Design of a product that facilitates weight management by means of MINDFUL EATING

appendices
Esther Toet
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INTRODUCTION
Appendix 1

The phases of the design process

Inspired on the model of the Product Innovation Process developed by Buijs and Valkenburg (2000)

scope of the project
In what way can ‘Mindful Eating’ be interesting for Philips?
Procedure Interviews ‘mindless eating’

Exploration on ‘Mindful Eating’ in The Netherlands

2.1. Bring:

- Photo camera
- Memo recorder
- Extra batteries
- Notebook + pen
- Pictures

2.2. Introduction:

1. Bedanken voor meedoen, vragen of ik heb mag opnemen voor verwerking van resultaten.

2. Afstudeeronderzoek naar smaakbeleving, maar voor een smaakbeleving moet je smaak wel bewust proeven. Tegenwoordig eten mensen echter vaak gedachteloos en kunnen ze achteraf niet goed herinneren hoe het eten precies smaakte. Het idee achter mijn afstudeerproject is om de smaakbeleving van mensen te stimuleren door hen bewuster te laten eten. Maar hoe dat product er precies uit gaat zien is nu absoluut nog niet belangrijk. Op dit moment moet ik eerst de huidige situatie goed in kaart brengen.

3. Ik ga beginnen met je een aantal scenario’s voor te leggen. Ik wil graag weten of je de situatie wel of niet herkend en hoe het er bij jou dan aan toe gaat. Misschien herken je niet jezelf, maar iemand anders hierin, dan wil ik daar ook graag meer over horen.

2.3. Current Situation:

Ik leg je nu een aantal scenario’s voor. Ik wil daarbij graag weten of je de situatie wel of niet herkend en hoe het er bij jou dan aan toe gaat. Misschien herken je niet jezelf, maar iemand anders hierin, dan wil ik daar ook graag meer over horen.

- Herken je jezelf of anderen in dit scenario?
- Kun je nog meer voorbeelden noemen waarbij je gedachteloos eet (‘mindless eating’). Uit eigen ervaring of misschien wat je bij anderen ziet gebeuren?
- Hoe voel je, je nadat je zo gedachteloos hebt gegeten? (te vol, schuldig, etc.)
- In welk van de gevallen vind je gedachteloos eten een probleem en waarom wel of waarom niet?
- Waardoor wordt gedachteloos eten bij jou getriggerd denk je?
- Bij wat voor soort voedsel wordt het met name getriggerd?

Vervolg interview vragen:

**Situatie: snel eten**

- Kun je, je dagelijkse gang van zaken beschrijven vanaf het moment dat je thuiskomt tot het moment dat je klaar bent met eten
- Waar eet je normaal gesproken? (FOTO!!)
- Wat voor servies gebruik je? (alleen vork of lepel of ook een mes?)
Situatie: snacken
- En als je aan het snacken bent (situatie snacken), waarnemen gebeurd dat het meest? (tijdstip/emotie)
- En waar zit je dan? (kan ook een situatie buitenshuis zijn)
- Gebruik je dan servies, zo ja: wat voor servies gebruik je?

2.4. Example Products
Het uiteindelijke doel van mijn project is het ontwerp van een product, waardoor je meer bewust je eten gaat proeven en er meer van gaat genieten. Vanuit de literatuur is gebleken dat als je bewuster eet, je ook langzamer eet en daardoor weer sneller vol zit.

Ik ga je nu een aantal bestaande producten concepten laten zien. Deze zijn niet ontworpen met het doel om ‘mindless’ eten te voorkomen, maar ik zou toch graag je (ongezouten) mening over deze producten willen horen.

- Wat vind je ervan?
- Denk je dat je lekker kan eten vanaf dit bord?
- Zou je het zelf gebruiken (als je alleen bent, als je met andere bent?)
- Zou je het product aan andere aanraden?
- Wat vind je van de vormgeving? Vind je dat belangrijk?

2.5. Interaction Models

De Politieagent

De Reisleider
De gids is er voor jou. Hij geeft je informatie en advies wanneer jij zelf beslist dat je het nodig hebt. Hij zorgt ervoor dat het plezierig is. Je kan hem gemakkelijk negeren.

De Moeder
De moeder heeft het beste met je voor. Het product geeft je advies op de momenten dat het mis dreigt te gaan, dus ook op momenten dat je er niet zelf om vraagt. Het is een extra check of datgene dat je doet ook werkelijk verstandig is en hetgeen is dat je wilt doen.

De Notulist
De notulist registreert alleen wat er gebeurd en het is aan jou om aan deze informatie waarde te hechten en er iets meer te doen.

2.6. Bedankt!
- Opmerkingen/vragen?
Ik ga deze informatie verwerken en designcriteria eruit filteren. Daarnaast zal het ook dienen als inspiratie voor de ideegeneratie.

2.7. Boekje
Ik wil je nog vragen of je ook mee wilt doen aan een aansluitend dagboek onderzoekje. Ik geef je nu een boekje mee. In de komende 3 weken zal ik je 6 keer smsen op willekeurige tijdstippen. Ik zou dan graag willen dat je een aantal korte vragen over het laatste wat je gegeten hebt in het boekje invult.

Zou je hieraan mee willen doen?
Appendix 3

Scenarios

Exploration on ‘Mindful Eating’ in The Netherlands

scenario 1.

Home Late from Work

- hungry
- stressed
- microwave food
- eat in front of the television
- eating fast

William comes home from work. He had to work late, because his co-worker is sick and work piles up on his desk. On top of that, there was a lot of traffic and he forgot to do groceries during the weekend! He’s hungry and just wants to eat! He finds some leftovers in the fridge, puts them in the microwave and impatiently waits until it’s ready! Ping! Finally, the food is done! He installs himself in front of the television and eats his dinner. Right before his last bite, he realizes that he has eaten his dinner in less than 3 minutes and did not taste a single bite!
scenario 2.

Snacking in front of the TV

- bored /lazy
- watching TV
- eating out of the bag
- repeating movement
- surprised you already finished it all

It's Sunday afternoon and Sara is sitting in front of the TV, feeling very lazy. She's just zapping around when she stumbles on a romantic comedy. She decides to watch it and gets a bag of potato chips from the kitchen. Already half an hour later, Sara has finished the whole bag of chips! She feels quite bad, because she just wanted a small snack and did not realize she was eating the entire bag!
scenario 3.

**Lunch at the computer**

- busy
- finishing up work
- in between meetings
- functional

It is 12.30 in the afternoon. Steven has a meeting with a client at 14 o'clock in the afternoon. He has to finish up some work before the meeting starts, so no time to go to the company cafeteria. Luckily, he prepared some sandwiches this morning, so he eats them behind his computer, while finishing up his report. When he wants to grab his final sandwich, he grabs into an empty bag. Without being aware of it, he already finished all his sandwiches!
scenario 4.

Birthday nuts

- many foods on the table
- talking and eating
- repeating movement
- no feedback how much you ate
- many people, but anonymous

Suzan is at a family birthday party. It is not really a party, but more of a very Dutch, we-sit-in-a-circle-and-talk get-together. There is lot's of food on the table and especially the nuts are irresistible. Suzan just cannot stop eating them. She knows she had enough and she is about to have dinner in 2 hours, but during the boring conversation with her aunt about how work is going etc. she just cannot stop herself taking a new hand full of nuts.
scenario 5.

Relaxing on Sunday

• reading the paper
• quiet Sunday morning
• relaxed
• eating until paper is finished

Anna lives together with her fiancé Jeffrey. Both of them have very busy social lives and unfortunately they don't eat together often. This weekend, Anna is on a trip to Berlin with her friends. Jeffrey has the house to himself and sleeps in on Sunday. After he wakes up, he picks up the morning paper, prepares a cup of coffee and some toast. While reading the paper, he eats his breakfast. It's finished quite quickly, but he is only through half his newspaper. Maybe make some more toast...
Appendix 4

Example products

Exploration on ‘Mindful Eating’ in The Netherlands

5a     5b     4a
3a     3b     4b
**Images references**

Appendix 5

Interaction personas

*Exploration on ‘Mindful Eating’ in The Netherlands*

The Guide

- plezierig
- alleen informatief wanneer het nodig is
- indien niet nodig, makkelijk te negeren
- zelf de beslissing nemen om te luisteren
The Police Officer

- precies de instructies opvolgen
- dwingend
- je kan de instructies negeren, alleen geeft je dat een ongehoorzaam gevoel
The Mother

- heeft het beste met je voor
- geeft je advies op de momenten dat het mis dreigt te gaan (dus ook als je er niet zelf om vraagt)
- extra check of datgene dat je doet ook echt datgene is dat je wilt.
The Transcripter

- registreert alleen wat er gebeurt
- rationeel
- je moet zelf waarde hechten aan de gegeven informatie
Extended Results & Conclusions

Exploration on ‘Mindful Eating’ in The Netherlands

6.1. Introduction

To explore the topic of mindful eating and how this could relate to product development, a set of 8 interviews were conducted. It was investigated whether people in the Netherlands in fact experience mindless eating in their daily lives and whether they were interested in enhancing their taste experience by means of mindful eating.

The following research questions were formulated:

1. In which situations does mindless eating occur and when do people actually consider it as a problem?

2. Are people interested in a product that enhances the taste experience by means of mindful eating?

3. In case they are interested, what do they expect/find important from a product that prevents mindless eating?
   a. What should the product look like?
   b. How do they want to interact with the product?

With the results of the interviews, design criteria were set up, which served as a basis for the idea generation phase.

6.2. Procedure

Each participant was individually interviewed. The semi-structured interview was divided in three parts:

Part 1: Current Situation

This part of the interview focused on the first research question. Five scenarios in which mindless eating is common to occur were presented to the participants and they were asked if they recognized these situations from their own experience. The gender of the main character of the scenario was always the same as the gender of the participant. In this part of the interview, it was explored what the participants’ current eating habits were and in which situations the participants found mindless eating problematic.

Part 2: Example products

During the second part of the interview, twelve example products were showed to the participants. The example products were existing concepts and products found on the Internet. Almost all products were related to food and eating, but they were not designed for mindful eating, since it is not clear if such a product already exists at the moment. The products were showed to get feedback on what the participants did and did not like in products related to food and eating. Besides the usage of the products, also the aesthetics were covered in this part of the interview.

Part 3: Interaction Models

After talking about what they did and did not like in the existing products, the participants formed a good opinion of how they think a future product, which will enhance mindful eating, should behave. In this last part of the interview they could express how they wanted the future
product to interact with them, on the basis of four so-called ‘interaction models’. The interaction models were drawn up from four distinct ways a product can interact with a user. They are based on the behaviour of existing products. It was not the intention that the participants had to pick one as their final choice, but the interaction models were used to stimulate a discussion about interaction. The interaction models were named after human characters to make them more familiar to the participants, because it is sometimes difficult to understand such abstract concepts for those who are not experienced in product design.

6.3. Participants

At the start of the study it was presumed that other people at the table can cause distraction, can influence eating speed and can influence your liking of the food. For that reason, only people who lived alone and/or frequently ate alone were selected to join the study, therefore eliminating the influence of table companions on mindful eating.

Students were excluded from the study, because they often have hectic lifestyles and usually are still developing cooking skills and routines. The participants were not screened on any other criteria.

6.4. Extensive overview of the Results (interviews nov’09)

All interviews were recorded on tape and analyzed afterwards. In the following chapter, the most important results are presented. The results will be discussed in three parts, similar to the set up of the interview.

6.4.1. Current situation

During the interviews it appeared that some of the participants did not recognize themselves as mindless
eaters. Three out of the eight participants already ate quite mindful, one was very mindful about how much food she would put on her plate and only one person admitted he would like to be assisted by a product that regulated his eating behaviour.

However, almost all scenarios were familiar to the participants: in some cases a participant only recognized parts of the scenario and in other cases they recognized it, but it happened seldom. The participants did not always focus on mindless eating in specific. When talking about food and eating behaviour, there was a strong tendency to talk about healthy food. Also a good taste experience was strongly related to healthy food, because although the taste of unhealthy foods could be quite nice, the participants mentioned they felt guilty after eating them, which spoiled the taste experience.

Although not always focused on mindless eating, their stories were significant for the context in which mindless eating may or may not occur. All significant topics that were mentioned by multiple participants will be discussed below, located at the scenario they best fit it.

**SCENARIO 1: HOME LATE FROM WORK**

*Quick meal*

All of the participants recognized the scenario where you come home late, quite stressed and fix a quick meal, because you are hungry. Like Participant E states:

“I recognize the fast eating and preparing something easy… (...) You just eat it quite fast, without enjoying it. If you are already stressed and you come home, than eating is more of an obligation than that you really make time for it and enjoy it” <Participant E>

However, it was surprising that nearly all of the participants had a strong reaction against the part of the scenario where the main character prepares his meal in the microwave. Only participant A frequently ate microwave meals, but also with aversion. She states:

“ If I come home from work and I’m cranky, I’m not in a good mood and when I’m at the supermarket then, I’ll just bring another microwave meal again… (...) Actually, I don’t even find it tasty and I notice that I’m hungry afterwards, even though the amount of food was quite enough!” <Participant A>

“Even a homemade meal [from the day before] tastes better heated up in a pan than in a microwave”
<Participant A>

All other participants’ state they don’t like eating microwave food because they don’t like the taste and they do not think the way of preparation is healthy for you:

“Heating up in the microwave…?!, No, I rather not do that. (...) I once read an article about that and now… no I prefer not to use it.” <Participant B>

“I just really think it tastes disgusting, it just does not taste well if you get it at the supermarket and they made it there…”<Participant E>

“That happens very rarely, because I don’t allow myself to eat microwave food” <Participant F>

“I do not do it often, since I usually feel to guilty to buy
a microwave meal, so in the end I just make soup or something like that” <Participant D>

It seems that the participants do not like microwave food for the bad taste and the unhealthy preparation, but this association is not that strong with other ready-to-eat meals, like frozen pizza, canned soup, ready-to-eat dinner salads, etc. Although they all state they prefer home made cooking over a ready-to-eat meal or take away food, they do eat these kinds of ‘bad’ food anyway. They mainly eat it in a situation where they are in a hurry to cook some food: for example when they are hungry, because they came home late (far after dinnertime) or they have to go somewhere after dinner, like the gym or to meet up with a friend. Six participants indicated they occasionally eat ‘something easy’ if they ‘have a good reason for it’;

“Wel… sometimes… mostly if I go out afterwards” <Participant B>

“Uhm… it actually only happens if I go to the gym or arranged to meet up with a friend afterwards. (…) I go to the gym two to three times a week” <Participant E>

Nevertheless, all participants perceive homemade food as tastier and healthier and they feel guilty towards themselves if they do not eat healthy. It seems like the perception of health is more important for the participants’ (preferred) food choice than the taste, since all their negative responses concerning ‘quick meals’ focus on health and not on taste (except in the case of microwave meals, since their taste is perceived as truly bad).

“For me that's not cooking. (...) If it really is only ready-to-eat, instant, microwave… Then I really think, well thanks, but no thanks… I don’t feel comfortable with that. Ok I eat it, but to say ‘yeah, party!’, no definitely not!” <Participant B>

“(…) The best thing, if you come home and you’re tired and fed up, is install yourself on the couch and cook something easy or you get some take-out food, but that is not always healthy”

Although convenience is brought up as the main reason for the ‘quick meals’, often the participants mentioned that they sometimes allowed themselves a ‘bad’ and unhealthy ‘quick meal’, because they earned it, either because they had a bad day, were stressed, etc. At first they also like the taste of the (greasy) food, but afterwards they liked the idea of eating the food more than the actual food.

“Just like with the McDonald's: then I feel allot like eating it and when I’m eating it I like it too, but afterwards… it just seems like you have a sponge in your stomach and you feel guilty… You body just notices it’s fat and it’s not good for you” <Participant E>

“I do feel more guilty about it, because it is less healthy and I think you should take good care for your body, but I do also enjoy it, because it is sort of a forbidden fruit to buy fast-food or ready-to-eat food…” <Participant D>

Eating is relaxing

Three participants explicitly mentioned that next to the nutritional value of a meal, they also consider it an important moment to slow down. These three participants have no problems with eating too fast and perceive cooking as relaxing. All three of them don’t eat in front of the TV often and regularly set the table, even when eating alone.

“Sometimes I have the feeling 'now I have to release the stress and just eat’. I then light a candle, add a glass of wine and I make it cosy (gezellig) for myself and all other things come later” <Participant B>

“Now if I eat alone, I also sometimes watch TV, but also sometimes not. Then I just put on some music and I am just focussing on my food. Then I sit at the table and just enjoying my food. That can make me very happy, like the day before; ‘Wow, I just cooked
quite a fine meal!” <Participant C>

About setting the table, Participant C mentioned it makes him more relaxed, because you don’t have to be careful with food that almost falls of your plate and the position of your body is better for swallowing the food. Furthermore, Participant B mentions:

“It gives meaning to the food, but it also creates cosiness [gezelligheid]. Then if you prepare the food it will be sort of welcomed. (...) Then I can simply enjoy my food” <Participant B>

Participants C and E also mention that cooking really makes them feel good:

“Even though you got things on your mind, you just have to cook. You should not cut down on that. (...) If I cook, I feel much better than when I slide a pizza into the oven, no doubt about that (...) and furthermore, in that case [pizza] all of your dinner is only 15 minutes of your day” <Participant C>

“You just feel better when you cook a meal, so that’s a good motivation to start cooking” <Participant G>

The participants that do not eat at the table when they eat alone mention they tried it, but did not felt comfortable with it.

“If I just sit there by myself… No I really do not like that” <Participant A>

“(…), but then I started to eat my food really fast, because I thought it was boring to sit there by myself” <Participant D>

“I never eat at the table by myself and just staring at the walls across me. I think it is so boring not to do anything during my dinner” <Participant E>

Participants that do not eat at the table, reveal that they eat in front of the TV or computer every night.

“If you work fulltime and you come home, you really don’t have the time… you find it a waste [of time] to eat and do nothing else. So you watch TV or do something else” <Participant F>

“The evenings I eat at home are really the nights that I plan to relax and do nothing else. That also stimulates sitting and eating in front of the TV” <Participant D>

Striking to see, is that those who eat at the table seem to eat slower and with more attention to their food, than those who eat in front of the TV or computer. Although all participants state that eating healthy is important, they only focus on a healthy food choice and are not aware that the way you eat your food (e.g. how fast you eat, where you eat, etc.) is also very important.

**Attention to preparation is attention to your dinner**

Not only distraction causes mindless eating: it looks as if the participants sometimes choose to eat their meal mindless and therefore choose to be distracted. It could be suggested that the amount of effort and attention that went into the preparation of the dish influences the amount of attention the participant has for the presentation and the taste of the food while eating it:

“It also depends a little on the food I prepared for myself. [She gives an example of soup] Than it does not take much time to make, so I finish it faster” [she furthermore states that if she puts effort in her dish and it took more time, she wants to enjoy it longer and enjoy the presentation on the table, etc.] <Participant E>

“I do think I eat with taste, but if you’re talking about frozen pizza… That thing tastes the same every time anyway… then I’m not really occupied with eating it. If I cooked a homemade meal, then I do..!” <Participant C>

“If you know how something is prepared, you deal with it way more mindful. (...) If you buy something
ready-to-eat, you eat much faster and less conscious. 
<Participant A>

Furthermore, Participants A states that she would love to eat healthier and prepare meals she puts effort in.

“That I don’t do it now is just a lack of time, with the result that I hardly ever cook with effort, because in the weekend I usually do prepare it like that. But just the idea while you have been working all day long… And that while cooking is one of my hobbies! But at night, than I just don’t want to do it anymore; you develop an aversion for it…” <Participant A>

One could state, that if the participants choose to eat a ‘quick meal’ or ‘fast food’, they almost automatically also choose for ‘fast-eat’; a state of mind where they do not consider the food important enough to pay attention to. Participant G illustrates this quite well. She explains that if she cooks a homemade meal, she will eat at the table, but if she eats something ‘easy and quick’ she will always eat it on the couch.

“On the couch I finish everything quickly, I’m not going to eat slow then. It’s more that you then shove it in, like ‘well… I ate something, because I had to’. However, when I’m sitting at the table, I’ll take more time for my dinner, because I want to take more time for my dinner.” <Participant G>

No control

The participants that stated they already ate quite mindfully were the people who had control over their behaviour and were quite disciplined. The two participants who admitted they ate very fast also stated they had no control over this and because of this, did not really enjoyed the food:

“I just eat more than I actually want to eat… If my plate is empty [after the first serving] I think: ‘oh shit… my plate is empty! But I have more on the stove, so I just take another bit’. (…) After that I’m often really stuffed”

“I don’t really find it problematic, however I do find it regretful… I then think: now I’m exercising you know, but it would be so much easier if I just ate one plate that’s it…” <Participant G>

“I always eat too fast, it does not matter if I cooked a homemade meal or that it is something really fancy or just fries, it’s all gone in one minute..! I can’t help it… actually I can do something about it, but I just don’t…”

“I do look forward to it, when I’m done working for the day. (…) Because it is nice, fun, tasty, I don’t know… but if I then finish it within three minutes, you are quite disappointed and yes, then you want more of where that came from!” <Participant D>

Participant D thinks her current behaviour is fairly strange, because when she was young, she was a very slow eater and in her family she was known for this: everybody always had to wait at the dinner table until she was finished.

“I used to be stuffed very fast, probably because I ate so slow…” <Participant D>

This suggests that eating fast is one of the causes that she is eating more.

Not all participants have trouble constraining themselves. The participants, who already ate quite slow and mindful, state that they almost never take a second serving and eat until they are full.

“If I am really stuffed, than I have really eaten a lot and I almost never do that. And then I really tried my best, because that hardly ever happens” <Participant C>

“If there is really much left, I occasionally take some more, but usually I have enough after one serving. So if I made a bit too much and it was really tasty, I might take some more, but that does not really happen often” <Participant G>
Participant H was quite a mindless eater in the past and she often forgot to eat. Because of that, her metabolism slowed down and she gained some kilos. A dietician helped her to get a good eating pattern and now she knows how much food a regular serving should contain. Because of that, she knows what she at least should eat and that is enough. After that she often does not want another serving, because she knows she had enough and she also knows that it takes time to actually feel full. She states that especially the 200 grams of vegetables make her feel so stuffed, that she often does not need an extra serving.

“Usually if I want more, I just wait a bit, definitely if I eat alone. Then you just sit in front of the television and then it is not a problem to wait to get some more. And usually after 15 minutes you know for sure if you are still hungry or not” <Participant H>

Her knowledge about the ‘right’ amount of food in a serving and the knowledge that it takes some time before you don’t feel hungry anymore help her control her eating behaviour. She does not care about her eating speed, because she controls the time between two servings.

But next to the ‘eating speed’, there is another factor that causes the participants to eat more. Many participants complain that it is very difficult to buy food that is suitable for just one person. All packages are too large for a one-person serving and then you always have leftovers.

Like Participant F stated above, he eats more than one serving, because if you know there is something left, in combination with fast eating there is a fairly large change you eat it all. Of course it is possible to put some leftovers in the fridge (before or after preparation), but this requires careful planning:

“If you put stuff in the freezer, of course you have to decide in the morning what you will eat in the evening, otherwise you still have to put everything in the microwave” <Participant F>

“There aren’t really one-person packages in the supermarket. (...) And I’m not that structured that I know in the morning that I definitely will eat alone in the evening, but if you have something in the freezer like meat, you, in fact, have to get it out in the morning” <Participant H>

In the end, planning seems very important as well for the food choice (homemade food vs. ready-to-eat/fast food) as for the amount of food that is prepared. In itself, the amount of food that is prepared, together with the eating speed and the control participants have over themselves, is responsible for the amount of food that is actually eaten.

**SCENARIO 2: SNACKING IN FRONT OF THE TV**

**Snacking in front of the TV**
- bored / lazy
- watching TV
- eating out of the bag
- repeating movement
- surprised you already finished it all

“It’s Sunday afternoon and Sara is sitting in front of the TV, feeling very lazy. She just stops around when she sees a bag of potato chips from the kitchen. Already half an hour later, Sara has finished the whole bag of chips. She then guilt but because she just wanted a small snack and did not realize she was eating the entire bag.

The comfort of eating

All participants perceive snacking as unhealthy and bad for them. Some try to avoid it by not buying the products that tempt you into snacking. Five participants mention that if they do buy this kind of food, like a bag of chips, it is finished very fast and they do not have the control to limit their intake.

“But that bag of chips is just there and you just
continue to eat, I don’t know why, but you just eat…” <Participant C>

“I just should not buy it, because if I do buy it I cannot control myself and not eat it if I know it’s there…” <Participant D>

“Usually I fill up a bowl and tell myself I can only eat that amount, but then if it’s empty I fill it up again until the bag is empty in the end anyway” <Participant E>

“Sometimes I buy it to have some in stock, but once I start to eat it, then it is really finished in two seconds” <Participant F>

There are several reasons why the participants start snacking. Three participants mentioned that they buy it in case company comes over and it is part of a social gathering [gezelligheid]. However, the foremost important reason the participants mentioned was that they eat it when they want to spoil themselves; when they allow themselves, because ‘they deserved it’.

“It maybe just belongs to cosiness [gezelligheid] or spoiling yourself, allowing yourself… and with other people, fun, social… actually, many things that you associate with positive, includes snacking.

“And it is also a sort of comfort, especially if you had a hard day of work (…), then I find myself very sad and I allow myself to eat chocolate or something like that. Than it is my reward or comfort”

“Especially in our society, where you spend a lot of time on you studies or work. And if you are single and you have a household to run, there is just not much energy left to create a nice and comfortable for yourself, while you can do that so easily with food. Food does not ask a lot, everything is ready-to-eat and there is more than enough choice and it immediately gives a sense of satisfaction and fulfiment of your time or something like that… It sounds very sad, but it really is a little bit like that…”<Participant D>

“… Except if I have a Sunday like that… than I deserved it! Once in a while you have to spoil yourself!” <Participant G>

Negative feeling afterwards

Although the participants feel like snacking and think they deserved it, they often feel bad about it afterwards:

“I do feel bad about it then (…) that I cannot control myself enough not to do it… If there is any, I eat anyhow, but already I feel bad, even while I’m still doing it I already feel guilty. And then if it is finished I feel even worse! But it does taste delicious, so you do it anyway and also enjoy at the same time… (…) Even though it is my reward or comfort, I still feel guilty… it is actually quite contradictive”

“Before, it didn’t really bothered me if I couldn’t control my snacking, but then I had size 34. Because I think I do feel worse about my weight than about my health, because I do think about that, but I think it is easier to forget that than those extra kilos.” <Participant D>

“Afterwards, I usually wish I had never eaten it, even though it was a reward, still I feel guilty. It should have been better if I hadn’t had done it, because it does not make me feel better and it is not good for you… You gain nothing, so it does not make you feel better.” <Participant E>

“Often I eat it after dinner, so then I already ate a lot at dinner [states before that he usually eats 1,5-2 servings] and then I also ate this… then I think ‘what have I eaten altogether?!’” <Participant F>

It appears that especially the participants who are not satisfied with their weight and have little control about their eating behaviour feel bad after snacking. Participant C for example, also mentions he cannot control the amount of chips he eats, he just eats until the bag is finished. However, he has no weight issues and sometimes even thinks he could gain some pounds. He states:
“I don’t perceive it as a problem. It just happens...”  
<Participant C>

Two participants mention they consciously control their eating behaviour. Participant H mentioned she also experienced this kind of uncontrolled behaviour in the past, but now she controls herself by not eating out of the package, but by putting it in a small bowl. Participant B also allows herself a certain amount, which she eats with pleasure and then has the discipline to stop.

“I just know how much calories it contains. Two pieces of fudge is enough for me and I will enjoy eating it and after that it's done. And that's purely out of discipline you can say... not too many calories”  
<Participant B>

**SCENARIO 3: LUNCH AT THE COMPUTER**

*Functional eating*

6.4.2. Most of the participants did not recognize this scenario, because they lunch with their colleagues and go to the cafeteria during lunch. They then get away from their work and feel relaxed and recharged afterwards.

Four participants mentioned they occasionally eat behind their computer, if they are busy and have to finish something. They all mention that they feel more satisfied with the food and enjoy it more when they really take a break, instead of eating as a side activity. They experience eating behind the computer as very functional and do not experience pleasure or taste.

“If I eat behind the computer, I eat with my mind [meaning she knows she has to eat, because it is lunch time; she does not start eating, because she feels like it]. Usually I eat two sandwiches for lunch, but if I eat behind the computer I know ‘this is sandwich one, this is sandwich two’ and then I stop eating, because I know I can eat until sandwich six. Because it is not processed [in your brain] any further, because you also taste less, so everything is good enough to eat”  
<Participant D>

“It is not really a problem, but I'm conscious of it and think ‘you fool!’. It is just a waste (...) you don't taste it. It is more to fill up your stomach, to get rid of the hungry feeling, than that you really enjoy it.”  
<Participant F>

“You know you are eating, because at a certain point you start eating because you are hungry, but you do not experience it”  
<Participant G>

**SCENARIO 4: BIRTHDAY NUTS**

*Social eating*

Six participants recognize this scenario. The other two state that in a certain situation they are too busy talking to people to be concerned about the food. The participants that do recognize the scenario admit that they often eat too much during these occasions and are really mindless about what they put in their mouth.
“That is very unconscious. The first bite goes like ‘mmm… that tastes good, that tastes like more’, but after that… (…) A party, having company… yes than it might happen to me that I’m mindlessly tucking in food” <Participant B>

“This is just a matter of do not start, because if you do you want to try everything” <Participant D>

“Yes that still happens to me that I cannot stop. It then seems like the food on the table yells harder to you then the people in the room. ‘eat me!’ If I’m not allowed, I’m just get more fixated on all the yummy things that are on the table. (…) I cannot control myself” <Participant E>

“It is not that you are hungry, it is purely out of boredom. (…) I always eat until I’m nauseous, as a rule.” <Participant F>

“It’s often the case that if there all kinds of delicious things, you want to have tasted them all” <Participant G>

“I think that’s just not enough on my mind then. Maybe if I’m on a diet, I would pay more attention to it, because then you are more aware of it. (…) I think just being social [de gezelligheid] is that you do it…” <Participant H>

However, nobody really perceived it as a problem: it happens sporadically and then they do not want to constrain themselves if they are having a good time.

“As long as I had a good time, I don’t really care” <Participant D>

**SCENARIO 5: RELAXING ON SUNDAY**

Nearly all participants don’t recognize this scenario, because they don’t have this behaviour on a Sunday. They do indicate they eat more mindlessly if they read the newspaper or if they are enjoying some really tasty food with friends. Participant H states she does recognize this exact scenario, but if she then wants to eat more, she always takes something healthy, like a tangerine.

Participant G also states that she recognizes it, but in that case it actually does not happen mindlessly. Usually she is very busy and does not have time to prepare something fancy or more than ordinary. On these kinds of Sundays she spoils herself like others do in cases of the scenario ‘snacking in front of the TV’. Because it does not happen often and because she really enjoys it, it is not perceived as a problem, but as compensation, since she usually does not have time for these kinds of things.

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**SCENARIO 5. RELAXING ON SUNDAY**

- reading the paper
- quiet Sunday morning
- relaxed
- eating until paper is finished
“If I just have a calm and relaxed day and I have the time to prepare something nice and to keep preparing it. You don’t have to check the time, ‘I have to go, so quick, quick, quick’. You can just eat normally, not because you have to. Because it is tasty and I’m still hungry and simply because I can…” <Participant G>

6.4.3. Example products

Twelve example products were shown to the participants to get an idea what they would and would not like. The participants were also asked if they thought the products would enhance a better taste experience.

1. Eetmeet

Product description:

De eetmeet is een product dat je helpt met het bepalen van de juiste eet snelheid. Je schept je eten op het bord en elke keer als je een hap neemt weegt het bord het verschil in gewicht. Aan de hand daarvan berekend hij de ideale tijdsduur van die hap. Op het moment dat je een hap neemt gaat het licht uit en je mag pas de volgende hap nemen als het licht weer aan gaat.

The participants strongly disliked this product. They thought it was too controlling and it made them feel inadequate:

“I would think ‘what the hell am I doing?’ chewing behind a plate until the light goes on… no…!” <Participant D>

“I feel too old for these kind of things, because it tells you what to do” <Participant H>

One participant was hopeful about the device. He is very open-minded towards new products and really likes gadgets. Since he is kind of fed up about his fast eating behaviour he states he would be tolerant about a product that forces him into certain behaviour and if the product would really work, he would like to try it:

“Yes! Yes definitely. Just a nice gadget, with light… it will think for you, yeah fine. I would really like that” <Participant F>
However, he did expect that the effect of the product would wear off after a week or two. All other participants expected to get extremely annoyed by the product, because it was thinking and deciding for them and it was not possible to make their own decisions. Furthermore, many participants thought it missed the goal, since they would miss out on their entire taste experience, because they would focus too much on the plate and the light instead of the food.

“Seriously…? I really do not like that. So this thing will determine how long I should chew and when to swallow? I think that is way too controlling. I just think it is bullshit…” <Participant C>

“Those would definitely not work for me, because first of all I do not look at my plate, because I’m watching TV and secondly I don’t want to be bothered if the light does or does not shine on my plate” <Participant D>

“I would get really annoyed of this plate, like ‘mind your own business’. I can decide myself when I take my next bite. Furthermore, I would enjoy my food less, because I’m focussing more on my plate.” <Participant E>

2. Firo

Product description:
De Firo maakt het mogelijk om je eten gemakkelijk mee te nemen en op de bank op te eten. Je klikt de geïntegreerde lepel en vork in de gaatjes aan de zijkant, waardoor ze dienen als een handvat. Het zachte omhulsel beschermd je tegen de hitte van het bakje.

Specific questions:
- Zou je het prettig vinden als je op een gelijksoortige manier ook uit de pan zou kunnen eten, waardoor je misschien minder afwas hebt
- Zou je het prettig vinden om een dergelijk product te gebruiken, zodat je niet thuis gehaast hoeft te eten, maar rustig op locatie kunt eten (b.v. de trein)
The participants are not particularly interested in this product. Many do not really like to eat out of a bowl, because they care about how the food looks like on their plate (this is especially the case with Vegetables-Meat-Potato dishes).

Furthermore, they were not very interested in a product that allows them to bring their food with them if they were in a hurry. Their preferred eating situation is at home, with a plate and cutlery.

“I do think it will be useful, however I do have a sort of consciousness that in my opinion you should eat with a plate and cutlery” <Participant F>

3. =Dear

Product description:
Dit product bestaat uit 2 delen. Het ene gedeelte is een soort batterij die je in het stopcontact stopt en zich dan oplaad. Als je dit deel vervolgens in één van de bijbehorende producten stopt, zoals een bord of een beker, verwarmt hij deze zodat je voedsel of drank niet afkoelt.

Specific questions:
• Wat vind je van de vormgeving?
• Wat vind je ervan dat er electriciteit door je bord heen gaat?

4. +/- HotPlate

Product description:
Dit product verwarmt het eten doordat het metalen figuur verwarmt wordt.

Specific questions:
• Als je dit product vergelijkt met de =Dear, welke heeft dan je voorkeur?

=Dear & +/- HotPlate
These two products have a similar functionality: they both keep a plate warm. Both were shown to the participants, since they had dissimilar appearances.

The participants did like it if their plates stayed warm, since they liked their food less if it turned cold and this happens especially if you eat slowly. However, the participants who already ate fast did not have the idea that this was caused because they were afraid their food turned cold.

Some participants were doubtful if they would really use a product like this, since there are already possibilities to heat up your plate and they also neglect to do that, so why buy a new product for that:

“I doubt if I would really use this product. (...) I don’t see myself warming up a plate before I start dinner, because I could do that already by placing a plate on top of a boiling pan” <Participant D>

“If I want a warm plate, I would just put a plate in the oven and not buy something like this” <Participant B>

The participants preferred the archetypical appearance of the +/- HotPlate better than the black, modern appearance of the =Dear.

“[About the =Dear] It looks like a Tefal pan! [About the +/-HotPlate] Yes, then I think this one looks much better.” <Participant E>

“[About the =Dear] I think the plastic is really plump. [About the +/-HotPlate] This I would be fine to buy” <Participant D>

“[About the =Dear] I would not eat from a black plate, I think it looks unappetizing.” <Participant H>

The participants did not mind that the product contained electrical components, as long as it was safe. They liked the concept of the =Dear better than the +/- HotPlate, because the +/- HotPlate contained a wire, which was very user-unfriendly. They liked it that you could recharge the stick of the =Dear and use it anytime you wanted.

“Wires on the table I find really annoying and the plate should not all of a sudden be ten times as heavy” <Participant C>
“[about the +/- HotPlate] You do have to put the thing in a socket, that is a lot of hassle, so I think I won’t use it that much, because many times I eat on the couch and there is no socket anywhere near me then” <Participant E>

“[about the +/- HotPlate] If I could just charge it and use it any time I want, then I would be more eager to use it” <Participant F>

“Ik like this one better than the =Dear, because it looks more like an ordinary plate, but I do like the socket-stick idea of the =Dear better.” <Participant G>

5. Anoli

Product description:
Dit product geeft door middel van een patroon aan hoe warm je eten is. Hoe groter het warme oppervlak, hoe groter het patroon. Als het eten warm is, kleur het patroon roze/rood, als het eten koud is, kleurt het patroon blauw.

Specific questions:
• Stel dat een dergelijk bewegend patroon je eetsnelheid aan zou geven, wat zou je daarvan vinden?

The participants considered the Anoli to be quite useless. They noted they can perceive themselves if the food is getting colder and they do not need a plate for that. Furthermore, four participants even remarked that they might eat faster if the plate tells them the food is getting colder. Some participants liked the pattern; some thought it would distract them from the food or make the plate look messy.

“I don’t think I need this… you can taste yourself when it’s getting colder and you don’t have to see this with a pattern. And I buy a plate because I like the pattern and then I don’t want it to disappear” <Participant G>

“I think the plate would look messy. I like a nice, white plate without the pink stuff on it, which appear from underneath your food and change colour” <Participant E>
6. Pattern Scale Plate

Product description:
Met dit product kun je in de gaten houden hoe groot je porties zijn, relatief aan de andere dagen dat je van dit bord eet. Hoe zwaarder het eten op je bord, hoe groter de rode ring wordt.

7. Line Plate

Product description:
Met dit product kun je ook je portie grootte in de gaten houden, alleen door middel van het volume van je eten. De binnenste lijn is een kleine portie, de middelste een medium en de buitenste lijn een grote portie.

Specific questions:
• Als je dit product vergelijk met de Pattern Scale Plate, welke heeft dan je voorkeur?

8. Poly Colour Plate

Product description:
De Poly Colour Plate laat meer kleuren zien naar mate je meer eten op je bord hebt liggen.

Pattern Scale & Line Plate & Poly Colour Plate

These three plates all give the user insight in how much food they put on their plate. The Pattern Scale Plate and Poly Colour Plate do this by means of weight, either by expanding the pattern or by showing a larger amount of colours, by which the user can see how much food there is relatively to other times he ate of the plate. The Line has pre-set portions, which serve as a guide for the total volume the user eats.

Most of the participants were of the opinion that they did not need a plate to tell them how much they put on their plate. They agreed that you sometimes might be misguided, if for example your plate is bigger than usual, but they still did not have confidence in these three methods.
“I can estimate myself if I eat little or a lot, I do not need a plate for that.” <Participant A>

“No… my plate is full and that is what I eat, so my servings are always quite the same size” <Participant G>

“I do have the opinion that people are not idiots and the pattern of your plate does not need to tell you how much you have put on it. (…) [About the Line Plate] Cornflakes have a very different volume than ice, so… I don’t really think this makes sense… but it does look nicer then the Pattern Scale Plate (…) weight is so relative, because the one weighs more than the other, so it does not tell you that much. It is just a bit unnecessary” <Participant D>

“No, no… Lettuce is very light, tomato is quite heavy, but tomato is not unhealthier than lettuce. And I associate this immediately with ‘wrong’. The heavier, the more wrong it is” <Participant H>

Furthermore, Participant H mentioned that she had problems with these products, because they did not take the length, weight and activity level of various people into account, but she did liked that it did not judge you in any way.

The Line Plate was preferred over the Pattern Scale Plate and the Poly Colour Plate, because it’s appearance is very subtle; the participants liked it that it is very easy to use it as a regular plate if you didn’t want to pay attention to it’s functionality. None of the participants liked the Poly Colour Plate, because they thought the colours looked unnatural and it distracted you from your food.

“Oh, this is nice tableware! The story of the lines I would just not tell, I just really like the design as far as it goes for a plate” <Participant B>

“I just prefer a light coloured plate. And if the colours move like that [with the Poly Colour Plate] No… I would not find that comfortable…” <Participant B>

“[About the Poly Colour Plate] I think this looks a bit unnatural. I would not mind if something moved underneath my plate, but it should not give the impression that the plate is not clean (hygienic).” <Participant F>
9. Orbital Plate

Product description:
Als laatste in de serie van borden, laat dit bord oorspronkelijk, door middel van een soort display, de temperatuur van je eten zien.

Specific questions:
- Je zou je ook voor kunnen stellen dat je in plaats van de temperatuur het aantal happen ziet dat je hebt gegeten, of het aantal happen dat je per X aantal minuten eet. Wat zou je daarvan vinden?

This plate originally showed the temperature of the food, but the participants were also asked what they would think of it if it showed the amount of bites per minute.

The participants differed in their opinion towards this product. The participants who already had quite some control over their behaviour thought it was unnecessary and a bit too much.

“I already have the feeling that I doing really well concerning; I try not to snack, try not to get fast-food, try not to eat too much chips, try not to eat too much in general, try to have enough variation in what I eat, go to the gym… If I also have a plate, which tells me how many bites I take per minute… damn don’t even go there! I just don’t want that. Then I have the idea I’m overreacting” <Participant E>

The participants who would like some help in controlling their eating speed, were more enthusiastic about the product, because they realised that if they were confronted with their behaviour, they would have the change to adapt it.

“Yes, I think this would be something that would be useful to me. Put it like this, I suppose I would eat more mindful because of this” <Participant F>

Participant D mentioned that she sometimes keeps track of the time passed while she is eating and that, that helps her to eat at a quieter pace and more mindful. She expected that this method then also
would probably work. Moreover, Participant C, who already eats quite slow, but tries to lose his smoking addiction, mentioned:

“It is maybe a bit of a forceful way of eating slow, you are being watched. But it is always like that with addictions; you have to be watched at the start, so you can be corrected” <Participant C>

10. Living wallpaper

Product description:
Op dit behang ontstaan bloemetjes als het warm wordt.

Specific questions:
• Wat zou je ervan vinden als deze bloemetjes zouden ontstaan als je te snel eet?
• Je kunt je misschien ook voorstellen dat een dergelijk effect ontstaat in de vorm van een schilderijtje of een beeldje op tafel. Wat zou je daarvan vinden?

The participants liked the wallpaper that changed if it was heated up, but they definitely did not like it if this happened as a result of their eating behaviour. They did not saw the link between something in the environment and how they ate, this was not logical to them. They want to focus on their food or the TV, but they do not have the need for something else in their environment that reminds them to eat more mindful.

“It is quite funny of course, but it gives me a ‘big-brother’ feeling and I don’t like that” <Participant A>

“I think this is a little bit too much... (...) And well, eating to fast... I do not know how the environment can help you with that” <Participant H>

11. Vibrating cutlery

Product description:
Dit is gewoon metaal bestek, met als uitzondering dat als je te snel eet, het gaat trillen.
12. Vibrating bracelet

Product description:

Je gebruikt niet bij alles wat je eet bestek. Je kunt je dan misschien ook voorstellen dat in plaats van bestek je een soort armband hebt die gaat trillen als je te snel eet. Dit hoeft niet zo goedkoop of sportief uit te zien als de armbandjes hiernaast, maar het kan ook geïntegreerd zijn in een mooi sieraad.

Specific questions:

• Als je dit idee vergelijkt met de trillende bestek, welke heeft dan je voorkeur?

Vibrating Cutlery & Vibrating Bracelet/Jewellery

Almost all participants were very fond of the vibrating cutlery. They liked it so much, because the reminder is very subtle and since you are the only one that can feel the vibration, it is very personal. It is not constantly visible, but only confronts you when you are out of line.

“It is just a signal ‘ey, yoo…! Time for yourself!’ and it is not that you are constantly confronted with it or anything. Because, if you do well, you know that you do well and that is also nice to know, just like with the OralB toothbrush [which vibrates after 2 minutes] Because you do pay attention to it, unconsciously, and it is not annoying” <Participant C>

“This I would like and probably actually use… (…) this might be ok, because it is not intrusive, not frustrating. You also don’t see it if you don’t know it” <Participant D>

“Yes, this is quite ok, I think this would help. (…) I think this is definitely better than a plate that changes colour. If I would really eat to fast and it would vibrate, I would think ‘oh yes… slow down’. Then I would pay more attention and slow down my eating speed. (…) yes, that you get a short reminder, not all the time…” <Participant D>

“It could be just a reminder, that I like…” <Participant B>

Some participants did have some doubts; one participant mentioned she would not like it if the device kept on vibrating constantly, so the
feedback should be a short vibration and there should be a possibility to turn it off. Furthermore, participant G mentioned it should only count the bites and not the movements you make while cutting, otherwise it would give wrong feedback.

Where cutlery can only be used for dinner, a vibrating bracelet can be used all day long. Although two participants liked it for this reason, the rest was less positive. The advantage of the cutlery, they mentioned, was that you already use it during dinner and you are not confronted with after dinner. One Participant even mentioned it reminded her of an ankle monitor used for offenders who are under house arrest.

“I doubt if I would use the bracelet, maybe because it is more around your body and because you can put down a spoon. You can put off a bracelet, but it still is more intrusive and closer to you. Cutlery you feel in your fingers, a bracelet in your whole arm. (...) It is like such a bracelet tells you what you can and cannot do, while this cutlery is more a funny reminder” <Participant D>

“The fun thing of the cutlery is that you can put it away in the cupboard and then it is gone. A bracelet stays with you the entire time or you have to wear it especially when you are going to eat and you do not do that easily.” <Participant E>

Images references

[EetMeet] Lissa Kooijman - http://www.lissakooijman.nl
6.4.4. Interaction Personas

After discussing the example products, the participants already developed a pretty good idea on what they would and would not accept from a product that ought to help them enjoy their food more.

**The Police Officer**

It became very clear that the interaction model ‘Police Officer’ was not the way to go. It was too judgemental and too controlling. All participants noted that this would not stimulate or remind them to enjoy their food.

“It does not make eating more enjoyable, it then sort of becomes an obligation, or something that is not allowed” <Participant A>

“I am not convinced that if you feel bad, you will behave better” <Participant C>

“I think ‘The Police Officer’ would be a bad motivator for me, because it would pall on me… it actually spoils the entire goal [which is a better taste experience]” <Participant F>

**The Transcripter**

The opinion towards ‘The Transcripter’ were divided; some had their doubts, since it rationalized eating too much and the user needs quite some knowledge to interpret the feedback. Others did favour it, since it would provide them with insights in their behaviour, without judging them. They also felt it gave them back the control, to decide to change their behaviour (or not).

“This kind of things transforms eating into something mechanical, while it should become more of an experience. With this you rationalize it too much” <Participant A>

“This one only provides data, so you can draw your own conclusions and follow that, so I suppose this would help me…” <Participant E>

“You know… and the one time you act on it and the other time you don’t… you can decide yourself” <Participant G>
The Mother

Although some participants were of the opinion they did not need ‘someone’ to advise them on how to eat, mostly this was because these participants did not encounter difficulties in their eating behaviour. One participant, who thought she didn’t need this kind of interaction model, could imagine it would be very effective for other people.

“I can imagine that something like this would sell very well, that there is a need for this” <Participant A>

The participants who did liked this interaction model, mentioned they might need this ‘unsolicited advice’, since they are doing not so well on their own now. However, the do believed the ‘advice’ should be short, like a reminder, and not continue on and on; you should be able to make up your own mind and possibly even ignore it.

“I think I would find it funny if a device would indicate it to me (...) there are no other consequences; it just let’s me know and I decide to join in or continue to eat the way I want to” <Participant D>

“I would be fine with it if the ‘unsolicited advice” is temporarily” <Participant E>

“Unsolicited advice? Yes I do like that one. I kind of need it; it confronts you with your own behaviour…” <Participant F>

The Guide

Although ‘The Guide’ appealed to many of the participants due to it’s mild approach, the participants who were dissatisfied by their eating behaviour believed it would never work for them.

“This requires to much intrinsic motivation. (...) ‘The Guide’ is too casual [vrijblijvend]. If I don’t have to, I don’t have to and too bad… sucks to be you… bye, bye!” <Participant F>

“The Guide’ to me is a bit redundant, because I do know… I don’t need to require the information, because I know… that is then is available to me, that will not stop me, because I don’t stop myself either, so that won’t work…” <Participant D>
“I don’t really know what to think of ‘The Guide’… On the one side I think ‘yes of course, something should be pleasant to experience’… pleasure is, of course, important, but if you want to reach your goal, you probably should not have too much fun!” <Participant C>

6.5. Conclusions

6.5.1. CURRENT SITUATION

Target group

It appeared that mindless eating was not really perceived as a problem by the participants. They indicated they sometimes choose to eat mindless, because they were tired, were in a hurry, because they believed they ‘deserved’ it or because they already had so much on their minds they did not want to spend energy on how to eat as well. Only a lack of taste experience was not important enough for them to find mindless eating problematic.

If the participants did find their eating behaviour problematic, it was when they had no control over it with the negative result of gaining weight or not loosing any weight. Participants had the intention to eat healthy, but several habits related to mindful eating caused them to eat more than they initially would have wanted, like for example eating too fast or taking a second serving too soon. Often they were not aware that these ‘mindless’ calories, the extra food intake they were not aware of, were their reason they did not succeed in their goal. A product that helps these people to control their eating behaviour could really be helpful for them.

The participants who already had quite some control over their eating behaviour or were satisfied with their ability to manage their weight were not interested in a product that enhances the taste experience by means of mindful eating. These participants believed that true taste experience has to come from your own intention and they did not believed a product would help them with that. The other participants partly shared this attitude, however they were open-minded towards a product that could assist them in controlling their eating behaviour by means of mindful eating, if this resulted in weight loss.

Problematic situations

The participants did not perceive mindless eating as problematic if it happens sporadic or if there is a good reason. For the participants with little control over their food intake, scenario 1 (Home late from work) and 2 (Snacking in front of the TV) were perceived as the most problematic, because these scenarios have the potential to occur daily.

The two scenarios differ much. The underlying cause of scenario 1 deals primarily with the physical side of mindless eating - not being aware of satiety and unconsciously being influenced by external cues like the amount of food that is cooked - whereas scenario 2 is to a greater extend driven by emotions and a lack of satisfaction. “…especially if you had a hard day of work (…), then I find myself very sad and I allow myself to eat chocolate or something like that. Than it is my reward or comfort” (Participant D).

Decision moments

During the interviews, the participants gave several reasons why they occasionally ended up in a mindless eating situation. From this data, six moments where determined when the participants made an (unconscious) choice to eat mindful or not:

1. First of all, planning seemed important. If there is no food available in stock, there is a tendency to buy
a ‘quick’ meal, which does not deserve the attention to eat mindfully.

2. Secondly, the **amount of time and effort it takes to prepare a meal** appeared critical: if you don’t spend much time cooking, you most likely don’t spend much time eating it.

3. Furthermore, it seemed to be important to make an effort for yourself, **mark the eating moment** and be comfortable with being alone. For example by setting the table, even if you eat by yourself.

4. When dishing up the first serving, it seemed useful to have knowledge on the right **portion size** for one dinner. Knowing that only that amount should be eaten could increase satisfaction and reduce the need for a second serving. Moreover, in that case no ‘mindless’ calories are consumed, due to the need to finish the amount on the plate or in the pan.

5. It seemed that after the first bite, there was no awareness of any **eating rate**. It could be helpful to get a reminder if you eat to fast from the start and become aware of this uncontrolled behaviour, which makes it possible to adjust it yourself.

6. Finally, the decision to have a **second serving** is often made **too fast**. It takes some time before the stomach sends a signal to the brain that you have eaten. It is possible within this delay that you keep on eating, because you do not feel satiated yet, while in fact you already ate enough. There should be at least fifteen to twenty minutes between your first bite and your next serving, so you know for sure you have the need to eat more.

### 6.5.2. EXAMPLE PRODUCTS

The participants were not fond of the example products of which the relation between function and goal was rather vague. In general, a product with a clear and distinct goal was most appreciated: it should be easy to understand how the product can help you to improve your behaviour.

**Feedback**

The users indicated they would get really annoyed by products that force their feedback upon the user: it makes them deviant instead of helping them. The participants noted they would very much like to be in control, and do not want to be controlled by the product. The participants want the product to point out something is going wrong, for example by means of a reminder; hence in their opinion the users’ behaviour change should come on their own initiative (or not) and should not be enforced by the product. Nevertheless, especially the user that admits to have little control over his behaviour is aware of the fact that some sort of monitoring is necessary, otherwise the current behaviour will not change.

The products feedback was preferred to be subtle and possible to ignore if the user chooses to do so. Participants indicated the product shouldn’t judge, but give information about the situation. The feedback should, in no way, distract the user from enjoying its food. The participants did not believe there is a need to confront the user with the situation continuously, since this only irritates and distracts him. Furthermore, there was a preference for a form of feedback that is only noticeable for the user, like vibration, as a result of which it is also possible to use the product while other people are around and the user is not continuously confronted with his eating-aid.

**Aesthetics**
The participants expressed a great preference for the example products with an archetypical design. They did not like the example products they associated with a helping-aid. Lighting was not perceived as a nice way of feedback with regard to food, since it influence the taste experience negatively.

The participants mentioned they strongly preferred an extended functionality in a product they already use over an additional product, because this makes them feel inadequate and dependant. A plate/bowl and cutlery are promising options.

**Electrical components**

The participants did not mind it if the device, for example a plate or cutlery, contained electrical components, as long as the usage did not bring on more effort than an ordinary product without electrical components. For that reason, the participants were not fond of electrical wires or daily charging, which both are a hassle and take effort.

**6.5.3. INTERACTION MODELS**

After discussing the example products, the participants formed a clear vision on how they want to interact with a future product.

It became very clear that the interaction model ‘Police Officer’ was too judgemental and too controlling. Event though ‘the Guide’ was appealing too many participants, many participants, especially those who were dissatisfied with their eating behaviour, believed this approach was too mild for them and it would not convince them to change their behaviour.

The opinions towards ‘the Transcriptor’ were ambiguous: some had their doubts as it rationalizes eating too much and much knowledge is required to interpret the feedback; others favoured it, since it provided them with insight on their behaviour, without judging them. For this reason ‘the Mother’ was not favoured, because the participants were afraid they were judged and corrected too much. However, most participants believed this interaction model could be the most effective. The participants who did like ‘the Mother’ mentioned they might need this ‘unsolicited advice’ since they are not doing so well on their own now. Nevertheless, they did believe the advice should be short and not continuous.

Considering the result of the interview about ‘Current Situation’, it seems like a product should be designed for users that acknowledge they don’t have complete control over their eating behaviour and would like some help with this. The interaction model ‘The Guide’ is too mild for them, whereas ‘The Police Officer’ is too intrusive, and will de-motivate the user, since they also do not perceive it as a major problem.

‘The Transcriptor’ and ‘The Mother’ are left as acceptable interaction models, for the reason that they are both monitoring the user and both allow the user to still make its own decisions. Since ‘The Transcriptor’ is rationalizing the eating process, (which is expected not distract you from your taste experience) and furthermore is continuously visible (which was not favoured in the example products), it is probably better to focus on the interaction model of the Mother. For that reason, the product should focus on monitoring the user and only advise him when the situation tends to go wrong, so the user can decide himself to change his behaviour.

**6.6. Discussion**

The interviews are extensively analyzed and many inspiring conclusions are drawn on the basis of these results. However, it should be noted that only a small amount of
participants are interviewed, of which not even half of them really perceived themselves as mindless eaters.

By coincidence, all participants had a high education level (HBO or higher). This might influence the results, since their lifestyle, especially in the case of food and cooking, might differ from people with a lower education. However, since Philips targets on people with high incomes and these often are people with higher educations, the lack of participants with lower education was not perceived as a major problem.

Furthermore, it was remarkable that all participants had a large aversion towards the microwave. It is expected that this is a coincidence, because after a short, oral questionnaire with random people in Eindhoven, it did not appear that this was the general opinion. It did seem that the microwave was perceived as less healthy, but many people had no problems with using it as a tool for defrosting or heating up. They stated they used it regularly.

For these reasons, the results and conclusions from this study should be used roughly and should not be handled as the absolute truth. It is recommended to verify these results in a set of interviews with a greater amount of participants who (already) perceive themselves as mindless eaters. Nevertheless, for the purpose of this graduation assignment, the results are sufficient to create design criteria as the start of the idea generation phase.

Finally it has to be noted that although the participants were quite clear about what they did not liked in certain products, it is very likely that, if a product proves to work, the participants are more open-minded towards the use of such a product.
DESIGN BRIEF FORMULATION
Enhance weight management by means of mindful eating
Extended analysis of the three design directions

by means of Foggs’ behavioural model for persuasive design

7.1. PORTION SIZE

Target behaviour:

The primary target behaviour is to dish up the correct amounts of the different food groups, like specified by authorities like ‘het Voedingscentrum’. Due to the insight that the food intake is a healthy amount, the user develops a confidence that enables him to eat more mindful, without feelings of guilt, haste or fear of not have eaten enough.

Due to the product, the user is no longer led by external cues, but learns to pay attention to its’ physiological satiety response.

Ability (Simplicity)

- Time:
  Weighing your food takes extra time, which you don’t want to invest when you are hungry.

- Money:
  Eating the right amount of foods probably saves you money, since you know what amounts you are going to consume and you can do effective grocery shopping. This factor is probably not very significant in this situation, but could be a stimulant for the user to keep on using the product.

- Physical effort:
  The extra effort put in the weighing is more cognitive than truly physical. Extra physical effort could include using a product that can help you define the right amounts or using more cooking pans while preparing a dinner (see brain cycles).

- Brain cycles (cognitive effort):
  ‘Brain cycles’ is by far the most influential factor in ‘Simplicity’. First of all, you have to figure out how much you have to buy and cook in order to eat the right amounts and not throw away too much. Next, you have to weigh the food, which includes extra cognitive effort compared to estimating a normal serving size by means of vision. In addition, weighing the different food groups is difficult when you, for example, already cooked the meat in the pan together with the vegetables, like you do with stir frying dishes. So, you either have to cook all the food groups in different pans (more physical effort in the form of dirty dishes!) or put the exact right amount in the pan (more cognitive effort), so you won’t have to weigh the food afterwards. The last one is difficult, since you then have to know how much uncooked food will result in the preferred amount of cooked food, which of course, is also dependant on the cooking process.

- Social deviance (break the rules of society?):
  Restricting yourself to certain amounts of foods is not really considered ‘normal’ in our society. Although some really need to restrain themselves due to obesity, it can be hard for those who just want to loose a few pounds. They are often considered to nag and are unmotivated by others who want them ‘to lighten up and not be concerned so much about their food intake’. Furthermore, many people do not want to admit they want or need (a product to help them) to loose weight and are ashamed of it.

- Non-routine:
  Defining the right amount of food of several food groups is not routine yet. However, the amounts will be the same.
everyday, so it has large potential to become a new routine activity.

CONCLUSION Ability:
The largest problem area for this design direction is in ‘brain cycles’; there are many reasons why it is difficult to select the right amounts in each food group and it takes much cognitive effort. If this effort can be reduced, people will definitely perceive the target behaviour as simpler. Furthermore, ‘social deviance’ should be taken into account: people do not like other people to know they put much effort in restricting their food intake, therefore the use of the product should be indistinctive and preferably integrated in a operation they already perform.

Motivation
• Pleasure/pain:
  + Participants want to loose weight and will become happy if they succeed.
  – Eating the right amounts of food can be unsatisfying for people who now have a very different eating pattern. For example, many people now eat far too much meat, and there are a lot of people who don’t even nearly eat 200 grams of vegetables.
  – Furthermore, motivation can drop because being so rational about your food intake can for some people also decrease their pleasure of eating.

• Hope/fear:
  + This method will give them hope of loosing weight and having a healthy eating pattern.
  + The fear of adding up extra pounds will keep them motivated to hold on.
  + For those who find it difficult to feel if they are satiated, they have the reinsurance they have not eaten too much or too less.

• Social acceptance/rejection:
  + The trend of eating healthy is socially accepted. The reinsurance that they have a proper eating pattern will be motivating.
  – It is not socially accepted to be so rational and fanatic about your food intake.

CONCLUSION Motivation:
The participants will probably start using the product because they hope to loose weight or adopt a healthy lifestyle. However, behaviour change is not completed in a day. If the user does not see or feel immediate response, there is a large possibility he or she becomes unmotivated to use the product. Therefore, there should be a strong motivating aspect in the product to prevent the user from giving up.

Trigger:
At this moment, people’s choose for a certain portion size is strongly triggered by external cues like package size or plate size. They put trust in the supermarkets to define the correct portion sizes (the amount in a package) for them. Unfortunately this is not the case and people eat far too much: they are influenced by the wrong triggers. Although still under the influence of this wrong trigger, the product should provide a stronger trigger to forget the amounts prescribed by the packages.

• Spark:
The product could give motivating triggers and tips on how the user can deal with the leftovers from
the big(ger) packages. Furthermore, it could give tips on how you can cook in a way that makes the weighing easier.

- Facilitator:
  Ability is quit low for the users. It is very difficult for the user to calculate the right portion size and therefore this trigger can also very well be used. The product can be seen as the facilitator in this case. It will trigger the user into the target behaviour of selecting the right portion size.

- Signal:
  Since ability is low at the moment, a signal will not be sufficient.

CONCLUSION Trigger:
The product will be most effective if it acts as a facilitator; it should increase ‘Simplicity’ (and therefore ‘Ability’). The task of defining a portion size should be made simpler and the product should do this. Preferably, the product should also contain some triggers that motivate the user to keep on using the product.

OVERALL CONCLUSION:
The two main reasons why the potential users are not weighing their food at the moment is because it takes a massive amount of extra cognitive effort and because in general, it is not socially accepted to restrain your food intake to this extend. By simplifying and facilitating this activity, there is a large chance people could be persuaded to perform the target behaviour and adopt a healthier eating behaviour. Although people are probably motivated to change when buying the product, the product should make sure the users stay motivated.

7.2. SLOWING DOWN EATING RATE

Target behaviour:
The primary target behaviour for this design direction is to slow down the users’ eating rate: the user shall take the time to consciously enjoy every bite. As a result, satisfaction is increased and the food intake will be reduced, because the user feels satiated sooner.

Ability (Simplicity)
- Time:
  People often believe that eating fast saves time, which could be important if you have an appointment after dinner. However, it is only the perception of saving time: the cooking process consumes much more time and even when eating mindfully, it is possible to finish within 10 minutes. The actual time you save by eating fast is limited.

  - Money:
  -

  - Physical effort:
  -

  - Brain cycles (cognitive effort):
    Eating fast and mindlessly costs less cognitive effort than eating slow and consciously tasting every bite. Furthermore, if you have the habit to eat fast, you deliberately have to slow down your eating pace, which costs brain cycles.

  - Social deviance (break the rules of society?):
    Social acceptability of your eating rate is relative and depends much on your table-companions. Eating slow, because you enjoy the food is not seen as improper. At the very most, it could be frustrating for your table-companions, if they have to wait to leave the table or get a second helping, until you are finished. In the end, enjoying
your dinner is well accepted and is everyone’s natural target behaviour.

• Non-routine:
Eating fast is a habit for the target group and therefore they have to get acquainted with a new habit of eating slower.

CONCLUSION Ability:
Ability is not the scarcest factor in this design direction. Eating slower does not require much from the user. Only in the beginning of the behaviour change, the target behaviour will take extra effort, since the new behaviour is non-routine. As the user adopts the new habit of eating slower, the amount of effort is costs will decrease.

Motivation:
• Pleasure/pain:
  + Eating fast is believed to result in less taste experience. Eating slow, and especially eating mindful, can help you to enjoy your dinner more and makes you more satisfied with what you have eaten.

• Hope/fear:
  + By eating slower and more mindful, you are more satiated and probably eat less than when you eat mindless and need a second serving, because you did not really experienced eating the first one. Therefore, hope to loose some weight is also a strong motivation.

  – However, in some situations the importance of pleasure decreases, if other things are more important, for example if you are in a hurry, stressed or really hungry and don’t want to care about it.

  – The motivation for eating slow can be decreased if you are afraid the food is getting cold.

Social acceptance/rejection:

– Social acceptance or rejection depends on the other people at the table. From the analysis it seemed that if the trigger is very intrusive or public, the user is embarrassed he/she needs a product to control him/herself.

CONCLUSION Motivation:
Loosing weight and an improved taste experience (which results in more satisfaction from the consumed food) are strong motivations to eat slower. There is no direct need to increase motivation. Merely in situations the user tends to forget of its intention (for example if they are in a hurry) the user should be reminded of its motivation. Motivation is believed to decrease if the interaction of the product is too public, intrusive and is associated too much with a helping aid.

Trigger

• Spark:
A spark is not necessary since motivation is already high.

Facilitator:

Ability is low on non-routine and brain cycles, since the target behaviour is opposite of a current (subconscious) habit. A facilitator is possible if it makes getting acquainted with the new habit easier.

Signal:

The best trigger for this behaviour change is a signal. Users are already high on motivation and ability, therefore they just need to be reminded to eat slower if they tend to lose control.

CONCLUSION Trigger:
The most effective trigger is a subtle and personal signal that reminds the user of its intention, when he tends to loose control. Due to the signal, the user can get acquainted with this new behaviour.
OVERALL CONCLUSION:

The focus for a product that persuades you to eat slower should be on the trigger. Motivation is already high, since eating mindful is already perceived as more comfortable than eating fast and mindless. Since eating slow involves getting acquainted with a new habit and does only take effort to learn a new routine, ability is already quite high. The function of the product should be to remind the user to perform the target behaviour and therefore the design should focus on a signal that triggers this behaviour.

7.3. 2nd SERVING TIMER

Target behaviour:
The primary target behaviour is to wait at least 20 minutes up from the start of your first serving before you decide to take a second serving. The ultimate goal is to prevent the user from taking a second serving. Only after 20 minutes, the user can truly evaluate its natural satiety response and there is a large possibility the user will decide not to eat more.

Ability (Simplicity)

- Time:
  Dinner will take longer if you have to wait 20 minutes. Not all people want to invest this time.

- Money:
  -

- Physical effort:
  After 20 minutes, it is possible the food has cooled down and if you want to have a second helping, you need to heat it up again. Tracking time can also take physical effort.

- Brain cycles (cognitive effort):
  If you have eaten fast, you have to wait a long time. During this time you need to have patience and occupy yourself with other activities or thoughts, otherwise waiting for a second serving becomes really frustrating. Furthermore it takes cognitive effort to track the time and check when the 20 minutes are over.

• Social deviance (break the rules of society?):
  It is frustrating if your dinner partner already starts his second helping and you have to wait a few minutes more. Others do not always understand this behaviour and it is therefore difficult to perform the target behaviour.

• Non-routine:
  The natural response if you are still ‘hungry’ after you have eaten, is to get a second helping. The target behaviour is therefore very non-routine and the user might need assistance or a strong trigger to perform the target behaviour. However, this probably has more to do with the trigger or the motivation than the actual simplicity and ability.

CONCLUSION Ability:

Ability is probably not the scarcest aspect in this situation. It is relatively easy to just wait, however over time the waiting period can have an influence on the motivation level. When eating with other people, social deviance can play a role, since they might find it strange to restrict themselves to wait.

Motivation:

• Pleasure/pain:
  + The motivation for waiting with your second serving is the pleasure of not eating so much that you get stomach pain. Since the signals from your stomach take quite some time to reach your brain, you sometimes eat more than you really want. Waiting with you second serving can help
you understand if you really want to eat more or that you just think you are still hungry.

• Hope/fear:
  + Another strong motivator is the hope of loosing weight. If you wait with your second serving, you might not want it anymore and you could ‘save’ up to 500 calories per dinner.
  – However, by waiting you can get unmotivated, because you are afraid the food is getting cold.
  – If you are eating with other people your motivation can also decrease because you are afraid there is no more food left for your second serving.

• Social acceptance/rejection:
  – If other people already take a second portion, it is a bit strange if you are waiting. It is more socially accepted if everybody takes a second portion at the same time.

CONCLUSION Motivation:
Motivation is a key factor in this product. The user should stay motivated to wait, because it does not cost much effort and it is tempting to give in to your craving for more. One of the strongest motivations to give in too soon are hunger and fear for the food to turn cold.

Furthermore, a facilitating trigger could keep the food warm.

• Signal:
A signal alone could also work, if the user is already motivated enough. The signal should give an indication when the user can get their second serving.

CONCLUSION Trigger:
The key to this behaviour change is to keep the user motivated between the end of the first serving up to the moment 20 min. have passed. Both a facilitating trigger as elements of a spark should be used.

5.3.5 OVERALL CONCLUSION:
The focus of this product is on motivation. The user should be kept motivated even though he or she still feels hungry, others already started a second helping or food is cooling down. The waiting process should be more comfortable and the user should be notified if time has passed.
#### 8.1. Portion size

The first case study was set up to find out what would happen if people had to eat their dinner according to the food intake regulations of ‘het Voedingscentrum’. Two women were asked to cook like they regularly do, but eat a minimum of 200 grams of vegetables, a maximum of 200 grams of grains (like potatoes, rice or pasta) and a maximum of 100 grams of meat. They were asked to portion their meals for one week. Since both women always eat dinner with their husbands, also the husbands partly joined the study. Each of the participants had to fill in a diary with questions about their dinner.

#### 8.2. Slow down eating rate

The second design direction, slow down the participants’ eating rate, was difficult to test for a week in a home situation without the use of a product or prototype that warned the participant when he or she eats too fast. Since I was constantly confronted with my own eating behaviour and eating rate due to this project, it was decided to describe my own experiences in this case study.

#### 8.3. 2nd serving timer

For the third case study, a male and a female participant were asked to eat their first serving like they are used to, but they had to start a stopwatch right before they took their first bite (e.g. on their mobile phone). If they felt like a second serving, they had to wait until the timer had passed 20 minutes. They were asked to carry on with this behaviour for a week. Since both women always eat dinner with their husbands, also the husbands partly joined the study. Each participant had to fill in a diary with questions about their dinner.
Beste Participant,

Zou je de komende week (7 dagen) de grootte van de portie van je avondeten aan kunnen passen aan de volgende hoeveelheden?

---

**Vrouwen:**
- Groente: min. 200 gram
- Aardappelen/rijst/pasta/peulvruchten: max. 200 gram
- Vlees/vis/kip: max. 100 gram (125 gram als je geen vleeswaren op brood hebt gehad)

**Mannen:**
- Groente: min. 200 gram
- Aardappelen/rijst/pasta/peulvruchten: max. 250 gram
- Vlees/vis/kip: max. 100 gram (125 gram als je geen vleeswaren op brood hebt gehad)

---

De aantallen zijn voor voedsel na bereiding! Als je iets meer of minder eet maakt dat niets uit, maar vermeld het dan. Voel je er vooral niet schuldig over, want jouw reactie zullen andere mensen ook hebben en dat is alleen maar goed om te weten als ontwerper!

Indien er een mengsel van verschillende ingrediënten is gemaakt (b.v. een pastasaus of een wokgerecht), tel dan de aantallen bij elkaar op; indien er relatief veel vlees in zit neem dan een beetje minder, zit er veel groente in neem dan evt. ietsje meer

Schrijf alle positieve en negatieve punten op! Alle frustraties, gevoelens, opvallendheden, irritaties... alles is interessant! Ook als je niet in staat was het af te wegen (b.v. als je uit eten ging), wil ik graag weten hoe je het hebt opgelost! Al met al: alles is interessant!

Als je niet genoeg ruimte hebt om te schrijven kun je altijd op de achterkant verder gaan! Je hoeft niet alle bladzijdes in te vullen, zo veel mogelijk zou fijn zijn!

Kun je het *uiterlijk zaterdag 6 feb. 2010* op de bus doen in de bijgeleverde envelop?

*Dank je wel voor het helpen!!*
Dag 1 - datum:

1. Wie heeft er gekookt?  
   - ik  
   - iemand anders, namelijk: ...............................................

2. Wat heb je vandaag gegeten?

<p>| |</p>
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3. Heb precies de voorgeschreven hoeveelheden aangehouden? Waarom wel/niet?

3a. Ik heb **wel** / **niet** * precies de aanbevolen hoeveelheid aangehouden omdat:

3b. Dit was **wel** / **niet** * genoeg, omdat:

* = doorstrepen wat niet van toepassing is

4. Had je behoeft aan een tweede portie?

4a. Direct na het eten had ik **wel** / **niet** * behoefte aan een tweede portie, omdat:

4b. Indien ja: heb toen **wel** / **niet** * een 2e portie genomen omdat:

* = doorstrepen wat niet van toepassing is

5. Hoe ging het afwegen? (evt. problemen of ‘trucjes’ omschrijven)

5a. **Positieve** ervaringen van deze methode vandaag:  

5b. **Negatieve** ervaringen van deze methode vandaag:
Evaluatie vragen via de email na het onderzoek

- Wat vond je van de voorgeschreven hoeveelheden? (Was dit anders dan de hoeveelheden die je normaal at en waar zaten dan de verschillen in?)
- Wat vond je van het afmeten van je eten?
- Welke problemen ondervond je met het afmeten?
- Heb je het idee dat je eetgedrag in de afgelopen week is verandert doordat je een ‘juiste’ hoeveelheid hebt gegeten? (denk aan eetsnelheid, meer/minder snacks na het eten, met meer aandacht eten, etc.)
- Wat is je algemene oordeel over de methode van afgelopen week?
- Wat vond je er prettig aan?
- Wat vond je er minder prettig aan?
- Denk je dat je oordeel over de methode zal veranderen als je het een lange tijd gebruikt en resultaat ziet?
- Zou je, nu je weet hoeveel je van welke voedselgroepen moet eten, je eetpatroon aanpassen?
Dag 1 - datum:

1. Wie heeft er gekookt?  ○ ik  ○ iemand anders, namelijk: ...............................................

2. Wat heb je vandaag gegeten?

3. Mijn 1e portie was een  ○ kleine  ○ gemiddelde  ○ grote portie voor mij
(relatief aan wat jij beschouwd als een normale portie)

4. Ik heb voor mijn doen  ○ snel  ○ gemiddeld  ○ langzaam gegeten

5. Heb je de timer op het juiste moment gezet? Waarom wel/niet?

6. Had je behoefte aan een tweede portie?

6a. Direct na het eten had ik  wel / niet * behoefte aan een tweede portie, omdat:

6b. Indien ja: ik heb toen  wel / niet * pas na 20min. een 2e portie genomen omdat:

* = doorstrepen wat niet van toepassing is

7. Heb je tijdens het eten op de timer gekeken? Waarom wel/niet en wat had dit voor effect?

8a. Positieve ervaringen van deze methode vandaag:  

8b. Negatieve ervaringen van deze methode vandaag:
Beste Participant,

Op het moment ben ik bezig met mijn afstudeeropdracht over ‘Mindless Eating’ voor de studie Industrieel Ontwerpen aan de TU Delft. Het uiteindelijke doel is het ontwerp van een product, waardoor mensen minder geneigd zijn een tweede portie te eten en daardoor, zonder hun eetpatroon aan te passen, toch een paar kilootjes per jaar kunnen afvallen, of in ieder geval niet extra aankomen.

Maar zo ver zijn we nog lang niet! Voordat ik echt een product kan gaan ontwerpen wil ik 3 kleine case studies doen om te kijken hoe eventuele gebruikers het ervaren.

**Wat verwacht ik van jou?**

Zou jij de komende week (max. 7 dagen) vlak voordat je begint met eten een stopwatch willen starten (of even op de klok kijken hoe laat het precies is)? Je hoeft hier verder niet op te kijken tijdens het eten. Indien je nadat je je bord leeggegeten hebt, nog zin hebt in een tweede portie, wacht je tot de stopwatch op 20min. staat. Met andere woorden: je wacht 20min. vanaf de start van je eerste portie voordat je je tweede portie opschept. Na het eten even het formulier invullen en klaar is kees! Als je niet genoeg ruimte hebt om alles op te schrijven kun je altijd op de achterkant verder gaan!

Schrijf alle positieve en negatieve punten op! Alle frustraties, gevoelens, opvallendheden, irritaties... alles is interessant! Ook als je niet in staat was te timen (b.v. als je uit eten ging of je tapas at en niet één gedefinieerd hoofdgerecht had), wil ik graag weten hoe je het hebt opgelost! Al met al: alles is interessant!

Als je een keer haast hebt en geen tijd hebt gehad om 20min. te wachten maakt dat helemaal niets uit, maar vermeld het dan even. Voel je er vooral niet schuldig over, want jou reactie zullen andere mensen ook hebben en dat soort dingen zijn alleen maar goed om te weten als ontwerper!

Kun je het formulier **uiterlijk zondag 7 feb. 2010** teruggeven? Als je niet alle 7 dagen hebt ingevuld is dat niet erg, maar probeer het zo vaak mogelijk te doen!

Heel erg bedankt voor het helpen!!
The three design directions were evaluated by means of Foggs’ Behaviour Model for Persuasive Design and three test cases, in order to gain a clear focus on the design problem. First, the approach of the evaluation is explained, followed by the results.

10.1. Approach of the evaluation

As part of the evaluation by means of Foggs’ behaviour model, it was evaluated which aspects are scarce in the current situation of the three design directions: motivation, ability or trigger. Starting point for this evaluation is the current home situation for people who live and/or often eat alone, but have table companions regularly. It was explored why people perceive it as difficult to perform the target behaviours at this moment and how a product could help them. The evaluation is based on the results of the interviews from the strategy formulation phase and common sense.

To compare, the results of the test case are described underneath the evaluation by means of Foggs’ behaviour model. During the test cases, four participants were asked to perform a target behaviour for a week and record which positive and negative experiences they encountered. The test case for ‘portion size’ was set up to find out what would happen if people had to eat their dinner according to the food intake regulations of ‘het Voedingscentrum’. The test case for ‘2nd serving timer’ was set up to explore what would happen if people had to wait at least 20 minutes up from their first bite before they were allowed to eat a second serving. The design direction ‘slow down eating rate’ was difficult to test without a prototype. However, since this project constantly reminds me of my own eating behaviour and eating rate, it was decided to describe my own experiences in the test case for this design direction.

For a detailed version of either the evaluation by means of Foggs’ behaviour model or the instructions of test cases, the reader is referred to the previous two appendices.

10.2. Evaluation ‘portion size’

Target behaviour

The primary target behaviour of this design direction is to dish up the correct amount of the different food groups, like specified by authorities, like information service ‘het Voedingscentrum’. Due to the product, the user gains insight that he is eating a healthy portion size and develops confidence that enables him to eat more mindful, without feelings of guilt, haste or fear of not have eaten enough. The user is no longer led by external cues and might learn to pay attention to his physiological satiety response.

The test case confirmed this statement. Although the participants expected the recommended portion size to be rather small, they later on indicated that they perceived them as a sufficient amount of food. The participants were satiated and especially the amount of vegetables was perceived as more than enough. One participant mentioned she liked being mindful about how much she ate and knowing it was a healthy amount. “I am more aware that I should not dish up portions that are too large and that a smaller amount of food is also sufficient”.

Ability

The largest problem area for this design direction is in ‘brain cycles’; there are many reasons why it is difficult to
select the right amounts in each food group and it takes much cognitive effort. If this effort can be reduced, people will definitely perceive the target behaviour as simpler. Furthermore, ‘social deviance’ should be taken into account: people do not like other people to know they put much effort in restricting their food intake, therefore the use of the product should be indistinctive and preferably integrated in a operation they already perform.

Both participants of the test case indicated that weighing the food is not pleasant. It takes much time and effort, due to which the food cools down, especially when you dish up for more than one person. One participant indicated that she would be less hesitant to weigh her food if it is easier: she once used her mothers’ digital scale, which made it less dreadful to weigh the food.

Both participants mentioned that social deviance played a role: they both had difficulties to measure up their portion size everyday, either because they were eating in an out-of-home context (where it is perceived us abnormal to measure up your food intake) or there was a special occasion. In those cases they did not want to pay attention to their portion size, because they wanted to enjoy their food.

In addition, the participants mentioned that some meals were difficult to measure up, which refers to brain cycles. It took many brain cycles, either because the food was already mixed during the cooking process (e.g. in a stir-fry dish), it was difficult to estimate before cooking how much would remain after cooking or because the participants were not 100% sure to which food group an ingredient belonged. Furthermore, they had doubts about how to deal with toppings like mayonnaise, Parmesan cheese, sauces, etc., because these were not specified by the instructions.

Motivation

The user most likely starts using the product because he or she hopes to lose weight or adopt a healthy lifestyle. However, behaviour change is not completed in a day. If the user does not see or feel immediate response, there is a large possibility he or she becomes unmotivated to use the product. Therefore, there should be a strong motivating aspect in the product to prevent the user from giving up.

Although the participants had the desire to maintain their weight level, they had little internal motivation to measure up their portion size. One participant mentioned that she could imagine it is less unpleasant to measure up your food if you have the desire to lose weight. The participants were not aware that a dinner has a large influence on your calorie intake and could therefore help your to maintain a certain weight level.

Trigger

Since the main function of the product should be to increase ‘Simplicity’ (and therefore ‘Ability’), it is probably most effective if it acts as a facilitator. In addition the product could contain some triggers that motivate the user to keep on using the product when there is no immediate result.

Conclusion

The two main reasons why potential users are not measuring up their food intake at the moment is because it takes a massive amount of extra cognitive effort and because (in general) it is not socially accepted to restrain your food intake to this extend. By simplifying and facilitating this activity, there is a big chance people could be persuaded to perform the target behaviour and adopt a healthier eating behaviour. Although people are likely to be motivated to change their behaviour when buying the product, the product should also make sure the users stays motivated over time.

Design Criteria:

- The process of measuring up the portion size of an evening meal should be facilitated
• Food should not cool down when determining a recommended portion size
• The interaction should be simple and intuitive
• The user should not perceive the product as ineffective, because it does not take into account major calorie intakes like sauces.

10.3. Evaluation ‘slow down eating rate’

Target behaviour
The primary target behaviour for this design direction is to slow down the users’ eating rate: the user shall take the time to consciously enjoy every bite. As a result, satisfaction is increased and the food intake will be reduced, because the user feels satiated with less food intake.

Ability
Ability is not the scarcest factor in this design direction. Eating slower does not require much from the user. In the beginning of the behaviour change, the target behaviour might take effort, since the new behaviour is still non-routine. However, as the user adopts the new habit of eating slower, the amount of effort it takes will decrease.

Motivation
The hope to lose weight and the pleasure of an improved taste experience (which results in more satisfaction from the consumed food) are strong motivators to eat slower. There is no direct need to increase motivation. Merely in situations the user tends to forget of its intention (for example if they are in a hurry) the user should be reminded of its motivation. Motivation is believed to decrease if the interaction of the product is too public, intrusive and is associated too much with a helping aid.

Every day, before starting my dinner, I reminded myself to eat slower than my table companions. This resulted in much more satisfaction and I actually ate less, because I was satiated sooner. It was very nice to enjoy the food more by slowing down my eating rate and focus more on the taste and texture of the food. Eating slower indeed increased pleasure and was therefore increasing my motivation to eat slower the next day. Of course it very subjective and unscientific to evaluate my own experiences, because I already knew so much about the topic, but I have I was actually surprised that it worked so well! A test case with a simple prototype is recommended to gain more (trustworthy) insight.

Trigger
The most effective trigger is a subtle and personal signal that reminds the user of its intention, when he tends to lose control. Due to the signal, the user can get acquainted with this new behaviour.

Originally, I am a fast eater. Although I tried to eat at an appropriate eating rate every day, I occasionally fell back in my old behaviour when I was in a hurry. In those cases I found out too late I was eating too fast. Therefore it would be nice to have a product that corrects you from the start.

To my opinion, a simple reminder when it tends to go wrong should be enough, because you know that the target behaviour is more pleasant. However, I can imagine that a product that gives feedback all the time is too distracting.

Conclusion
A product that persuades you to eat slower should mainly focus on a trigger. Motivation is already high, since eating slow and mindful is probably already perceived as more comfortable than eating fast and mindless. Eating slow involves getting acquainted with a new habit, which takes some effort, which will decrease when the behaviour becomes routine. Therefore, it could be concluded ability is already quite high. The function of the product should be to remind the user to perform the target behaviour when the situation tends to go wrong. For this reason the
design should focus on a signal that triggers the user to perform the target behaviour.

**Design Criteria:**
- The product should trigger the user to eat slower, when he tends to eat too fast
- The product should correct the user from the start that he or she is eating too fast, and not at the end.
- A short reminder is enough; the effect of enjoying your food is the reward

10.4. Evaluation ‘2nd serving timer

**Target behaviour**
The primary target behaviour is to wait at least 20 minutes up from the start of your first serving before deciding to take a second serving. The ultimate goal is to prevent the user from taking a second serving. Only after 20 minutes, the user can truly evaluate its natural satiety response and there is a large possibility the user will decide not to eat more.

The participants of the test case indicated that setting a time limit for the second serving did affect their food intake. Both participants mentioned that they often lost the need for additional food and they liked this effect. They also stated they did not mind setting the timer. One participant mentioned that it even felt good to wait for a second serving.

**Ability**
Ability is probably not the scarcest aspect in this situation. It is relatively easy to wait, however over time the waiting period can have an influence on the motivation level. When eating with other people, social deviance can play a role, since they might find it strange to restrict themselves to wait.

Both of the participants mentioned that it was difficult to complete the instructions if they were eating with other people. It was frustrating to wait, while the others were already dishing up their next serving.

**Motivation**
Motivation is a key factor in this product. The user should stay motivated to wait, because it is tempting to give in to the craving for more. One of the strongest motivations to give in too soon are hunger and fear for the food to turn cold.

One participant mentioned that due to the waiting, the leftovers in the pan already completely cooled down and the participant did not like eating it anymore. It was not rewarding to wait for twenty minutes to make a conscious decision, which resulted in the food being spoiled. It completely decreased her motivation and the next few days this participant did not waited the full 20 minutes anymore.

**Trigger**
The key to this behaviour change is to keep the user motivated to wait between the end of the first serving up to the moment 20 min. have passed. Both a facilitating trigger as elements of a spark should be used.

**Conclusion**
The focus of this product is on motivation. The user should be kept motivated, even though he or she still feels hungry, others already started a second serving or food is cooling down. The waiting process should be more comfortable and the user should be notified if time has passed.

**Design Criteria:**
- The food should stay warm, so the user is not tempted to start the second serving sooner
- The waiting period should be facilitated
- Preferably, the other table companions should also be persuaded to wait.
- The user should be notified if time has passed
DirectLife is the first product to come out of New Wellness Solutions, Philips’ venture that focuses on new healthy living. The program monitors the users’ activity by means of a product called the activity monitor, and provides the user with personal feedback and support. The ultimate goal is to accomplish long-term behaviour changes towards a healthier, more active lifestyle.

DirectLife is a good example of how a product can persuade the user in specific target behaviour and achieve long-term behaviour change. In this case study DirectLife is analysed in order to examine if their methods can be applied onto the three design directions.

12.1. DirectLife’s model for behaviour change

DirectLife uses three elements to achieve behaviour change:

1. A device, called the Activity Monitor that tracks the users’ activity.
2. A website that monitors the users’ personal progress
3. Motivating feedback from a professional, real-life coach.

The Activity Monitor is based on the Philips Tracmor, an accelerometer developed by Philips Research and Maastricht University. In order to get accurate data on the users daily activity, the users must wear the Activity Monitor all day long: either in a trouser pocket, on the belt or as a necklace around the neck.

DirectLife is based on a model for behaviour change, consisting of four steps: ‘awareness’, ‘insight in personal situation’, ‘creating a plan’ and ‘act upon this plan’. By offering the user the possibility to measure and visualise its personal activity level, a personal goal can be created. A fifth ‘step’, ‘feedback on the achievements’, is added to this model to close the feedback loop. The user does not always experience immediate result, therefore it important that the DirectLife program motivates and confirms the user he is doing well. Wietske Rodenhuis, Senior Consumer marketing manager of DirectLife, believes the user should gain insight in the cause of his progress; only then a long-term behaviour change can be accomplished (Rodenhuis, 2010).

Since October 2009, this behaviour model is used to stimulate people in adopting a more active lifestyle. This is only the first step, as DirectLife focuses on healthy living in general and not just activity. Users already pointed out their interest in a similar product that manages their energy intake. An extension of the brand in the direction food intake is therefore very likely in the near future, according to Wietske Rodenhuis. She furthermore states that the method DirectLife uses to accomplish behaviour change can be applied to food intake as well.
12.2. How the DirectLife program works

1. Determine personal profile

The program starts with a preliminary assessment. This consists of wearing the activity monitor without receiving feedback, in order to measure the initial activity level.

2. Personal plan

Based on the users’ gender, weight, length and the preliminary assessment, the coach will set up a personal plan with targets and goals that fit the user.

3. Increase activity

By wearing the activity monitor, the user can keep track of his activity level. DirectLife stimulates the users to add activities in their daily routine that they enjoy doing. As a result, the program fits into even the most hectic of schedules. To help the user, tips and an activity calculator are available on the website.

4. Check progress

The user can check its daily progress via the Activity Monitor. At the start of each day, the Activity Monitor indicates zero activity, visualised by one single green light. Each additional green light brings the user 15% closer to its daily 100% activity target. If the Activity Monitor is connected to the computer more specific information about the users’ progress can be checked.

5. Maintain

Every new undertaking is fun in the beginning, until real life kicks in. To achieve long-term results, the users of DirectLife are supported by a personal coach that motivates them when necessary. Once the users’ personal plan is finished, the user can still check its progress or start a new plan.
12.3. Personal coaching

The personal coach keeps track of the users’ progress and motivates them when needed. The coach sends regular updates about the users’ performance, can give advice on specific questions and can adjust the users’ weekly targets and long-term goals. The DirectLife coaches are trained and specialized in a related science like health psychology and movement sciences.

All communication between user and coach is via email. The users tend to feel a responsibility towards their coach to achieve to their goal: they are not only letting themselves down when they fail, but they feel they also let their coach down. According to Wietske Rodenhuis (Rodenhuis, 2010), this is for some people the extra stimulant they need in order to persist and reach their goal.

12.4. Provision of information

Not all users have the same need for information; while some users like detailed and specific information, others only care about the status of their daily target. To meet the demands of both user groups, DirectLife embedded different layers of information in its program. When detailed information is desired, the user is able to find it, but if the user does not care about the details, he will not be confronted with it.

First level: Activity monitor

The Activity Monitor offers the plainest form of information: six lights to indicate the status of the daily target and three more for extra activity. It is very basic information: did the user reach its 100% target, yes or no? There seems to be a large group of users that only uses this information and hardly ever looks on the website.

Second level: home page of the personal website

The homepage is displayed when the user uploads its achievements to the personal website. It offers the second layer of information: an accurate percentage of yesterday’s achievements, the activity history of the previous week and the personal plan can be observed in a glance.

Third level: detailed activity history on the personal website

The third and most detailed form of information can be consulted if the user enters the personal website. Detailed overviews of the activity history on year, month, week, day and even hour level can be examined. In addition, the personal website includes the users’ goals, useful tips and a community, where users can see how well others are doing. If the user has any questions or needs an extra push, the personal coach can be contacted on the website to provide answers and motivation.

No matter on what level, information is provided to the user in a factual form, without judgement. From context mapping studies it seemed that the user already feels bad when the daily target is not reached and does not appreciate it if the DirectLife program emphasizes this (for example by means of a sad emoticon) (Rodenhuis, 2010). To the contrary, when the user reached his daily target he should be praised and it should feel like a party!
12.5. Conclusion

DirectLife is a good example of how a product-service combination can stimulate people to perform long-term behaviour change. The motivation and encouragement the coaches offer are of great importance for the success of the program.

Since motivation seems to be quite a necessary element to achieve long-term results in behaviour change, it could be considered to position the outcome of the graduation assignment as an extension of the DirectLife program. Adding a motivational program with coaches to the three design directions, would increase the likelihood users will change their eating behaviour enduringly.

DirectLife is part of the Philips brand and it already explores the possibility to extend its activities into the area of food intake. Similar to the design vision of this project, DirectLife stimulates people by setting small goals that fit the users’ daily life, without asking them to change their entire lifestyle.

There are indications the DirectLife program would be a valuable addition to the graduation assignment. During the idea generation phase the role of DirectLife will be taken into account. The specific approach of how a product that enhances weight management will be embedded within the DirectLife program will be evaluated subsequent to the concept choice.
IDEA GENERATION
facilitate weight management by means of mindful eating
13.1. Brainstorm Set-up

Goal of the brainstorms: get a varied amount of input to generate ideas.

1. Introduction: taste experience – mindful eating – losing weight
2. 7 points where you decide to eat mindless/mindful
3. Focus on 3 aspects: Portion size – lower eating rate – 2nd serving timer
4. Not deal with all of them in this brainstorm – not time
5. End result for me is variety of new, unexpected elements which I can use for idea generation

13.2. BRAINSTORM 1: FOODsig

Date: 10 Feb. 2010

Participants: Members of Philips Research involved in food related projects

OPWARMER:
1. HCY... What do you see around you during dinner? (7 min)

BRAINSTORM: (How Can You sessions)
2. HCY... Communicate something in a subtle way? (7 min)
3. HCY... How can you measure food (7 min)
4. HCY... persuade somebody to wait without him/her being aware of it? (7 min)
5. HCY... inform people that 20 minutes have passed by? (7 min)

BRAINDRAWING:
Split up in 2 groups:

2+3 > “Communicate the right portion size to the user”
4+5 > “Make the user wait 20 minutes (up from its first bite) before taking a 2nd portion”

In a group generate ideas that combine a result from brainstorm 2 and a result from brainstorm 3 (or 4 and 5).
Write all the ideas down. After 15 minutes present the best 3 ideas from your group.

13.3. BRAINSTORM 2: TU Delft (ex) students

Date: 12 Feb. 2010

Participants: Students and former students of Industrial Design and Architecture in Delft

Bring:
Camera – Post-its – Tape – Markers

OPWARMER:
1. HKJ... Wat staat er om je heen tijdens het avondeten? (5 min)
In this brainstorm all participants write on post-its and stick it on the board themselves

BRAINSTORM: (How Can You sessions in Dutch)
2. HKJ... (een product) aandacht trekken? (5 min)
3. HKJ... snelheid bepalen? (5 min)
6. HKJ... een bepaalde hoeveelheid materiaal afmeten? (5 min)
7. HKJ... (een product) subtiel iets duidelijk maken? (5 min)
9.1.3 BRAINDRAWING:
Ideas were generated for two situations

2+3 > “Slow down the user’s eating rate”

4+5 > “Communicate the right portion size to the user”

All participants of the brainstorm pick a result from brainstorm 2&3 or 4&5. With these two results they draw an idea (3 min.). Then they keep the result from 2 (or 4) and pick a new one from 3 (or 5). After 1 min. they keep the result from 3 (or 5) and pick a new result from 2 (or 4), etc. etc.

Figure 1. Braindrawing format
13.4. RESULTS BRAINSTORM – HCY sessions

During the HowCanYou sessions (in Dutch HKJ), the participants of the brainstorm generated many solutions: from realistic and usable to very ‘outside of the box’. All ideas will be used as inspiration during the sketch phase if the design process. After all HCY’s were completed, the participants choose three results per HCY they find most promising (except for HCY 1, there the selection was not done by the participants but my myself). In the clustering below, the size of the font is in proportion to the amount of votes.
Brainstorm 1 (Both Groups)

This brainstorm was mainly focused on warming up the participants. Furthermore, the results will be used as inspiration, since from the analysis it seemed the users prefer a product that is integrated in a product they already use.
Brainstorm 2 (FOODsig)/5 (TU)

This brainstorm was executed both in the FOODsig group as in the TU group. Of the many results that were generated, especially the right side of the brainstorm is interesting, since these results are easier to implement in a product. Although the left side is quite ‘outside of the box’ for a product, results can result in innovative solutions and should therefore also be taken into account.

How can you... (a product) communicate something in a subtle way?
Brainstorm 3 (FOODsig)

This brainstorm was quite a difficult one for the participants. Besides many relative ways to measure food, no actual usable results appeared, besides the obvious result ‘weight’. The initial question might have been too specific on measuring food, so it was difficult to come up with new things. Therefore, for the TU group this HCY was adjusted into “How can you size up a specific amount of material?”.

**How Can You... Measure Food?**

- Scale
- Weight
- Portion
- Volume
- Size
- Calories
- Counting
- Timer
- Camera
- Precise
- Sensors (Oliver AMFT)
- Temperature
- Colour
- Taste
- Smell
- Time you need to eat it
- How much fits in your mouth
- Feeling “full”
- Looking
- Inaccurate
- Amount of spoons
- Standard cup/bowl
- Handful
- Comparing
- Cutting it
- Squeeze
- Stirr
- Relation/Proportion
- To plate size
- Throw at the ceiling
- Pressure (fruit/meat/feeling)
- Touch
Brainstorm 4 (TU)

This already generated more diverse results. It seemed that there are not much results in the corner ‘accurate-little cognitive effort’ although these would have been the usable and interesting results.

### Hoe Kun Je... Een bepaalde hoeveelheid materiaal afmeten?

- Chemische reactie
- Massaspectrometer
- Accu
- Laser
- Accellerometer
- Uitrekenen valtijd (F2)
- Verwarmen/afkoelen
- Elec. weerstand
- CAD scan/MRI
- Computer model

### Accurate

- Druksensor
- Lineaal
- Weegschaal
- Aflezen
- Maatbeker
- WIP
- Balk
- Balans
- Contra gewicht
- Veer

### Inaccurate

- Aflezen pakje
- Stijging waterstand
- Spaghetti afmeet cirkel
- (Dille & Kamille)
- Collectief geheugen
- Termen (snufje)
- Tellen
- Veiling (€)
- Touwtje
- Tot het niet meer past

### Much cognitive effort

- Foto maken en relaties uitrekenen
- In verschillende maatbekters overgieten
- Verbranden en kijken hoe lang het duurt

### Little cognitive effort

- Ruiken (alcohol in drank)
- Verbranden en kijken hoe lang het duurt

### Simplicity!
Brainstorm 4 (FOODsig)

This brainstorm focused on keeping motivation up, while waiting before you can take your second serving. It seems that there are many possibilities in distracting the user.

**How Can You... Persuade somebody to wait without him/her being aware of it?**

<table>
<thead>
<tr>
<th>DISTRACTING</th>
<th>GAME</th>
<th>NON DISTRACTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEND IN WRONG DIRECTION</td>
<td>WASHING THE DISHES</td>
<td>NO Saturated COLOURS (WAITING ROOM RESEARCH)</td>
</tr>
<tr>
<td>DO A MORE IMPORTANT ACTIVITY</td>
<td>PROVIDE SOMETHING TO DO</td>
<td></td>
</tr>
<tr>
<td>PROVIDE SOMETHING TO DO</td>
<td>SEND IN WRONG DIRECTION</td>
<td>TELL SOMETHING ABOUT THE (WONDERFUL) EXPERIENCE AFTERWARDS</td>
</tr>
<tr>
<td>HAVING (FANCY) COFFEE</td>
<td>MAKE STANDARD WAITING TIME (YOU KNOW WHAT TO EXPECT/Routine)</td>
<td></td>
</tr>
<tr>
<td>GIVE SOMETHING TO EAT</td>
<td>TELL A STORY</td>
<td></td>
</tr>
<tr>
<td>CHANGE FOCUS</td>
<td>DRAG INTO A CONVERSATION</td>
<td></td>
</tr>
<tr>
<td>DRAG INTO A CONVERSATION</td>
<td>TELL A STORY</td>
<td></td>
</tr>
<tr>
<td>TELL A STORY</td>
<td>TIME LINE (NON LINEAR, FASTER TOWARDS THE END)</td>
<td></td>
</tr>
<tr>
<td>TELL USER A JOKE</td>
<td>REWARD AFTER WAITING</td>
<td></td>
</tr>
<tr>
<td>PRODUCE SOUNDS/NOISES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SO YOU KNOW SOMETHING IS HAPPENING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BEER + LEESMAP (LIKE @ CHINESE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WATCH TV</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Active**

- Ask user to tell a story
- Change focus
- Drag into a conversation
- Provide something to do
- Send in wrong direction
- Washing the dishes
- Do a more important activity
- Produce sounds/noises so you know something is happening
- Tell a joke
- Make standard waiting time (you know what to expect/routine)

**Non distracting**

- No saturated colours (waiting room research)
- Tell something about the (wonderful) experience afterwards
- Tell user a joke
- Time line (non linear, faster towards the end)
- Send in wrong direction
- Active
Brainstorm 5 (FOODsig)

The results generated in this HCY were mainly triggers to inform people they can get a second helping if they still want to. The top-right corner is most interesting, since the user possibly prefers to keep it to him/herself that he needs a product for this. However, the public side could be interesting if you perform this method with your whole household.

<table>
<thead>
<tr>
<th><strong>How Can You... Inform People That 20 Minutes Have Passed By?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>subtle</strong></td>
</tr>
<tr>
<td>Change Setting</td>
</tr>
<tr>
<td>Changing Lights</td>
</tr>
<tr>
<td>Wake Up Light</td>
</tr>
<tr>
<td>Regular Ticking Sound, Frequency</td>
</tr>
<tr>
<td>Changes Right Before 20 min.</td>
</tr>
<tr>
<td>Hour Glass (No More Movement)</td>
</tr>
<tr>
<td>Food Coloured</td>
</tr>
<tr>
<td>Plate Is Covered</td>
</tr>
<tr>
<td><strong>dominant</strong></td>
</tr>
<tr>
<td>Do Task, Afterwards 20 min. Are Over</td>
</tr>
<tr>
<td>Very Bad Smell</td>
</tr>
<tr>
<td>Chair Uncomfortable</td>
</tr>
<tr>
<td>Ask Time at Start, <em>Vibration</em></td>
</tr>
<tr>
<td>Ask Again After 20 min.</td>
</tr>
<tr>
<td>Invisible Clock (Appears After 20 min.)</td>
</tr>
<tr>
<td>Food Tastes BAD/COLD</td>
</tr>
<tr>
<td>Food Evaporates</td>
</tr>
<tr>
<td>Food Becomes Stone</td>
</tr>
<tr>
<td>Food Coloured</td>
</tr>
<tr>
<td>Power Shuts Down, Silverware Stuck</td>
</tr>
<tr>
<td>Big Band Comes In</td>
</tr>
<tr>
<td>Hands Cut Off</td>
</tr>
</tbody>
</table>
Brainstorm 2 (TU)

Like in the previous brainstorm, the top-right corner is most interesting, since the user does not want to attract too much attention with the use of this product. The bottom-right corner could also be interesting, since these triggers are very strong, however they are very negative and intrusive, therefore not suitable for the target behaviour change.
Brainstorm 3 (TU)

The goal of this brainstorm was to get inspiration how to measure eating speed. Especially results in the top-right corner are interesting, since these are both accurate and can be implemented in a product to reduce eating speed. The left side can be discarded, since it seems impossible to use them other then for inspiration and associations.

**Hoe kun je... snelheid bepalen?**

<table>
<thead>
<tr>
<th>accurate</th>
<th>possible to measure eating speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stopwatch</td>
<td>HARTSLAG</td>
</tr>
<tr>
<td>Timer</td>
<td>KM TELLER</td>
</tr>
<tr>
<td>Doppler Effect</td>
<td>BPM</td>
</tr>
<tr>
<td>Infrarood</td>
<td>Klok</td>
</tr>
<tr>
<td>Checkpoints</td>
<td></td>
</tr>
<tr>
<td>Stapjes</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>inaccurate</th>
<th>impossible to measure eating speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>BotSEN</td>
<td></td>
</tr>
<tr>
<td>Flitspaal</td>
<td></td>
</tr>
<tr>
<td>Multitasken</td>
<td></td>
</tr>
<tr>
<td>Knoop aan touw</td>
<td></td>
</tr>
<tr>
<td>Wat kun je allemaal nog</td>
<td></td>
</tr>
</tbody>
</table>

**SIMPLECTITY**

- ValSnelheid
- (Lucht)Weerstand
- Paaltjes langs
- Snelweg tellen
13.5. RESULTS BRAINSTORM – braindrawing sessions

The braindrawing sessions were a bit different for the two groups, since the Foodsig group was not used to designing and generating ideas.

The FOODsig group was split in two: half of the group focused on combining a result from brainstorm 2 and a result from brainstorm 3 in order to generate ideas on how to make it easy for the user to dish up a right amount. The other half of the group combined a result from brainstorm 4 with a result from brainstorm 5 in order to generate ideas on how you can make people wait 20 minutes since their first bite before taking a second helping.

The TU group was used to sketching ideas and generated ideas individually. They alternately designed an idea combining results from brainstorm 2 and 3 or 4 and 5 and had to pass their sheet to the person next to them after 3 minutes. Like described in the set up, they had to use a result the previous person picked and combine it with a result they could choose themselves. When the sheets were full (8 ideas per sheet), everybody presented their best idea.
Selection Best Ideas FOODsig: Portion Size

*Idea 1*

**Result 2: Gestures**

**Result 3: Weight**

People are influenced by the size of their plate. The size of the border of this plate becomes smaller as you add up extra food to your serving.

*Idea 2*

**Result 2: Whisper**

**Result 3: Calories/weight**

The plate keeps track of the calories/weight of the plate and it tells you if you had enough (during dinner?) If you are in company it will whisper to you.

*Idea 3*

**Result 2: Comparing**

**Result 3: Smiling**

Your plate has a smiley on it. If you put too much on your plate, the smiley will start looking sad.
Selection Best Ideas FOODsig: 2nd portion timer

Idea 1
Result 4: Music turns on
Result 5: Play music

In Dutch: ‘Stoelendans’. Music starts, people start dancing. If the music stops you quickly have to sit down. There is one spot without a plate: too bad for you, no second serving!

Idea 2
Result 4: Game
Result 5: -

To kill time, you play games, which will generate discussion. After a certain amount of minutes there is a winner and you can decide if you want a second serving.

Idea 3
Result 4: Tell a story
Result 5: Heavy cutlery

After dinner, someone will read a story to the others. The size of the story is (automatically) adjusted to the time left until a second serving can be taken. While the story is read, the cutlery is so heavy it cannot be hold.
Selection Best Ideas TU: Slowing down eating rate

Idea 1
Result 2: Cannot take
Result 3: Checkpoints

The car drives along the border of the plate. If it passes a checkpoint you have to take a bite of that particular food group. This idea is perhaps more suitable for young children, but it is very cool!

Idea 2
Result 2: come to life
Result 3: countdown

The ‘plate’ starts as a bowl: it is more difficult to eat fast and it keeps the food warm. As the time passes the ‘bowl’ unfolds into a plate.

Idea 3
Result 2: Focus
Result 3: Checkpoints

Your dinner is divided in 3 parts: you can only start eating the next part if you finished the first one or after a certain amount of time. This is an interesting idea, because you often only find out you have eaten to fast if you already finished all the food. With this idea you have three of those ‘evaluation moments’.
**Idea 4**

**Result 2: Association**

**Result 3: BPM**

A speaker is attached to a plate. The plate can weigh the amount of food on it. If you eat too fast, the music will change its rhythm.

---

**Idea 5**

**Result 2: Contrast**

**Result 3: Flitspaal**

If you eat at the correct eating speed, the lamp keeps lighting and warming the food.
Selection Best Ideas TU: Portion Size

Idea 1
Result 4: Laser
Result 5: Changing colours

There is a little device on the table that shine a laser to the ceiling. The pans are in contact with the laser. If the food is dished up, the laser changes colour if the max. of a portion is reached.

Idea 2
Result 4: Contra weight
Result 5: friend tells you

All plates communicate with those of the neighbours or friends. Via internet or a display on the plate you get information about the average of the other people, how you are doing compared to that and what the ideal is.
Idea 3

Result 4: Estimating

Result 5: Message slowly appears

Bit by bit you can add food on the plate. The plate slowly colours as the right portion size is reached.

This is an interesting idea, because it is not so rational and it does not judge.

Idea 4

Result 4: Terms

Result 5: Magnet

User puts a portion on a plate and puts the bell jar on top of it. If the portion is too big, the magnet on the plate does not stick to the bell jar and you cannot bring the plate to the table until you reduce your portion.
Sketches

Portion Size

idea generation
ZIT MET EEN GROEP TE ETEN. DIEGENE DIE HET SNEELST EET ZIJN BORD KLEURT ROOD!

WHAT HAPPENS IF YOU EAT TOO FAST??

IF YOU EAT TOO FAST YOUR BOWL WILL BEND.

POINTE/SORRELSPIT ZIJN NAAR BINNEN

HANDLE GETS WARM.

IF YOU EAT TOO FAST YOUR BOWL WILL BEND.

idea generation

Slow Down

JE ZIET OP HET BORD DE OUTLINE VAN WAT JE GEGETEN HEBT (+ HOE LANG JE EROVER GEDAAN HEBT?)

VOORDEEL DAT ETEN WARM BLIJFT > BEVORDERD MOTIVATIE OM HET BORD TE GEBRUIKEN.

LAMPE = TRIGGER (SIGNAL)

>> VOOR BEHAVIOUR CHANGE EN MOTIVATIE OM LANGZAMER TE ETEN

PARTICIPANTEN ANALYSE INTERVIEW ONEN AANDAG ZEILT HIER PRETJE ZOUDEN VOUDEN

VOEDINGSPORTIE OVER DRIE BORDJES:

3X MOMENT DAT ETEN OP IS,

>> 2X (2X) REMINDER DAT JE RUSTIG MOET ETEN

BORD BLIJFT WARM WAARDOOR EETEN NIET Koud WORDT. ALS JE TE SNEL EET GAAT VERWARMING UIT (STRAF EN DUS INDICATIELAMPE OOK

ALS JE BEGINT MET ETEN IS PATROON B.S. ROOD

> VERBLEEKT TOT BORD UITENDELLIJK NEERSAAL

WIT IS >> DAN PAS NIETW BORD HALEN GELEIDELIJK, NIET OP TIMER ZITTEN WACHTEN ZOALS EEN KOKSWENKER.
Eating Rate

- As you eat too fast, water in the glass will bubble up.
- You need to take a break and take a sip to relax.
- The glass lights up when eating too fast.
- The lamp starts burning brighter when eating too fast (or dims).
- The pattern forms as you eat too fast.
- The hand of the pan lights up when you eat too fast.

*Integrated in a product that is already there

- Not every one puts pan on the table
  (but also + >> forced to sit at the table)
idea generation

2nd Serving Timer

RINGETJE 1X HELEMAAL
RONDRAAIEN. NA 20MIN. SPRINGT
ER EEN PINNETJE UIT.
(NON DIGITAL SOLUTION)

misschien geen reactie na
15min, want dan gaan mensen
juist nog een 2e portie nemen
(omdat het kan...). Product
alleen om te roddelen!
Plate registers weight if too much weight is added. It knows you put on put. It starts the timer automatically when weight decreases (or with button). After 20 minutes the words “Do you still want more?” appear. You have to press yes or no. This data, together with the total weight, is sent to DirectLife for analysis.

Put portion on plates and the leftovers in a special box. Box = “Leftover Box”

>> Keeps warm and has a timer only opens if the timer has finished. No second serving? Put box directly in the fridge!

Ezeltje Strekje
Dr. Bibeer
Kookwekker:

PV geluid springt iets open!

SLOT SPRINGT OPEN NA 20 MIN.!!

Klein timer met zuignap = goedkoop!

Hyft warm in pan

Extra beslissmoment

Meer moeite voor openen
Appendix 15

Other five scenarios

Portion size: SERVING SPOON

Martin uses the Philips Serving Spoon to maintain a healthy eating pattern. This product helps him to manage his food intake. He can weigh uncooked food before he puts it in the pan or cooked food when he dishes up his plate.

The dots on the handle visualize the amount Martin has put in the pan as a ratio of his recommended food intake. The Philips Serving Spoon remembers and adds the amount of every spoon to the total food intake.
Martin uses the Philips Serving Spoon to maintain a healthy eating pattern. This product helps him to manage his food intake. He can weigh uncooked food before he puts it in the pan or cooked food when he dishes up his plate.

The dots on the handle visualize the amount Martin has put in the pan as a ratio of his recommended food intake. The Philips Serving Spoon remembers and adds the amount of every spoon to the total food intake.

The Philips Serving Spoon concept consists of multiple spoons with different shapes. All spoons have the same functionality. They charge and transfer data in a docking station.

With the turn button Martin can select weather the food on the spoon is cooked or raw and to which food group it belongs: vegetables, meat or past/rice/potatoes.

Martin can also use the product after cooking, for example when his friends come over.
Iris comes home from work and is really hungry. She starts eating and without noticing it, she eats very fast and mindless.

Suddenly her Philips Vibrating Cutlery warns her she is eating too fast.

Slow down eating rate: VIBRATING CUTLERY
Iris comes home from work and is really hungry. She starts eating and without noticing it, she eats very fast and mindlessly.

Suddenly her Philips Vibrating Cutlery warns her she is eating too fast.

She slows down her eating rate and starts to pay more attention to her food. Nice!! Much more relaxed!
Jamie is a fast eater. Since a while he is using the Philips Warming Plate. Before he tried to eat slower, but then his food turned cold and he did not like that!

The Philips Warming Plate keeps his food warm during dinner. A little red light indicates the warming function is switched on.
Jamie is a fast eater. Since a while he is using the Philips Warming Plate. Before he tried to eat slower, but then his food turned cold and he did not like that!

The Philips Warming Plate keeps his food warm during dinner. A little red light indicates the warming function is switched on. When Jamie is eating too fast, the warming function switches off and the indication light turns off. For Jamie, this is a subtle cue too eat slower. When he does eat slower, the indication light is switched on again. Jamie continues his dinner slower and more mindful.
Sara has the habit to eat very fast. After her first plate, she is a bit disappointed that dinner is already over and she takes another serving. She has just started to use the Philips Timing Cutlery, to help her decide if she is still really hungry or just ate too fast.

When Sara starts eating, the timer starts counting down. Because it takes around 20 minutes for the stomach to send a signal to the brain that you are satiated, the timer counts down from 20 minutes.
After she has finished her plate, Sara waits until the cutlery gives her a signal that the 20 minutes have passed by. She then can make an honest decision to...

...dish up a second serving in the kitchen

OR

...put the leftovers in the fridge
Carl has been using the Philips Timer Box for a while now. After dishing up his plate, he puts the leftovers in the box. The box will keep his food warm while he eats his first serving.

He presses on the timer and it starts counting down from 20 minutes.

When Carl has finished his dinner, he is still a little bit hungry, but he does not immediately take a second serving. He knows it takes around 20 minutes before the stomach sends a signal to the brain you are satiated. Therefore, he cannot objectively decide yet, if he needs more food.
Carl has been using the Philips Timer Box for a while now. After dishing up his plate, he puts the leftovers in the box. The box will keep his food warm while he eats his first serving.

He presses on the timer and it starts counting down from 20 minutes.

...remove the thermo sleeve and put the leftovers in the fridge.

After a while he checks the timer box. Still 4 minutes to go... When the timer has reached zero, Carl either decides to...

...open the timer box and take another serving, because after 20 minutes he is still hungry.

When Carl has finished his dinner, he is still a little bit hungry, but he does not immediately take a second serving. He knows it takes around 20 minutes before the stomach sends a signal to the brain you are satiated. Therefore, he cannot objectively decide yet, if he needs more food.

2nd serving timer: TIMER BOX

OR

...remove the thermo sleeve and put the leftovers in the fridge.
16.1. Intro

- Ideas generated for people living alone (but sometimes guests)
- Mindful eating > 6 moments you decide to eat mindful.
- Mindful eating both emotional as physical.
- People only interested in mindful eating when it is a tool to another goal like losing weight.
- **3 design directions:**
  - **Portion size:** no mindless calories because portion size is too big
  - **Slow down eating rate:** enjoy smaller amount more if eating slow
  - **Second portion timer:** takes 20 minutes since first bite for the stomach to send a signal to the brain you are satiated. So wait at least 20 minutes before deciding to take a second serving, otherwise mindless calories.
- Product is tool to learn new mindful eating behaviour, Direct Life is to motivate & support
  > Pictures!
- Ideas generated in big brainstorm session
- 2 ideas per design direction

16.2. Questions

1. Recognizable? “Is het probleem waarvoor het product een oplossing biedt herkenbaar?”
   *(zie invulvragen onder)*

2. Wat is je eerste indruk?
3. Zou je dit product gebruiken: ja / nee
4. Wat vind je er positief aan?
5. Wat vind je er minder positief aan?
6. Wat zou je aan het product willen veranderen?
7. Specific questions

8. Vergelijking 2 concepten
PORTION SIZE recognizable?  

CB: Zou je dit product gebruiken: ja / nee  
CB: Need for the ‘real’ absolute weight as well?  
SS: Zou je dit product gebruiken: ja / nee  
CB SS

SLOW DOWN EATING RATE recognizable?  

VC: Zou je dit product gebruiken: ja / nee  
WP: Zou je dit gebruiken met andere mensen erbij? ja / nee  
WP: Zou je dit product gebruiken: ja / nee  
WP: Zou je dit gebruiken met andere mensen erbij? ja / nee  
VC WP

2nd SERVING TIMER recognizable?  

TC: Zou je dit product gebruiken: ja / nee  
TC: Integrated in special cutlery or slide on product?  
TC: What kind of signal (Vibrating, light, beep, etc.) or no signal?  
TB: Zou je dit product gebruiken: ja / nee  
TB: Signal after 20 minutes necessary?  
TB: Rather a time bar (circular) instead of a timer?
17.1. Portion size

**Chopping board**

**Positive**

- Easy to use and would make the process of deciding how much food to cook much definitely easier.
- “Makes it easy to see how much you need, something that is very difficult at the moment. If you want to do something about that, this would be a very good application”
- Clear and unambiguous interface (also more clear compared to the serving spoon)
- One participant was a severe asthma patient, which had doctors’ advice to maintain a certain weight. She particularly mentioned this product would be very useful for her, because she than has insight how to eat enough to stay at a certain weight in a healthy way. She furthermore expressed that there are many lung and CARA patients who are in a similar situation as hers, and this would be very useful to them as well.
- Easy to store
- Nice that you can also use it if you cook for more people (by putting the plate on the chopping board)
- “Really nice! This is really something for me! Being mindful about what I eat already during the preparation”
- Nice to have insight how much food is ‘good’ and enough for you
- The combination between the function of a scale and a chopping board is perceived as useful and practical, since you already want this function during cutting.
- “Ahhh useful!!”
- Only cook what you may eat: no leftovers to seduce you to eat more.

**Negative:**

- Not logical to use a chopping board if you use pre-cut vegetables
- What to do with sauces, toppings, oil, etc.? Those are the calories that make you fat, but this product does not give you insight in that. Nice to also have insight that you are doing ok in this area. Then weighing the three main food groups does not feel useless.
- If you are in a hurry it takes a lot of actions to press all the buttons (however, participants also mention it
is a nice way of building up a meal gradually due to these buttons)

**Remarks:**

- There is a need to also see the weight in grams. Should not always be visible, but it should be possible to show it. Then the board is multi-purpose and can also be used as a regular scale. If the weight in gram is always visible, people can get shocked by the amount and take a little more of less.

- One participant mentioned she would really want to be able to control and easily adjust her targets. She would rather want to be able to simply adjust her goals than to have a dietician or coach: that is too much hassle.

- You can ‘save’ the amount of food you place on the chopping board, but how about the next day? Need for a reset/new day button!

---

**Serving Spoon**

**Positive:**

- “Cool!”

- Useful to have different spoons, for different shapes of food.

- Easier to use than the Chopping board if you eat with multiple people.

- You have control up front

- From the start you are very aware and mindful about the cooking process.

- Close to the preparation & dishing up process.

**Negative:**

- Difficult to use with ‘one-pan-dishes’

- Much dishes if you have to use different spoons to dish up different ingredients of your dinner.

- A lot of hassle to weigh your food on a spoon, particularly when you weigh it before cooking the food. It adds an extra action if you weigh it up front: instead of throwing it in the pan right away, you first have to put it on the spoon and if it does not fit in one time, you have to do it in two or more times.

- Not logical to cut food and than weigh the amount: “With the serving spoon I only find out I cut too much after the cutting, while with the chopping board this is one action”.

- “It is easier to use the serving spoon after cooking, however than I cannot accurately estimate up front
how much I have to cook and I have leftovers” (but the participant mentioned this can be learned).

- Always in sight on the countertop.

17.2. Slow down eating rate

Vibrating Cutlery

Positive:
- “Very useful!”
- Immediate correction (feedback) is nice and effective
- Perceived as more effective than the warming plate
- “Funny… genius!”
- “Nice that it is just a quick reminder, since nobody else will do that. It is a good solution if you do not have your eating rate under control”
- Does not take extra effort
- You don’t have to pay attention to the feedback, if you eat to fast, you will feel it anyway (in comparison to the indication light to which you have to pay attention)
- “Great idea!”

Negative:
- Not comfortable if the product would vibrate in your mouth.
- “Would be weird to use this product in front of others, I would feel ashamed”
- ‘Mind-your-own-business’-feeling
- Very compelling

Remarks:
- Some participants mentioned vibrating cutlery is more obtrusive than the warming plate, since the little light can be ignored and vibration not. Others perceive the warming plate as more obtrusive, since table-companions can see the light of the warming plate but not feel the vibration of the vibrating cutlery.
- 4 Participants would also use this product when eating with others.
- “How fast will it vibrate? I do not want (others) to hear it!”
- “It should only measure the bites and not the other movements during dinner”
- “I would like normal cutlery, no special lights or buttons on it”
- “It would be nice if you could control the preset eating rate, for example if you think it is too sensitive” (preferably during dinner)

Warming Plate

Positive:
- Opinions towards the two functions were divided: some much appreciate the warming function and
indicate it is the main reason they like the concept. Others mention they would only prefer the little light and have no need for the warming function. In addition there were also people who liked both functions.

- "I would use it for two reasons: it keeps your food warm so you are really able to eat slower and you are ware of your eating rate. Kill two birds with one stone!"

**Negative:**

- If I eat a salad, I would not want a warming function.
- "I might not look at the light if I’m watching TV during dinner”
- One participant mentioned that she does not associate Philips with tableware (like a plate). “Cutlery usually all looks the same, but with a plate I find it important it looks good. I do not associate a plate, designed by Philips with a Philips logo, with a nicely set table. Cutlery is less in sight, a plate is always ‘in-your-face’.”
- This same person mentioned she did not really cared for the warming function. She would rather use her own plate and for example put a ‘Philips indication light sticker’ on the plate to help her eat slower.
- Association with children’s plate

**Remarks:**

- Some participants mentioned vibrating cutlery is more obtrusive than the warming plate, since the little light can be ignored and vibration not. Others perceive the warming plate as more obtrusive, since table-companions can see the light of the warming plate but not feel the vibration of the vibrating cutlery.
- Participants would also use this product when eating with others.

- Maybe the indication light should be green, since green is associated with ‘good’. It could also turn red if you eat too fast, instead of turning off.

### 17.3. 2nd serving timer

**Timing cutlery**

**Positive:**

- Easy to just place next to you and almost forget about it.
- Very subtle and very useful.
- No extra effort

**Negative:**

- “I like the idea, but why shouldn’t I just set an alarm clock?” Participant would like it, if it would have more technical functions than just the alarm clock: it should have an added value over a normal alarm clock.
- Since cutlery is in your sight, you are more aware of it and triggered to take a second serving.

**Remarks:**
It would be better if there wasn’t a signal when the 20 minutes have passed by, because this will trigger you to think about taking a second serving. Only a timer, which you can check, would be better.

On participant mentioned it is also possible that the cutlery gives a signal if you dish up within 20 minutes.

The timer should be integrated in Philips cutlery, since an end-piece would be too much hassle and too apparent.

**Timer Box**

**Positive:**
- More interesting than the cutlery, since it has a double function of also keeping your food warm.
- “Very practical!” (Specifically mentioned by those people who already save food in a plastic box. Those who throw away their leftovers were not interested in this idea).
- Conscious choice if you take more
- Not awkward to use this if more people join dinner, because of the warming function.
- Nice that your food stays warm
- Very subtle and easy to perform the new behaviour. No extra effort.
- Keeping your food warm is a big advantage!

**Negative:**
- If you decide to take a second serving, you do not take a bit from the pan, but probably are triggered to eat the entire box. Also because the food is still warm.
- Possibly motivates you to take a second serving because the food stays warm.
- People should be careful the food does not go bad (fish/chicken?)
- If you eat all the leftovers after 20 minutes, you have extra (unnecessary) dishes.

**Remarks:**
- Maybe there should be different sizes of boxes, because you do not do a little bit of food in a big box.
18.1. Leida Kruijf

*Leida de Kruijf is een diëtiste.*

Denkt dat concept effectief zou kunnen zijn, er is zeker een doelgroep voor. Ziet zelf liever een hele uitgebreide versie, zodat met name dialyse en nier patiënten dit product ook kunnen gebruiken, maar deze doelgroep is veel kleiner. “Zou geweldig middel zijn voor mensen met een strenge dieet. Die mensen komen er nu vaak niet meer uit”.

Keuze maken waar product rekening mee houdt: al het voedsel op gehele dag (inclusief zouten, kalium etc.) of alleen calorieën bij avondmaaltijd?

Mensen zijn snel hun interesse kwijt. Wat je met het product wilt bereiken is het ‘Wauw!’-effect, dat mensen echt in gaan zien wat een ingrediëntenkeus voor verschil kan maken.

Enerzijds moet je mensen hierin blijven prikkelen en ze op die manier gemotiveerded te houden (dat kan door echt inzicht te geven in verschil, dus nauwkeurigheid), anderzijds moet het zo simpel zijn dat je het elke dag wilt gebruiken (simplicity).

Balans vinden in hoe nauwkeurig ga ik het doen en hoe simpel moet het zijn dat mensen het blijven gebruiken:

- moet ook niet te simpel dat het geen meerwaarde heeft boven een normale weegschaal
- geen extra handelingen naast bestaande ritueel.
- achteraf als blijkt dat er ook behoefte is aan een gezinsversie, dan snijplank voor bereiding en op borden een verdeelsleutel van datgene wat bereid is.

Voorwaarden voor alle concepten:

- Iets van een tool waarmee je sausjes/olie/vetten/mayo etc. kan afwegen (was enthousiast over lepel idee)
- Eiwitrijk voedsel (vlees/eieren) geeft een verzadigd gevoel, daar moet je niet te veel op korten. Iets te veel daarvan eten maakt niet heel veel uit, maar aan de andere kant doen we dat al automatisch.

Keuzes maken:


(2 situaties die zorgwekkend waren; deze gekozen, omdat mensen open stonden voor verandering, emoties te lastig. Lunch niet betrekken, want vaak niet thuis eten of geen invloed. Bewustwording creëren, kan doorgaan in andere etenmomenten als gedrag avondeten verandert is. Alle eten zijn meegenomen en avond eten al snel goed voor 1000 cal. Per maaltijd, dus bijna helft van calorie-inname en daarbij zijn veel van deze calorieën ook mindless en zal je dus niet missen.) Voor een nette maaltijd is 600 cal. een mooi aantal. Voor dieet, max 500 cal. per dag minder, anders voel je je niet ok.

- energierijk of alle aspecten van een dieet?
- Wie is doelgroep?

Doel product: stimuleren van eten van genoeg groente en zorgen dat mensen niet te energierijk eten.

Tijdens gesprek ook afgevraagd: bij afvallen met een professioneel dieet mag je eigenlijk nog heel veel eten. Waarom pijnigen mensen zich dan met een lastig crashdieet? > marketing en de ‘mythe’ om het dieet heen. Misschien is de functie van dit product ook ‘de mythe’!
Mogelijkheid DirectLife:

- 1 gerecht met verschillende graden van ‘gezondheid’
  > steeds vettere producten. (inzicht in hoe je dingen moet veranderen om gezond te maken
- gerecht insturen en gezond alternatief krijgen van coach
- dieetplan toegespitst op jou persoon + activiteit
- achteraf invullen welke voedingsmiddelen de gewogen producten waren en aan de hand daarvan advies krijgen.

Naar aanleiding van een gesprek met haar zijn er drie opties voor concepten:

Simpel concept:

Onderverdeling in groente – vlees – zetmeelproducten, maar bij vlees en zetmel producten een subverdeling, omdat 100gr. speklap of pasta erg verschilt van 100gr. kipfilet of aardappelen. Voordeel is simpelheid, weinig effort en over grote geheel toch voorkomen van mindless calorieën. Grote rol van DirectLife project. DirectLife kan wel ‘themaweken’ houden, waarbij b.v. elke dag bijgehouden wordt welk vlees wordt gegeten en dat de coach daar dan advies over geeft. Zou prima werken voor de ‘op gewicht blijver’, iemand die echt dieet zou een dieetplan moeten krijgen, en daarin wordt al aangegeven welk soort vlees je moet eten. (mager).

Adaptive concept


Advanced concept:

Gebruiker geeft precies aan welk product hij weegt. (kan dmv tomtom adres invoersysteem?). Hierdoor kunnen de doelen per ingrediënt afgesteld worden. Achteraf kan DirectLife toegespitst tips geven wat knelpunten zijn en hoe de gebruiker zijn gedag gemakkelijk kan aanpassen.

Strategie:

eerst basis ding, daarna als het aanslaat en er een behoefte ontstaat om uitgebreid te registreren (veel effort) een extended versie op de markt brengen.

Wat ook zou kunnen: interface afhankelijk van eigen van eigen voorkeur. Afhankelijk welk profiel je instelt moeten beide dingen mogelijk zijn in 1 apparaat.

18.2. Ir. Dr. Andrea Werkman van het Voedingscentrum

Interview met Andrea Werkman van instituut ‘het Voedingscentrum’

Insteek voedingscentrum: eten wat je nu al eet, alleen in juiste hoeveelheid en verhouding bijschaven. Gaat erom dat je goed gevarieerd eet dan maakt verschil in calorieën niet zoveel uit (bv tussen kip en speklap). “Je hebt de dagelijks aanbevolen inname, maar omdat je heel sterk inzet op variatie, fluctueert dat natuurlijk heel de tijd” > indeling voedingscentrum aanhouden. Voorwaarde dat DirectLife heel sterk inzet op variatie!

Voedingscentrum raadt niet aan om minder speklap te eten, maar juist door te variëren heb je ruimte voor die speklap. Conclusie: niet verminderen in gewicht, lost zichzelf door de week op als je varieert. “Het zit hem meer in de variatie over de dagen en niet zozeer in de hoeveelheid”
Richtlijnen voedingscentrum zijn richtlijnen voor een individu, geen absolute waarden! Doelen moeten op de persoon worden aangepast. Helemaal als je het ook gaat koppelen aan bewegen. Echte energie balans is = meer op weekniveau.

Niet perse nodig energie van gehele dag mee te nemen, want een boterham is een boterham, dat zijn al porties. Daarin kun je veel duidelijker advies in geven.

“Sowieso dat mensen gaan afwegen, dat scheelt al heel erg, want mensen doen het heel vaak op het oog en maten en gewichten, dat is heel lastig.” >> maten en gewichten boekje!!

Vond het mooi dat de plank af te wassen is. Heeft wel voorkeur voor 2 planken, i.v.m. kruisbesmettingen. (Vlees los van vis, los van groente, maar aangezien vis en vlees waarschijnlijk niet op 1 dag, zijn 2 planken genoeg)

Blij met het product, want je kunt het inzichtelijk maken. Denk wel dat het product bij veel mensen kan helpen: “Bij heel veel van die afval methoden ga je er ook naar terug dat mensen zich er meer bewust van zijn en dit is 1 van de manieren om dit heel goed in kaart te brengen en hier hoef je niet steeds weer te gaan wisselen en wisselen en bakje dit, bakje zo. Je kunt het meteen wegen en meten en dat vind ik wel heel erg leuk”.

Zou fijn zijn als mensen we zelf hun optimale hoeveelheden erin kunnen zetten en een optimum kunnen vinden in gewicht behouden en het ook volhouden. “Het moet wel leuk blijven” Met name 200 gram groente is lastig vol te houden. Coach zou hier tips in kunnen geven (bv tomaat afwegen en bij lunch eten).

Zou heel erg voorstander zijn van DirectLife programma eromheen. Product zou moeten ondersteunen in:

- inzicht in duidelijke verhoudingen in avondeten
- stimuleren van groente eten, want dit is een goede vuller en mensen eten het nu veel te weinig
- mensen realiseren zich misschien, door hier gebruik van te maken, het op den duur als een probleem. “Wie weet vinden ze nog helemaal niet dat ze een probleem hebben” mensen krijgen inzicht in waar probleemgebieden zitten

ook nog iets met calorieën doen? (zijn die zichtbaar ergens?)

Variatie eten is gewoon heel erg belangrijk, zodat je al je voedingsstoffen binnen krijgt. Alleen eentonig (mager) eten is ook niet goed. Voeding is niet alleen calorieën en het moet ook een beetje lekker blijven!
Rondjes op bord moeten misschien niet groen > misschien randje eromheen vs. ingekleurd.

Oliën niet echt afwegen; lepel idee = leuk!

Doel voedingscentrum: “Mensen op hele kleine stukjes tips geven, op hele kleine stukjes laat nadenken ‘als ik alleen dat al zou veranderen, zou het voor mij al schelen’ en dat hoeft niet eens te gaan over afvallen, maar over gezondere keuzes maken. Dit is ook een kleine stapje; ga maar gewoon eens afwegen. Als je dit product niet zou hebben is het best een bewerkelijke stap en dit maakt het al een stuk gemakkelijker. Dus daar zou het heel mooi bij aansluiten.”

18.3. DirectLife: Gijs de Beer & Wietske Rodenhuis

Wietske Rodenhuis: Senior Consumer Marketing Manager

Gjis de Beer: Design Engineer (focus on interaction design of the website)

DirectLife filosofie


Verweven door programma is behaviour change model:

1. **Besef/informatie** (informatie bieden, inzicht geven in hoe het goed voor je is) via website

2. **Inzicht** (?) (inzicht in eigen situatie, toepassen van de informatie) via activity monitor en uitgebreid via website. Hier zou ook gewicht in zitten.

3. dan omzetten in de wil om te veranderen en een plan hoe je dat gaat doen. Op dit gebied heeft DirectLife nog niet echt iets met eten, maar hier zou mijn product komen.

4. **actie** (plan uitvoeren, met name op de lange termijn).

Echte behaviour change is het moeilijkste wat er is en is pas na 1 of 2 jaar. Belangrijk dat de intrinsieke motivatie bevorderd blijven.

**Gelaagdheid van informatie:**

1. **activity monitor**: 4 lampjes om doel te halen + 2 voor extra activiteit. Hele simpele informatie. Haal ik m’n percentage, ja/nee?

2. **homepage personal DirectLife website**: percentage doel gehaald met wat meer informatie.

3. **Personal webpage DirectLife**: overzicht in geschiedenis en doelen, tips, communitie.

Als je hele specifieke informatie zoekt dan kun je er komen, maar als je dat niet wilt wordt je er ook niet meer geconfronteerd.

Het is de vraag wat verkoop je? Een gadget? Nee geen gadget, het is voor lange termijn, we willen mensen veranderen en gezonder krijgen. Wij zijn geen dieetprogramma, wij zijn het hele spectrum. En dat hele spectrum is om je op de lange termijn gezonder te krijgen in algemene zin. Dus in die zin kan het een gevaar zijn dat dieet daar zo in te pakken.
Tactisch doel van DirectLife is om mensen gezonder te maken. Dat is nu in eerste instantie activiteit, omdat het gemakkelijk meetbaar is, maar het hele plaatje is activiteit&voedsel,sleep,stress,allerleigezondheidsaspecten in iemands leven. Uiteindelijk is het, het idee dat je met behulp van allerlei digitale middelen mensen gezonder krijgt.

Meetbaar en zichtbaar maken, want dan heb je iets om naar toe te werken. Het zichtbaar maken van wat je doet, is in zichzelf een hele grote motivatie om dan ook meer te gaan doen. Die propositie zou je kunnen toepassen op allemaal dingen, ook voedsel. Trucje: meten = weten = motiveren MET EEN FEEDBACK LOOP! Je maakt zichtbaar wat mensen doen en dat geeft een stimulans om er beter op te letten en er bewuster mee bezig te zijn. Dit is helemaal in lijn met mijn project.

Met name de feedback loop dichtmaken is erg belangrijk! Je moet kunnen zien ‘en daarom behaal je dit resultaat’ dat is wat lange termijn resultaat is. Wat zijn de doelen wanneer je begint? Dan houden we die voor je bij en als je die dan haalt dan is het ook echt een feestje! Feedback loop extreem belangrijk, want je ziet dus geen instant resultaat. In die tussentijd zul je mensen dus continue moeten bevestigen in ‘je bent goed bezig, dit is goed voor je, ook al zie je nu nog geen resultaat, het komt nog wel’. Langzame afvallen opvangen door dieetplan met volume eten; moet wel een tool zien te vinden om dit te communiceren.

\textit{DirectLife & Food op dit moment}

Mensen goed bezig met bewegen, maar ook veel vragen naar hoe om te gaan met voeding.

Gaan bezig met voeding vanaf juni, alleen webbased; onderdeel toevoegen waarbij voedsel kan worden gelogd (dagboek) en je gewicht kunt loggen. Daarmee toewerken naar een doel, net zoals bij beweging. Voor gewicht wordt dan ook toegewerkt naar een bepaald doel. Een volgende stap zou kunnen zijn om het advies van eten hierin te verwerken, maar dat is een wat lastigere stap, want dan zit je met hoe breng je dat? (zoals voedingscentrum of Food Pyramid?) De eerste stap zou voor ons zijn, web-gebasseerd vooral gericht op gewicht en een stukje het vastleggen van voedinginname. Mijn project is een stukje verder. Zijn wel al aan het denken aan een (personen)weegschaal, die automatisch communiceert met de website. Daar zit wel een lastig punt dat je mensen niet het advies geeft hoe ze dan moeten afvallen.

Als je beweging combineert met voedinginname, kun je echt een balans opstellen. Volgens Gijs is de sterkte van het product dat het mogelijk is om het veel meer te integreren wat nu sec een productje en een website is in iets dat in het dagelijks leven zit.

\textit{Coaching}

Met name coaching is een hele onderscheidende factor van het project; gaat allemaal via email, maar het geeft je de mogelijkheid om echt serieuze, specifieke vragen te stellen. Zijn deskundigen op het gebied van beweging (bewegingswetenschappen, op gebied van sport, voedingswetenschappen).


Mensen zijn ook meer overtuigd van het programma omdat er coaches zijn, verhoogd betrouwbaarheid en perceived effectivity van het programma. Tips die gegeven worden zijn ook meer credible.
Voorwaarden voor mijn project

- Interactiviteit op website erg belangrijk. Simpele variant, maar wel eentje waarop je op een hele speelse manier door heen kan
- Mobiele interfaces erg in opkomst (denk aan ipad, mobiele telefoon, etc.) omdat al verweven in dagelijks leven
- Product gaat alleen werken als het HEEL simpel is. In het begin doe je het fanatiek, maar op een gegeven moment gaat je aandacht verslappen. Eigenlijk wil je dat het gebruik van dit product een soort ingebakken handeling wordt. **Quick Check** en vooral niet te streng, werk met ranges. Werk daarna met verschillende informatielagen.
- **Dit moet iets zijn dat op je aanrecht blijft liggen of zo gemakkelijk** is dat **dit gewoon het meest gemakkelijke ding is dat je pakt op het moment dat je wilt gaan snijden. En ook dat je, je kant-en-klare zakje groente er even over uitstort**
- Het begint heel erg als hoeveel is nou eigenlijk genoeg, maar op een gegeven moment wordt het een fase van ‘oh nee even een ‘sanity check’ ongeveer zoveel klopt het? > dan zou je bijna een interface shortcut willen. (heel andere informatie behoefte voor experts)
- Haal ook echt de 6 punten van mindfulness terug!!! (Wietske)

Ideeën

Wat nu vaststaat is dat het een plaat is die kan wegen en waarbij je portieadvies kan krijgen zowel voor als na het koken. Product is minimum info, voor uitgebreidere info ga je naar de website. Onder andere ook omdat het anders fragment wordt en je er wel op snijdt met messen; dat is een spanningsveld.

o Balans tussen voedselinnname en beweging (energie intake and output), soort wip.

**How the cutting board could fit in DirectLife**

**Goal product:**
Stimuleren van een (nieuw) gezond eetgedrag tijdens de avond maaltijd, door inzichtelijk te maken wat een aanbevolen en gezonde portiegrootte is, afgestemd op de gebruiker. (voorkomen dat mensen zich tijdens portiegrootte laten leiden door verkeerde cues)

2 trajecten:

1) **op gewicht blijven**

weten wat gezond is. Erg simpel, inzicht. Eten wat je nu al eet, maar in juiste hoeveelheid en balans. Deze mensen zijn al bewust bezig met gezond eten, maar zijn zich niet bewust van de onbewuste calorieën van het avond eten. Tevens houden ze zich zo in overdag, dat ze dan los gaan tijdens avond eten (theorie literatuur), omdat ze dan geen rem meer hebben en denken dat het gezond is. Terwijl hier juist ook veel calorieën zitten! Dit alleen volgens richtlijnen van voedingscentrum laten eten, zelf keuze maken in producten.

2) **afvallers**

diëtplan, volume eten, weten wat gezond is daarom bewuster eten. Dit volgens richtlijnen voedingscentrum laten eten, maar alleen voorkeursproducten en beetje minder. (angepaste doelen) je eet de producten die je coach je voorschrijft, daardoor nog niet nadenken over variatie en product keuze.

Vanuit DirectLife bekend dat er verschillende **‘persona’** zijn met verschillende behoeften, zowel op gebied van toegankelijkheid (heb ik n probleem?) en informatiebehoefte (gelaagdheid van info)
groep die alleen interface activity monitor gebruiken; bezoekt niet of nauwelijks de website (kan ook actief met product bezig zijn, zonder website bezoek)
• groep die alleen homepage personal website bekijkt tijdens inladen
• groep die website bezoekt en doorklikt naar overige functionaliteiten DirectLife

strategie:
fijn om te kunnen richten op ‘low hanging fruit’: mensen die al weten dat ze een probleem hebben en stap om aan DirectLife mee te doen is relatief klein. Mensen die in het behavioural change process helemaal aan het begin zitten, die hebben nog niet echt door dat ze een probleem hebben en moet je eerst overtuigen dat ze eigenlijk wel zouden moeten veranderen, dat ze daar nu mee moeten beginnen en dan dat ze dat ook met Direct Life moeten doen. > veel marketing budget spenderen. Direct life richt zich dus echt op mensen die al willen veranderen; deels voor afvallen of actief weight management (bv na fors afvalproces). Vanuit leden huidige DirectLife veel vragen naar weight management. Voedsel extensie is een heel logisch vervolg: als je meet hoeveel je verbrand dan wil je ook meten hoeveel je binnenhaalt. DirectLife gaat nu twee stappen doen in roadmap: 1) weight management module: hou je gewicht bij, bereken je BMI, maar nog niet hoeveel eet ik nou? 2) de volgende stap zou zijn ‘hoeveel eet ik nou?’. Daar zit een enorme educatieslag.

PRODUCT:
• Hoeveelheden wel echt op persoon afstemmen! Kan enorm schelen.
• 2 planken: groente en vlees/vis plank.
• Cutting bord minimale laag van informatie (zo simpel mogelijk)

• Volgens Gijs nog stap extra erbij: zou 1 doel van voedsel willen maken. (maar hoe is dit mogelijk? Scheiden van invoeren en doel laten zien. Maar naar mijn mening niet mogelijk omdat je 3 onderdelen van voedsel hebt.) > wat is je 100% doel? (‘goede dag’/‘slechte dag’) Gemiddelde van de 3 targets? En is avondmaaltijd een soort indicatie van de rest van de dag?

• Uiteindelijk doel van product is dat je, jezelf niet meer voor de gek kan houden. Natuurlijk zijn er meerdere dingen te bedenken waardoor je het breder kan trekken, maar dit is 1 mogelijkheid voor thuisgebruik. (andere situaties zijn vaak als je onderweg bent)

• Geen oordeel of negativiteit (sad smiley) als het slecht gaat (die conclusie trekt de user zelf wel), maar wel een feestje als je, je doel bereikt hebt! (mensen dansen er dan echt naast!) mensen bevestigen in hoe goed ze zijn prima, mensen kritiek geven nee, maar tegelijkertijd wel accountable maken door heel feitelijk blijven (dit zou je moeten doen, dit doe je). Als je dit verkeerd doet kan het wel nog zo’n fantastisch product worden, maar dan gaan mensen het echt haten.

SERVICE:
• Tweede en derde laag van informatie. 2e laag is doel gehaald per dag totaal en voedselgroep specifiek. 3e laag is per dag en per week, met invuloptie ingrediënten.
• educatie (wat is gezond)
• voorgang laten zien: hoeveelheden + variatie producten (variatie-evaluatie verspreiden over afgelopen 7 dagen: op display een code of juist op homepage van website, omdat mensen tijdens invullen wel weten dat ze al 5 dagen uitzonderingsproducten eten?)
• Stimuleren van variatie
Mogelijkheid exact invullen wat gegeten (avond eten en/of hele dag) dan net als ‘Kies ik gezond’ van voedingscentrum laten invullen wat je zelf denkt en dan specifieke tips krijgen wat betere keuzes zijn; dan ook “Ahaa!”-moment die de diëtiste wilt. Ook specifiek maken, dat advies van hele week meegenomen wordt.

Niet benadrukken als het fout gaat, hoogstens een wake-up call/reminder. Wel een feestje als je het goed doet! (dansende stipjes van activity monitor)

Je koopt product en krijgt eerste 4 maanden coach erbij: coach stelt samen met jou plan op en helpt je met optimaliseren tijdens deze 4 maanden.

Gewicht bijhouden > inclusief wireless weegschaal of iPhone app. Als dan echt niet afvallen/aankomen, kijken waar het fout gaat en tips overige dingen op de dag.

Overwegingen/mogelijkheden:
- Indeling groepen
- calorieën ergens laten zien? (Misschien)
- Standaard voorbeeld weekmenu’s
- voorbeeld recepten van users
- voeding is niet alleen calorieën en het moet ook een beetje lekker blijven!
- hoe houdt DirectLife activity verband met DirectLife foodintake? Hoe worden ze ten opzichte van elkaar gepositioneerd? Twee aparte startpunten die, indien samen gebruikt, met elkaar communiceren of activity is het startpunt en foodintake is een additioneel product?
- makkelijk bijhouden wat je bij avond eten doet, maar ook optioneel om alle voedselintake bij te houden?
- Balans tussen voedselintake en beweging (energie intake and output), soort wip.

Wietske:
Product is leuk, maar ik kan me voorstellen dat je dit enorm zou kunnen verrijken door iets als historie. (wireless!) Hou de historie bij en zie ook dat het je dag na dag lukt of zie ook dat het je gister ook absoluut niet is gelukt, maar dat die ene dag in je hele lijn niet zo erg is.

Het kan veel groter worden: dit product kan 1 input zijn puur voor portion control, maar er zijn veel meer mogelijkheden. Dit wel een sterke tool, want mensen vinden portie control erg moeilijk, met name in america! Andere input zoals pratende weegschaal, quick reference tool voor als je uit eten bent, portion control als je uit eten bent, aantal glazen water, mobiele applicatie, etc. Of kijk op sparkpeople.com voor inspiratie (grootste weightloss site van America. Geeft een hele concrete set van tools en tips waarmee mensen aan de slag kunnen op een luchtige manier gebracht. Plus een member-to-member-motivation section. Het hele idee is dat je hier niet alleen voor staat. Er bestaan al zoveel goede dingen, dat zou philips misschien niet zelf ook moeten proberen, maar hier juist in moeten tappen. Wát is er in de markt, ontbreken daar nog dingen aan, kan ik daar dingen aan toevoegen of kan ik daar dingen uit extraheren waarvan ik denk die zijn echt heel nuttig (linkjes of simpelweg kopiëren).

Wat DirectLife we toevoegt aan deze sites is het coaching aspect:

1. motivatie
2. accountability (er kijkt iemand mee naar wat jij doet en daardoor voel je, je toch een beetje geneigd om het voor iemand anders te doen en je te verontschuldigen als je het niet goed doet). Extra steuntje in de rug dat echt enorm helpt.
3. Educatieve gedeelte (deze visie op wat gezond afvallen is moet er nog wel komen)
4. (Feedback)

5. (heel concreet product, waarvan de cutting board er één is, maar er zijn veel meer expansies mogelijk > veel interessanter voor Philips dan één productje).

**Balans effectiviteit vs. nauwkeurigheid**

DirectLife heeft nu ook issues met spanningsveld tussen nauwkeurigheid en effectiviteit: DirectLife geeft je een goed beeld van je activiteiten niveau over een lange periode van tijd, maar als je gaat inzoomen op een uur een specifieke sport, dan zijn er nauwkeurigere manieren om dat te meten. Is heel belangrijk, want wat doet het met je geloofwaardigheid?! (vb. Mensen die alleen 3x per week intensief sporten). Lossen ze deels op door intensieve educatie en aan de andere kant door gewoon niet te proberen het voor de hele wereld aantrekkelijk te maken. Het is voor een bepaalde doelgroep.

Het product nog nauwkeuriger maken gaat ten koste van de ease of use van het product, want de hele kracht van het product is dat je hem om doet en er helemaal niet meer over na hoeft te denken.
### Hoeveel mag ik eten op een dag?

<table>
<thead>
<tr>
<th>Productgroep</th>
<th>1-3 jaar</th>
<th>4-8 jaar</th>
<th>9-13 jaar</th>
<th>14-18 jaar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groente</td>
<td>50-100 g</td>
<td>100-150 g</td>
<td>150-200 g</td>
<td>200 g</td>
</tr>
<tr>
<td></td>
<td>1-2 opsheplepels</td>
<td>2-3 opsheplepels</td>
<td>3-4 opsheplepels</td>
<td>4 opsheplepels</td>
</tr>
<tr>
<td>Fruit</td>
<td>150 g</td>
<td>150 g</td>
<td>200 g</td>
<td>200 g</td>
</tr>
<tr>
<td></td>
<td>1 ½ stuk</td>
<td>1 ½ stuk</td>
<td>2 stuks</td>
<td>2 stuks</td>
</tr>
<tr>
<td>Brood</td>
<td>70-105 g</td>
<td>105-140 g</td>
<td>140-175 g</td>
<td>210-245 g</td>
</tr>
<tr>
<td></td>
<td>2-3 sneetjes</td>
<td>3-4 sneetjes</td>
<td>4-5 sneetjes</td>
<td>6-7 sneetjes</td>
</tr>
<tr>
<td>Aardappelen, rijst, pasta, peulvruchten</td>
<td>50-100 g</td>
<td>100-150 g</td>
<td>150-200 g</td>
<td>200-250 g</td>
</tr>
<tr>
<td></td>
<td>1-2 aardappelen/opscheplepels</td>
<td>2-3 aardappelen/opscheplepels</td>
<td>3-4 aardappelen/opscheplepels</td>
<td>4-5 aardappelen/opscheplepels</td>
</tr>
<tr>
<td>Vlees(waren), vis, kip, eieren, vleesvervangers</td>
<td>60 g</td>
<td>60 - 80 g</td>
<td>80 - 100 g</td>
<td>100 - 125 g</td>
</tr>
<tr>
<td>Melk(producten)</td>
<td>300 ml</td>
<td>400 ml</td>
<td>600 ml</td>
<td>600 ml</td>
</tr>
<tr>
<td>Kaas</td>
<td>½ plak (10 g)</td>
<td>½ plak (10 g)</td>
<td>1 plak (20 g)</td>
<td>1 plak (20 g)</td>
</tr>
<tr>
<td>Halvarine</td>
<td>10-15 g 5 g/sneetje</td>
<td>15-20 g 5 g/sneetje</td>
<td>20-25 g 5 g/sneetje</td>
<td>30-35 g 5 g/sneetje</td>
</tr>
<tr>
<td>Bak-, braad- en frituurproducten, olie</td>
<td>15 g 1 eetlepel</td>
<td>15 g 1 eetlepel</td>
<td>15 g 1 eetlepel</td>
<td>15 g 1 eetlepel</td>
</tr>
<tr>
<td>Dranken (inclusief melk)</td>
<td>¾ liter</td>
<td>1 liter</td>
<td>1-1 ½ liter</td>
<td>1-1 ½ liter</td>
</tr>
</tbody>
</table>

Elke kleur van een productgroep is een vak uit de Schijf van Vijf. Eet iedere dag uit ieder vak!
Per leeftijdsgroep gelden de kleinste hoeveelheden voor de jongere kinderen en de grootste voor de oudere kinderen.

Ook voor kinderen en jongeren is variatie essentieel voor het binnenkrijgen van de juiste voedingsstoffen. Gevarieerd eten zorgt vanzelf voor de nodige vitamines, mineralen, voedingsvezels én andere gezonde voedingsstoffen. En: jong geleerd, oud gedaan.
<table>
<thead>
<tr>
<th>Productgroep</th>
<th>19-50 jaar</th>
<th>51-70 jaar</th>
<th>71 jaar en ouder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groente</td>
<td>200 g</td>
<td>200 g</td>
<td>150 g</td>
</tr>
<tr>
<td></td>
<td>4 opschelepels</td>
<td>4 opschelepels</td>
<td>3 opschelepels</td>
</tr>
<tr>
<td>Fruit</td>
<td>200 g</td>
<td>200 g</td>
<td>200 g</td>
</tr>
<tr>
<td></td>
<td>2 stuks</td>
<td>2 stuks</td>
<td>2 stuks</td>
</tr>
<tr>
<td>Brood</td>
<td>210-245 g</td>
<td>175-210 g</td>
<td>140-175 g</td>
</tr>
<tr>
<td></td>
<td>6-7 sneetjes</td>
<td>5-6 sneetjes</td>
<td>4-5 sneetjes</td>
</tr>
<tr>
<td>Aardappelen, rijst, pasta, peulvruchten</td>
<td>200-250 g</td>
<td>150-200 g</td>
<td>100-200 g</td>
</tr>
<tr>
<td></td>
<td>4-5 aardappelen/</td>
<td>3-4 aardappelen/</td>
<td>2-4 aardappelen/</td>
</tr>
<tr>
<td></td>
<td>opschelepels</td>
<td>opschelepels</td>
<td>opschelepels</td>
</tr>
<tr>
<td>Vlees(waren), vis, kip, eieren, vleesvervangers</td>
<td>100 - 125 g</td>
<td>100 - 125 g</td>
<td>100 - 125 g</td>
</tr>
<tr>
<td>Melk(producten)</td>
<td>450 ml</td>
<td>500 ml</td>
<td>450 ml</td>
</tr>
<tr>
<td>Kaas</td>
<td>1 ½ plak (30 g)</td>
<td>1 ½ plak (30 g)</td>
<td>1 plak (20)</td>
</tr>
<tr>
<td>Halvarine</td>
<td>30-35 g</td>
<td>25-30 g</td>
<td>20-25 g</td>
</tr>
<tr>
<td></td>
<td>5 g/sneetje</td>
<td>5 g/sneetje</td>
<td>5 g/sneetje</td>
</tr>
<tr>
<td>Bak-, braad- en frituur-producten, olije</td>
<td>15 g</td>
<td>15 g</td>
<td>15 g</td>
</tr>
<tr>
<td></td>
<td>1 eetlepel</td>
<td>1 eetlepel</td>
<td>1 eetlepel</td>
</tr>
<tr>
<td>Dranken (inclusief melk)</td>
<td>1 ½ -2 liter</td>
<td>1 ½ -2 liter</td>
<td>1 ½ -2 liter</td>
</tr>
</tbody>
</table>

Per leeftijdsgroep gelden de kleinste hoeveelheden voor de vrouwen en de grootste voor de mannen.

**Gebruik eens de tool ‘Kies Ik Gezond’?**

En ontdek wat gezonde en wat minder gezonde keuzes zijn binnen een groep vergelijkbare producten. Overigens is het zo dat je best wel eens minder goede producten mag als je dat lekker vindt. Zolang je verder ook maar gezonde keuzes maakt. Je vindt de tool op voedingscentrum.nl/kiesikgezond
Categorization of ‘het Voedingscentrum’

(Scanned from the brochure: “Wat eet ik voor de verandering? Voedingscentrum introduceert: Het Nieuwe Eten”)

## Wat kan ik beter wel of juist wat minder eten?

<table>
<thead>
<tr>
<th>Bij voorkeur</th>
<th>Middenweg</th>
<th>Bij uitzondering</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Groente</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alle soorten verse groente, groente in diepvries, blik of pot zonder toevoegingen</td>
<td>Groentepuree, tomatensap, groentesap</td>
<td>Groente à la crème of met saus</td>
</tr>
<tr>
<td><strong>Fruit</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alle soorten vers fruit, fruit in diepvries, fruit in blik of pot op water of eigen sap</td>
<td>Vruchtenpuree zonder toegevoegde suiker, sinaasappelsap met vruchtvlees</td>
<td>Fruit in blik of pot op siroop, sinaasappelsap</td>
</tr>
<tr>
<td><strong>Brood</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volkorenbrood (alle soorten), roggebrood, volkorenkrentenbrood, mueslibrood, volkorenknäckebröd</td>
<td>Bruinbrood (alle soorten)</td>
<td>Witbrood, krentenbrood, beschuit (alle soorten), knäckebröd goudbruin, croissant</td>
</tr>
<tr>
<td><strong>Graanproducten</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brinta, Bambix, achtgracenontbijt</td>
<td>Havermout</td>
<td>Muesli, cornflakes, rice crispies</td>
</tr>
<tr>
<td><strong>Aardappelen, rijst, pasta, peulvruchten</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gekookte aardappelen, peulvruchten (alle soorten)</td>
<td>Volkorenpasta, zilvervlijesrijst, aardappelpuree, couscous</td>
<td>Gebakken aardappelen, frites, aardappelkroketten, pasta, rijst</td>
</tr>
<tr>
<td><strong>Vlees, kip, eieren, vleesvervangers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kip zonder vel, biefstuk, rosbief, varkensfilet, varkenshaas, varkensfricandeau, hamlap, runderbakkappen, entrecote, tartaar, gekookt ei, vegetarisch gehakt, vegetarische burgers, Vales</td>
<td>Rundergehakt, kip met vel</td>
<td>Gehakt, hamburger, lamsvlees, doorregen rundvlees, schouderkarbonade, varkenslap, slavinken, worst, gebakken ei</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bij voorkeur</th>
<th>Middenweg</th>
<th>Bij uitzondering</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vleeswaren</strong></td>
<td>Magere knakworst</td>
<td>Pekelvlees, alle soorten worst, rauwe ham, leverkaas, rookvlees, leverpastei, paté</td>
</tr>
<tr>
<td>Beenham, achterham, kipfilet, schouderham, casseleerrib, gekookte lever, varkensfricandéau</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vis</strong></td>
<td>Vissticks, kibbeling, lekkerbekje</td>
<td></td>
</tr>
<tr>
<td>Alle verse vis en vis in diepvries en blik, zoute en zure haring, gestoomde makreel, gerookte zalm, geroosterd paling, mosselen, garnalen</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Melk(producten)</strong></td>
<td>Halfvolle melk, halfvolle yoghurt, magere vruchtensap met zoetstof, yoghurtdrank met zoetstof</td>
<td>Volle melk, volle yoghurt, volle via, magere vla met suiker, alle soorten vruchtensap en yoghurtdranken met suiker, alle soorten chocolademelk met suiker, alle soorten pudding</td>
</tr>
<tr>
<td>Magere melk, karnemelk, magere yoghurt, magere kwark, magere vla met zoetstof, magere vruchtensap met zoetstof, yoghurtdrank met zoetstof</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Kaas</strong></td>
<td>40+ edammer, 45+ camembert, 50+ brie, Maasdammer, 40+ Parmezaanse kaas</td>
<td>48+ Goudse kaas, alle soorten smeerkas en korstloze kaas, alle soorten roomkaas, 60+ (room)brie, roquefort, emmentaler</td>
</tr>
<tr>
<td>20+ en 30+ kaas, 30+ camembert, mozzarella, hüttenkäse, verse geitenkaas, verse lichtkaas</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vetten</strong></td>
<td>Margarine in een kuipje met meer dan 40% vet</td>
<td>Margarine in pakjes, roomboter, hard bak-, braad- en frituurvet</td>
</tr>
<tr>
<td>Halvarine, alle soorten olie, vloeibare margarine en vloeibare bak-, braad- en frituurproducten</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dranken</strong></td>
<td>Frisdranken met max. 20 kcal per 100 ml</td>
<td>Appelsap, druivensap, gewone frisdranken, sportdranken, alle alcoholhoudende dranken</td>
</tr>
<tr>
<td>Koffie en thee zonder suiker, (mineraal) water, frisdranken zonder energie</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Altijd hetzelfde op je boterham? Varieer eens wat vaker met je beleg. Denk ook aan groenten, die zijn altijd goed. Een manier om daarmee te variëren is door met de kleuren te spelen. Maar ook door bijvoorbeeld rauwkost af te wisselen met groente die je kookt.
CONCEPTUALIZATION
Pugh's checklist (summary)

April 12, 2010

Aspects involved product design

“There are checklists of aspects, which usually play a role in the assessment of a product. By aspects we mean such general issues such as performance, environment, maintenance, aesthetics and appearance, materials, and packaging amongst others. Such checklists have been drafted by Hubka and Eder[3], Pahl and Beitz, and Pugh”

Source: http://www.wikid.eu/index.php/Checklist_for_generating_requirements

21.1. Checklist of Pugh

Performance
The product provides feedback on the recommended amounts of the three food groups vegetables, meat and grains. This feedback will be recorded in order for the user to look into his history and receive feedback on his performance. The user is expected to use the product for its advice on how much food to prepare in order to make dinner for one or two persons.

Environment
The product will be used in the kitchen. The kitchen environment is a dynamic surrounding often subjected to stress and incautious actions. The product will most probably be exposed to moist, water, hot food, frozen food, cutlery, kitchen knives, (ceramic or glass) dishes, dirty hands, bacteria (like salmonella) and cleaning liquids. The product will probably be mass-produced in China and transported to Europe or the US by sea. The product will most likely be sold via the internet; the user places an order on the DirectLife website and the product is sent to the user by parcel service.

Life in service
The user will use the product nearly every day. The user is expected not to use the product in special occasions, for example if he eats out or when organizing exclusive dinner parties. The product is either used at the start of the cooking process, in order to weigh the uncooked food, or at the end of the cooking process, when dishing up the food. Data transfer to the computer should be carried out at least once a week. The product should not breakdown within 5 years.

Maintenance
The product contains a power supply, e.g. a battery. The battery might die or need charging. The product is exposed to raw food and should be cleaned after each usage. As for the rest, the product should be as maintenance-free as possible.

Target product cost
Considering costs of diets and other weight loss products, the retail price should not exceed €200,− (?), resulting in a maximum cost price of €50,− (?).

Transportation
Packaging should be as compact as possible, due to cost-effective transportation as well as sustainability. The product is not expected to obtain excessive dimensions that transportation overseas will become problematic. Packaging dimensions could take into account container dimensions. Transportation to the user will be through
parcel service, like FedEx or TNT parcel services. The user needs to sign before receiving the package, so there is no need to reduce the dimensions of the package to the dimensions of the letterbox.

Packaging
Packaging is required for transportation. The product is expected to include electrical components, which should be protected during transportation. Although the product itself should protect these components from incautious handling and moist during usage, parcel services are renowned from handling the packages roughly.

Quantity
First series that is produced for consumers is expected on 5000 pieces. Depending on the sales numbers as strategy for further sales is formulated. Mass production techniques like injection moulding can be used during production.

Manufacturing facilities
Phillips possesses excellent facilities for mass production. The aim is to produce the product with conventional techniques in China. If unconventional techniques are necessary, feasibility should be considered but if expected to depend more on the cost price than production facilities.

Size and weight
Usage is the limiting factor on size and weight. The size of the chopping board should not exceed a reasonable size for a chopping board: it should be small enough to conveniently fit a common countertop, but large enough to weight a normal amount of food. It should be possible to grab the chopping board with one hand from a cupboard above the countertop.

Aesthetics, appearance and finish
The design of the product should fit the Philips identity, a kitchen environment and preferably the DirectLife appearance. The product should look clean, since food is prepared on it.

Materials
The materials used should be easy to clean and not absorb moist with regard to bacteria. The material should be able to sustain excessive chopping. Furthermore, it should be able to handle frozen food from the freezer or hot, recently cooked food. In case of misuse, it should be able to handle a hot pan that is placed on top of the chopping board as a coaster. Materials that harm the environment or the user should be avoided.

Product life span
The product life span is expected to be at least 5 years. The cutting area is probably worn out sooner, therefore it should be possible to easily replace this part and replace it for a fair price.

Standards
To enable sales in Europe and the United States, a TÜV certificate or related organisation is required. At this point, special regulations in this area cannot be obtained. It is expected that standards will include rules on chemical tests of the materials and waterproof housing of the components. Furthermore, the power supply is expected to be 12V or should hold a ground potential.

Ergonomics
It should be possible to grasp the chopping board with one hand. The interface should be so simple that an amount can be added within 10 seconds (on average). When using the interface, the input buttons should be unambiguous to use and buttons should be placed in such a way, other buttons are not pushed by accident.

Quality and Reliability
‘Mean times before failure’ and ‘mean times before repair’ are expected to be greater than 5 years. It should be
possible to reset the product. Results from that day will be deleted from the memory, but other data will be saved until the data is uploaded to the personal website. It should be considered if the user be able to manually restore the

**Shelf life and storage**

It is not expected that problematic situations will occur in this area. Storage will be handled in the same way as the Activity Monitor.

**Testing**

A preliminary test will be executed at the end of this graduation assignment. It is expected that after this test improvements will be implemented and working prototypes will be developed in order to execute longitudinal field study.

**Safety**

The material of the chopping board should not emit toxic substances. The electrical components should protected from moist and liquids.

**Product Policy**

There are no current of future product ranges yet. It is preferred if the product could match the Activity Monitor in usage and aesthetics, but it is not necessary.

**Social and political implications**

The product could be regarded as the next new thing in the area of weight loss. This product can have a major influence on peoples’ food intake and health. Misuse (due to ignorance) should be avoided by education and pro-active coaching from the start.

**Product liability**

Philips cannot be held responsible for excessive weight loss or weight gain. The user is responsible for the portion size, but should communicate clear the user is responsible for the food choice and the results that food choice has on the users’ weight level.

**Installation, operation**

The product is assembled in the factory. The only installation the user has to perform is enabling the power supply (it should yet be decided if this is in the form of battery cells, a rechargeable battery or a connection to the power net).

**Re-use, recycling, disposal**

In all design decisions concerned with parts and assemblies, recyclability and disposal should be considered.
# Stakeholder analysis

*April 12, 2010*

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Main activity</th>
<th>Sub-activity</th>
</tr>
</thead>
</table>
| Philips Research     | 1. Research as basis for product  
2. Development of product                                                    | Use project to acquire new assignments                 |
| DirectLife - company | 3. Determines goals of new business activities  
4. Formulates product policy  
5. Prepares for production  
6. Produces product  
7. Distributes the product |                                                        |
| End user             | 8. Buys the product  
9. Uses the product  
10. Spreads mouth-to-mouth marketing | Become healthy and slim                                  |
| DirectLife - coach   | 11. Motivates the user  
12. Answers the users questions | Detect frequent problems                                |
| Table companions     | 13. Discourage/stimulate the use of the product |                                                        |
| Rivalling diets      | 14. Are compared to the program |                                                        |
| Dieticians           | 15. Forms an opinion towards the effectiveness of the product/program  
16. Recommend/discourage use of the product |                                                        |
## Process tree

**Appendix 23**

**April 12, 2010**

<table>
<thead>
<tr>
<th>PRODUCTION</th>
<th>Product development</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[A1] Aesthetics</td>
</tr>
<tr>
<td></td>
<td>[A2] User interface</td>
</tr>
<tr>
<td></td>
<td>[A3] Component selection</td>
</tr>
<tr>
<td></td>
<td>[A5] Integration within DirectLife</td>
</tr>
<tr>
<td></td>
<td>[A6] Design packaging</td>
</tr>
<tr>
<td></td>
<td>[A7] Preferences for solutions</td>
</tr>
<tr>
<td>Testing</td>
<td>Product evaluation</td>
</tr>
<tr>
<td></td>
<td>[A8] Make experience prototype</td>
</tr>
<tr>
<td></td>
<td>[A9] Evaluate prototype by means of 'Wizard of Oz'-method</td>
</tr>
<tr>
<td></td>
<td>[A10] Optimize product</td>
</tr>
<tr>
<td>User testing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[A11] Make working prototype</td>
</tr>
<tr>
<td></td>
<td>[A12] User testing (longitudinal)</td>
</tr>
<tr>
<td></td>
<td>[A13] Optimize product</td>
</tr>
<tr>
<td>Production planning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[A14] Obtain certification</td>
</tr>
<tr>
<td></td>
<td>[A15] Source and select components &amp; suppliers</td>
</tr>
<tr>
<td></td>
<td>[A16] Draw up Bill Of Materials</td>
</tr>
<tr>
<td></td>
<td>[A17] Administration of costs</td>
</tr>
<tr>
<td></td>
<td>[A18] Design tools and moulds</td>
</tr>
<tr>
<td></td>
<td>[A19] Set up plan for assembly line</td>
</tr>
<tr>
<td>Trial run</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[A20] Routing and production means</td>
</tr>
<tr>
<td></td>
<td>[A21] Send out Purchase Orders</td>
</tr>
<tr>
<td></td>
<td>[A22] Pay advance of PO</td>
</tr>
<tr>
<td></td>
<td>[A23] Guarantee reproduction accuracy</td>
</tr>
<tr>
<td></td>
<td>[A24] Evaluate sample(s)</td>
</tr>
<tr>
<td></td>
<td>[A25] Optimize parts</td>
</tr>
<tr>
<td>Production</td>
<td>Steady state planning</td>
</tr>
<tr>
<td></td>
<td>[A26] Deploy people and resources</td>
</tr>
<tr>
<td></td>
<td>[A27] Set up information system</td>
</tr>
<tr>
<td>Parts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[A28] Make parts</td>
</tr>
<tr>
<td></td>
<td>[A29] Quality check</td>
</tr>
<tr>
<td></td>
<td>[A30] Pay remainder of PO</td>
</tr>
<tr>
<td>Assembly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[A31] Transport parts to assembly facility</td>
</tr>
<tr>
<td></td>
<td>[A32] Assemble parts</td>
</tr>
<tr>
<td></td>
<td>[A33] Assemble subassemblies</td>
</tr>
<tr>
<td></td>
<td>[A34] Quality check</td>
</tr>
<tr>
<td>Finishing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[A35] Surface treatment</td>
</tr>
<tr>
<td>Packaging</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[A36] Package product</td>
</tr>
<tr>
<td></td>
<td>[A37] Package boxes in transportation box</td>
</tr>
<tr>
<td>Transportation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[A38] Load products in truck</td>
</tr>
<tr>
<td></td>
<td>[A39] Transport to harbour</td>
</tr>
<tr>
<td></td>
<td>[A40] Customs (China)</td>
</tr>
<tr>
<td></td>
<td>[A41] Transportation overseas</td>
</tr>
<tr>
<td></td>
<td>[A42] Customs (Europe/US)</td>
</tr>
<tr>
<td></td>
<td>[A43] Transportations to distribution centre</td>
</tr>
<tr>
<td>DISTRIBUTION</td>
<td>Price policy</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Terms &amp; conditions</td>
<td>Delivery terms</td>
</tr>
<tr>
<td>Promotion</td>
<td>Users Activity Monitor</td>
</tr>
<tr>
<td>New users</td>
<td>Newsletter</td>
</tr>
<tr>
<td>Advise</td>
<td>Benefits of product on website</td>
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<tr>
<td>Sales</td>
<td>Individual order by website</td>
</tr>
<tr>
<td>Business to business</td>
<td>Negotiations</td>
</tr>
<tr>
<td></td>
<td>Package for large order</td>
</tr>
<tr>
<td></td>
<td>Deliver to client</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>USAGE (product)</th>
<th>Purchase</th>
<th>Orientation on website</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Order product</td>
<td>Sign for delivery</td>
</tr>
<tr>
<td></td>
<td>Carry product indoors</td>
<td>Unpack product</td>
</tr>
<tr>
<td>Prepare for usage</td>
<td>Unpack product</td>
<td>Compile parts (batteries, adapter, etc.)</td>
</tr>
<tr>
<td></td>
<td>Connect to power supply</td>
<td>Switch on product</td>
</tr>
<tr>
<td>User profile</td>
<td>User profile</td>
<td>Read instructions intake-week</td>
</tr>
<tr>
<td></td>
<td>Register portion size (one week)</td>
<td>Transfer data to personal website (PW)</td>
</tr>
<tr>
<td></td>
<td>Ask questions on initial use to coach</td>
<td>Specify used ingredients and toppings on PW</td>
</tr>
<tr>
<td></td>
<td>Receive feedback on initial food intake</td>
<td>Set goals with coach</td>
</tr>
<tr>
<td></td>
<td>Transfer goals and food intake plan to profile tool</td>
<td>Insert profile tool in Chopping board</td>
</tr>
<tr>
<td></td>
<td>Switch on product</td>
<td>Cut vegetable</td>
</tr>
<tr>
<td>Usage</td>
<td>Cutting</td>
<td>Cut meat</td>
</tr>
<tr>
<td></td>
<td>Cut fish</td>
<td></td>
</tr>
<tr>
<td>C22</td>
<td>Scrap ingredients together</td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------</td>
<td></td>
</tr>
<tr>
<td>C23</td>
<td>Remove ingredients</td>
<td></td>
</tr>
<tr>
<td>C24</td>
<td>Cut food</td>
<td></td>
</tr>
<tr>
<td>C25</td>
<td>Determine food type</td>
<td></td>
</tr>
<tr>
<td>C26</td>
<td>Weigh food</td>
<td></td>
</tr>
<tr>
<td>C27</td>
<td>Frozen food</td>
<td></td>
</tr>
</tbody>
</table>

**Determine portion size**

**Uncooked**

- C28 Cut vegetable
- C29 Cut meat
- C30 Cut fish
- C31 Scrap ingredients together
- C32 Remove ingredients
- C33 Determine portion size
- C34 Cut food
- C35 Determine food type
- C36 Weigh food

**Cooked**

- C37 Frozen food
- C38 Cook food
- C39 Hot/burned food
- C40 Place plate/bowl on Chopping board
- C41 Calibrate product to 0 gram
- C42 Determine food type
- C43 Dish up food on plate/bowl

**General**

- C44 Uncooked
- C45 Cooked
- C46 General
- C47 Personal Website
- C48 Data transfer
- C49 Feedback
- C50 Communication
- C51 Storage
- C52 Maintenance
- C53 Cleaning
- C54 Repairs
- C55 Misuse

**Personal Website**

- C40 Connect to computer
- C41 Upload data to personal website
- C42 Check performance
- C43 Check personal plan
- C44 Change personal plan
- C45 Compare performance with similar users

**Data transfer**

- C46 Ask question to coach
- C47 Communicate with similar users

**Feedback**

- C48 Storage
- C49 Place next food type on Chopping board
- C50 Grab product
- C51 Turn product
- C52 Clean superficial with cloth
- C53 Remove cutting area
- C54 Clean cutting area in sink
- C55 Clean cutting area in dishwasher
- C56 Clean interface
- C57 Clean interface
- C58 Replace/charge battery
- C59 Replace cutting area
- C60 Send back to Philips
- C61 Disassemble
- C62 Replace parts
- C63 Send back to user
- C64 Replace hot pan on product
- C65 Clean entire product with dishes washer or under the tab
- C66 Drop on floor
- C67 Place on hot stove
- C68 Not storing weighted amounts to user profile
<table>
<thead>
<tr>
<th>Appendix A</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>[C19] Cut vegetable</td>
<td></td>
</tr>
<tr>
<td>[C20] Cut meat</td>
<td></td>
</tr>
<tr>
<td>[C21] Cut fish</td>
<td></td>
</tr>
<tr>
<td>[C22] Scrap ingredients together</td>
<td></td>
</tr>
<tr>
<td>[C23] Remove ingredients</td>
<td></td>
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<tr>
<td>[C24] Determine portion size</td>
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<tr>
<td>[C25] Cut food</td>
<td></td>
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<tr>
<td>[C26] Determine food type</td>
<td></td>
</tr>
<tr>
<td>[C27] Uncooked</td>
<td></td>
</tr>
<tr>
<td>[C28] Frozen food</td>
<td></td>
</tr>
<tr>
<td>[C29] Cook food</td>
<td></td>
</tr>
<tr>
<td>[C30] Hot/burned food</td>
<td></td>
</tr>
<tr>
<td>[C31] Place plate/bowl on Chopping board</td>
<td></td>
</tr>
<tr>
<td>[C32] Calibrate product to 0 gram</td>
<td></td>
</tr>
<tr>
<td>[C33] Cooked</td>
<td></td>
</tr>
<tr>
<td>[C34] Dish up food on plate/bowl</td>
<td></td>
</tr>
<tr>
<td>[C35] Compare amount to 100% target</td>
<td></td>
</tr>
<tr>
<td>[C36] Give feedback</td>
<td></td>
</tr>
<tr>
<td>[C37] Optimize portion size</td>
<td></td>
</tr>
<tr>
<td>[C38] Store amount to profile tool</td>
<td></td>
</tr>
<tr>
<td>[C39] Place next food type on Chopping board</td>
<td></td>
</tr>
<tr>
<td>[C40] Personal Website</td>
<td></td>
</tr>
<tr>
<td>[C41] Connect to computer</td>
<td></td>
</tr>
<tr>
<td>[C42] Data transfer</td>
<td></td>
</tr>
<tr>
<td>[C43] Upload data to personal website</td>
<td></td>
</tr>
<tr>
<td>[C44] Check performance</td>
<td></td>
</tr>
<tr>
<td>[C45] Check personal plan</td>
<td></td>
</tr>
<tr>
<td>[C46] Change personal plan</td>
<td></td>
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<tr>
<td>[C47] Feedback</td>
<td></td>
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<tr>
<td>[C48] Communication</td>
<td></td>
</tr>
<tr>
<td>[C49] Storage</td>
<td></td>
</tr>
<tr>
<td>[C50] Grab product</td>
<td></td>
</tr>
<tr>
<td>[C51] Place product in cupboard</td>
<td></td>
</tr>
<tr>
<td>[C52] Maintenance</td>
<td></td>
</tr>
<tr>
<td>[C53] Clean superficial with cloth</td>
<td></td>
</tr>
<tr>
<td>[C54] Remove cutting area</td>
<td></td>
</tr>
<tr>
<td>[C55] Clean cutting area in sink</td>
<td></td>
</tr>
<tr>
<td>[C56] Clean cutting area in dishwasher</td>
<td></td>
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<tr>
<td>[C57] Clean interface</td>
<td></td>
</tr>
<tr>
<td>[C58] Replace/charge battery</td>
<td></td>
</tr>
<tr>
<td>[C59] Replace cutting area</td>
<td></td>
</tr>
<tr>
<td>[C60] Send back to Philips</td>
<td></td>
</tr>
<tr>
<td>[C61] Disassemble</td>
<td></td>
</tr>
<tr>
<td>[C62] Parts</td>
<td></td>
</tr>
<tr>
<td>[C63] Repairs</td>
<td></td>
</tr>
<tr>
<td>[C64] Send back to user</td>
<td></td>
</tr>
<tr>
<td>[C65] Misuse</td>
<td></td>
</tr>
<tr>
<td>[C66] Place hot pan on product</td>
<td></td>
</tr>
<tr>
<td>[C67] Drop on floor</td>
<td></td>
</tr>
<tr>
<td>[C68] Place on hot stove</td>
<td></td>
</tr>
<tr>
<td>[C69] Not storing weighted amounts to user profile</td>
<td></td>
</tr>
<tr>
<td>[C70] Store amount, but afterwards add more food</td>
<td></td>
</tr>
<tr>
<td>[C71] Stand on it</td>
<td></td>
</tr>
<tr>
<td>[C72] Use product with dirty hands</td>
<td></td>
</tr>
<tr>
<td>[C73] Drop/position other products on CB (e.g. jars, glass, etc.)</td>
<td></td>
</tr>
<tr>
<td>[C74] Weigh several food groups at once</td>
<td></td>
</tr>
<tr>
<td>[C75] Weigh frozen food (too much weight of water)</td>
<td></td>
</tr>
<tr>
<td>[C76] Use product with dirty hands</td>
<td></td>
</tr>
<tr>
<td>[C77] Drop knife on the interface</td>
<td></td>
</tr>
<tr>
<td>[C78] Weigh non-eatable leftovers from cutting</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DISPOSAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>[D1] Disassemble product</td>
</tr>
<tr>
<td>[D2] Transport disassembled parts and materials to waste disposal facilities</td>
</tr>
<tr>
<td>Recycle</td>
</tr>
<tr>
<td>[D3] Re-use parts</td>
</tr>
<tr>
<td>[D4] Re-use material</td>
</tr>
<tr>
<td>Waste</td>
</tr>
<tr>
<td>[D5] Burn</td>
</tr>
<tr>
<td>[D6] Store</td>
</tr>
</tbody>
</table>
Kitchen scale suppliers state that the kitchen scales are not suited for cutting, because the dynamic forces that occur during cutting and chopping can damage the load cell. Therefore, several solutions were generated to avoid a force on the load cell during the cutting stage of the usage (next page).

However, after consulting two experts on the topic (Luxen, 2010; Mulder, 2010), it seemed that the load cell and strain gauge itself are not the problem and can handle such forces. Regarding the mechanics of a load cell, there is a slight chance that the strain gauge gets elongated too much. According to Mulder, this problem can easily be solved by a mechanical stop that prevents the strain gauge from bending too far. According to him, the main problem is that it is not possible to display an accurate value at high (dynamic) forces; kitchen scales often display an error in such cases. To summarize: the load cell will not be damaged when the user is cutting; it is just confusing that a non-accurate and fluctuating value is displayed. Adjusting the PCB can easily prevent this, so that the weight is not displayed when the load fluctuates or is above a certain level.

In the end it can be concluded that a common load cell can be used in the design. Perhaps this sensor and the electric circuit need some minor modifications, but it is not expected that a company like Philips is not able to do so. Load cells that are used in kitchen scales are very small nowadays; some models are not higher than 15mm.

24.1. How Does A Digital Kitchen Scale Work?

Digital kitchen scales use something called a strain gauge. A strain gauge evenly distributes the weight of whatever is placed on the top of it. This weight is then transferred to a load cell. As weight is applied to this load cell, it bends slightly, which changes the amount of electrical resistance running through it. The amount of this electrical resistance is passed through a converter that changes it from analog to digital and sends it to a small microchip that’s responsible for the numbers that appear on the LCD display. If you lift off the top plate of your digital kitchen scale, you should see some type of panel that is secured to a middle section by a couple of screws. That middle section under the panel is where you will find the load cell. Usually there will be a few rubber dots around the panel so the top plate is always securely held and able to give very exact measurements.


24.2. Load cell

A load cell is a transducer that is used to convert a force into electrical signal. This conversion is indirect and happens in two stages. Through a mechanical arrangement, the force being sensed deforms a strain gauge. The strain gauge converts the deformation (strain) to electrical signals. A load cell usually consists of four strain gauges in a Wheatstone bridge configuration. Load cells of one or two strain gauges are also available. The electrical signal output
is typically in the order of a few millivolts and requires amplification by an instrumentation amplifier before it can be used. The output of the transducer is plugged into an algorithm to calculate the force applied to the transducer.


24.3. Telephone conversation with Rob
Luxen, IO studiolab on 22 April 2010

Strain gauge is applied between a wedge in a metal block. The strain of the metal block, when load is applied on the kitchen scale, cannot be seen by eye. Signal than amplified by amplifier: expensive for prototype, but can be integrated in PCB and when produced in large amount not expensive anymore.

Rob believes it is possible to cut on the scale-chopping board, as long as the metal block is strong enough. Electrical circuit around the load cell does not even need to be cut, but maybe just not display because the numbers displayed are not relevant when cutting (it is not actual load). Strain from the gauge can diminish in time, but probably not by the force of cutting. (Makes comparison between weighing meat and a truck).

>> Consequence for design: can use load cell while cutting. Power circuit around it probably best to cut off while cutting.

24.4. Telephone conversation with Bernardo
Mulder, Advanced Technologies,
Philips, Drachten on 22 April 2010

According to Bernardo, it would not be a problem to use a load cell in this appliance. It would be wise to set boundaries, that the signal is not amplified and send to the interface after that level. The maximum force that can be measured can be set mechanically. An obstacle can be made, that ensures the wedge from not bending more.

Consequence for design: an ordinary load cell can be used, even while cutting. The signal should not be send to the display while cutting, but this can be programmed. A maximum measured force can be set mechanically.
need for high force to lift with one push?

no load on scale when cutting

seperate scale part

two parts that become dirty (chopping board and basket)

extra action
how to pan/plate?
why not use ordinary scale?

only things that are going to be eaten will be on the scale

only works for mechanical scales very simple

ring

da ring prevents the scale from being loaded

user needs to close the drawer when cutting

user automatically activates the ‘scale-state’ when he uses the interface

attached to each other by magnets & datapins

only suspended on one side?

two parts that become dirty (chopping board and basket)

extra action
how to pan/plate?
why not use ordinary scale?

only works for mechanical scales very simple

ring

da ring prevents the scale from being loaded

user needs to close the drawer when cutting

user automatically activates the ‘scale-state’ when he uses the interface

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how to pan/plate?
why not use ordinary scale?

only works for mechanical scales very simple

ring

da ring prevents the scale from being loaded

user needs to close the drawer when cutting

user automatically activates the ‘scale-state’ when he uses the interface

extra action
how to pan/plate?
why not use ordinary scale?
when cutting
- steady ground when cutting
- no load on scale when cutting
- scale-sensor on chip: existing scales are as thin as 15mm
- distance between scale and chopping area can be very small (only a few mm.)

need for high force to lift with one push?

simple compact

board is supported by grooves. with 1/4th turn, the cutting area is lowered on the scale. (click at the top position, to secure)

feet

only suspended on one side?
or turn and pins on both sides turn in?

fasten cutting area with pins

pins automatically contract when interface is used (so need for weighing)

turn around with dirty hands?
extra action, not simple

user automatically activates the 'scale-state' when he uses the interface

extra action, not simple

can this be done automatical?

user needs to close the drawer when cutting

- steady ground when cutting
- no load on scale when cutting
- scale-sensor on chip: existing scales are as thin as 15mm
- distance between scale and chopping area can be very small (only a few mm.)

only things that are going to be eaten will be on the scale
two parts that become dirty (chopping board and basket)
can this be done automatical?

space for user interface

user interface

extra action, not simple

board is supported by grooves. with 1/4th turn, the cutting area is lowered on the scale. (click at the top position, to secure)

feet

only suspended on one side?
or turn and pins on both sides turn in?

fasten cutting area with pins

pins automatically contract when interface is used (so need for weighing)

turn around with dirty hands?
extra action, not simple

user automatically activates the 'scale-state' when he uses the interface

extra action, not simple

can this be done automatical?
24.5. Components in an existing kitchen scale
Appendix 25
overview of the sub solutions for controls

- Physical buttons (push)
  - cheap
  - great freedom of form
  - direct tactile feedback

- Flexible top layer
  - 2K injection moulding: can be expensive
  - rubber buttons can be difficult to clean

- Button integrated in casing
  - intuitive
  - easy to clean
  - direct tactile feedback
  - one surface, therefore waterproof

- Rubber/silicone top layer
  - moist and dirt can collect in the gaps (or buttons need to be sealed with a rubber ring on the inside)

- Touchscreen
  - available with very thick screen
  - work with capacitive sensing
  - does not necessary to have that much freedom with the use of a pointer

- Reed switches
  - user has a "wireless"-button (=magnet) when it is passed over a 'button' the function is activated
  - also called sensor or Reed switches

- Touchscreen available
  - with very thick screen
  - work with capacitive sensing
  - does not necessary to have that much freedom with the use of a pointer

- Magnet switch:
  - user has a "wireless"-button (=magnet) when it is passed over a 'button' the function is activated
  - also called Reed switches

- Touch screen
  - available with very thick screen
  - work with capacitive sensing
  - does not necessary to have that much freedom with the use of a pointer

- Rubber/silicone buttons might be difficult to clean: buttons should not be white

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- Rubber/silicone buttons might be difficult to clean: buttons should not be white
controls

- touch sensitive button

- magnetic switch

- touchscreen

- speech recognition

- rotary controls

- physical buttons (push)

- switches

controls

- easy to clean
- waterproof

- only on/off, not pressure sensitive
- intuitive
- easy to clean
- one surface, therefore waterproof

magnet switch:
user has a "wireless"-button (=magnet) when it is passed over a 'button' the function is activated

what if you loose 'button'? you really have to slide the magnet, this might be an illogical movement

'wow'-effect
components can be sealed and protected
one 'button' for all switches
not expensive, commonly used

不可能 too much effort for all buttons stays in that position (no automatic on/off)

not necessary to have that much freedom with pointer

touchscreen available with very thick screen
> work with capacitive sensing

not necessary to have that much freedom with pointer

user might feel ashamed speaking loud alone?

the buttons should be very sensitive, like the ones on the LivingColour remote. Not like the ones on induction cookplates. Does it also work well with wet hands?

rubber/silicone buttons might be difficult to clean. Buttons should not be white - easy to clean - waterproof

also called Reed switches

2K injection moulding can be expensive
rubber buttons can be difficult to clean
rubber/silicone top layer components can be sealed and protected

what if you loose 'button'?

please? interesting for foodgroup or go/slow/whoa button?
26.1. Rejected options for controls

Speech control seems an attractive option to control the chopping board, because the user is able to control the product without touching it with dirty hands. However, people often indicate that talking to an inanimate object does not feel ‘natural’ and users tend to find it difficult to remember the correct commands. Furthermore, speech control is not yet as reliable as pressing a single button: failure of speech recognition can occur due to bad pronunciation or background noise. The benefits of speech control do not add up to the disadvantages, therefore speech control is eliminated as an option.

Switches and rotary controls could be used for the food group choice and variation score (go/slow/whoa), however, they are more difficult to clean than the selected options described above and they do not have an automatically on/off function.

Finally, magnetic switches have a great ‘wow’-effect, as they can be used ‘wireless’ and they offer the possibility to integrated an ‘invisible’ interface, where the replaceable cutting areas can cover the entire product. However, the user can easily ‘lose’ the buttons. Taking that into account, using a magnet as a button is inconvenient and does not offer greater benefits that the selected options.

26.2. Magnetic Switch (Reed contact)

(http://nl.wikipedia.org/wiki/Reed-contact)

Een reed-contact of magneetschakelaar is een elektrisch schakelcontact in een glazen buisje dat bediend wordt door een magnetisch veld, afkomstig van een permanente magneet of van een spoel waardoor een stroom loopt.

Het glazen buisje is gevuld met een edelgas, zodat het schakelen van stromen de schakelcontacten niet aantast; er kunnen immers geen of nauwelijks vonken ontstaan. Reed-contacten worden meestal gebruikt voor het schakelen van stuurstromen, dus niet voor grote vermogens.

Een reed-contact kent een hoge toelaatbare schakelfrequentie, tot 300 Hz, iets wat de meeste mechanische schakelaars niet kunnen bereiken. Reed-contacten zijn beschikbaar voor kleine (30 V DC - 0,01 A) tot grote (7500 V DC - 0,2 A) spanningen.

Een reed-contact heeft last van hysterese. Dat betekent dat er een iets groter magnetisch veld nodig is om de schakelaar te bedienen, dan nodig is om dat in stand te houden.

Betrouwbaarheid

Doordat de contacten in een glazen behuizing zitten, kunnen ze niet oxideren of vuil worden. Een reed-contact is daardoor voor lange tijd heel betrouwbaar en kan gebruikt worden in een omgeving met agressieve stoffen. Omdat eventuele vonkjes van de contacten binnen de behuizing blijven, kunnen reedcontacten gebruikt worden in een omgeving waar er een gevaar is met brandbare...
gassen. Een microschakelaar of optocoupler is minder betrouwbaar, doordat die vuil kan worden.

Een nadeel is dat de glazen behuizing kan breken. Ook kunnen de contacten binnenin doorbranden als er een te grote stroom doorheen gaat.

**Toepassing**

De kleine uitvoering kan bij modeltreinen tussen de rails gemonteerd worden. Door een magneetje onder een locomotief of wagon te plaatsen kunnen zodoende wissels, spoorbomen enzovoorts bediend worden. De sensor van fietscomputers en elektronische stappentellers werkt meestal met behulp van een reed-contact.

Een veel gebruikte toepassing is voor alarmsystemen: het reed-contact zit bijvoorbeeld in de deurpost verborgen en in de deur zit een kleine magneet. Zodra de deur dicht is, zal de magneet ervoor zorgen dat het reedcontact gesloten is. Zodra de deur wordt geopend zal de afstand tussen de magneet en het reed-contact te groot worden en zal het magnetische veld uiteindelijk te klein worden om het reedcontact gesloten te houden: het reed-contact opent zich. Het reed-contact in de deurpost wordt soms afgeschermd met een plaatje. Ook bij liften wordt veel gebruikgemaakt van reed-contacten: voor het postioneren van de liftkooi en het tellen van de etages; de bistabiele uitvoering wordt hier veel gezien, deze wordt door de zuidpool van een magneet ingeschakeld en door de noordpool uitgeschakeld.

OOK: >>> Moof Fiets lampje

Voorbeeld Youtube: http://www.youtube.com/watch?v=2fJx0YbrEjs&feature=related

http://www.youtube.com/watch?v=7e2eZJofM0&feature=related

shows there can be distance between the switch and the magnet.

In addition to their use in reed relays, reed switches are widely used for electrical circuit control, particularly in the communications field. Reed switches actuated by magnets are commonly used in mechanical systems as proximity switches as well as in door and window sensors in burglar alarm systems and tamper proofing methods; however they can be disabled by a strong, external magnetic field.

Reed switches were formerly used in the keyboards for computer terminals, where each key had a magnet and a reed switch actuated by depressing the key; cheaper switches are now used. Speed sensors on bicycle wheels use a reed switch to actuate briefly each time a magnet on the wheel passes the sensor.

Electric and electronic pedal keyboards used by pipe organ and Hammond organ players often use reed switches, where the glass enclosure of the contacts protects them from dirt, dust, and other particles.

Reed switches are used in modern laptops, which put the laptop on sleep/hibernation mode when the lid is closed.
OLED vs. LCD

27.1. OLED Advantages and Disadvantages

The LCD is currently the display of choice in small devices and is also popular in large-screen TVs. Regular LEDs often form the digits on digital clocks and other electronic devices.

**OLEDs offer many advantages over both LCDs and LEDs:**

- The plastic, organic layers of an OLED are **thinner, lighter and more flexible** than the crystalline layers in an LED or LCD.
- Because the light-emitting layers of an OLED are lighter, **the substrate of an OLED can be flexible instead of rigid**. OLED substrates can be plastic rather than the glass used for LEDs and LCDs.
- **OLEDs are brighter than LEDs**. Because the organic layers of an OLED are much thinner than the corresponding inorganic crystal layers of an LED, the conductive and emissive layers of an OLED can be multi-layered. Also, LEDs and LCDs require glass for support, and glass absorbs some light. OLEDs do not require glass.
- **OLEDs do not require back lighting** like LCDs (see How LCDs Work). LCDs work by selectively blocking areas of the backlight to make the images that you see, while OLEDs generate light themselves. Because OLEDs do not require backlighting, **they consume much less power than LCDs** (most of the LCD power goes to the backlighting). This is especially important for battery-operated devices such as cell phones.
- **OLEDs are easier to produce and can be made to larger sizes**. Because OLEDs are essentially plastics, they can be made into large, thin sheets. It is much more difficult to grow and lay down so many liquid crystals.
- **OLEDs have large fields of view**, about 170 degrees. Because LCDs work by blocking light, they have an inherent viewing obstacle from certain angles. OLEDs produce their own light, so they have a much wider viewing range.

Problems with OLED. OLED seems to be the perfect technology for all types of displays, but it also has some problems:

- **Lifetime** - While red and green OLED films have longer lifetimes (46,000 to 230,000 hours), blue organics currently have much shorter lifetimes (up to around 14,000 hours [source: OLED-Info.com]). (CALCULATION: assumed you use the Chopping Board 1 hour a day and it should run 5 years: 1 x 365 x 5 x 3 (safety factor) = 5475h > also use of blue OLEDs are possible.)
- **Manufacturing** - Manufacturing processes are expensive right now.
  > (Will change in the future, if it is produced more)
- **Water** - Water can easily damage OLEDs.
  > (This could become a problem, but can be prevented by sealing)

Source: http://electronics.howstuffworks.com/oled5.htm (16 april 2010)

Example of OLED application

There was the solar powered cell phone and now there will be the kinetic energy – powered one. It is called the Kyocera and is capable of folding up like a wallet. The
EOS phone consists of a soft, semi-rigid polymer skin surrounding a flexible low-energy OLED display. It also has this unique shape memory feature that allows its keys to pop up when in use and blend in with the surface during downtime. It is designed by industrial designer Susan McKinney. When the Kyocera EOS is folded it can be used as a normal phone and when unfolded it opens into a wide screen. It also apparently derives energy from human interaction.

And another interesting feature is that the more you talk on the phone the kinetic energy is turned into an electric charge through an array of tiny piezoelectric generators. Its still in the initial stages but the Kyocera teams in San Diego and Bangalore hope to integrate concepts from the device into cell phone lineups in the near future.


Commercial uses

OLED technology is used in commercial applications such as small screens for mobile phones and portable digital audio players (MP3 players), car radios, digital cameras, and high-resolution microdisplays for head-mounted displays. Such portable applications favor the high light output of OLEDs for readability in sunlight, and their low power drain. Portable displays are also used intermittently, so the lower lifespan of OLEDs is less important here. Prototypes have been made of flexible and rollable displays which use OLEDs’ unique characteristics. OLEDs have been used in most Motorola and Samsung colour cell phones, as well as some LG and Sony Ericsson phones, notably the Z610i, and some models of the Walkman. It is also found in the Creative Zen V/V Plus series of MP3 players and iriver U10/clix. Nokia has also introduced recently some OLED products, including the 7900 Prism, the Nokia 8800 Arte, and the Nokia N85 and the Nokia N86 8MP, both of which feature an AMOLED display.


Figure 8. EOS phone with OLED screen
Appendix 28
overview of the sub solutions for the user token

- speech recognition
  - user might feel ashamed speaking loud alone?
  - how profiles added to CB?
  - how does CB display user? (OLED?)
  - simple action to click onto chopping board
  - waterproof
  - cheap

- data pin
  - use like mobile phone
    - instead "call <name>" your say: 
      "<name> ON!"

- connector strip
  - this side as personal profile
  - this side in the chopping board

- USB
  - usb slots should be well protected against moist
    - max. 2 users per time (if there are two slots)
  - easy access to computer
  - familiar technique to user

- touch
  - easy
  - use with dirty hands

- magnet
  - very fragile
  - (in combination with knives)

- RFID
  - no extra buttons

- button /
  - switch
  - dirt can reach components (not with 2K injection moulding)

- easy access to computer
  - familiar technique to user
  - user might feel ashamed speaking loud alone?
  - simple action to click onto chopping board
  - waterproof
  - cheap

- profile needs to be stored in CB memory before it can recognize it
  - magnet switch is cheaper and does the same, expect no automatic user recognition

- no data transfer, upload profile to CB should be by means of some other technique.
  - buttons/switch should be designed in such a way no moist or dirt can slip underneath (toothbrush button, iphone button?)
  - CB should display when user is on or off
  - data storage on USB
  - where does user keep identifier?
  - identifier can become dirty
  - no extra buttons use with dirty hands

- how can USB be integrated in product that it does not stick out (annoyingly)

- USB slots should be well protected against moist

- very fragile (in combination with knives)

- no data transfer, upload profile to CB should be by means of some other technique.
xtra buttons on CB (chaotic)
only 2 users: user #1 and user #2
reach components injection moulding

cheap
easy
familiar

buttons/solution should be designed in such a way no moist or dirt can slip underneath (toothbrush button, iphone button?)

ct User Profile
- recognize user profile
- switch profile on
- switch profile off
- display/choose which profile is in use (both for uncooked, only one for cooked)

button/switch

RFID

magnet switch: user has "wireless"-button (=magnet) pass the userprofile magnetic switch and user profile is activated

what if you loose ‘button”? you really have to slide magnet, this might be an illogical movement

‘wow’-effect
components can be sealed and protected
one ‘button’ for all switches
not expensive, commonly used

‘buttons’ need to be at least 5cm apart
need 7 RFID readers = expensive
profile needs to be stored in CB memory before it can recognize it
magnet switch is cheaper and does the same, expect no automatic user recognition

no data transfer, upload profile to CB should be by means of some other technique.

steps
- recognize user profile
- switch profile on
- switch profile off
- display/choose which profile is in use (both for uncooked, only one for cooked)

CB should display when user is on or off
data storage on USB
where does user keep identifier
identifier can become dirty

see: Tiktegel for possibilities technology!

'buttons' need to be at least 5cm apart
need 7 RFID readers = expensive
profile needs to be stored in CB memory before it can recognize it
magnet switch is cheaper and does the same, expe no automatic user recognition

no data transfer, upload profile to CB should be by means of some other technique.
29.1. Summary

29.1.1. Wood

Wood has a luxurious appearance, is strong, durable, can sustain hot pans and has natural bacteria-killing properties. However, it is also expensive (in case of high quality), it needs much maintenance and wooden chopping boards cannot be washed in a dishwasher, because then they can warp. Furthermore, it is difficult to integrate electronics in wood, as it might warp and deform in a moist environment.

Bamboo is the slightly cheaper and more sustainable version of the wooden chopping boards. This material basically has the same characteristics as wood, though it is harder and therefore less forgiving to the knives.

Wood can only be used in specific design solutions. It can probably only be used for the cutting area and not as a casing for the whole product.

29.1.2. Plastic

Plastic chopping boards come in different shapes and sizes; there are big and heavy butchers’ blocks (often HDP or a rubber variant), cheap and light-weighted cutting boards (HDPE, LDPE or PP) or flexible sheets (LDPE). The strength, weight and feasibility to create 3-dimensional shapes depend on the material and the production process. Nevertheless, there are many possibilities. Advantages of plastics include (relatively) low costs and they often can be washed in the dishwasher. Disadvantages are that they scratch easily, can have a cheap appearance and bacteria’s can accumulate in knife scars. Especially the cheaper models have a shorter lifespan than wooden chopping boards.

Plastics are a feasibly option to use in the product. The shape and size depend very much on the design. When using a (soft) plastic for the chopping area, it should be taken into account that the user might want to replace the cutting area within a year and that it should be possible to separately order this ‘part’ (for example on the DirectLife website).

29.1.3. Epicurean

Epicurean is a recently introduced material that is created from a composition of plastic and layers of paper that are densely pressed together. The minimum thickness is around 5mm; it is too brittle to produce thinner boards. The material combines the advantages of wood and plastic: it is maintenance free, easy to clean, dishwasher proof, it can sustain hot temperatures and it is gentle to the knives. It has quite a luxurious appearance and it feels cold like stone. The downside of the product is that it only comes in an indistinct brown and blackish colour and 3-dimensional shapes are only possible to produce by means of milling.

This material has great benefits and it has the high-quality appearance that is expected from a Philips product. The material can probably only be used for the cutting area, as it is very difficult to integrated buttons and an interface in the material.
Options:

- **Wood** (much maintenance: oil/lemon juice/salt, can sustain hot pans, cannot be washed in dishwasher)
- **Plastic** (soft, scratches easily, cheap, can be washed in dishwasher)
- **Epicurean** (combination wood and plastic, durable, best tested by Elsevier, expensive, can sustain hot pans, can be washed in dishwasher)
- **Bamboo** ('sustainable', similar to wood, but harder material. Less forgiving to the knives)
- **Sani-tuff** (Rubber)  

**NOT OK:**

- **Glass and RVS** > will damage knives.

### 29.2. Discussion on preferences of users:

Wood is preferred most. Wood is especially preferred most for chopping boards used for vegetables/fruit and plastic chopping boards for meat/fish. There is no awareness of the new material Epicurean.

“I prefer a wooden chopping board to plastic or glass - much kinder on the knives and, if looked after properly, just as hygienic.”

“WOOF! and I agree with Olivia re: hygiene... as long as you clean it well (and remember to dry it properly - dont leave it on the side of the kitchen sink or it’ll take the water and go mouldy on the side!) - Can you just tell it’s experience talking?”

“I have a couple big wooden blocks and a few small wooden boards and a few plastic... i find tend to use plastic for meat and wood for everything else..”

“Wood is best. Apparently an Aussie show called “What’s Good For You” did a road test and found wooden boards to be hygienically better than other kinds of chopping boards. I have a couple of wooden boards at home of varying size (depending on what I’m chopping).”

“I like wood chopping boards the most because of their weight and they’re easiest to work with. Glass is a no no for me as I think it blunts knives, and is just generally horrible to work with. Plastic have their place, but I don’t like the texture.”

“I would use any kind of oil or finish on a wooden chopping board. If the board is made properly from the right kind of wood, then it won’t split or warp. My big board has never been oiled - just washed regularly with cold then hot water, and scrubbed with a stainless steel pan scourer. Its over 30 years old, and still going strong.”

“Again, plastic is NOT more hygienic than wood. Here is a quote from the food network site that puts it more eloquently than I can: Cutting Board Conundrum Trying to decide whether to opt for the wooden chopping block, or the plastic cutting surface? With the wooden option, bacteria dry off within minutes. An unwashed plastic cutting board will actually multiply the bacteria. Wood has a natural bacteria-killing property which plastic lacks. ”


### 29.3. Wood cutting boards

1. End-grain boards: here, each piece of the board is arranged so that the grain of the wood runs vertically. These cutting boards are of very high quality and look like chess-boards. They are harder and more durable than other wooden boards and are more resistant to knife cuts.

2. Flat-grain boards: most wood cutting boards are flat-grain, perhaps because it is easier to make them. Here, the grain of each piece runs horizontally.
Characteristic features of wood cutting boards...

- Wood boards are visually appealing: this is the classical type of cutting board. Even old, with lots of knife scars on them, these boards look unique. You can bring an accent to the kitchen by leaving a good wooden board on the countertop.
- Wood boards don't blunt the knife blade as fast as other cutting boards like glass or marble ones, which are harder.
- Wood has a natural bacteria-killing property.
- Wood boards are strong and durable if you maintain them properly.
- To a certain extent, knife scars on wood boards will fade with time.

Disadvantages...

- Hardwood cutting boards are heavy (while bamboo boards are light). That's why some boards have handles. Handles may be carved in the board, projecting out of it, and may have a rough surface to prevent slippage when your hands are wet. A heavy board is, however, an advantage when you want to knead bread dough manually or do any other harder task.
- Wood boards usually cannot be used in a dish-washer, though some are specially made for such use.
- Wood boards require maintenance if they are to remain in good condition.

29.4. Plastic cutting boards

Characteristic features of plastic cutting boards...

- Plastic cutting boards don't stain easily because of their non-porous surface. Food juices won't penetrate into them, which will reduce the possibility of bacteria. Some synthetic boards even have an anti-bacterial coating.
- Plastic boards are lighter than wooden boards, which makes them easier to work with.
- You can usually wash them in a dish-washer, which is good as far as your board's hygiene is concerned. However, the thinner and more flexible synthetic boards may not be strong enough to use in a dish-washer.
- Plastic boards are available in a greater range of colors and shapes, which offers the opportunity to give your kitchen a more modern look.
- Plastic boards are cheaper than wooden boards.
- Being thinner than wooden boards, plastic cutting boards are more flexible, which can be useful. For example, you can chop onions and then bend the board to put the onion right into the pan without it scattering out.
- UHMWPE is processed using the following methods: compression molding, ram extrusion, gel spinning, sintering, and kneading. (Source: http://en.wikipedia.org/wiki/Ultra_high_molecular_weight_polyethylene)

Disadvantages...

- Plastic boards don't possess the charm of wooden boards.


29.5. Epicurean cutting boards

Characteristic features of plastic cutting boards...

- Maintenance free
- Easy to clean
- Dishwasherproof
- Min. Thickness of Epicurean products: 3/16 inch = handy series = 4.8mm
- Light weight
• Gentle to your knives
• Can sustain temperature up to 175 degrees Celsius. (can be used as a coaster)
• NSF label (National Sanitary Foundation)

Disadvantages...

• Only 2 colours: fake wood and grey/blackish
• Pressed paper and plastic, so no integrated plastic surfaces or buttons? > made of plates, only possible to mill shapes afterwards.
• Epicurean® cutting surfaces are stain resistant, but as with most materials there is a possibility of staining when left in contact with a highly alkaline product or food for a prolonged time. A few examples are liver, papaya and red beet. To remove stubborn stains, try a non-abrasive household cleaner.
• if left in wet or damp conditions for long periods of time, it can warp. To avoid warping, thoroughly dry your surface upright and on edge before storing your surface.
• Can be slippery due to light weight.

Epicurean snijplanken zijn professionele, lichtgewicht snijplanken, gemaakt van diverse dicht op elkaar geperste laagjes papier, wat leidt tot een keihard snijoppervlak. Deze snijplanken, ideaal voor het snijden en serveren van voedsel, zijn gemakkelijk in het gebruik, leiden niet tot botte messen, en zijn vaatwasmachinebestendig.

Het niet poreuze materiaal behoeft geen onderhoud, voorkomt dat bacteriën en ongewenste geurtjes in de snijplank trekken en kan zelfs een temperatuur van 175 graden Celsius aan, dus ook als pannenonderzetter te gebruiken!

Met al deze voordelen behoren deze lichtgewicht natuurlijke snijplanken tot de absolute top en horen dan ook in iedere goed geoutilleerde keuken te hangen, vandaar het oogje!
Appendix 30

overview of suitable materials

- HDPE (High Desity PolyEthylene)
  - form freedom (3D, compression moulding)
  - multi colour
  - dishwasher safe
  - strong and durable
  - multi colour

- rubber
  - only 1 boring yellowish colour
  - heavy weight
  - expensive
  - dishwasher not recommended
  - non flexible

- plastic
  - form freedom (3D, milling)
  - multi colour?

- flexible sheet material
  - only 2D shape
  - multi colour
  - slippery?

- pressed paper and plastic
  - Can be slippery due to light weight.
  - needs replacement in time

- wood
  - natural bacteria-killing property
  - cannot be washed in dishwasher
  - expensive (good quality)

- flat-grain boards
  - easy on knives
  - hygienic

- end-grain boards
  - visually appealing
  - classical
  - strong and durable

- PP
  - dishwasher safe
  - light weight
  - cheap
  - needs replacement in time

- PE
  - dishwasher safe
  - light weight
  - cheap
  - needs replacement in time
expensive
heavy
cannot handle temp > 80 degrees Celsius

? form freedom (3D, compression moulding)
multi colour

**FUNCTIONAL**

dishwash safe
cheap
light weight

needs replacement in time
Can be slippery due to light weight.

**MATERIAL**

- easy on knives
- hygienic

- hygienic: NSF label (National Sanitary Foundation)
- can sustain high temperatures (up to 175 degrees Celsius)
- can warp
- Can be slippery due to light weight.
- Only 2 colours: fake wood and grey/blackish

**End-grain boards**

natural bacteria-killing property

- can sustain high temperatures
- classical
- knife scars will fade with time.
- visually appealing
- strong and durable

expensive (good quality)
cannot be washed in dishwasher
need maintenance
can warp

**Flat-grain boards**

- pressed paper and plastic, so no integrated plastic surfaces or buttons?

**wood**

- sustainable
- harder, can hurt knives

**bamboo**
(almost same qualities as wood)

- can warp
- only 2D shape

**PE**

(standard cheap boards)

- easy on knives
- hygienic

- hygienic: NSF label (National Sanitary Foundation)
- can sustain high temperatures (up to 175 degrees Celsius)
- Easy to clean
- Light weight
- Maintenance free
- nonporous
dishwash safe

**epicurean**

- form freedom (3D, milling)
min. thickness sold = 5mm

- form freedom (3D, milling)
- multi colour

? form freedom (3D, milling)
multi colour

- form freedom (3D, milling)
Appendix 31

Style collages

MODERN

simplicity  advanced  quality  clean
FUNCTIONAL

form follows function    minimalistic    practical    neutral
HEALTHY

clean  naturall  clear  hidden technology  simple
FRESH

happy  cheerful  engaging  fun  friendly
CLASSIC

quality  timeless  traditional  conventional
EMBODIMENT DESIGN
Appendix 32

Shape study
Appendix 33

Visualisations DirectLife Food website
Figure 9. DirectLife Food - homepage.
Target Vegetables: **200 gr.** (uncooked)
Target Meat/fish: **150 gr.** (uncooked)
Target Grains: **175 gr.** (uncooked)
Target Meat/fish: 150 gr. (uncooked)

Figure 11. DirectLife Food - User history meat
Variation Balance

Plan | Year | Month | Week | Last

GO | SLOW | WHOA

Well done! variation tips
target

GO | SLOW | WHOA

try to eat more go examples ‘go’ products & recipes
target

GO | SLOW | WHOA

Well done! variation tips
target

Apr 5 - 11 2010

Previous | Next

detailed overview vegetables
detailed overview meat/fish
detailed overview grains

Need help or have a question? Contact your personal coach

Figure 12. DirectLife Food - Variation balance
ADVICE
try to eat more **go** products for example:
- chicken breast
- extra lean ground beef
- tuna canned in water
- trimmed beef and pork

*recipes that match my variation balance*
GO, SLOW, WHOA categorization

Figure 14. DirectLife Food - Go, slow, whoa categorization. Parts of the figure are copied from: Voedingscentrum (2010) “Eet ik gezond?” Retrieved August, 2010 from http://www.voedingscentrum.nl
Figure 15. DirectLife Food - Accurate advice
Appendix 34

Beurer, KS48 Plain

KS48 plain

Kitchen scale
Limited Design Edition

- Super flat design kitchen scale
- Glass weighing surface in various motifs - a jewel for every kitchen
- Size: approx. 24 x 18 x 1,7 cm
- Easy-to-read LCD display
- Large LCD display
- 5 kg capacity
- 1 g graduation
- Tare weighing function
- 5 year warranty

Enlarge Video
Technical Details
Compare products
Product overview

enlarge
Appendix 35

Load cell in preliminary design

[Image of a load cell with labels:
- Foot bends down due to counter force of the foundation
- Force due to weight on scale
- Top casing (scale up side down)]
F res = 10 x 100 gr = 1 N
F press button = 0.98 N

F res \times r1 > F press button \times r2

M1 = F res \times r1 = 1 \times 0.078 = 0.078 Nm
M2 = F press button \times r2 = 0.98 \times 0.027 = 0.026 Nm. >> Fz keeps device stable.

Considering 100gr. of food on the device, it will definitely be stable!
36.1. Introduction

During the user test the usage of the design is evaluated by means of a functioning prototype. The participants will be instructed to cook a recipe and weigh the ingredients on the Philips chopping board. It will be evaluated if usability problems occur during regular usage. The focus of the user test is on detecting short-term interaction problems and the users’ attitude towards the function and perceived effectiveness of the product. Long-term usability problems could not be assessed during this user test and should be evaluated during longitudinal user test in the future.

36.2. Participants

4 male and 6 female participants were invited to the user test, including one participant for the pilot test. The participants did not join in previous user evaluations of this project. Almost all participants had an interest in losing weight, weight management or adapting healthy eating behaviour. The participants lived in a one or two-person household and cooked dinner regularly. Ages ranged between 25 and 60+ years and both Philips employees and people from outside the company were invited. All participants were Dutch, except for one female who lived in the Netherlands over 10 years.

During one of the sessions it became clear that one participant did not meet the selection criteria. He solely applied because he was interested in the product from a design perspective. As he did not experienced a need for losing weight or weight management, many of his remarks became irrelevant and are therefore excluded from the analysis. His comments concerned with general aspects of the product (which are not target group specific) are not excluded.

36.3. Prototype

During the test the participants were asked to operate a prototype of the design. The prototype included a functioning interface with among others LEDs, tactile switches and a load cell. These components were connected to a phidgetLED and a Phidget textlcd, which were controlled by a software program that was programmed in MAXmsp 5.1 with the help of Reinier Jansen. The electronics of the prototype were created with the help of Rob Luxen of the Delft University of Technology. The prototype only includes those functionalities that were important for the objective of the user test. Appendix XX describes how the prototype is made and explains the limitations of the prototype.

36.4. Procedure

The user test was carried out in the kitchen environment of ExperienceLab at the High Tech Campus in Eindhoven. Prior to the test, the participant received information about the ‘go’, ‘slow’ and ‘whoa’ classification and they received a copy of the recipe. At the start of the user test, some background information of the project was explained to the participant and the usage of the device was demonstrated to eliminate first-time usage mistakes.

Subsequently, the participant was instructed to cook the recipe with the provided ingredients and kitchen tools in
ExperienceLab. The participant was instructed to weigh all vegetables and meat up front and the grains afterwards. During this part of the interview the participants were observed from a separate room by means of cameras.

Afterwards, the participant was asked some questions about his experience during the usage of this product. Furthermore, some questions were asked about the participants’ general attitude towards the product, the features of DirectLife and how both could be improved.

36.5. Questionnaire

When the participant arrived, he was asked to first fill in a small questionnaire. Due to the questionnaire it could be assessed weather problems that occurred during the user test could have been influenced by the participants (lack of) cooking skills.

![Questionnaire in Dutch](image-url)
36.6. Instructions

The participants received the recipe below. They were instructed to weigh the meat and vegetables up front and the rice after they cooked it. They were instructed to prepare the dish for one person and estimate the amounts by means of the product.

This recipe was selected, because it is easy and fast to prepare and the ingredients are expected to be familiar to the participant. The recipe included different vegetables to evaluated how the participant would deal with weighing different ingredient in one foodgroup.

36.7. Interview questions

1. Wat is je eerste reactie?
2. Wat vond je van de interface? (soort & grootte van knopjes, feedback, plaatsing van componenten?)
3. Wat vond je van het gebruik van de user token?
4. Wat vond je van de snijplank in het algemeen? (vorm, kleur, materiaal, etc.?)
5. Tegen welke onduidelijkheden liep je aan?
6. In hoeverre zou je het vervelend vinden om de ‘go’, ‘slow’, ‘whoa’ categorisatie aan te moeten leren?
7. Zijn er aspecten die je anders zou willen zien? (en hoe zou het er dan uit moeten zien?)
8. In hoeverre ga je door dit product bewuster eten?
9. Zou je het product thuis ook gebruiken, waarom wel/niet?
10. Heb je verder nog opmerkingen, tips, suggesties, vragen, etc.?

Bedankt!
Recipe the participants were instructed to cook

**Rijst met ketjapgroenten**

*hoofdgerecht* bereiden 20 min

**Keuken**
Oosters

**Kooktechniek**
roerbakken

**Ingrediënten**
- witte rijst
- varkensspekjes
- wokolie
- ui, in ringen
- rode paprika, in repen
- Chinese roerbakmix
- courgette
- wok essentials keişap-sesam

**Bereiden**
1. Kook de rijst volgens de aanwijzingen op de verpakking. Verhit de olie in een wok en bak het vlees in 3 min. bruin. 2. Voeg de ui, de paprika en de roerbakmix toe en bak 5 min. Voeg de woksaus toe en warm al omscheppend 1 min. door. 3. Weeg de rijst af en schep de ketjapgroenten met saus erop.

**Vooraf wegen (raw):**
- GROENTE
- VLEES

**achteraf wegen (cooked):**
- RIJST
This appendix elaborates on the features of the prototype and how it is constructed.

### 37.1. Components:

**Printed circuit board**

The PCB was attached to the top casing by means of a screw connection. The PCB layout was designed by Rob Luxen from the Delft University of Technology and ordered at www.precisioncircuitscanada.com. Checken by Rob!!

The LEDs, tactile switches, resistors and connectors were soldered to the PCB. LEDs were ultra bright LEDs and ordered at www.dotlight.de (white: NSPW300DS, green: LLG32060). The tactile switches were ordered at www.Farnell.com (Omron, horizontal projected plunger type, B3F-1050. Order code Farnell: 176433) Connectors, resistors, etc. were supplied by the TUD.

**Phidgets**

The components of the PCB are connected to the PhidgetLED or the Phidget TextLCD by means of connectors and cables. The phidgets and the cables were purchased at www.phidget.com. The tactile switches and the load cell were connected to the digital inputs of the Phidget TextLCD, the LEDs were connected to the PhidgetLED. The phidgets are also connected to a computers that runs MAXmsp 5.1.

**Load cell**

The load cell used in the prototype came from an existing kitchen scale from the brand Tristar (€12,95 at Blokker). It was a different load cell than used in the original design, as it was too difficult to integrate the four small load cells in the design instead of the one that is used now. The PCB of this existing kitchen scale could not be used for the prototype; therefore small PCB was designed by Rob Luxen to convert the signal from the load cell into something that the Phidget could read. In order to set the weight range a potentiometer was added to the PCB.

**Casing + user tokens**

The two parts of the casing and the user tokens were designed in Solidworks and 3D printed by the rapid prototype company Mareco. The model was made my means of Selective Laser Sintering. The casing was adapted for the prototype, as the construction with one load cell was different from the design with four flat load cells. Ribs were added to prevent the casings from warping. The casings were first spray painted with a primer and later on with satin gloss paint, colour: RAL 9010. To imitate the printed text a sheet was printed and fixed to the top casing by means of spray glue of the brand Bison.

**MDF box**

Due to the height of the phidgets, it was not possible to position all the components in the casings. For this reason, a MDF box was build, which was positioned underneath the model. The load cell and PhidgetLED were fixed on the bottom of the box and the Phidget TextLCD and reset...
button to the top plate of the box by means of screws. The box was painted with MDF primer from the brand Flexa (water based) and grey satin gloss paint from the brand Gamma (water based).

**Buttons**

The buttons of the prototype were made from the material of an Ikea Lamp (type: unknown, foldable lamp). The material was translucent but not (semi) transparent. The material was cut in pieces, heated with hot air (professional hot air blower) and shaped by pressing the material between a coin with the correct dimensions and the hole in the top casing. The icons were printed on sheet and glued to the buttons with spray glue.

**Cutting sheet**

In the final design, the cutting sheet covers the entire top plate, including the buttons. As it was not possible to manufacture such a cutting sheet in the available amount of time, the cutting sheet did not cover the buttons in the prototype. The cutting sheet was cut out from Ikeas’ PRÖJS; a transparent desk pad made of EVA plastic with an anti-slip surface underneath.

### 37.2. Limitations of the prototype

Due to time restrictions, the prototype only included those functionalities that were important for the objective of the user test. This paragraph elaborates on the features that were not included in the prototype.

**Simplified electronics and construction**

The prototype does not include the same electronics as the final design. The prototype includes a different type of load cell and in the final design the PCB contains a chip that controls the LEDs and tactile switches instead of the phidgets. The construction and the load cell of the prototype are not as accurate a mass-produced product of the final design will be. Due to the construction, the load cell presented a higher weight when an ingredient was placed at the bottom side then when placed in the middle. For this reason the participants were instructed to position the ingredients in the middle of the top plate. Nevertheless, the display weight was then accurate enough for the participants to trust the feedback the prototype showed them.

**Box underneath the model**

As mentioned before, a box was positioned underneath the model, because the model was too slim to include all the electronics. The box was painted in a neutral colour that contrasted well with the product, in order for the participants to perceive the model well without being influenced by the box too much. Due to the box and the construction, the participants were not able to pick up and turn around the model.

**One dummy user token**

During the user test, the participants had to prepare a dish for one person. As there was not enough space to position connectors for both rows of LEDs (user 1 and user 2), only the LEDs for user 1 and the matching connectors were positioned onto the PCB. In the design, the product is only activated when the user connects an activity monitor. The prototype does not include this function, as the user token is only a dummy. The dummy can be connected, because magnets are positioned inside the user token and on the inside of the casing.
Adding within one food group

It is possible with the prototype to first add an ingredient, press save and than add another ingredient in the same food group. However, the ingredients should both belong to the same state (raw or cooked).

For example, it is possible to first weigh a raw paprika and then weigh a raw courgette. It is not possible to weigh a cooked courgette after weighing a raw paprika.

This is a result of the way the software is programmed: at this moment, the LEDs are set according to the weight on the load cell and the stored weight of a previous input within one ‘state-food group’-combination (e.g. raw-vegetables). Because the targets of the two ‘state-food group’-combinations are not equal, the stored weight cannot be used in both ‘state-food group’-combinations within one food group. For example the stored weight of a courgette (raw-vegetables) cannot be used when weighing a cooked paprika, because they weighs cannot be compared. To solve this, the weight should first be translated in to something that could be compared within one food group before setting the LEDs. It was detected too late to change it in the available amount of time.

Gap around the buttons

The buttons of the final design are 2K-injection moulded in the top casing. It was not possible to simulate such an effect in the prototype. Therefore the prototype contains regular buttons with a small gap around it. The buttons were also not covered by the cutting sheet. However, the intended effect of the final design was explained to the user.

Larger display

Instead of a small monochrome display, a Phidget TextLCD was used. This component was bigger than the intended component in the final design, therefore it was placed at the top side of the model, integrated in the surface of the MDF box. The dimensions and position of the intended display was printed on the top plate.

User cut on chopping board next to model

The participants of the user test were instructed to cut on the model. However, because the model was somewhat unstable, participants were told they could also cut on a chopping board next to the MDF box if they preferred to. As a result, all participants cut on the chopping board next to the MDF box. Later on they told it was a result of the unstable model and also because it was elevated due to the MDF box. They did remark they would have cut in the model if it were positioned stable on the countertop.

No green light when saved 100%

In chapter XX, it was decided that the white 100% LED would turn green if the user saved exactly within the 100% range. This could not be tested in the prototype as it was not possible anymore to use a RGB LED at the moment this was decided.

37.3. Involved parties:

Electronics

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3D print

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Figure 18. PCB of load cell (designed by Rob Luxen)

Figure 19. PCB attached to top plate by means of 7 screws.
Figure 20. Fixing the PCB to the top plate

Figure 21. Inserts were placed in the top plate
Figure 22. Test set up to program MAXmsp

Figure 23. Soldering in StudioLab with Rob Luxen

Figure 24. Soldering the connectors
Figure 25. Wires run through the bottom casing to the phidget in the MDF box.

Figure 26. The laptop needs to be attached to run the MAXmsp software that controls the phidget.
Figure 27. Tactile switches on the PCB

Figure 28. Testing

Figure 29. Connector that connects the PCB with LEDs to the phidget