Appendices

Appendix A

Moonbird analysis

Hypothesis of the mechanism behind the Moonbird

Fixed hinge

Actuator: Servo

Wings of a bird - hence the name moonbird
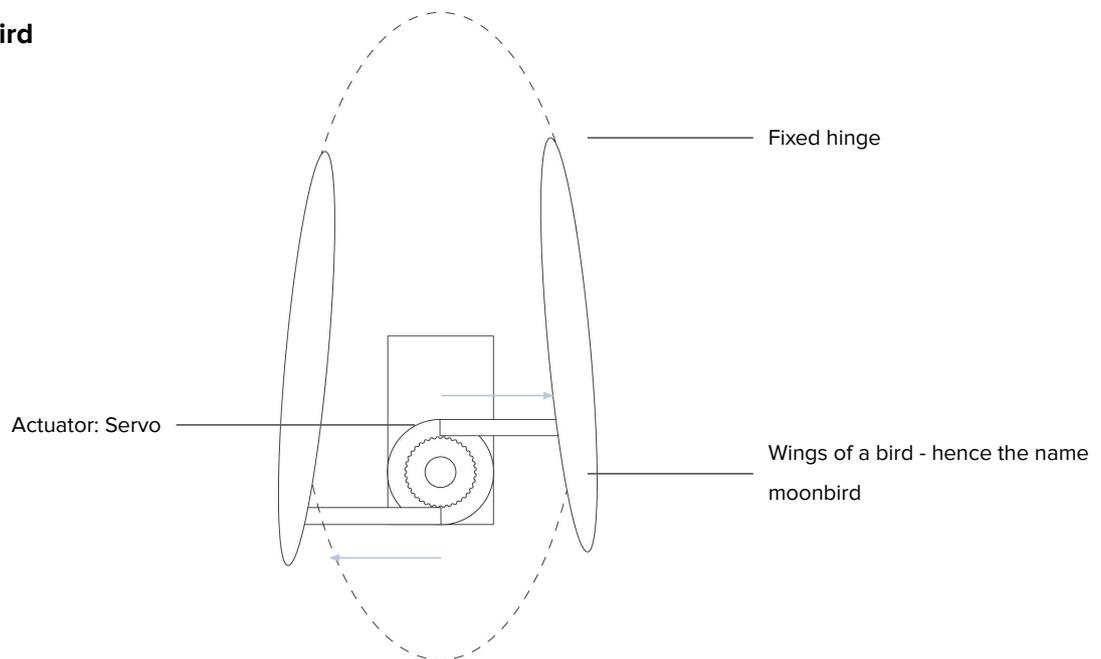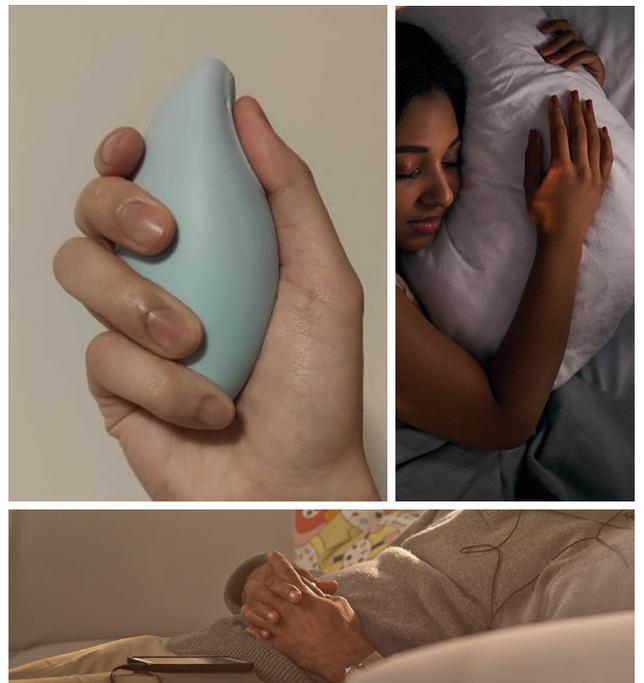
Product ergonomics

The breathing displacement is minimal (< 1 cm) and can only felt at the bottom of the "wings".

To properly feel the breathing you have to grab the moonbird tightly. When you relax your hand, the breathing can't be felt anymore. - (is this a natural position when a person is trying to relax?)

Product ergonomics

To feel the breathing optimally you should hold
the moonbird upside down. (The wings have the
largest displacement at the bottom) - But then the
PPG sensor loses its value.

Product ergonomics

The breathing from
one wing can
primarily be felt in the
ring finger. (Does this
make sense?)

The moonbird is not
suited for smaller
hands. The fingers do
not touch one of the
breathing wings.

Product experience

Interactions are not clear without manual.
It lacks feedback (What have I done?) and
feedforward (what am I supposed to do?)

Example:
In standalone state, you have to shake it to turn on the
breathing. But in connected state, the shake functions doesn't
work. - How do I know in which state my Moonbird is?

Moonbird

Stand alone state:
Shake to turn on

Connected state:
Press button on app to
turn on
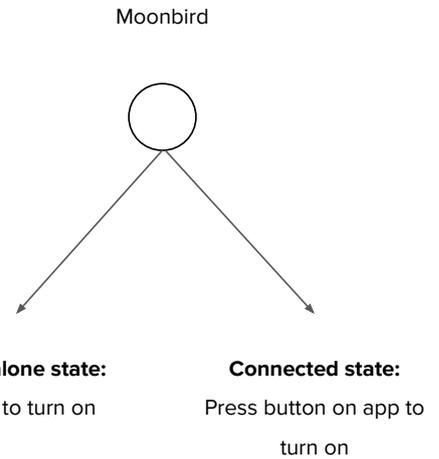
Product experience

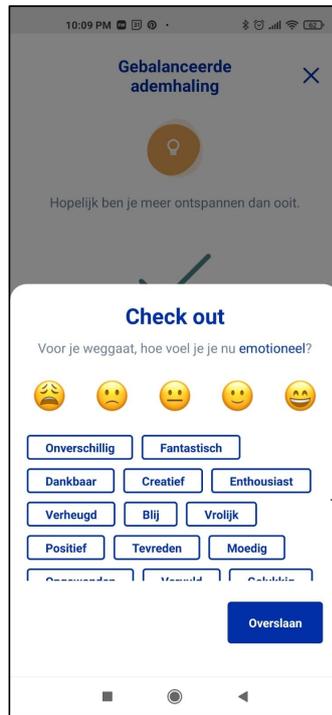"Time to relax. Lock your screen"
What is then the point of showing
my HRV data and coherence
feedback?

For someone that is new to the
topic. What is HRV? And what
does 16 HRV or 0 HRV mean?

Gebalanceerde ademhaling

Tijd om te ontspannen, vergrendel je scherm en
volg het tempo van je moonbird.

0 min

5,5 ADEMHALINGEN / MIN

0 hrv

HRV COHERENCE HR

Audio dempen

Stop oefening

Product experience

The checkout idea is nice. It subjectively shows the impact of the exercise.

But: Do you get more happy after an exercise? Or do you feel more relaxed?

Choice of parameters doesn't fit the context.

Product experience

The many options can be overwhelming. Where does the user start? And what's the difference between each traject?

Why are less stress and better sleep different trajects. What if the person is both stressed and can't sleep? Which traject should he choose. This might be unclear for beginners.

From my own research I found that the stressed "Career Carmen's" do not care about breathing exercises. They care about an effective solution that can help them.

- "It's not clear which option is the most effective for me - what is the most effective way to get rid of my symptoms?"

Product experience

In the first program of both trajects, the guide talks about what stress/ insomnia is - what the impact is on your life - what the symptoms are etc.

- The first program is not meant to provide relaxation, it's to provide education.
    - But users buy this product, because they're already stressed or don't sleep. Do they really want to hear again how bad it is for your health? They likely now already
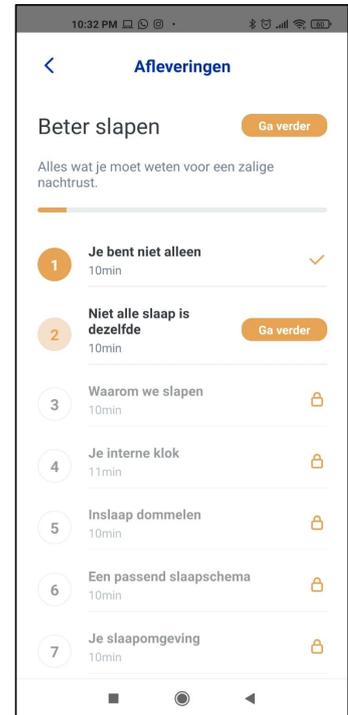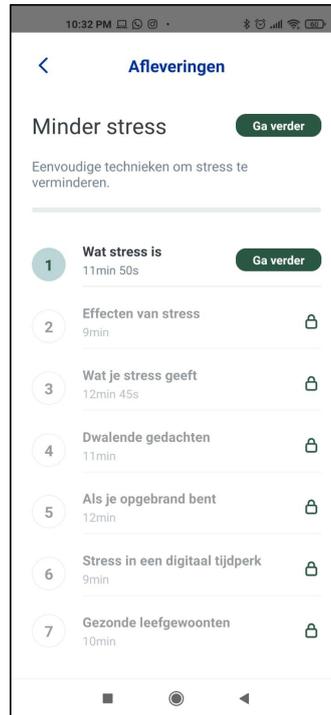
Appendix B

Final user test template

Appendix B: Final user test template

Final user test

Participant	
Stress frequency	
Stress impact on life	

Procedure

1. Take a base HRV measurement for 1 minute
2. Take HRV measurement with prototype 1 for 3 minutes
   a. This is followed by a questionnaire
3. Take HRV measurement with prototype 2 for 3 minutes

Alternate order between prototype 1 and 2 to remove order-bias

Questionnaire

Task analysis

Prototype	

1. I had no difficulties performing the exercise (1 = strongly disagree, 5 = strongly agree)

1. Ik had geen moeite met het uitvoeren van de oefening (1 = Zeer oneens, 5 = Zeer eens)

Score	
Uitleg	

2. I am confident that I have performed the exercise correctly (1 = strongly disagree, 5 = strongly agree)

2. Ik ben er zeker van dat ik de oefening goed heb uitgevoerd (1 = zeer oneens, 5 = zeer eens)

Score	
Uitleg	

3. I experienced the exercise as relaxing (1 = strongly disagree, 5 = strongly agree)

3. De oefening ervaarde ik als ontspannen (1 = zeer oneens, 5 = zeer eens)

Score	
Uitleg	

Phase 2

Prototype	

1. I had no difficulties performing the exercise (1 = strongly disagree, 5 = strongly agree)

1. Ik had geen moeite met het uitvoeren van de oefening (1 = Zeer oneens, 5 = Zeer eens)

Score	
Uitleg	

2. I am confident that I have performed the exercise correctly (1 = strongly disagree, 5 = strongly agree)

2. Ik ben er zeker van dat ik de oefening goed heb uitgevoerd (1 = zeer oneens, 5 = zeer eens)

Score	
Uitleg	

3. I experienced the exercise as relaxing (1 = strongly disagree, 5 = strongly agree)

3. De oefening ervaarde ik als ontspannen (1 = zeer oneens, 5 = zeer eens)

Score	
Uitleg	

After the comparison

Feedback

1. Was the feedback distracting from the exercise?

1. Leidde de hartslag je af van de oefening?

Elaboration	

2. Did you notice the difference between the different vibration states?

2. Merkte je het verschil tussen de verschillende vibratie standen?

Elaboration	

3. Did the heartbeat contribute to relaxation of the exercise? – contributed to the exercise?

3. Had de hartslag een bijdrage aan de ontspanning van de oefening?

Elaboration	

Adherence

1. How likely do you think you will use this product daily for 10 minutes? (1 = very unlikely, 5 = very likely)

1. Hoe waarschijnlijk denk jij dat je dit product elke dag voor 10 minuten zult gebruiken

Score	
Elaboration	

2. Seeing my HRV increase, will motivate me to practice with the device daily (1 = very unlikely, 5 = very likely)

2. Het zien dat mijn HRV omhoog gaat, motiveert mij om dagelijks dit product te gebruiken (1 = zeer onwaarschijnlijk, 5 = zeer waarschijnlijk)

Score	
Elaboration	

Form

1. Can you rate the comfortability of the product, on a scale from 1 – 10? Are you able to comfortable place your hand on the device. Did you find any discomfort?

1. Kan je het comfort van het product een cijfer geven van een schaal van 1 tot 10?

Score	
Elaboration	

Perception

1. How likely would you recommend this product to someone who is stressed (1 = very unlikely, 5 = very likely)

1. Hoe waarschijnlijk zou jij dit product aanbevelen aan iemand die gestrest is (1 = zeer onwaarschijniljk, 5 = zeer waarschijnlijk)

Score	
Elaboration	

2. How much would you pay for this product?

2. Hoeveel zou je betalen voor dit product?

Price	
Elaboration	

Appendix C

Interview template

Appendix C

Questionnaire template

Deelnemernummer: **Datum:**   **Tijd:**

Deel 1: demografsche gegevens

Geslacht:
Leeftijd:
Occupatie: werk/school
Hoeveel uur in de week doet u dat?
Hoeveel jaar doet u dit al?

Deel 2: Stress peiling (Perceived Stress Scale) (kwantitatief)
Op een schaal van 0 tot 4 (1 = nooit en 5 = heel vaak)

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. Journal of Health and Social Behavior, 24(4), 385-396. Dutch translation.

*De items in deze schaal vragen naar je gevoelens en gedachten in de **afgelopen maand.***

_____ 1. Hoe vaak raakte je van slag omdat er iets onverwachts gebeurde?
_____ 2. Hoe vaak had je het gevoel dat het je niet lukte om alles onder controle te houden?
_____ 3. Hoe vaak voelde je je gestrest en nerveus?
_____ 4. Hoe vaak had je het gevoel dat je je persoonlijke problemen aankon?
_____ 5. Hoe vaal had je het gevoel dat de dingen gingen zoals jij dat wilde?
_____ 6. Hoe vaak had je het gevoel dat je niet alle dingen aankon die je had te doen?
_____ 7. Hoe vaak heb je je ergernissen moeten inhouden?
_____ 8. Hoe vaak heb je het gevoel gehad dat jou niets kon gebeuren?
_____ 9. Hoe vaak heb je je opgewonden over dingen waarop je geen invloed had?
_____ 10. Hoe vaak heb je ervaren dat het huiswerk zich zo hoog opstapelde dat je het niet meer aankon?

Openvragen – kwalitatieve metingen

Deel 3A: Stress peiling

1. Merk je dat stress veel invloed heeft op jouw leven? (Belemmerd het activiteiten, je humeur, heb je lichamelijke klachten?)
2. Op welke momenten ervaar jij stress (bijv. door de dag heen, voor het slapen gaan, terwijl je aan het werk bent?)
3. Kan je beschrijven hoe stress voor jouw aanvoelt?

Deel 3B: stress coping

4. Ben jij je bewust van jouw stress gevoelens? (dus op het moment dat je aan het stressen bent, hoe snel ben jij je daar bewust van?)
5. Bent je bewust van wat jouw stress veroorzaakt? (zijn dat specifieke oorzaken)
    a. Zo ja, wat zijn de oorzaken?
    b. Zo nee, waarom niet?
        i)   Zou jij daar graag achter willen komen?

        ii)   Waarom wel of waarom niet?

6. Hoe ga jij met stress om?
7. Hoe bevalt dat?

Deel 3C: Meditatie en mindfulness

8. Heb je weleens meditatie, mindfulness, ademhalingsoefeningen geprobeerd
    a. Zo ja, hoe ben jij daarmee in aanmerking gekomen?
        i) Waar doe je dat?
        ii) Hoe beviel dat?
    b. Was het moeilijk om de oefeningen aan te leren? / vind je het nog steeds moeilijk?
    c. Liep je ergens tegen aan tijdens het beoefenen?
    d. Hoe vaak deed/doe jij de oefeningen?
        i) Waarom ben je ermee gestopt?
        ii) Zou je het vaker willen doen?/ weer willen oppakken?
    a. Zo ja, lukt dat ook?
        i) Wat heb je gedaan om daarvan een routine te maken? (wekker/ inplannen/ discipline)
        ii) Zo nee, waar loop je tegenaan? Wat houd jou tegen?
9. Heb jij het gevoel dat je ergens terecht kan wanneer je stress voelt?
10. Weleens nagedacht om naar een psycholoog te gaan voor stress-gerelateerde problematiek?
    a. Zo ja, heb jij daar baat bij?

Openvragen concurrent producten – kwalitatieve meting

Deel 4A: Scenarios - Moonbird

https://vimeo.com/473596229?from=outro-embed

1. Zie jij jezelf dit product gebruiken?
2. Wat vind je van het idee van een tactiele ademhaling begeleider?
3. Waarom wel en waarom niet?
4. Wat vind je sterk aan dit product?
5. Wat zou je aan dit product willen verbeteren?
6. Hoeveel ben je bereid hiervoor uit te besteden?

Deel 4B: Scenarios - Spirestone

https://www.youtube.com/watch?v=aTLvkePq1NY
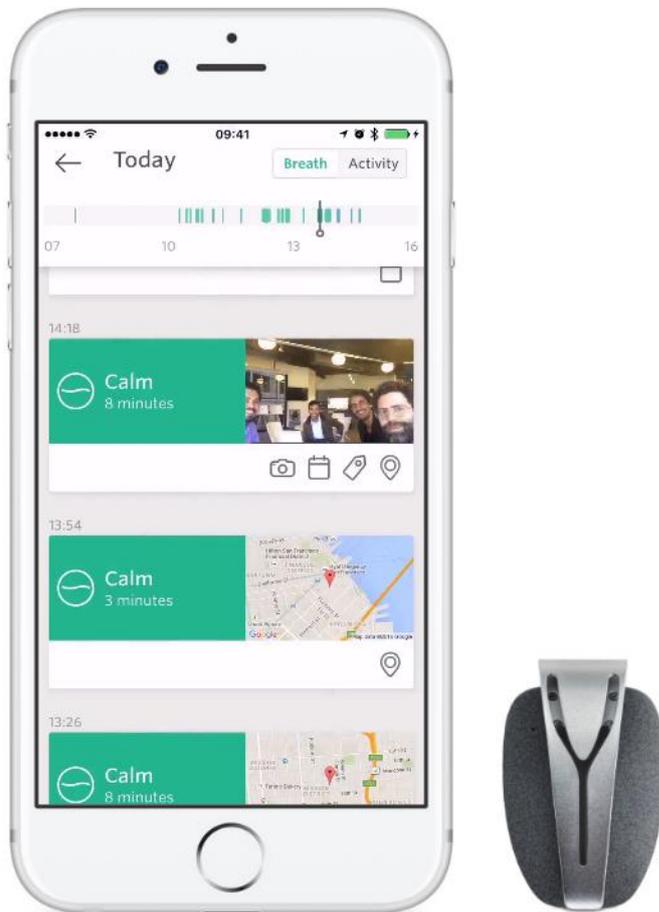
1. Zie jij jezelf dit product gebruiken?
2. Wat vind je van het idee dat het product laat zijn wanneer je strest? Denk je dat dit waardevolle informatie is?
3. Waarom wel en waarom niet?
4. Wat vind je sterk aan dit product?
5. Wat zou je aan dit product willen verbeteren?
6. Hoeveel ben je bereid hiervoor uit te besteden?

Appendix D

Arduino code prototype 2 & 3

Appendix D: Arduino code prototype 2 & 3

```cpp
#include <Servo.h>


class Flasher
{
  boolean vibState = LOW;
unsigned long previousMillis;
int vibStrength = 50;
int beginPulse = 50;
int endPulse = 200;
int vibPin = 6;
int vibPause = 1950;
int vibLength = 0;
int increment = 2;
int counter = 0;
int counterIncrement;
boolean counterState = LOW;
int counterToggle;

  // Constructor - creates a Flasher
  // and initializes the member variables and state
  public:
  Flasher(int pin)
  {
  previousMillis = 0;
  Serial.begin(9600);
  }

  void Update()
  {
```

```arduino
unsigned long currentMillis = millis();

int trigger = analogRead(0);

Serial.println(counter);

if(vibState == HIGH){
 analogWrite(vibPin, 0);
 if(currentMillis - previousMillis > vibPause){
  previousMillis = currentMillis; //Update Time
  vibState = LOW;
 }
}

 if(vibState == LOW){
  if(currentMillis - previousMillis >= vibLength){
   previousMillis = currentMillis;
   vibStrength += increment;
   analogWrite(vibPin, vibStrength);
   // if((vibStrength <= beginPulse) || (vibStrength >= endPulse)){
    //increment = -increment;
     if ((vibStrength >= endPulse) || (vibStrength <= beginPulse)){
      increment = -increment;
      if(vibStrength <= beginPulse){
       vibState = HIGH;
       counter += counterIncrement;
      }
     }
   }
  }
 }
```

```
if(counter == -1){
 counter = 0;
}


if(counter == 0){
 vibLength = 0;
 endPulse = 180;
 vibPause = 1950;
}


if(counter == 1){
 vibLength = 5;
 endPulse = 120;
 vibPause = 2000;
}


if(counter == 2){
 vibLength = 10;
 endPulse = 120;
 vibPause = 2000;
}


if(counter == 3){
 vibLength = 10;
 endPulse = 120;
 vibPause = 2100;
}


if(counter == 4){
 counter = 3;
}
```

```cpp
    if(trigger >= 500){
     counterIncrement = +1;
    }
   if (trigger <= 500){
     counterIncrement = -1;
    }
  }

};


class Sweeper
{
  Servo servo;          // the servo
  int pos = 120;        // current servo position
  int increment;        // increment to move for each interval
  int  interval;     // interval between updates
  unsigned long lastUpdate; // last update of position
  boolean toggleSpeed = false;

public:
  Sweeper()
  {
   increment = 1;
  }


  void Attach(int pin)
  {
   servo.attach(pin);
  }
```

```cpp
void Detach()
{
  servo.detach();
}


void Update()
{
  if (toggleSpeed == false){
    interval = 100;
  }
  if (toggleSpeed == true){
    interval = 67 ;
  }


  if((millis() - lastUpdate) > interval)  // time to update
  {
    lastUpdate = millis();
    pos += increment;
    servo.write(pos);
    Serial.println(pos);
    if ((pos >= 150) || (pos <= 90)) // end of sweep
    {
      // reverse direction
      increment = -increment;
      toggleSpeed = !toggleSpeed;
    }
  }

  //Serial.println(pos);
}
};
```

```
Flasher led1(6);
//Flasher led2(12, 350, 350);
//Flasher led3(13, 200, 222);


Sweeper sweeper1;
//Sweeper sweeper2(25);


void setup()
{
  Serial.begin(9600);
  sweeper1.Attach(9);
//  sweeper2.Attach(10);
delay(100);
}


void loop()
{
  sweeper1.Update();
//  sweeper2.Update();

  led1.Update();
//  led2.Update();
//  led3.Update();
}
```

Appendix E

original project brief (approved by IDE's board of examiners)

IDE Master Graduation
Project team, Procedural checks and personal Project brief

This document contains the agreements made between student and supervisory team about the student's IDE Master Graduation Project. This document can also include the involvement of an external organisation, however, it does not cover any legal employment relationship that the student and the client (might) agree upon. Next to that, this document facilitates the required procedural checks. In this document:

- The student defines the team, what he/she is going to do/deliver and how that will come about.
- SSC E&SA (Shared Service Center, Education & Student Affairs) reports on the student's registration and study progress.
- IDE's Board of Examiners confirms if the student is allowed to start the Graduation Project.

USE ADOBE ACROBAT READER TO OPEN, EDIT AND SAVE THIS DOCUMENT
Download again and reopen in case you tried other software, such as Preview (Mac) or a webbrowser.

STUDENT DATA & MASTER PROGRAMME
Save this form according the format "IDE Master Graduation Project Brief_familyname_firstname_studentnumber_dd-mm-yyyy".
Complete all blue parts of the form and include the approved Project Brief in your Graduation Report as Appendix 1 !

family name	Yip
initials	K.C. given name Kai Chun
student number	4734653
street & no.	
zipcode & city	
country	
phone	
email	

Your master programme (only select the options that apply to you):

IDE master(s): (★ IPD)   (DfI)   (SPD)

2nd non-IDE master: _____

individual programme: _____ - ____ (give date of approval)

honours programme: (Honours Programme Master)

specialisation / annotation: (★ Medisign)
(Tech. in Sustainable Design)
(Entrepeneurship)

SUPERVISORY TEAM **
Fill in the required data for the supervisory team members. Please check the instructions on the right !

** chair	Bourgeois, J	dept. / section: SDE, KInD
** mentor	Goto, L	dept. / section: HCD, AED
2nd mentor	Stijn Antonisse	
	organisation: Somnox B.V.	
	city: Rotterdam	country: Nederland

comments (optional)

Chair should request the IDE Board of Examiners for approval of a non-IDE mentor, including a motivation letter and c.v..

Second mentor only applies in case the assignment is hosted by an external organisation.

Ensure a heterogeneous team. In case you wish to include two team members from the same section, please explain why.

Procedural Checks - IDE Master Graduation

APPROVAL PROJECT BRIEF
To be filled in by the chair of the supervisory team.

chair __Bourgeois, J__   date 6 - 11 - 2020   signature _____

CHECK STUDY PROGRESS
To be filled in by the SSC E&SA (Shared Service Center, Education & Student Affairs), after approval of the project brief by the Chair.
The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total: __33__ EC

Of which, taking the conditional requirements
into account, can be part of the exam programme __30__ EC

List of electives obtained before the third
semester without approval of the BoE

(★) YES   all 1st year master courses passed

( ) NO   missing 1st year master courses are:

name __Monique von Morgen / Colinda__   date 13 - 11 - 2020   signature _____

FORMAL APPROVAL GRADUATION PROJECT
To be filled in by the Board of Examiners of IDE TU Delft. Please check the supervisory team and study the parts of the brief marked **.
Next, please assess, (dis)approve and sign this Project Brief, by using the criteria below.

- Does the project fit within the (MSc)-programme of the student (taking into account, if described, the activities done next to the obligatory MSc specific courses)?
- Is the level of the project challenging enough for a MSc IDE graduating student?
- Is the project expected to be doable within 100 working days/20 weeks ?
- Does the composition of the supervisory team comply with the regulations and fit the assignment ?

Content: (★) APPROVED   ( ) NOT APPROVED

Procedure: (★) APPROVED   ( ) NOT APPROVED

- also approved for Medisign

comments

name __Monique von Morgen__   date 24 - 11 - 2020   signature _____

Initials & Name __K.C.____Yip_____ __4555__   Student number __4734653__

Title of Project __Somnox mini: designing a portable breathing regulation device__

Somnox mini: designing a portable breathing regulation device

project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date   09 - 11 - 2020

09 - 04 - 2021   end date

INTRODUCTION *

Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

STRESS-RELATED SLEEP DISORDERS
It's estimated that 20% of the population suffer from sleeping problems. The consequences of sleep deprivation have a detrimental impact on the person's well-being and thereby the quality of life. Somnox focuses on solving stress and anxiety-related sleeping disorders. Stress leads to poor sleep, which makes the person more susceptible to stress, which leads to poor sleep again. It is a vicious cycle that worsens over time. Somnox breaks this cycle, by tackling the stress through breathing regulation technology (see figure 1).

THE SOMNOX SLEEP ROBOT
This solution is the Somnox Sleep Robot, which is a companion-like robotic pillow that improves the user's sleep using breathing regulation technology. The Robot simulates a relaxed breathing pattern using robotics, which the user subconsciously takes over and helps to reduce the user's stress response and thereby sleep better. Unlike conventional methods, the Sleep robot is more time-efficient and has no negative side-effects.
However, the use of the robot (due to the way it is designed) is limited to a fixed context, which is the home. Stress and anxiety can also happen in contexts outside the home. Examples are; when commuting to work, on a business trip abroad, in the waiting room of the dentist, etc. In these scenarios stress and anxiety are present, but the sleep robot does not fit in these contexts. (see figure 2)

THE OPPORTUNITY (AND CONSTRAINT)
This is the limitation of the Sleep Robot but a new opportunity for Somnox to design a portable version that is suited for a dynamic context as described above. Since we're now designing for outside the home, we need to take into consideration that the product will be used in public spaces as well (e.g. office, public transport, etc.), therefore the solution should be something subtle and is able to seamlessly fit the context in which the product is going to be used.

MY ROLE IN THIS PROJECT
As a master student in Integrated product design, I have a thorough understanding and experience in product conceptualization and therefore can help Somnox in turning the opportunity described above into an advanced concept design. Combined with my background in interaction design, and experience with Medisign I plan on approaching this project with a human-centered approach and involve the user/patient group (people experiencing stress and anxiety) as much as possible, to come up with a technologically feasible concept that is able to truly solve the problem this user group faces.

space available for images / figures on next page

introduction (continued): space for images
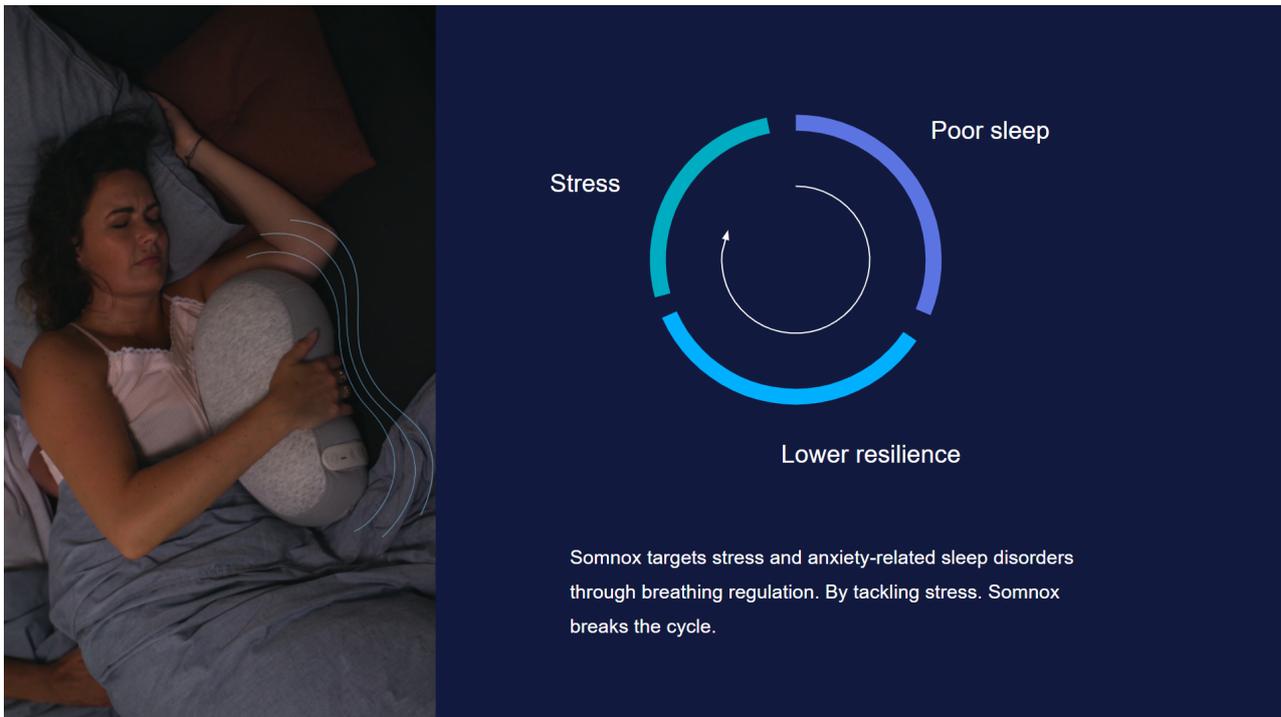
image / figure 1:   Somnox's value proposition
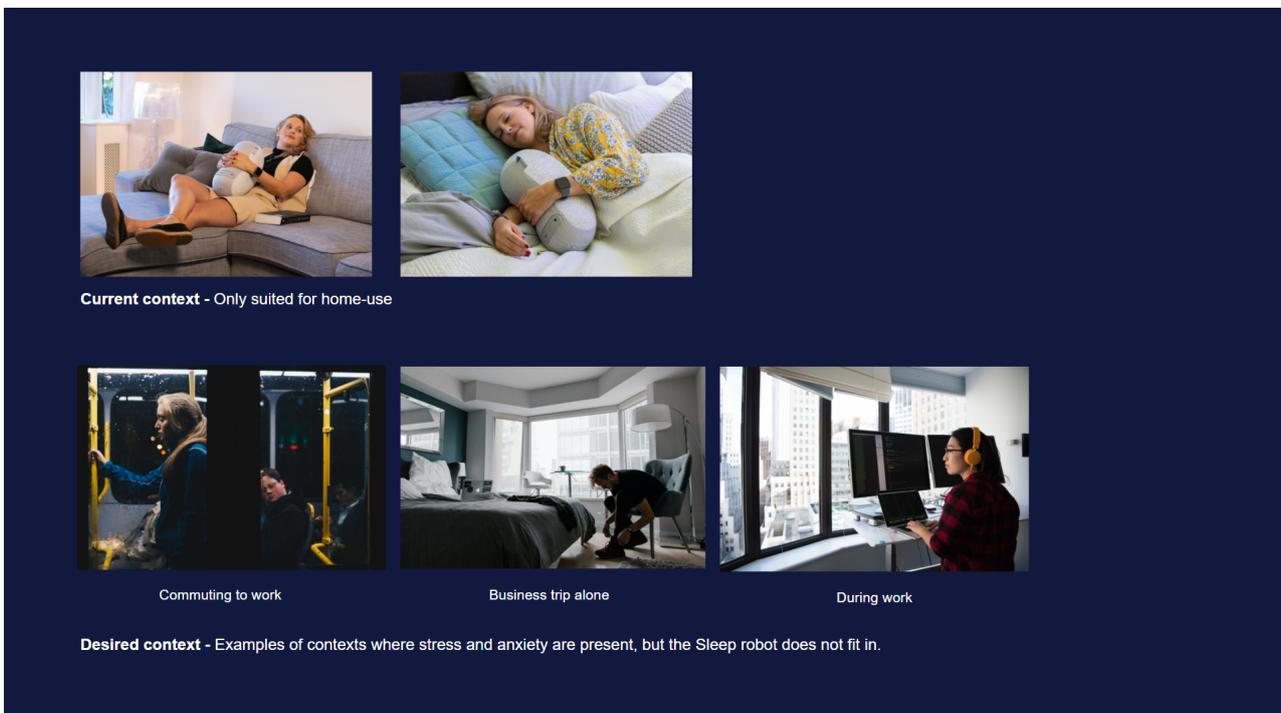

image / figure 2:   The opportunity for Somnox

Initials & Name   K.C.   Yip   Student number   4734653

Title of Project   Somnox mini: designing a portable breathing regulation device

PROBLEM DEFINITION **
Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

The Sleep Robot can only be used inside the home, due to the way it's designed. However, there are many scenarios where stress and anxiety are present outside the context of the user's home. This is a new opportunity for Somnox to design a portable product, with the same (or similar) value proposition of the Sleep Robot. The main purpose of the graduation project is to come up with an advanced concept of a smart, portable breathing regulation device that helps the user to reduce stress and anxiety. This product should seamlessly fit into a dynamic context. The outcome of the project will be a concept that has addressed the following issues:

1. The shape and actuation of the product.
Will it be a handheld product, a wearable, or something else? And what actuation and form are best for amplifying the benefits of stress-reducing breathing exercises?

2. The interaction between the user and the product.
Will the product have a passive role, and only activate when the user requires it to, or will it be a product that takes initiative? (E.g. it can tell that the user is stressed and activates itself on its own.)

3. What data does the product collect, and how is it going to be used?
What data will the product measure, and how will it use this data to provide a valuable output for the user and Somnox? (e.g. if the product is able to sense that the user is stressed, what biometric data is needed, and what sensors should be implemented? what valuable insights can the product give to the user to prove the impact of the product or to change his/her behavior? Or what kind of insights can the product give to Somnox to improve its value proposition?)

ASSIGNMENT **
State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, ... In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

The assignment is to design a concept of a smart, portable breathing regulation device that can reduce the stress and anxiety of the user and seamlessly fit into a dynamic context.

To solve the issues as described in the previous section, the outcome of the design project will be the following:

1. A product visualization and storyboard that shows the intended interaction between the user and product in the intended context.

2. A functional prototype that can:
a. Collect the data that is defined during the research
b. Demonstrate the actuation of the product

The project will follow a human-centered design approach, in which the target group/patient group is included in every iteration. I believe this brings the biggest success rate to create a product that is truly valuable and has the potential to reduce stress and anxiety and thereby increase the wellbeing of this target group. The approach will be further elaborated on in the next section.

Initials & Name   K.C.   Yip   Student number   4734653

Title of Project   Somnox mini: designing a portable breathing regulation device

PLANNING AND APPROACH **

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

start date   9   - 11 - 2020   9   - 4 - 2021   end date

Date	09/Nov	16/Nov	23/Nov	30/Nov	07/Dec	14/Dec	21/Dec	28/Dec	04/Jan	11/Jan	18/Jan	25/Jan	01/Feb	08/Feb	15/Feb	22/Feb	01/Mar	08/Mar	15/Mar	22/Mar	29/Mar	05/Apr
Important dates																						
Kick-off																						
Midterm																						
Greenlight																						
Ceremony																						
Tasks																						
Research Somnox technology																						
Research on sleep, stress and anxiety science																						
Benchmark on existing solutions																						
User interviews																						
Speficy on user group and user needs																						
Contextual inquiry																						
Problem reframing																						
Conceptualization phase																						
Design sprint #1 - Exploratitive in nature to different concept directions																						
Design sprint #2 - Exploratitive in nature to different concept directions																						
Design sprint #3 - Semi-functional prototype to validate concept direction																						
Design sprint #4 Semi-functioanl prototype to refine previous iteration																						
Design sprint #5 Semi-functioanl prototype to refine previous iteration																						
Design sprint #6 Final prototype																						
Preperation for next spring (ordering components & recruiting participants)																						
Finishing up																						
Final renders & visualizations																						
Report writing																						
Presentation preperations																						

The project starts with thorough context research. The main goal of this phase is to learn about existing solutions, specify the user group and their needs, and come up with a reframed problem statement that acts as a starting point for the conceptualization phase.

The context research will be a combination of literature research, interviews, and contextual inquiry. The interviews will be aimed to gather a general understanding of when and how people deal with stress, and the contextual inquiry will be focused on how people perform stress-reducing breathing exercises, to discover why these work and don't work.

Following the research phase, I would like to implement a lean, agile design approach using the human-centered design cycle.

This approach consists of small design sprints that approximately take 2 weeks each. The sprint can be divided into a (1) ideation phase, (2) prototyping phase, (3) testing phase, and (4) evaluation phase. The idea is to start from very lo-fidelity prototypes (for exploration purposes) and slowly work towards semi-functional prototypes that are tested with users.

Initials & Name   K.C.   Yip   Student number   4734653

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MOTIVATION AND PERSONAL AMBITIONS

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, ... Stick to no more than five ambitions.

The first reason why I picked the project is that Somnox's mission aligns with the vision I have as a designer. I believe materialism is one of society's biggest issues. Our materialistic behavior not only hurts the environment but is also proven to be detrimental to our mental wellbeing.

I do believe that designers are partly contributing to this problem, by creating these beautiful artifacts that people desire so badly. As a designer, I do not want to create another beautiful chair, another speaker, a luxurious designer bag. Instead, I would like to use my design skills in more impactful areas that contribute to humanity, such as designing for our wellbeing, which is why I decided to do the Medisign track. I believe that my vision as a designer fits very well with Somnox's mission to improve wellbeing through innovation. Furthermore, as a person who has suffered from insomnia and anxiety in the past, I'm familiar with the cumbersome and frustrating process patients have to go through in finding an effective solution. Therefore I'm very excited about the opportunity to make a positive contribution to this area through this project.

The second reason why I chose the project is because of my interest in designing smart, complex products. In the past, products used to be static (e.g. a chair, a toaster, etc.) but as technology is advancing we are seeing that products are becoming smart, they have gained the ability to learn from and adapt to the user's behavior which makes them much more valuable but also a lot more complex. To design for these products I think that next to having competence in design engineering, it also requires competence in interaction design. Since my bachelor was focussed on interaction design, and am now doing integrated product design which is more focused on design engineering, I was searching for a graduation project in which I would be able to apply both competencies. This project fits this profile well.

My learning goals for the graduation project is to learn how I can apply the knowledge I gained in Medisign into a full design project. In past medisign electives I've learned to work closely and design for patient groups (e.g. eHealth elective and Inclusive design). This is an approach I would like to implement in this project as well and make a design that truly solves the issue that people with stress and anxiety face. Moreover, I want to learn more about designing for IoT systems and learn about the technology behind smart products, especially how products can process the data and turn it into valuable insights for the user, and in the process further develop my programming skills and knowledge.

FINAL COMMENTS

In case your project brief needs final comments, please add any information you think is relevant.

Initials & Name ___K.C._____Yip_____   Student number __4734653_____

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