due to the current situation that "ritual" falls away and nothing remains. This makes it clear that a real ritual never existed."

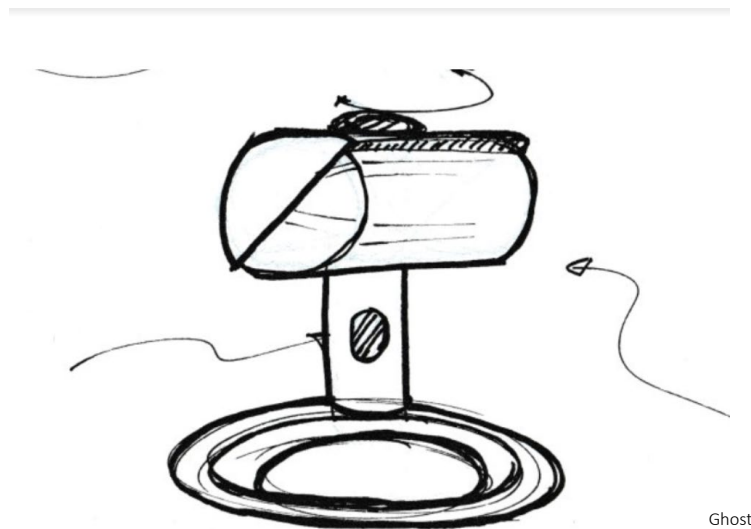
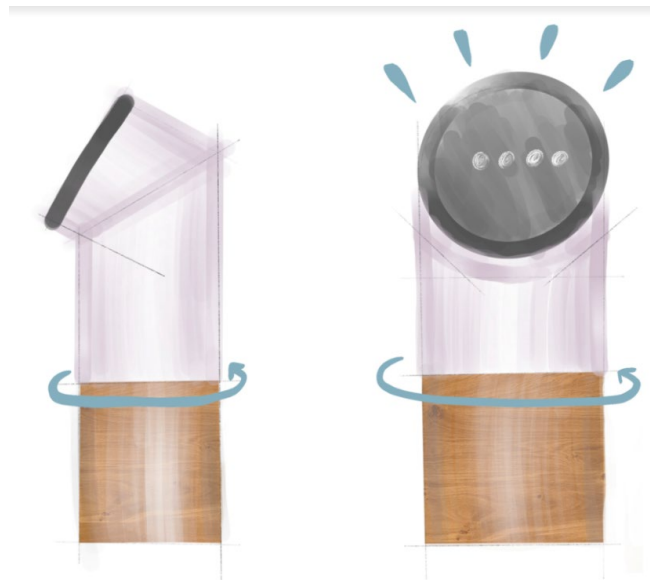
Based on the above description we worked towards a new ideation session and a new preliminary literature review, from which the results can be found in the chapter 'Related work and benchmark'.

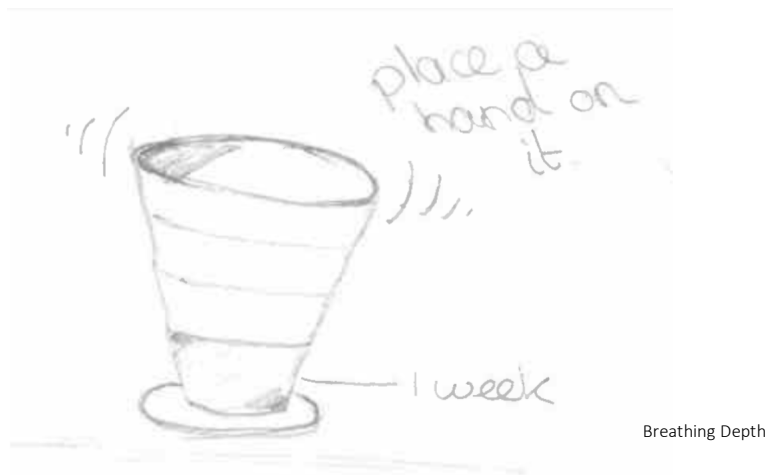
### New iterative ideating

#### New sketches

Based on our new context and problem definition we started with a new ideation session. Firstly everyone made individually a few sketches about possible design opportunities within the new context. These sketches can be found in the appendix. Based on these sketches we had a discussion during which we had to select the three concepts that we were going to use for further ideation.

Below are the three sketches that were used as a starting point to make lo-fi prototypes. A detailed description of the three different concepts can be found in the next chapter.





### Sketches to prototypes

Based on the sketches, three new and specific lo-fi prototypes were made. The three different concepts are further elaborated below.

#### The Friction Periscope

As the title already suggests, this smart speaker is meant to create friction. Friction in such a way, that it physically moves you around. To cause friction, this unaware device slowly turns around (the top parts, now cardboard). It turns around its base (the black fabric) and therefore the speaker is directed in another way. In this low-fi prototype it is not well shown, but the angle of the speaker should be more to 60 degrees instead of its current +/- 30 degrees. This way the speaker is more directed towards another corner of the room.

To be able to hear and communicate well you need to walk in the area the speaker is pointing at. Otherwise, the direction of the periscope is guiding the sound away from you. You will only encounter the changes when the sound is actually different than before; which might take some time due to the slowness of the device.

By taking all the control as the device, the user encounters friction with it and might want to turn the periscope to a right direction. Though, when this occurs, an alarm will ring. The device just wants to do what it is doing and not something else.

It is still hard to connect this device to the current context we have, due to the unawareness of the device.



The Friction Periscope Prototype

## Ghost

Ranging from low to high impact on daily routines, Ghosts exists out of a table lamp, an alarm clock and a power switch. Three products that actuate with a delay between one day and a week, depending on the routine they visualize.

Most promising is the low-impact table lamp. It has the most flexibility in usage and can be used to indicate presence in either a work (desk) or a non-work (couch) location in the home. Either one will be an indication of work-relaxation balance. By using a PIR sensor, presence can be recorded without requiring focused attention of the user, making the experience of living with a past self even more realistic.

The idea is that the lamp is most useful when used in a routine, repeating between a day and a week (or even month), selected by the user. The ghost (your past self) indicates your prior routine, and provokes reflection about work routines.

Over time, a new effect could emerge, where the timing is no longer based on one prior instance but an average or multiple days/weeks/months. Brightness indicates when you usually work, by becoming brighter, or rarely work, by shining dimmer or not at all. This way, slow tech is implemented on two levels.



Ghost Prototype

### Breathing dept

The boundary between working and relaxing at home is fading. Having a winddown routine can help people to close their working day both mentally and physically. In this way people are able to recharge for their next day at work.

This concept can help people to create a winddown routine. After a working day, the employee places his or her hand on the top of the object. At this moment the 'ball' in the object slowly starts to vibrate to the rhythm of a breath. The user can breathe along at this rhythm for a certain period of time on the basis of these vibrations.

When the object notices that there has been little or no interaction in the recent period of time, the object will slightly light up. In this way the user is reminded to interact with the object and build up a routine. When a user builds up this routine again, the light in the object will slowly dim. This means that a routine has to be built up over a longer period of time to ensure that the light in the object goes completely off.



Breathing Depth Prototype

## Getting ready for midterm

### Decision making process

After creating the three new concepts (Friction Periscope, Ghost and Breathing Depth) there was another brainstorm within the group to choose a specific concept. This specific concept was then further elaborated and a fully functioning prototype was made.

During the brainstorm we all first came to the conclusion that the Friction Periscope will not be further developed. The reason for this is that, in our opinion, this concept has no clear connection with the current problem and context. Next, we chose to drop the Breathing Depth as well and continue working with Ghost. The reason for this is that Breathing Depth facilitates a routine which makes this concept very specific. In addition, we believe that a routine can be different for each person. For this reason we want to focus on creating reflective moments where the user can create their own routine. The Ghost concept stimulates this moment of reflection.

Based on the above arguments, the choice was made to further develop the Ghost concept for the Midterm Demo Day.

### The making of MOOORA

As described above, the Ghost concept was the starting point for the development of the hi-fi prototype for the Midterm Demo Day. We used a render as an intermediate step between the lo-fi and the hi-fi prototype. In this way we were able to choose the materials we wanted to use in the development of the hi-fi prototype. In the image below the render can be seen.





Based on this render the first version of the hi-fi prototype was made. Here we started with the design of the object and later on we continued to work on the electronics and software to make this prototype fully functioning. In the pictures below you can see some of the different steps we took during the creation of the first hi-fi prototype.



The making of MOOORA by Maud, Rick and Yvonne



After finishing the prototype we had to prepare ourselves for the Midterm Demo Day. This included making a video, taking pictures, making a poster and writing a pitch. One other important step was to come up with a name. We selected the name 'MOOORA'. MOOORA means delay in Latin and since our project is about Slow Tech we figured this was a suitable name for this first version of the hi-fi prototype. In the next chapter a full description of the functionalities of MOOORA can be found.

## MOOORA

Current day communication technology enables people to stay connected to their workplace 24/7, blurring the boundary between the work and the non-work domain. This is also known as the always on culture.

Employees find it difficult to mentally end the working day, while this is very important to recover from work-related stress. This process of recovery takes place when an employee is no longer mentally or physically connected to work. Usually we disconnected by traveling to and from work. These days, when we work from home, this division narrows down to almost nothing. Supporting daily routines can help to recover and restore the balance between work and non-work domain.

MOOORA is a motion-triggered lamp that automatically lights up with a delay of a whole day or week. Rather than offering an efficient light source, this "slow technology" evokes reflection and encourages the user to establish routines that include taking a break from work or stopping completely after six PM.





MOOORA in context

# Future Work

## Feedback from the Midterm Demo

During the midterm presentation we received a lot of feedback. We were pleased by the overall positive reaction regarding the quality of our prototype. Next to that people felt like the topic we described was very knowledgeable and slow technology could actually mean something in this context. Especially because the control is moved from the user, though the user still has the ability to decide for their own actions. Interesting to see too is that behavior change might be a spillover effect of the design.

Of course we also received some constructive feedback regarding the current elaboration of the idea and some outliers in routines that might affect the design negatively. Interesting to hear were the thoughts on the reverse effect of MOOORA. By the use of light that could stay on longer, people might feel they should work longer. Next to that, providing just one perspective (working or relaxing) we do not reflect on the actual balance. Another interesting mention is “why light?”. We heard this quite some time and it was something we were already thinking about ourselves. Getting this feedback confirmed our thoughts that we should look into more possibilities. Connected to this, right now the lamp is on or off. It might be interesting to see if there could be something like a “preparation” before an action happens. Could be with noises or scent too, instead of light. On top of this, adding another layer of interaction, next to reflection, might be interesting too.

Due to our quite ‘late’ decision on MOOORA, we did not have time yet to put this into a business perspective. Who is paying for this and who is the target audience? Really something to look into in the future of this project.

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