

# HELLO PREGGO!

*A tool that encourages teenagers  
who are pregnant to eat healthy*

MASTER THESIS BY  
AVITAL LA-TOYA ZANDVLIET



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to eat healthy during their pregnancies.

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# PREFACE

This thesis is a deliverable for a graduation project for the master Design for Interaction (DFI) at the faculty of Industrial Design Engineering (IDE) at the Delft University of Technology, the Netherlands. This graduation project is about healthy nutrition during pregnancy. Advanced knowledge has shown that having had an unhealthy nutritional lifestyle could not only result into problems during pregnancy as well as fetal growth problems, but also could increase the risk of health problems after birth during infancy and later in life (Cetin et al., 2010; Steegers-Theunissen et al., 2013). There are several initiatives and organizations advocating for, and providing guidance on, healthy nutrition during pregnancy. For instance the Smarter Pregnancy programme, developed by the Erasmus Medical Centre in Rotterdam. Currently, they mainly focus on a higher segment of the Dutch population, and the opportunity arose to research other segments within the Dutch population. This project is not directly executed for this programme but explores alternative possibilities to support more challenging segments in the Dutch population. This graduation project will focus on teenage pregnancies.

# ABSTRACT

This thesis walks the reader through the research and design process of 'HelloPreggo!', a tool developed for pregnant teenagers to guide them towards a healthier nutritional lifestyle during pregnancy.

To start off, both literature and empirical research have been conducted on teenagers who are pregnant in the Netherlands in order to understand (1) who we are talking about, (2) what their current situation is and (3) what needs and values can be identified within this target group. Literature was found on the professional perspective of teenage pregnancies. Subsequently, three professionals in the field have been interviewed among which an author of a paper. This research identified many contextual factors that the target group has to deal with. These context factors leave them clueless & indecisive and affect their self-esteem & self-efficacy. Their resilience, however, is strong and they are willing to do what is best for their unborn child.

A context mapping research was done to gain deeply rooted information from the target group itself. Sensitising booklets gave clear insights into their daily life and their behaviour towards food. Subsequently, generative sessions were held that provided insights in their underlying values and needs; e.g. the status of being a mother, not to be perceived as less, a need for peers and daily activities. In addition, literature research was conducted on food behaviour and behavioural change.

Based on the findings in the conducted researches, a list with twenty design guidelines was established together with the following design goal: 'To create a set of experiences that engages young mothers-to-be to mature towards a healthy nutritional lifestyle during pregnancy'. This design goal was enhanced with a clear interaction vision and personas that visually characterise the target group.

The design process started off with a brainstorm session after which a design direction was chosen. This evolved into the initial concept of a gamified idea of a 'cookbook learning calendar' consisting out of challenges. The goal of the game is simple: to complete all challenges and to get a hold of all items. Simultaneously, the user gains knowledge and skills about making healthy food choices. During each challenge, players gain knowledge about a nutritionally related subject and are provided with physical items to apply the newly gained knowledge to. The catch in this game is that the user needs the other players to continue to the next challenge. Aspects of this concept were further elaborated through several interventions; looking at the overall concept, its interactions and the design & content of all components. Hence, "HelloPreggo!" has been created.

An interactive prototype was used to evaluate the concept. For this evaluation, a usage scenario movie has been created. This showcased the intended interactions to which the target group has responded. Subsequently, the different components of the concept have been evaluated.

Attention has been given towards the implementation of the concept. The business model canvas was used to display the complete network behind "HelloPreggo!", looking at two different cases; as a stand-alone organisation and complementary to an existing organisation. The closing chapter of this thesis finalises this report with a conclusion, limitations and recommendations of the concept for future research and development.

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# CHAPTER 1 | INITIATE

Each project starts with a good understanding of the subject, a clear direction in terms of an objective and a set of guidelines on how to reach the objective. This chapter sets the course of the project.

This chapter will describe:

- >> The introduction to the subject
- >> The project objective
- >> The approach and used methods
- >> The structure of the thesis

## 1.1 INTRODUCTION

### 1.1.1 THE IMPORTANCE OF EATING HEALTHY DURING PREGNANCY

Optimising fetal development is one of the objectives of the World Health Organization (WHO). According to the WHO the impairment of fetal development globally is huge and particularly high in developing countries, but significant as well in the more developed parts of the world (WHO, 2006). Recent knowledge has shown that exposure to an unhealthy nutritional lifestyle can affect the most critical cell divisions as well as the processes taking place that leads to the establishment of well-functioning fetal organs and the placenta of the embryo (Steegers-Theunissen et al., 2013; Vermeij-Keers, 1990). During the first 10 weeks, these processes can lead to a dysfunction of the placenta and fetal organs and thus slow down the embryonic growth. These early life events contribute to pregnancy complications and can increase the risk of health problems after birth, in particular certain chronic diseases such as cardiovascular diseases and diabetes (Cetin et al., 2010; Steegers-Theunissen et al., 2013). Observational and experimental evidence increasingly supports a correlation between growth and development during fetal and infant life and health in later years (WHO, 2006). Therefore, the WHO acknowledges the need to invest in the health and education of young people concerning their responsibilities during pregnancy and parenthood in order to create an optimal environment for fetal development.

### 1.1.2 THE SMARTER PREGNANCY PROGRAMME

Providing good preconception healthcare is not only a task of the obstetrics and gynaecologists but also for the future parent. It starts with them. That is why the Erasmus Medical Centre in Rotterdam developed the Smarter Pregnancy mHealth platform. The Smarter Pregnancy mHealth platform is to support women and their partners in the Netherlands before and during pregnancy to provide them with individual coaching on nutrition and lifestyle to increase their chances of pregnancy and to facilitate a healthy pregnancy, primarily focusing on the higher segment of the Dutch population. Preliminary research has been done on the Smarter Pregnancy platform to increase the suitability and to attract more segments of the Dutch population, for instance Dutch citizens with a non-western cultural background or youngsters within their own teenage subculture, this research can be found in *Appendix 1: preliminary research Smarter pregnancy*. There is a possibility that the final design could function as a complementary part to the Smarter Pregnancy programme, and thus will be taken into account throughout this graduation project.

## 1.2 THE PROJECT

### 1.2.1 OBJECTIVE AND SCOPE

The main objective of this graduation project is **‘to design a product or service that will support pregnant teenagers living in low- Socio-Economic Status (SES) to help better their food choices in order to provide the right environment in which a fetus can properly develop’.**

1. The first step to do so is to investigate the current situation of teen pregnancies in the Netherlands and the preceding of a teen pregnancy.
  2. The second step is to immerse with the target group. By studying their daily life need and values, attitudes and perceptions with regard to their food consumption can be identified.
  3. The third step is to find a suitable solution that fits with the target group and whereupon iterations can take place, that will lead to a final concept.
  4. The fourth and final step is an implementation plan using a Business Model Canvas.
- The researcher established this graduation project as a stand-alone project, with the possibility of adjoining the Smarter Pregnancy mHealth platform. Therefore the concept should be able to work properly without the mHealth platform of Smarter Pregnancy.
  - The researcher demarcates the target group to teenagers in the Netherlands; further segmentation will take place throughout the project.
  - The researcher continues the development of the idea till a proof of concept. A prototype will be made in order to do so.
  - Providing nutritional content does not lie within the expertise of the researcher. Therefore no full content will be provided when it comes to the nutritional aspect within this graduation project. Any advice given in this graduation project serves as an example only and a certified dietician needs to be consulted before use of the example.

According to the regulation of the Faculty of Industrial Design Engineering (IDE) a graduation project for the master Design For Interaction (DFI) takes 22 weeks. This is a limited amount of time for any individual design project. A clear scope is therefore necessary for the feasibility of the project.

### 1.2.2 MISSION

This graduation assignment has been established by personal interest of the author and established a personal mission for this graduation project. Therefore, the final solution or design of this project should contribute to the following mission:

**‘The mission for the designer is to allow youngsters to realise the importance of healthy nutrition and to start making smart food choices not only for them but also for their offspring. After all, every mother wants the best for her child.’**

### 1.2.3 APPROACH

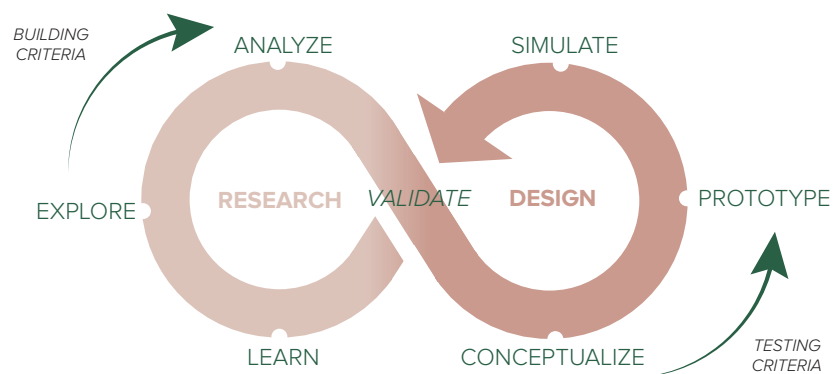
During this graduation project an iterative process of research and design will be used. As visualised in *Figure 1*, the researcher uses a loop that works as a tilted eight. Constant cycles will be made through ‘research’ and ‘design’ in terms of an infinity loop. Thus, a design is never finished and improvements can always be made. One single cycle is divided into different parts: learn, explore, analyse, validate, conceptualise, prototype, simulate, and again, validate. Then the cycle restarts and a new iteration takes place.

### 1.2.4 METHODS

Throughout the iteration cycles several methods and tools have been used to develop the concept. In advance, several methods have been identified to be useful for this graduation project:

- Design and culture cards: a card set to help designers towards a culture-conscious approach to design (Van Boeijen, 2015).
- Opportunity detection kit: a practical method that assists in detecting user needs, desires and gives a broad view of the user’s life (Mink, 2015)
- Contextmapping: A technique which includes generative session to gain deeply layered knowledge about the target group (Sleeswijk visser et al., 2005)
- PLEX cards: Playful experience (PLEX) card set to design for playful (game) design (Lucero & Arrasvuori, 2010)
- A cookbook Method for Persuasive Game Design (Siriaraya, et al., 2018): A set with commonly used game design components and tools which designers can choose at different stages of the design process.
- Human Centered Design (HCD) toolkit.
- Business Model Canvass (Osterwalder & Pigneur, 2010)

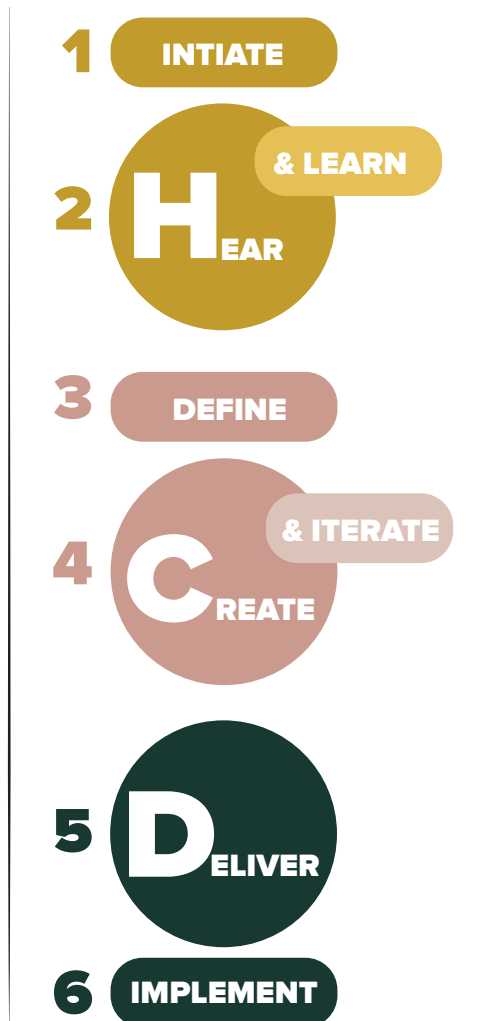
The researcher would like to stretch out that the selected research methods and tools are not dealt with in seclusion as per research question but rather in conjunction.



**Figure 1:** an iterative approach of research and design

## 1.3 STRUCTURE OF THE THESIS

The main structure of this thesis is based on the HCD-toolkit, it provides a distinction between three phases: **Hear, Create and Deliver**. Several intermediate steps have been added to the structure, *Figure 2*. The thesis starts off with **Chapter 1: Initiate**, as can be read above this chapter lays the fundament of the project and starts off with explaining the objective and scope and continues explaining the approach and methods that will be used. In addition, the researcher's personal vision and mission is displayed. **Chapter 2: Hear and learn** is all about acquiring a deep understanding of the target group. This chapter will describe whom we are talking about, what their current situation is, what their behaviour is towards their nutritional lifestyle and what needs and values can be identified. This is obtained using multiple research techniques. The findings are then further defined in **Chapter 3: Define**. This chapter will set the course by translating the findings into a set of guidelines using a design goal and interaction vision. **Chapter 4: Create and iterate** will display the first ideas and continues to iterate on a concept until the working principle has been proven to fit with target group. The concept will be further elaborated in **Chapter 5: Deliver**. This chapter closes with the conclusion of the final concept. In the **Chapter 6: Implementation** the business perspective of the concept will be mentioned, using a Business Model Canvas. The Marketing Mix will summarise the 4P's necessary for implementing the concept. The final **Chapter 7: Closure** reflects back on this graduation project and it provides the necessary recommendations for further development of the concept.



**Figure 2:** structure of the thesis



## CHAPTER 2 | HEAR AND LEARN

Designing a useful and meaningful solution that serves the target group starts with a deep understanding of their current situation, their behaviour with respect to their nutritional lifestyle along with their own needs, values and future aspirations.

This chapter will describe:

- >> Who we are talking about
- >> What the current situation is
- >> What needs and values can be identified

## 2.1 TEENAGE PREGNANCIES

### 2.1.1 INTRODUCTION

Adolescent or teenager is a term commonly used to describe an age group between childhood and adult hood, mostly between the ages of 13 to 19 years. This phase of life is considered to be a vibrant phase in life full of discovery, balancing the urge for independence but not fully being able to and the search for (self) identity while fitting within their social context. The shared attitudes, beliefs and values among teenagers have let them to create their own (sub) culture. As Spencer-Oatey (2000) defines:

**“Culture is a fuzzy set of attitudes, beliefs, behavioural norms, and basic assumptions and values that are shared by a group of people, and that influence each member’s behaviour and his/her interpretations of the “meaning” of other people’s behaviour”.**

Part of this journey during adolescence is experimenting with adult behaviours, such as intimacy. Where intimacy grows into sexual activity, sexual activity can lead to pregnancy. In this chapter the researcher digs deeper into the demographics, the actual background and contextual factors that play a role among teen pregnancies in the Netherlands.

Alongside a literature research expert interviews have been conducted with three professionals in the field, see *Figure 3*. These interviews gave a clear understanding of the professional’s perspectives on, attitudes towards and opinions about pregnant teenagers and their situation and nutrition habits . The goal of this research was to gain deeper insight in **(1) the current state of teen pregnancies in the Netherlands, (2) contextual factors that are of importance around teenage pregnancies and (3) insights in communication and knowledge transfer between professionals in the field and the target group**. The semi-structured interviews were conducted in person, by email and telephone. Moreover these interviews in *Appendix 2: expert interviews*.

### 2.1.2 DEMOGRAPHICS

A factsheet of the last available numbers of the state of teenage pregnancies has been visualized including *Figure 4*. This graph clearly shows a decline in the overall teen pregnancy rate. makes a distinction between the cultural backgrounds of the teen pregnancies. In addition, the two pie charts showed in *Figure 6* visualises the latest available numbers of 2016.

There are four main risk factors that precedes a teen pregnancy:

- **The lack of direction in life;** some teenagers have no clear goals in life. Motherhood could ‘the’ goal for them. Once they become a mother they are entitled to social welfare and/or receive an urgency housing procedure that can contribute their status and independence.
- **Deficient sexual education;** many young mothers do not possess enough knowledge of their own bodies and contraception. They have many misconceptions about the proper usage of contraception.
- Often girls have had to deal with an **unstable home situation and shocking events** that have damaged their psychological development that made them more vulnerable and less defensive to boys.
- **Role patterns;** young mothers often subordinate their own wishes, desires and perception to those of their boyfriends in a relationship.

Overall these four reasons are more apparent among Dutch girls with a non-Dutch cultural background, as can be seen in *Figure 5*. Moreover in the next section 2.1.3: background and contextual factors.

EXPERT	ORGANISATION	PROFFESION
Marianne Cense	Rutges	Researcher and intervention developer
Eline Dalmijn	FIOM	Project manager
Annebe Vries	Iriszorg	Social worker and counselor

**Figure 3:** table of interviewed experts

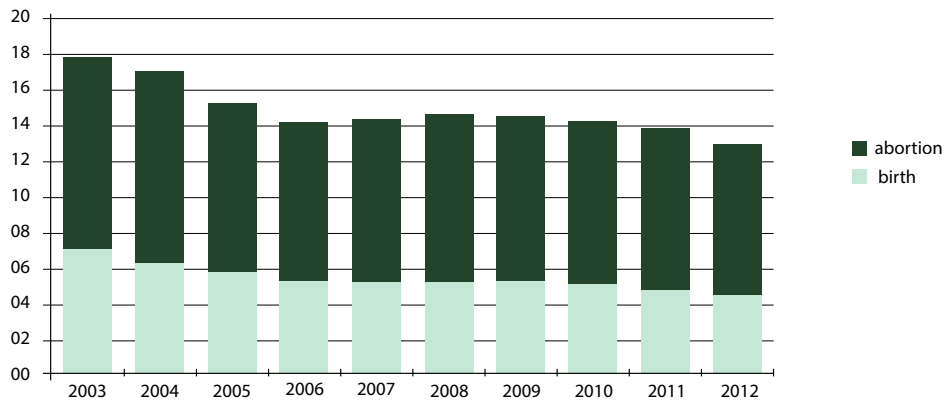


Figure 4: abortion and birth rates per 1000 teenagers (15-19 years) (Picavet & van der Vlugt, 2014)

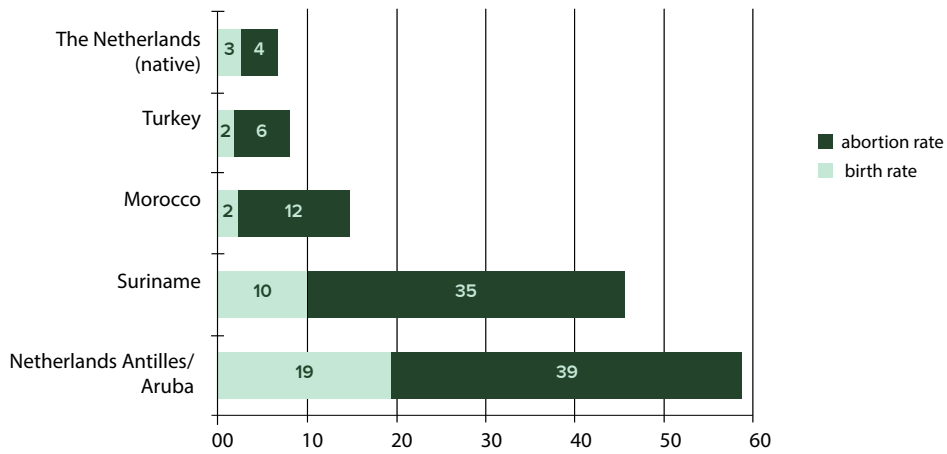


Figure 5: cultural background per 1000 girls in 2012 (Picavet & van der Vlugt, 2014)

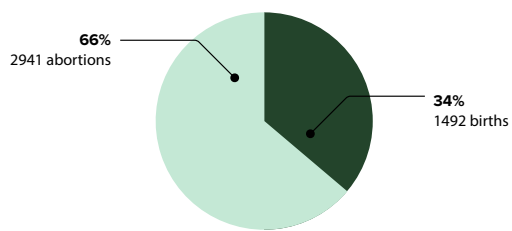
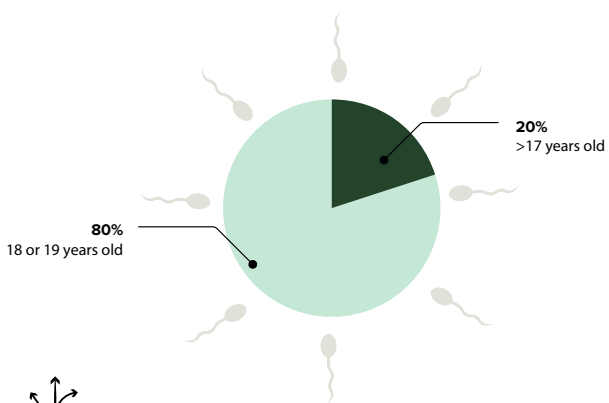


Figure 6: numbers of 2016 (FIOM, 2017)

The lack of direction in life.  
No clear goals, study, job etc.

Not provided with sexual education.

Unstable situation(s)  
at home

Traditional role pattern  
Taking a subordinate role to partner.

### 2.1.3 BACKGROUND AND CONTEXTUAL FACTORS

Teenage pregnancies are in most of the western countries a big concern. Although the Netherlands has one of the lowest teenage birth rates the Dutch government and its organisations make a lot of effort to keep this number low or to make it lower through research and education (FIOM, 2018). According to the last available numbers there were 4433 pregnant teenagers in 2016, of which approximately two third of the girls decided to abort the pregnancy and one third decided to keep the baby as can be seen in the fact sheet (FIOM, 2018). Extensive research has been done of these pregnant teenagers' background situation and what has preceded teen pregnancies.

Research showed that according to the teens themselves they got pregnant because **(1) they wanted to have a baby, (2) they did not use adequately contraception or (3) according to them, they just had bad luck and the contraception did not work** (van Berlo, W. 2005).

There four risk factors from the previous section will be elaborated here. These factors lead to seven main scenarios that are visualized in *Figure 7*.

- (1) **Lack of direction in life:** Problematic and chaotic home situation/upbringing such as a lack of structure and stability, feelings of insecurity at home and neglect, conflicts, divorce, violence, addiction and mental problems of parents that led to feelings of loneliness, a lack of bonding and low self esteem (Rutgers, 2016). Some girls therefore wish to have something (a child) of their own to fill up that gap. Once they become a mother they are entitled to social welfare and/or receive an urgency housing procedure that can contribute their status and independence.
- (2) **Deficient knowledge about sexual education:** Often teens do not think through which contraception to use and if this particular contraception is fitting to them. This often has led to poor use and misconceptions about taking the pill. Some girls are just not yet responsible enough to take the pill consistently. Partly, this can be put on poor education; not knowing what other contraception is available out there (Picavet, 2014).
- (3) Also **Shocking events** in their youth or extended bullying can lead to feelings of unworthiness and decreased their confidence and resilience; this can lead to not only a strong physical but also emotional dependence on boyfriends and an early sexual debut (Rutgers, 2016).
- (4) **Role pattern:** Despite the fact that some girls do grow up in a loving family some developed mental problems during puberty or ended up in unequal relationships (Rutgers, 2016). A lot of girls still subordinate their own wishes and desires to that of their partner. They do not have sex out of pleasure or lust, but because their boyfriend wants to, because all their friends already did 'it,' or for some other reason beyond themselves (Picavet, 2014).

It must be noted that there isn't really one factor that determines what preceded a teen pregnancy; it is mostly a combination of several factors, which are intertwined, and reinforces each other as can be seen in *Figure 7*.

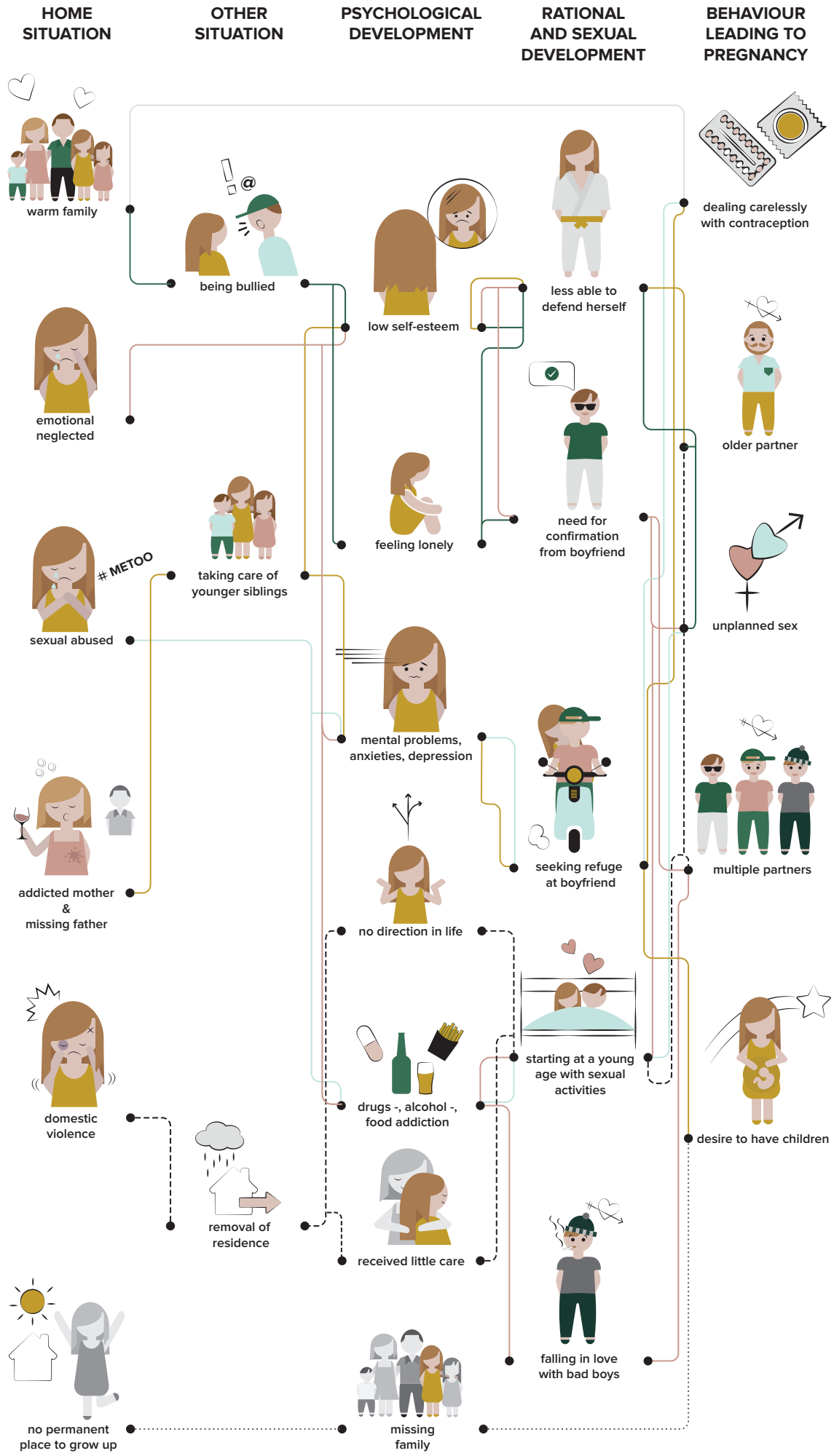


Figure 7: Displays the seven most accuring scenario's preceding a teen pregnancy based on Cense & Dalmijn (2017). Each scenario is marked with a different color and can be followed throughtout the different risk factors visualized in the figure.

## 2.1.4 LIFE AS A PREGNANT TEEN

### A huge dilemma

For most of the pregnant teenagers the pregnancy came as a complete surprise. According to Cense and Dalmijn (2016) who performed extensive and qualitative research of the target group, they were shocked beyond belief, feared the reaction of their social context and mostly that of their parents. The fact that they did not know what to expect scared them too. The girls often struggled with feelings of guilt and shame because they became pregnant at such a young age. Some of the interviewed girls were immediately happy that they were pregnant, but many others felt ambivalent or negative about it (Cense & Dalmijn, 2016).

In a short time frame a huge roller coaster of emotions came along and a radical decision needed to be made. Meanwhile they have had to deal with the social norms of abortion, teen pregnancies and the judgmental opinions of their social surroundings (Hoggart, 2012; Tabberer, 2000). This led to the following six different paths in the decision making process: (1) It is clear: **abortion**, because having a baby in their situation is irresponsible (2) It is clear: **keeping the baby**; because abortion is murder (3) rational choosing but **emotional ambivalence**; feeling as if there is **no other choice** (4) **being pressured**, this always includes a sacrifice since they either have to put aside their own feelings and risk regret or risk breaking an important relationship with their parent(s) or boyfriend (5) not taking the responsibility, **not being able to make a decision** because they have panicked and someone else is making the decision for them (6) keeping the baby: needing support to become a mother, **feeling supported** by either parents or boyfriend can make the decision to keep the baby easier (Cense, 2017).

The researcher would like to stretch that even though this graduation will be about teens committing to full-termed pregnancy, the decision making beforehand still has a major influence on the continued experience of the pregnancy.

*‘Girls do it never right, whatever they do. They are either sluts or prudes. It is their fault they got pregnant, abortion is murder and keeping the baby is irresponsible.’*

*Mariska van der Pol (Siriz)*

### Continuing the pregnancy

Continuing a pregnancy at such a young age is not an easy task. During the pregnancy the girls have to make a lot of practical arrangements before the baby arrives, in addition they cannot participate in all their peer activities anymore, sometimes they feel isolated and quit school and therefore they cannot fully enjoy the pregnancy (Cense and Dalmijn, 2016). Some girls, the ones coming from warm-hearted families, do get immediate support from their parents, while girls that come from a disruptive household often receive little to no support. At home those girls often get conflicted about the pregnancy due to a financial or of a practical nature or a combination of the both, sometimes leaving them to fend for themselves. Obstacles such as housing, income and education play a severe role (Cense, 2017). Despite all those feelings the love for the (unborn) child helps them find the strength to make the most out of it.

*‘Though coping with an unintended pregnancy is hard it can also bring a positive turnaround. Committing to the baby can bring a clear goal and forces them to take responsibility.’*

*Annebe Vries (IrisZorg)*

### Support

Some girls chose or end up in so-called teen mother housing. It gives them a safe place, peace and security during the pregnancy while they get the support they need on becoming a mother. They get help to plan their future such as housing, income and education. Most girls leave within a year. Annebe Vries explains ‘**Most girls had little to no support from friends and family, they felt rejected by their social environment. They came to us because their social network could not help them.**’ When it comes to peer support it differs. When friends are or have been in similar situations, then they can find a lot of emotional support from each other. However, most of the time friendships slowly grow apart due to the fact that they live in two completely different worlds. Annebe Vries explains ‘**Very often colleagues and I would ask about who they can rely on when they have found a place of their own. Who can you ask to help you move, or who could watch your baby for a few hours. Very often they could not name a person. Or perhaps they wouldn’t want to bother a person. I was under the impression that there wasn’t a social network available.**’

### Food choices

From the interview conducted with Annebe Vries can be derived that there was a lot of friction when it comes to food and the rules about them at the teen mother house and that there was a big need for structure and schooling on meal preparation.

At the Iriszorg facility there is a shared kitchen and living area. Girls were assigned to do certain tasks, such as grocery shopping, cooking and dinner was always together. Annebe Vries explains **'We had restrictions; pizza, fries or something like that (fast food) only once a week. They couldn't comprehend why they couldn't put a pizza in the oven. They have a strong preference for any kind of fast food. If you are used to eating that stuff, you will miss it. It is mostly convenience because cooking is believed to take too much effort and time.'**

During the end of the stay they have learned from each other how to cook. Annebe explains, **'Very often they like to talk about how they prepare dishes from their cultural background, the girls liked that.'** In addition, they realise how much money they were spending on ready-to-eat meals, and that cooking yourself is tastier and cheaper.

## 2.1.5 KEY INSIGHTS

The following contextual factors need to be taken into account:

- The target group is dealing with a lot of **uncertainties and practical issues**, such as education, housing and income. This makes them very insecure and indecisive.
- The target group is mentally working to cope and accept the change that is happening in their lives i.e. small(-er) or **no social network, breakings with important relationships**, having (new) responsibilities.
- Due to their current situation and previous made decisions **psychological factors** such as low self-esteem, **self-efficacy**, and **cognitive dissonance** are often apparent in this target group.
- The changes in attitudes often occur after the baby arrives, as primal mother instinct kicks in those young moms start taking responsibility for their child and they start making things happen, with respect to education, housing and income.

### Self-efficacy

'Self- efficacy is the belief in your own ability to successfully perform a specific behavior.'

### Cognitive dissonance

'Cognitive dissonance is a theory of social psychology in which an uncomfortable feeling is caused by holding conflicting ideas simultaneously. People may change their beliefs, attitudes and actions but in turn reduce their dissonance by justifying, blaming and denying the change that they have made.'

When it comes to communication and the transfer of knowledge the following insights need to be taken into account:

- A huge need for **structure**; knowing where you are going and how to get there. Even though the girls want **a feeling of being in control**, there is still a big need for confirmation, as a pat on the back.
- The lack of **knowledge in nutrition and preparing meals**. During their stay they like to share 'their' cultural kitchen and they are learning together.
- During their stay, their own experience teaches them that their perceptions on time, money and effort, with regard to self-prepared meals, was wrong.

## 2.2 FOOD BEHAVIOR

### 2.2.1 INTRODUCTION

The author chose to define **food behavior** as ‘An behaviour shaped by food, personal, cultural and social factors that create certain attitudes, perception and beliefs leading to what, how, where, when and why a person consumes a food product or not.’ This paragraph puts a bigger focus on the behaviour of pregnant teens concerning food. Therefore one needs to immerse themselves in their circle and to retrieve their attitudes, perceptions and beliefs from their personal perspective.

#### Food behavior

‘A behavior shaped by food, personal, cultural and social factors that create certain attitudes, perception and beliefs leading to what, how, where, when and why a person a food product consumes or not.’

In order to do so a contextmapping research has been performed. It is a technique that includes a sensitizing booklet and a generative session to gain a deeply layered knowledge of the target group (Sleeswijk-visser et al., 2005). The research is layered in several steps in order to reach a deeper level of knowledge, see *Figure 9: framework contextmapping session*. The goal of the research was defined as ‘A true understanding of pregnant teenagers their daily life and behavior’ during the generative session the focus was put on ‘understanding influencing factors (personal, cultural, social) in food behavior and identifying the needs and values’. A pilot session was performed at the teen-mother house of ‘Zij aan Zij Leger des Heils in Zeewolde’, with participant A and B after which minor alterations were made. Subsequently a second session was held at the teen-mother housing of ‘Siriz in Delft’ with participants C, D and E, see *Figure 8: participants contextmapping session*. The participants received a self-made gift; a baby bandana napkin and towel (see *Figure 12*). Both of the conducted sessions were audio and video recorded as well as analysed afterwards. Moreover this research in Appendix 3: Contextmapping.

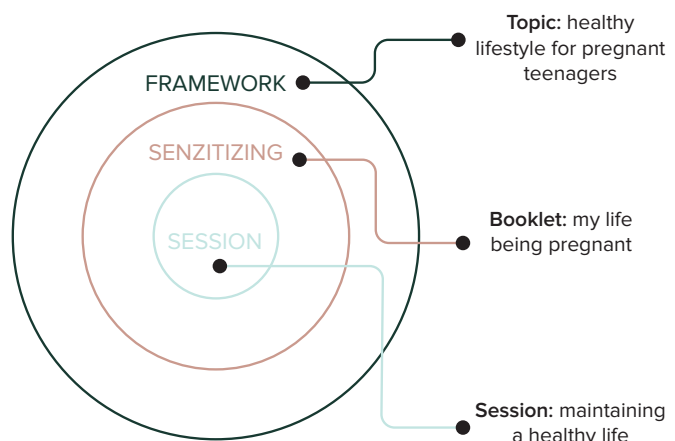


Figure 9: framework contextmapping session

PARTICIPANTS	AGE	PREGNANCY DURATION	CULTURAL BACKGROUND
Participant A	19	34 week + 4 days	Dutch
Participant B	17	20 weeks	Dutch
Participant C	18	33 week + 2 days	Hindu
Participant D	19	3 month old baby girl	Antillian
Participant E	18	5 month old baby boy	Colombian

Figure 8: participants contextmapping session

# ...dag uit mijn leven...

...tijdin gebetaliseerd aan wat je doet  
...de de dag (activiteit, hoe laat en met wie)  
...in je tijdin aan wanneer je denkt aan of bezig  
...ant voor de baby. Bijvoorbeeld: je koelt jou kindje  
...schroeven of je koopt een schattig rompertje.  
...Gebruik de emotion sticker vel en geef a  
...van deze activiteit vind.



Figure 10: image of a timeline

## 2.2.2 CURRENT LIFESTYLE

The participants had to fill in a small booklet with five assignments as homework prior to the generative session. The booklet can be found in the back cover of the report. As stated in the goal part of the objective was to understand their daily life. It became clear that the girls staying in teen mom housing had no daily activities besides the mandatory chores at the house. The counsellors provide them structure through specific breakfast, lunch and dinner times, preventing them from staying in their rooms all day. Their minds are completely focussed on the baby though none of the girls were in school. They all mentioned the intention to continue or to start a new course after the baby is born and once they're settled. Obtaining a degree is highly valued among the girls. However, turning matters into action is a difficult task at this moment in time.

Since most people and friends are working or in school their days are mostly filled with resting, sleeping, 'chilling' and their phone. The girls make intensive use (>2 hours) of Whatsapp, the paid apps Spotify and Netflix, Facebook, Snappchat and Instagram throughout the day. Paid applications are often shared to split costs. See *Figure 10: image of a timeline*.

When it comes to their current nutritional habit, the girls differ a lot. Some girls are aware of 'bad' and 'good' food and are trying to improve their eating habits. Though some still prefer and continue to consume fast foods on a daily basis. Food cravings are also apparent and tend to include mostly include fast-food such as fries, pizza, pancakes. These kinds of food are predominantly consumed with friends.

### Attitudes, Perception and Beliefs regarding healthy food

There is a strong understanding of what types of food are nutritional beneficial and what kinds of food are not. However, the reason why certain food types are nutritional valuable and how it affects the body is not clear.

A prevailing attitude among the girls is that they do want to eat healthy due to the pregnancy and acknowledge the benefits of eating healthy. However it takes a lot of effort and discipline to do so. It is too easy to give in to the strong rooted habits of comfort and convenience.

Other noticeable perceptions that emerged from the session are:

- It believed that drinking water is only for losing weight.
- That fast-food isn't cheaper than healthier alternatives.

*Figure 11: perceptions and beliefs regarding healthy/unhealthy food* summarizes certain attitudes, perception and beliefs that occurred during the generative sessions.

***'I was addicted to energy drink before and drunk lots of soda as well, nowadays I drink more water and dairy products... and fruits! I never ate fruits before!' - Participant C***

***'I eat exactly the same as before my pregnancy... for me nothing has changed' - Participant A***

**Needs and values**

Several values have been valued as most important:

- **The baby is valued most** and scaled highest in the list of priorities together with having a place of your own and personal health due to the pregnancy.
- A diploma and those considered family
- **The status of being a mother;** being a mother give you rights. The right to make your own decisions and those are respected by the family.
- The usage of the following apps is being valued and even paid for: Spotify, Netflix. **‘Counselor: You need to pay for that application, right? Participant C: True, but without spotify you can not live, you need to have spotify. I share my account with my cousin, so then it’s not that expensive’.** In addition apps such as: Whatsapp, Instagram, Snappchat and Facebook are identified as ‘not being able to go without it’.
- **Not to be perceived as less,** this participant is concerned on how she will be perceived when she will start a new course, since she expects to be older than others partaking that course. **‘Participant D: I want to do something in tourism... but I still need to see how and what... I don’t want to be in a classroom or full of toddlers.**

The following needs have been identified as most important:

- **The need for activities during the day.** Most girls aren’t in school and feel bored throughout the day. As a result they use their phones the entire day.
- **The need for interaction with peers,** a social network during the day
- When it comes to their food choices, they do want to eat healthy but **do not know where to start and how to continue it.** Making healthy choices and to vary every time is difficult.
- Participants were open minded in the thought of improving their food choices, but had different opinions on how to do it; some were already taking steps to improve their nutritional health and felt the need for professional **coaching** (in the background) to help them. Some need an elder to teach them how to cook. Some need a peer or friend to start this off together. Some like to partake this journey individually but would like to have someone/something to provide them the knowledge and conformation in the background.

	<b>ADVANTAGES</b>	<b>DISADVANTAGES</b>
<b>UNHEALTHY</b>	Tasteful Fast Cheap Easy Convenient	Feel quickly hungry again Gaining weight/add fat Health is deteriorating (e.g. hair, and skin) Unhealthy food can be more expensive in the long run Feeling lazy and having less energy
<b>HEALTHY</b>	Mood improves Tastier Feel fulfilled for a longer time Feeling more energetic Knowing that you eat healthy (mentally) endorses and motivates more to become healthier (physically)	Takes more effort to come up with ideas of what to prepare Takes more effort to vary Takes more effort to obtain No motivation to eat healthy Difficult to continue (longer time) Less tasty (‘rewarding with a cucumber’)

**Figure 11:** perceptions and believes regarding healthy/unhealthy food



Figure 12: image of the author making and preparing the gifts

### 2.2.2 INFLUENCING FACTORS IN FOOD BEHAVIOUR

Extensive research has been done on the influencing factors in behaviour towards food. Each factor takes in a lesser or bigger part in the forming of attitudes, beliefs and perceptions towards food consumption. Safefood (2012) created an overview and discussed these factors. It divided these factors into four domains: personal factors, social situation, culture & (wider) environment and food factors. A mindmap has been created to display these factors, see *Figure 13*. Due to the extensiveness of the Behaviour towards Food topic the most relevant factors will be discussed in relation to the target group for this graduation project. The complete overview can be found in Appendix A3.3.

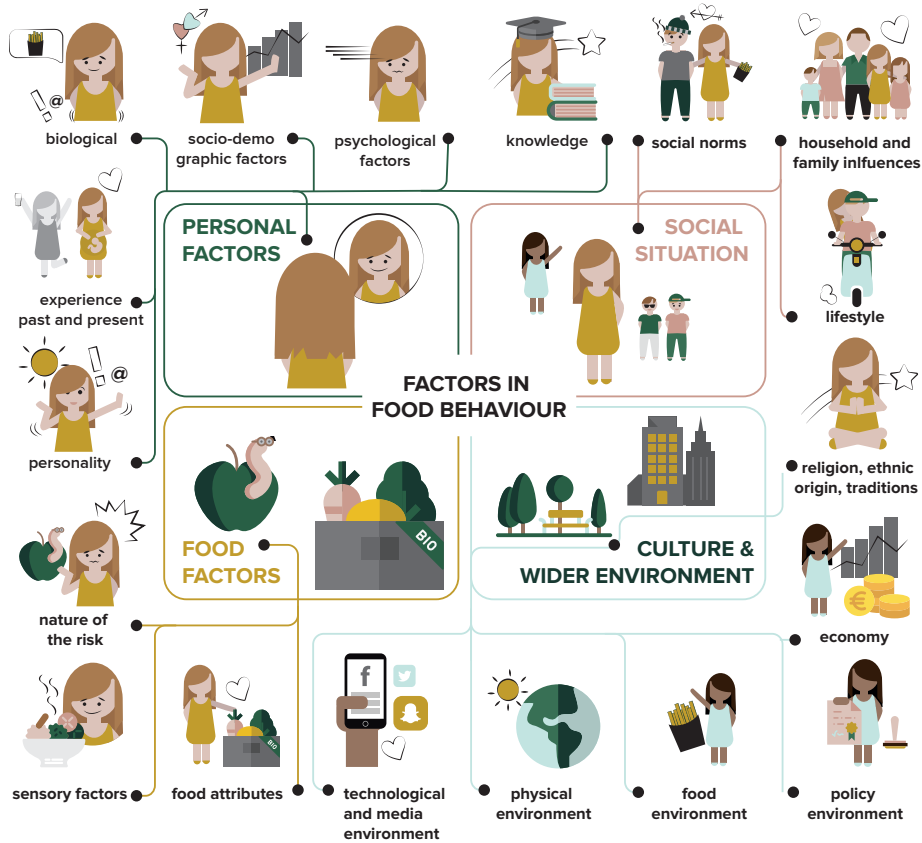


Figure 13: factors in food behaviour based on Safefood (2012)

**Personal factors**

Figure 14, illustrates the personal factors related to the behaviour towards food these are personality traits, past and present experiences, biological factors, the socio-demographic factors of a person, the psychological factors and the knowledge a person possesses regarding food. In these factors there are several aspects that need to be taken into account for the target group.

- Both professionals and participants indicated the need for social learning through experience, as can be read in paragraph 2.1.4.
- Peoples' attitude towards healthy eating is proven to differ according to their age, gender, educational level and SES (Wilcock, et al., 2004) – The target group is relatively young, from a low SES and is starting to learn the responsibility of preparing a meal. Nonetheless, it's proven that women are more likely to be dieting and attach greater importance to healthy eating (safefood, 2012).
- Emotions are dominating pregnancy due to the hormonal fluctuations. Pregnancy food cravings occur regularly and are usually cravings for fast food.
- Because girls have to deal with their mental health and their self-image (self-efficacy and self-esteem) that is often badly damaged due to the contextual factors described in paragraph 2.1.3. All participants describe their need for someone or something in order to change their nutritional habits.
- Psychological factors such as cognitive dissonance and optimistic bias: Participant C describes in her booklet that she thinks it's not right to smoke once a while, but she continues to smoke and tries to justify that. Participant B explains that her smoking doesn't affect the baby because he (the baby) is growing just fine.
- The participants themselves explain that they could gain something when it comes to knowledge about cooking and the education on nutrition.

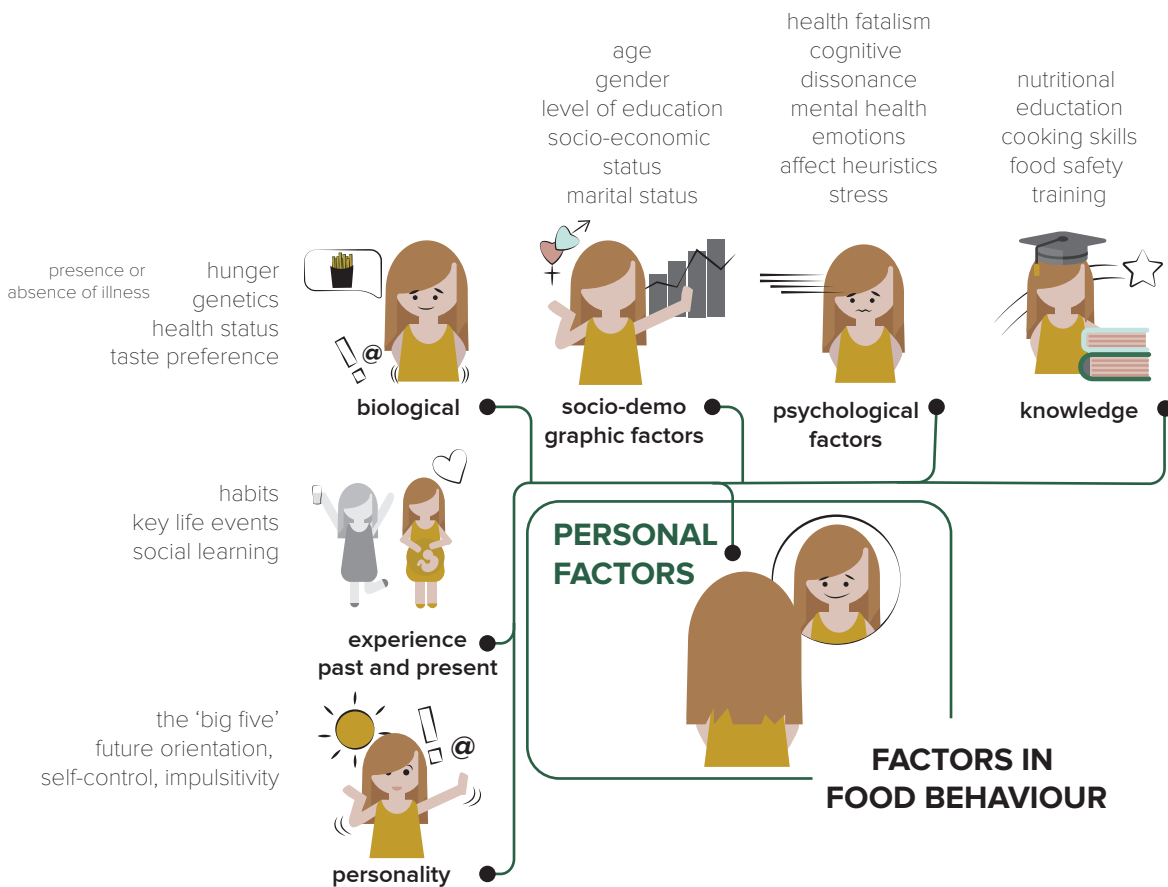
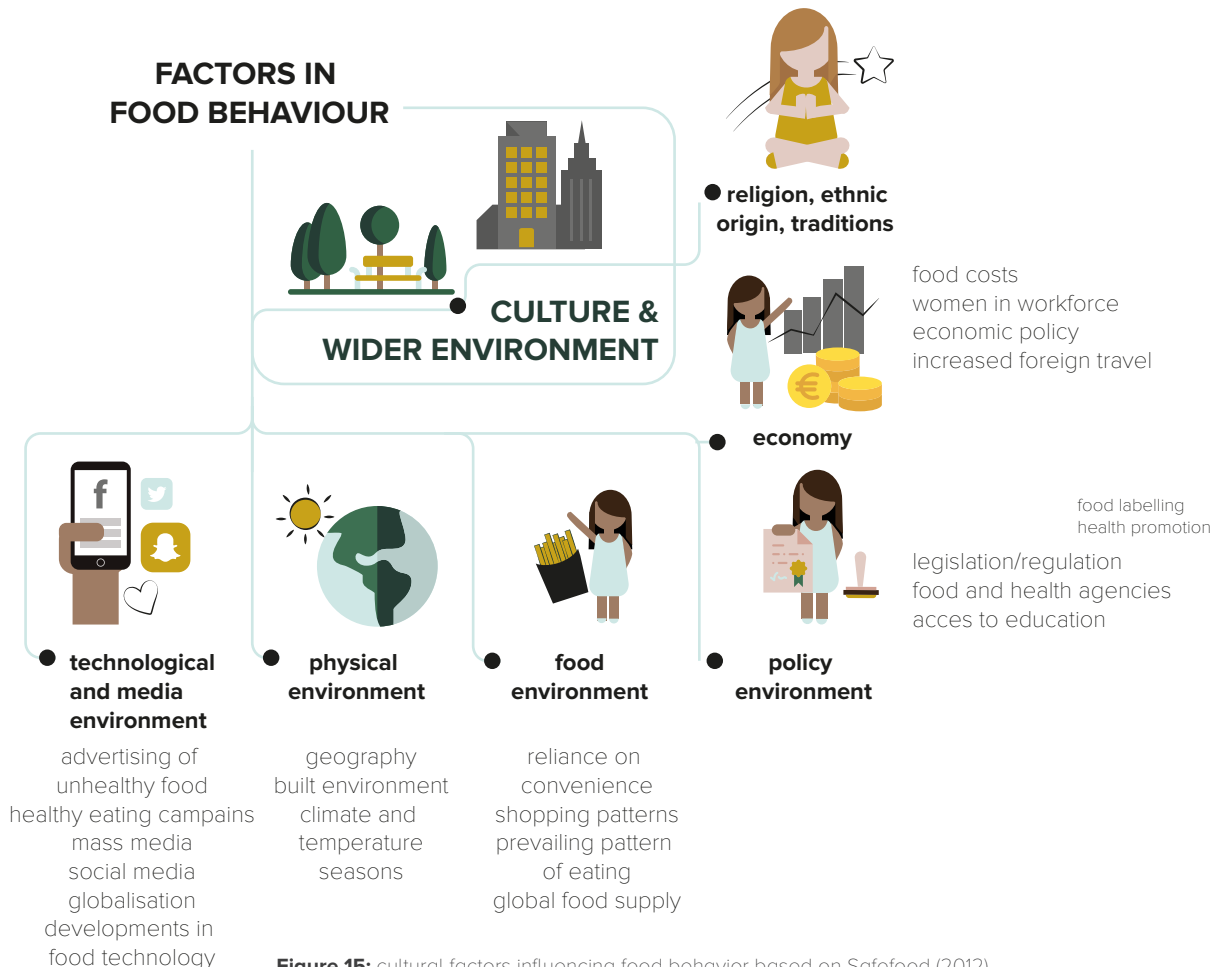


Figure 14: personal factors influencing food behavior based on Safefood (2012)

**Cultural and wider environmental factors**

Figure 15, illustrates the cultural and wider environmental factors related to behaviour towards food: these factors are religion, ethnic origin and traditions, economical factors, policy-, media-, physical-, technological-, and food environments. Among these factors there are several aspects that need to be taken into account for the target group.

- Cultural values are proven to be important predictors of a person’s opinion about products and issues. Religion, ethnic origin and traditions have a major influence on the food choices a person makes. As Annebe Vries explained before in paragraph 2.1.4 girls like to share their cultural dishes. Even though sometimes they do not exactly know how to prepare it. This became apparent during the session were three participants from three cultural backgrounds (Dutch Antilles, Colombia and Dutch-Hindu), were planning to cook together and discussed on how to prepare a Columbian meal.
- Economical factors such as food cost and
- women in the workforce are influencing the girls’ food choices as well. Research proved that both adults and adolescents indicate price as the one of the most influential factors determining their choice in food (Lappalainen et al., 1997; French, S. A. 2001; Shannon, C. 2002). Participant E explains: ‘In general healthy food is more expensive except when you are in a supermarket, there you can find cheaper healthy foods.’
- The rapid rise in the use of social media and the increased importance of the ‘word of mouth’ marketing indicates that this medium may become an important influencer of behaviour, including the behaviour towards food (SafeFood, 2012).
- When it comes to the factor food environment there is a huge reliance on convenience that has emerged as a key factor in consumer food choices. People are eating out more frequently. Shops and restaurants are open longer, which makes it easier to gain access to food including having it delivered.



**Figure 15:** cultural factors influencing food behavior based on SafeFood (2012)

**Social factors**

Figure 16, illustrates the social factors related to food behaviour, these are social norms, household and family influences and lifestyle. Within these factors there are several aspects that need to be taken into account for the target group.

- In the teenage subculture there are social norms and mostly peer influences
- Parental influences, the interviewed participants look up to their mother or grandmother and their choice and/or opinions of food. Their choices in food and opinion of food have a major influence on those of the participants.
- Although the interviewed participants were not in school, some pregnant teenagers are. Hence the school environment plays an important role in terms of presence or absence of a health-promoting environment.

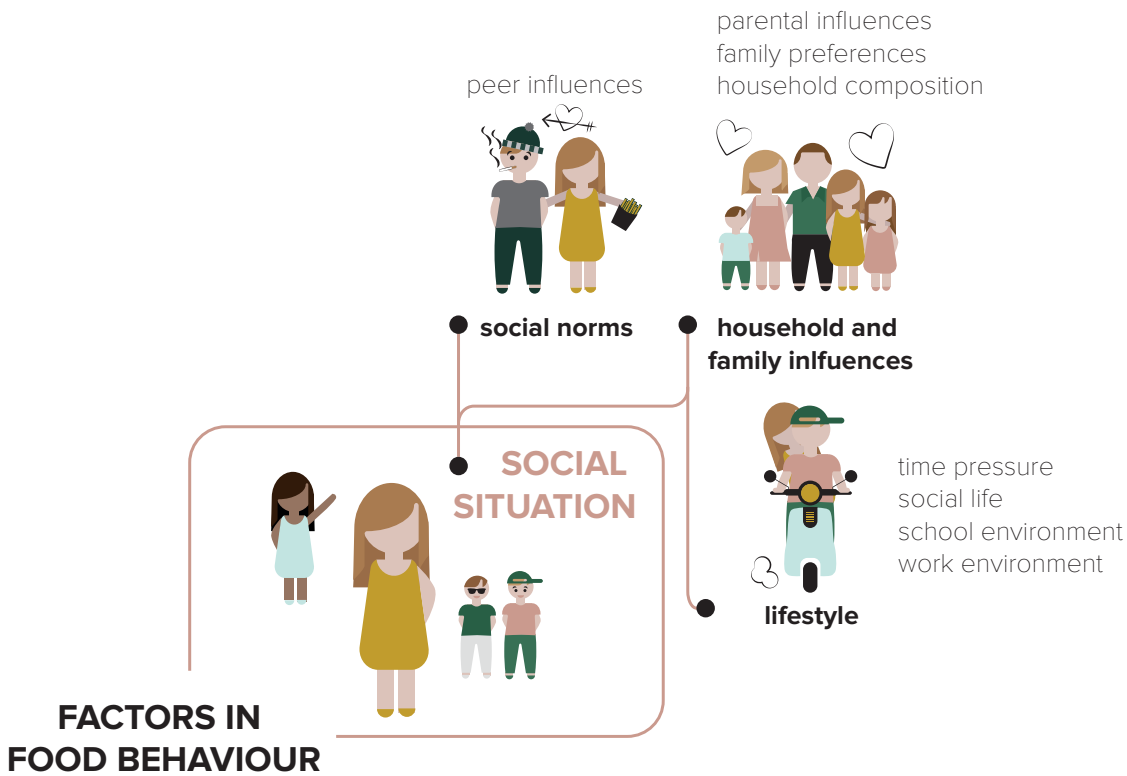


Figure 16: social factors influencing food behavior based on Safefood (2012)

## 2.2.4 KEY INSIGHTS

The goal of the research was defined as **'A true understanding of pregnant teenagers their daily life and behaviour' and 'understanding influencing factors (personal, cultural, social) in food behaviour and identifying needs and values'**.

Key insights regarding their daily life and behaviour:

- No scheduled daily activities, most girls are thinking to start school, but keep postponing until they are settled.
- Extensive use of their mobile phones and applications on it for two reasons: no scheduled daily activities and to stay in contact with others (outer social network).
- Strong understanding of what types of food are nutritionally beneficial and what kind of foods are not. The why and how is unclear.
- Fast food is being consumed on a regular basis, though some participants made some improvements, others eat what their body craves.
- Girls are open-minded and are willing to learn to improve their nutritional habits and food choices with the help of someone or something.
- Convenience is one of the biggest factors of their choice in food.

During the generative session the following needs and values have been identified:

- Having a place of your own and personal health because of their pregnancy.
- A diploma and those considered family.
- The status of being a mother; being a mother gives you rights. The right to make your own decisions and these are respected by the family.
- Not to be perceived as less.
- Need for daily activities, interactions with peers and a social network during the day.
- Guidance; Someone or something that tells them how to start and how to continue. The way they want to receive this information differs; some prefer professional coaching, an elder, a peer or friend or just content. They need confirmation of being on the right track.

The influencing factors that appear among the participants are:

- Personal factors; a need for social learning, age and social economic status that shapes attitude and beliefs regarding their food choices, a possible lower self-image (self efficacy and self-esteem) due to their situation, psychological factors being used as coping mechanisms (cognitive dissonance and optimistic bias).
- Cultural and wider environmental factors: food costs, cultural background, social media and the reliance on convenience.
- Social influences: peers and parental.

## 2.3 PSYCHOLOGY OF BEHAVIOURAL CHANGE

### 2.3.1 SELF DETERMINATION THEORY

To get acquainted with the psychology of behavioural change the author delved into the Self-Determination Theory (SDT). It is a macro theory of human motivation and has been successfully applied to various domains of life e.g. education, healthcare, sports, virtual worlds and more (Deci, Olafsen & Ryan, 2017). The theory was initially developed by Deci and Ryan, and has been elaborated and refined by scholars from many countries.

#### The Self-Determination Theory (SDT)

The combination of the words ‘motivation’ and ‘teenager’, can either be interpreted as ‘difficult’ or ‘inspiring’. People are often concerned on how to motivate themselves or others. Whether they are parents, teachers or employers who found it difficult to motivate the one they mentor. Or individuals that struggle to find the energy and effort to fulfil a task. External factors such as rewards and grades might give the extra push to succeed; this is called extrinsic motivation. On the other hand there are also people who are driven from within, e.g. by interest, curiosity or values. Due to their drive they experience joy and satisfaction when they complete. This is called intrinsic motivation.

According to Deci, Olafsen and Ryan (2017) there are various types of extrinsic motivation with each having predictable consequences. This so-called autonomy continuum has been visualised and

can be found below *Figure 17*. Achieving a strong sense of autonomous motivation is what ideally is needed to be achieved with this graduation project. Being autonomous refers to acting with a sense of volition and the experience of willingness (Deci & Ryan, 2012). As can be seen in the visualisation, autonomous motivation consists of both intrinsic and well-internalised extrinsic motivations.

Motivations are mediated by three psychological needs. SDT identifies three psychological needs that an individual need to experience in their social context in order to achieve a strong sense of autonomous motivation, engagement of activities and wellness.

**Autonomy** – the experience of acting with volition and willingness, in congruence with one’s own goals, needs, values and identity

**Competence** – the experience of ones (growing) ability to achieve the desired change in the world

**Relatedness** – the experience of an intimate connection with others

Once the above-mentioned psychological needs are not being supported enough in the social context, it will have a negative effect on the individual’s wellbeing. The social-contextual factors that satisfy the three basic psychological needs will stimulate autonomous functioning, persistence, effective performance (especially on heuristic tasks) and wellness (Deci & Ryan, 2012). These three needs can serve as criteria points once the design phase is entered.

	A-motivation	Extrinsic motivation				Intrinsic motivation
		controlled motivation		autonomous motivation		
KIND OF REGULATION	non-regulation	external regulation	introjected regulation	identified regulation	integrated regulation	intrinsic regulation
SOURCE OF MOTIVATION	absent	external	partially external	partially internal	internal	internal
MOTIVATION REGULATORS	no intentions incompetence lack of control	rewards threats	self-esteem ego status	valuing the activities acceptation	congruence	interest enjoyment satisfaction

Figure 17: Table 1 autonomy continuum based on Deci, Olafsen and Ryan (2017)

### 2.3.2 SOCIAL MARKETING APPROACH

A well-known approach to achieve behavioural change in the health sector is the social marketing approach (Kotler and Lee, 2008). Social marketing is not a theory but framework derived from several disciplines such as psychology, sociology and communication (Gordon et al., 2006). It uses various communication formats, edutainment and pays attention to social, cultural and regulatory environments.

Social marketing focuses on voluntary behavioural change by making it attractive. It uses its foundation in commercial marketing (4P's) to do so. Social marketing has widened from a primary focus on the individual to the wider environmental issues impacting on behaviour. It identifies barriers to change and overcomes those difficulties by 'packing' positive behaviours together while it highlights its value(s) to the individual. It advocates change through mutual exchange of benefits. It is therefore necessary to understand why the target group behaves the way it does and how they can be persuaded to change behaviours, and what they would value in exchange as has been researched in the previous paragraphs 2.1 and 2.2. The marketing mix or four 'P's adopted from commercial marketing practices include (Safefood, 2012):

- **Product** (tangible and intangible) – the benefit of the behavioural change activity, intangible complex behaviours and the behaviour you want the target audience to adopt
- **Place** – communication and distribution channels
- **Price** – what the target group has to give up in order to develop the behaviour
- **Promotion** – persuasive communication.

### 2.3.3 KEY INSIGHTS

- The SDT provides the theory of identifying different kinds of motivation that are apparent in the target group and what kind of motivation regulations can be used.
- Some participants had no intention to improve their nutritional habits they are unmotivated.
- Other participants had little intention and needed external regulators to motivate them such as threats and rewards. This kind of controlled motivation only works briefly.
- Very few showed sincere interest and had tried to pursue an improved nutritional lifestyle, they have been identified as regulated. This kind of autonomous motivation sustains an activity or behaviour.
- The concept should use any kind of controlled motivation to educate and stimulate the target group towards a healthy nutritional lifestyle. It is highly appreciated if the concept triggers a transition towards any kind of autonomous motivation, so that they will continue this behaviour after their pregnancy.
- To focus on voluntary behavioural change.
- To identify barriers that need to be changed
- To overcome the barriers using 'packed' positive behaviour and to highlight its value
- To make use of the exchange of benefits



## CHAPTER 3 | DEFINE

Setting a clear direction for the following phase is the next step in the process. This chapter displays the findings from the previous chapter in a translated set of guidelines as a direction to move forward with. Simultaneously, those guidelines will serve as a list of criteria points that measures the suitability of the concept.

This chapter will describe:

- >> The Conjunction of the key findings
- >>The Design Goal (what) and Interaction Vision (how)
- >> The representation of the target group (who)

### 3.1 DESIGN GUIDELINE

#### 3.1.1 CONJUNCTION OF THE KEY FINDINGS

An overview of the key findings has been created and visualised in order to have a clear overview, see *Figure 18*. The findings are divided into the following separate sections through the use of the theory of the social marketing approach: Daily life and behaviour, influencing factors, barriers to change, needs and values. The concept needs to overcome the barriers, visualised as a bridge, by highlighting their values while their needs are being satisfied.

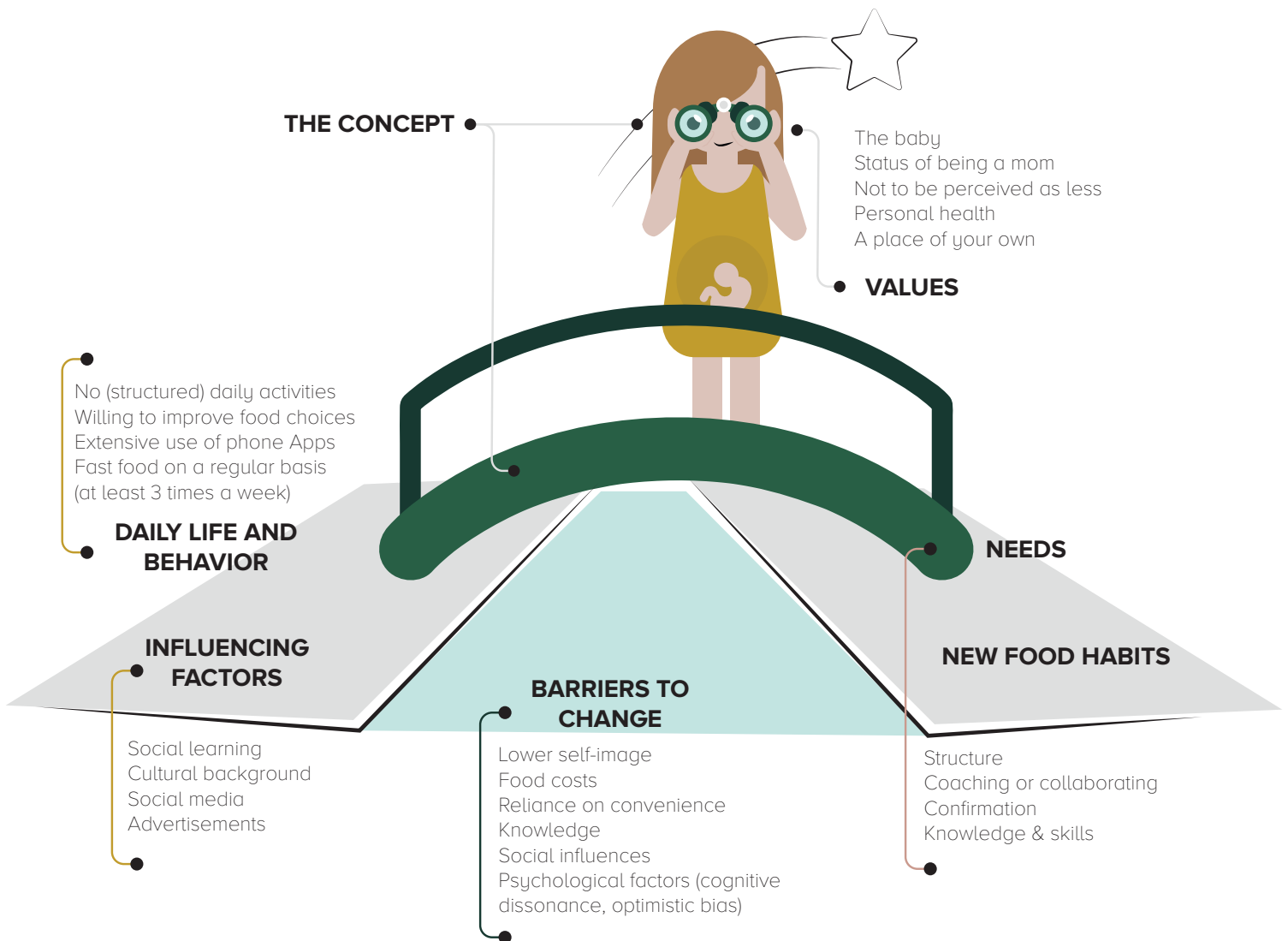


Figure 18: conjunction of key findings

### 3.1.2 OVERVIEW DESIGN GUIDELINES

Based on Paragraph 2.1: Teen Mothers the concept should:

1. **Allow the target group to (re-) gain self-confidence and self-esteem:** Due to their current situation and previous made decisions psychological factors such as low self-esteem, self-efficacy, and cognitive dissonance are often apparent in this target group.
2. **Allow the target group to reconnect with others:** The target group is mentally working on coping and accepting the change that is happening in their lives i.e. small (-er) or no social network, breaking with important relationships, gaining (new) responsibilities.
3. **Act with a main focus on the baby:** The changes in their attitude often occurs after the baby arrives, as a primal mother instinct kicks in, those young mothers start taking responsibility for their child, they start to make things happen.
4. **Have a clear structure but allows the target group to be in control.**
5. **Offer some kind of confirmation,** that lets them know that they are on the right track: The target group is dealing with a lot of uncertainties and practical issues, which makes them very insecure and indecisive.
6. **Provide knowledge and/or to be able to exchange knowledge about nutrition and the preparation of food:** There is a lack of knowledge about nutrition and preparing meals, during their stay they like to share 'their' cultural kitchen and are learning together.
7. **Allow the target group to learn through experience:** Their own experience during the stay teaches them that their perceptions of time, money and effort with regard to self-prepared meals, was wrong.

Based on Paragraph 2.2: Food Behavior the concept should:

8. **Activate the target group during the day:** No scheduled daily activities, most girls are thinking to start school, but keep postponing until they are settled.

9. **Be connected with their mobile phones somehow:** Extensive use of their mobile phones with applications for two reasons: no scheduled daily activities and to be in contact with others.
10. **Provide knowledge on why and how certain foods or nutrients are beneficial:** A strong understanding of what types of food are nutritionally beneficial and what kinds of foods are not. The why and how is not clear.
11. **Highlight the values:** The status of being a mother, not to be perceived as less, having daily activities, having peer interactions during the day.
12. **Provide different forms of guidance:** Someone or something that tells them how to start and how to continue etc. The way they want to receive this information differs; some prefer professional coaching, an elder, a peer or friend or just content. They need confirmation of being on the right track.

The concept needs to take into account:

13. **A need for social learning.**
14. **Cultural and wider environmental factors:** food costs, cultural background, social media and the reliance on convenience.
15. **Social influences:** peers and parental.

Based on paragraph 2.3: Psychology of Behavior Change the concept should:

16. **Use external regulators** to motivate them such as threats and rewards. This kind of controlled motivation only works briefly.
17. The concept should use any kind of controlled motivation to educate and stimulate the target group towards a healthy nutritional lifestyle. It is highly appreciated if the concept triggers a transition towards any kind of autonomous motivation, so that they will continue this behaviour after their pregnancy.
18. **To focus on voluntary behavioural change.**
19. **To overcome the barriers using 'packed' positive behaviour and to highlight its value.**
20. **To make use of the exchange of benefits.**

## 3.2 CREATING A DESIGN GOAL AND INTERACTION VISION

### 3.2.1 DESIGN GOAL (DG)

The following main objective was created at the start of the project: “to design a product or service that will support pregnant teenagers living in low- Socio-Economic Status (SES) to help them better their food choices in order to provide the right environment in which a fetus can properly develop”. Extensive research has been performed (see chapter 2) sketched a clear understanding of the target group and their situation; the key findings derived from that research were shown in the previous paragraph. The intended result of the project is to reinforce good food choices of pregnant teenagers and young mothers-to-be through design, by means of the following design goals:

#### DESIGN GOAL

**‘TO CREATE A SET OF EXPERIENCES THAT ENGAGES YOUNG MOTHERS-TO-BE TO MATURE TOWARDS A HEALTHY NUTRITIONAL LIFESTYLE DURING PREGNANCY’**

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### 3.2.2 INTERACTION VISION (IV)

A common technique used to express how the goal (the ‘what’) needs to be achieved is to make use of a vision; a so-called interaction vision that stresses how the product should interact with the user. The best way to describe that IV is to make use of a metaphor.

**Standing in front of a crowd, filled with people you don’t know, you feel insecure. You feel like running away but you can’t, because the band already started to play the melody. There is no running away anymore. You start your performance with the help of your band. While doing so you gain confidence. The more confidence you gain the more the crowd responds. You feel worthy and feel you have accomplished something. You are the one leading the band.**

The next time you feel more familiar, you have gained more confidence, you are still a little uneasy but you know that the reward is fulfilling beforehand. Until you feel comfortable on stage and dream of nothing else but being on stage, because it makes you feel good. The next time you get more familiar, gained a bit

**User** – The users are defined as young mothers-to-be. Though, the focus will be on teenage pregnancies until the age of 20, the word “mother-to-be” is chosen to emphasise the future perspective instead of ‘pregnant teenager’ that seemingly stresses a negative tone, hence the positive focus of this project.

**Context** – The moment a young mother-to-be decides to accept and commits to (coming) motherhood during pregnancy.

**Effect** – The maturing or growing into a healthy nutritional lifestyle during the girl’s growth into a mother. More in the next section 3.2.2: Interaction Vision.

more confidence, still its not easy but you know upfront that the reward is fulfilling. Until you feel comfortable on stage and dream of nothing else, because it makes you feel good. The translation from the metaphor in relation to the concept is as follows:

The band: the concept

The melody: an activator of the concept

The performance: healthy food

The crowd: opinion of others

#### Interaction qualities

Characteristic feelings that are obtained from interacting with the product are so-called interaction qualities. These feelings are the feelings that are valued and needed within the target group and therefore need to be highlighted, as explained in section 2.3.2 and paragraph 3.1. Thus, should the concept should bring forward the following interaction qualities

- Feeling accomplishment (status of being a good mother, gaining skills and confidence)
- Feeling worthy (taking good care of the (unborn) baby, not to be perceived as less, understood, loved, gaining confidence)



Figure 19: image methuon



## CHAPTER 4 |

## CREATE & ITERATE

This chapter will release the ideas that have been emerging throughout the conducted researches described in previous chapters. Ideas will be turned into a concept on which several iterations will take place. Various interventions have been conducted to make those iterations and improve the concept.

This chapter will describe:

- >> The idea generation process
- >> The explanation of the concept
- >> The concept interventions

## 4.1 IDEA GENERATION PROCESS

### 4.1.1 BRAINSTORMING

A brainstorm session was held with three fellow graduate students. A technique called 'how could you?' was used to loosen up and think out of the box. With this technique, you write down a question per sheet. Each sheet is passed to the next one after a minute. Each question is answered with a drawing or text. It is also possible to continue to build on somebody's idea. To set up the right questions, the design guidelines were used.

After this input the researcher continued generating ideas (see Appendix: 4), clustered them and came out with three different directions e.g. (1) growing vegetables to build a relationship with food (alone or with a community greenhouse), (2) food-related challenges and social learning (challenges in an advent calendar) and (3) connecting with others through a common goal (build a picnic blanket together out of recipe clothes). It became clear that many ideas had something in common; having a challenge.

This element fits well with the design guidelines. Completing a challenge can increase self-confidence and the feeling of worthiness (see 3.2.2: Interaction vision). This element can be used in diverse ways. The researcher decided to elaborate more on (2) food-related challenges and social learning.

### 4.1.2 THE IDEA CONTINUATION

Another element that arose during brainstorming was the current trend of advent calendars. Those calendars can be purchased in December and are well-known chocolate boxes for children. Each day of December the child is allowed to open one door and eat the chocolate. Currently, this has evolved and has become a huge trend among cosmetic companies such as (LUSH, Rituals and the Body shop), all having their own advent calendar filled with items. Advent is Latin for 'arrival'. The idea arrived that with the items in an advent calendar the pregnant teenager can educate herself nutritional-wise, before the arrival of her baby. The idea to use some kind of advent calendar as a reward and motivator in combination with a cookbook of food challenges evolved into a concept that can be read in the next paragraph.

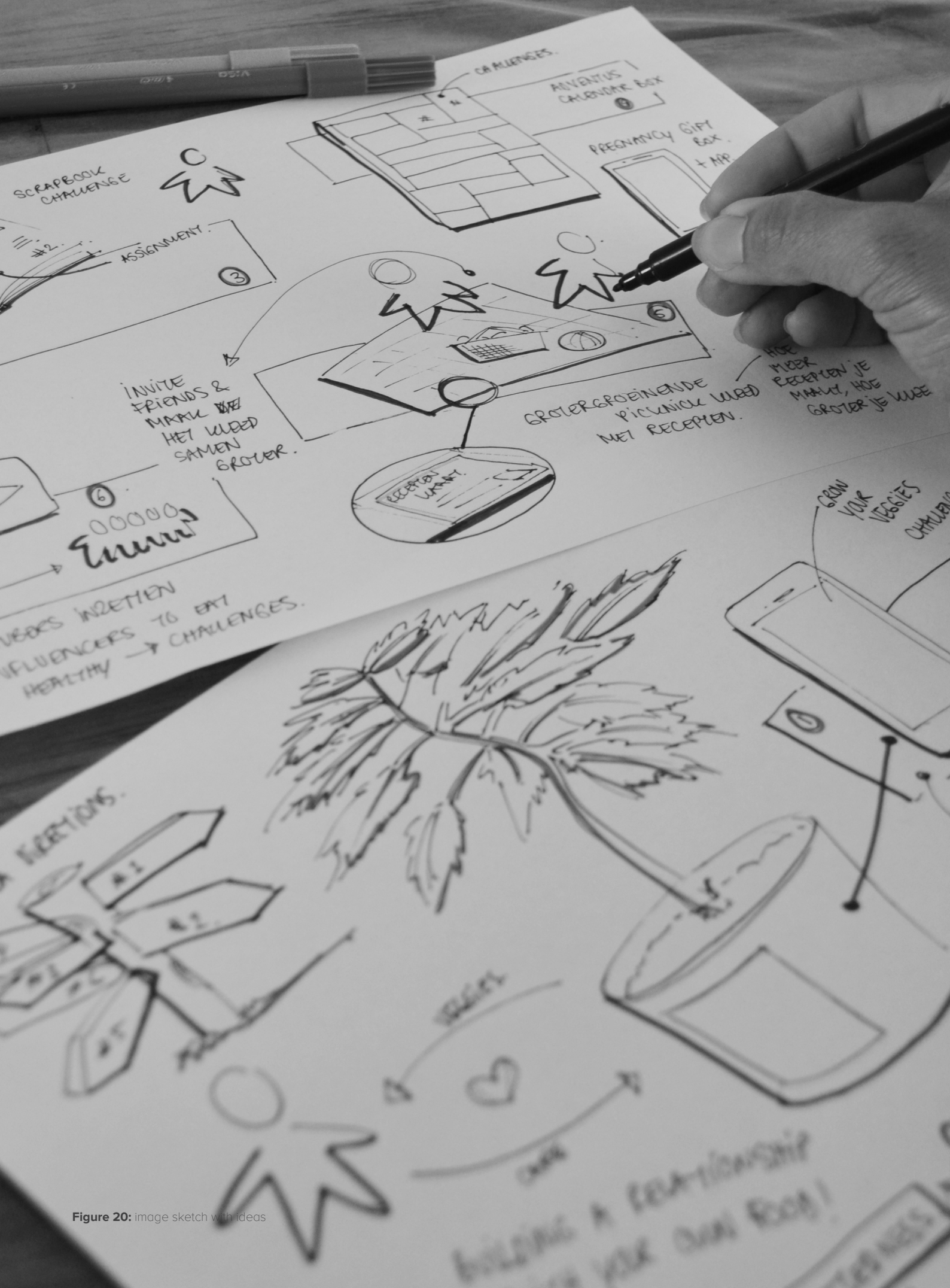


Figure 20: image sketch with ideas

## 4.2 CHOSEN CONCEPT

### 4.2.1 CONCEPT EXPLANATION

The concept is a 'gamified' idea of a 'learning cookbook calendar' where small challenges are given. The goal of the game is simple: to complete all challenges. During each challenge players gain knowledge about a nutritionally related subject and are provided with tools to put the newly gained knowledge into practice. After a challenge is completed and a new challenge automatically opens, once 'proof of completion of the challenge' is shared with, and replied to by other players. Thus, you need each other's positive feedback to continue the game. The main goal is to complete all challenges and to obtain all the tools. Simultaneously, the player gains the knowledge and skills to be able to continue this road after the game is completed..

The concept consists out of two elements a product: **the gift box** and a service: **the online platform**.

#### The gift box

The gift box is comparable to any other (free) gift boxes that pregnant women can apply for, such as the 'Blije doos' from the Prenatal baby store. Except this box consists out of tools to use during the challenge in order to improve and stimulate healthy nutritional habits. In this box a new gift can only be opened once a player has started/accepted a new challenge.

The gift box serves as the activator and motivator for two reasons; (1) it's kept in sight, which reminds you to continue and (2) it consists out of tools (rewards) that can be opened each time a challenge is completed. The urge to open a new reward serves as a motivator.

#### The platform

The online platform has taken the shape of an App. This app is the facilitator of the game. It facilitates knowledge of the nutritionally related subject and content of the challenge. It connects and facilitates communication with other players. And allows the player to open a new tool from the gift box to start a new challenge.

The platform provides a wide range of challenges, from learning new recipes to learning how to read nutritional food labels. It helps the player to continue to build skills and knowledge in order to pursue this road after the game is finished, since the tools, knowledge and skills are handed over.

Figure XX visualizes how the concept works.

A name has been created for the concept:

#### Hello Preggo! - Food Challenge

Preggo is short for a person who is pregnant in urban language. Preggo is often used on social media.

### 4.2.2 CONCEPT DISCUSSION

Now that a concept has been ideated it is noteworthy to mention how it corresponds with the guidelines, DG an IV set out in the previous chapter.

#### Design guidelines

There are several guidelines that touch the core of the concept such as (2) re-connect with others, (5) offers conformation, (6& 10) provide knowledge, (7) learn by experience, (9) connected with their phones, (15) make use of social influences, (16 &17) use controlled motivation regulators, (18) focus on voluntary behavioural changes (20) make use of exchanging benefits.

There are some guidelines that are apparent in the concept but they need to be further worked out during the coming iterations such as (1) the gain of self-confidence and self-esteem, (3) to act with the main focus on the baby, (4) to have a clear structure but to allow the target group to be in control, (8) to occupy the target group during the day (11) to highlight the values, (12) to provide different forms of guidance, (14) to take into account wider cultural and environmental factors and (19) 'packing' the values.

# HELLO PREGGO! FOOD CHALLENGE

**Figure 21:** concept drawings

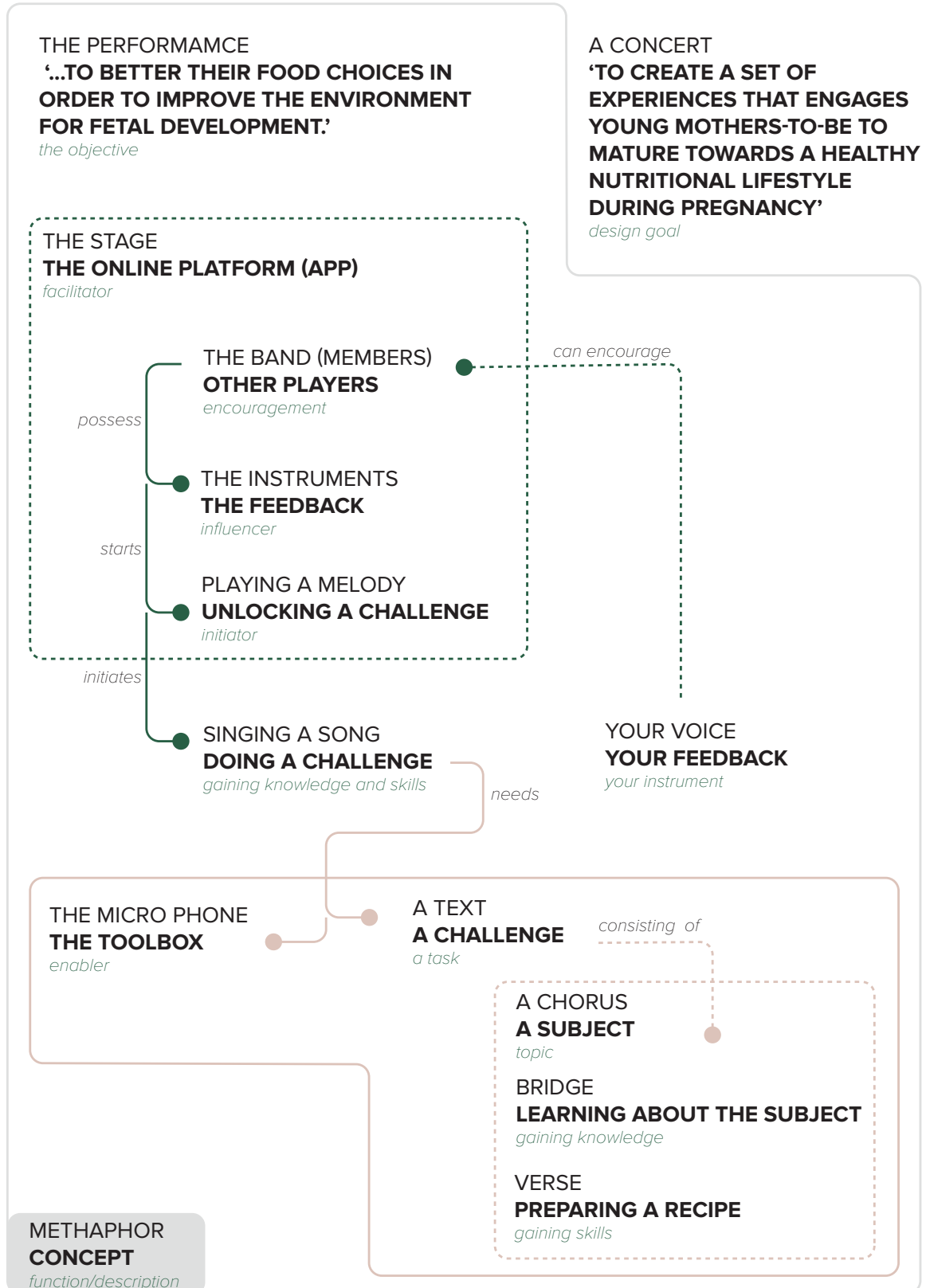


Figure 22: Extended Interaction Vision (IV)

## DG and IV

The concept suits the DG very well since it offers multiple experiences with each challenge that is given during their pregnancy. *Figure 22* has been created to explain the concept using the IV.

The **stage** (App) is the facilitator. It allows the band, (other players) possessing **instruments**, (feedback) to start a **melody** (unlocking a challenge). The melody (unlocked challenge) initiates to sing a **song** (doing an assignment). However, in order to do so, you need a **microphone** (a toolbox) that enables you to sing a song (doing an assignment). You need a **text** (a challenge) as well. The text consists out of different elements; the **chorus** (subject) explaining the main topic, a **bridge** (gaining knowledge) bridging between the chorus and verse, and the **verse** (gaining skills by practice). A text (challenge) can consist out of multiple verses. Your **voice** is an instrument as well. It's your instrument (your feedback). By using your voice towards the band (other players) you can encourage them to start a new melody (unlocking a challenge) for you.

In this IV the performance is the objective: '... to better food choices in order to improve the environment for fetal development'. And giving a concert is the design goal: **'to create a set of experiences that engages young mothers-to-be to mature towards a healthy nutritional lifestyle during pregnancy'**.

-

## 4.3 INTERVENTION #1: TESTING THE CONCEPTS ARCHITECTURE

### 4.3.1 INTRODUCTION

A lot of thoughts have been put into how to test the interactions between the user(s) and the concept. A preliminary brainstorm session on 'how to translate the concept into practice' was held and can be found in Appendix 5: Intervention #1.

A session was organised with Stichting JAM, a non-governmental organisation that offers trainings for young mothers (to-be), a perfect occasion to test the concept. The objective of this session was to gain insights into the user-product interactions. Does the concept evoke the intended interaction qualities of feeling accomplishment and feeling worthy? What can be said about the way that knowledge is offered to the participants? What can be said about providing skills? Do the gifts stimulate the participants to complete the assignments? What can be said about the communication platform? Does the concept fit with the different levels of needs apparent within the target group, when it comes to cognition, intelligence and ability?

The session was held in a community centre in Arnhem, from where Stichting JAM normally provides their training. In total six pregnant girls and young mothers participated in the session, see *Figure 23: participants intervention #1*. Parts of the session were audio and video recorded and pictures were made. Moreover the session can be found in Appendix 5: Intervention #1.

### 4.3.2 TESTING

Six different assignments were created, each consisting of a small instruction booklet, post-it's the necessary tools and ingredients. Each assignment had its own colour and had to be finished within 15 minutes. Once completed an assignment the participant can hand the assignment over to another participant (player), using the same-coloured post-its attached to the assignment (key). When starting (unlocking) a new assignment they receive a gift (a tool) that they will use during there assignment. The goal in the session was to collect all the colours and thus complete all assignments/ collect all the gifts. At the end of the session an evaluation talk was held, to receive their feedback over the concept. See *Figure 24*, *Figure 25* and *Figure 26*.

PARTICIPANTS	AGE	AGE CHILD(REN) / PREGNANCY DURATION
Participant A	24	2 years
Participant B	18	1 year
Participant C	19	34 weeks pregnant
Participant D	26	3 years & 2 months
Participant E	24	5 years
Participant F	19	2 years

**Figure 23:** participants intervention #1



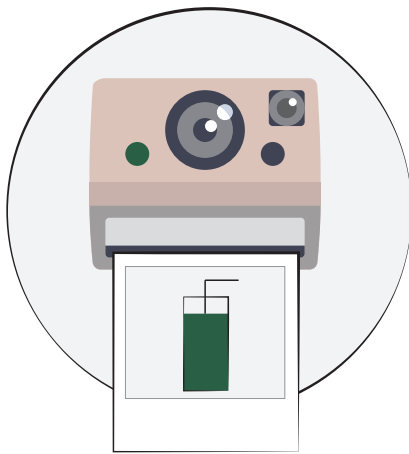
Figure 24: image of a participant doing a challenge



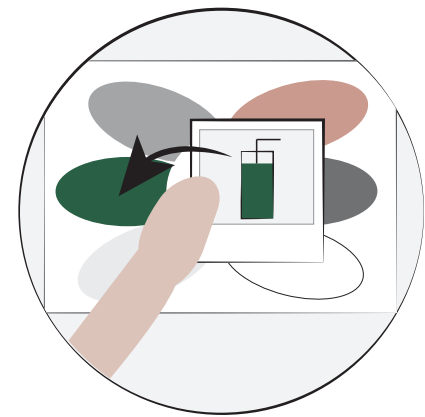
1. Each participant received a personal main page. This main page has six different colours, resembling the six different assignments. In addition, the participants could fill in some personal information, such as name, age and nutritional habits.



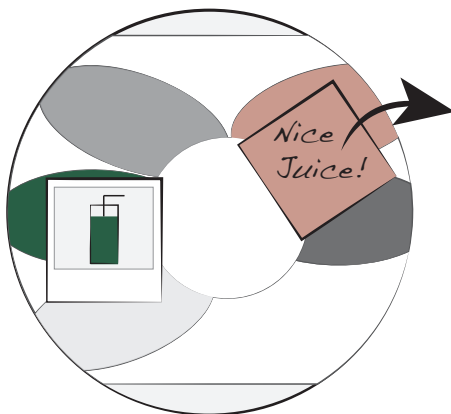
2. To start off, each participant received a key (post-it), in a specific colour belonging to the same-coloured assignment.



3. Once the participants completed the assignment, they needed to prove it by sharing a picture of the assignment on their own main page, where others could see it and comment on it. They used a Polaroid picture to do so.



4. Since each colour stands for an assignment, they had to place their picture on the colour of their just completed assignment.



5. Handed with the assignment were keys (post-its). They had to take one off and stick it on other players (participants') page with a positive comment on that person's picture. In this way, they unlocked that assignment for another person.



6. Some other player (participant) did the same for her. She received a new coloured key (post-it) with a positive encouraging message on it. This allowed her to go to the next assignment.

Note that not all players have to receive a key (post-it) it was possible that some received two and others none. And had to wait around and try to do better in order to receive a key (post-it).

**Figure 25:** steps during the session

### 4.3.3 RESULTS

#### During the session:

- The participants had a clear mission: to complete all the colours. And they were diligent to do so. The assignments were clear and where open to try new things.
- Very enthusiastic about the gifts they received. “wow, I almost bought that one”
- They were positively surprised most of the time about their findings or the taste that their creation had.
- The assignments were traded between participants, instead of using the personal page.

#### Feedback session:

The participants found the session very informative in a fun way. After explaining the ‘real concept’ participants responded: (A): ‘I would love to have tried that out during my pregnancy’ another participant (B) reacted and said ‘to be honest, I know I would have eaten healthier’ then (A) continued and said ‘You know... I was really scared to eat, I did not know what I was allowed to eat and then in the end I barely ate. For example salami, I did not know if I could eat that and then I just left it. (B): Yeah you get a list from the midwife, but it does not really say anything.

Participant C said: I ate healthy but did not have a lot of variety.

The comments on their personal page were not always read. They were too busy trading and looking for assignments they haven’t done yet. Though, they found it fun to comment on other persons. Though some results shocked them (example the amount of sugar in cans of soda), they keep using them due to habits. Participant A said:

***‘To break this habit??... Learn in a fun way like this but repeatedly’.***

*Participant A*

Other participants mentioned that they found it important that other persons are enjoying it, for example her daughter and that the time and budget needs to be taken into account. Some preferred partaking this alone while others liked to do assignments together. One pregnant participant who is eating consciously explained that she is eating healthy but still learned a lot during the session. A time frame of 2-3 months would be a good way to start.

### 4.3.4 DISCUSSION

At the introduction of this paragraph some research questions were set-up, that will be answered here.

The interaction qualities are difficult to measure though participants were happily sharing their results and talking about the things they have learned the researcher felt a sense of accomplishment among them. Whether this gives them a feeling of worth or not, that can only be measured in the long-term once they have gained enough knowledge and skills that could turn into a change in attitude.

When it comes to the knowledge offered, small improvements can be made. In the session, mainly text was used with icons. Short - between 150-180 words - and clear information was given about the subject and its relation to the pregnancy and unborn baby. With a few instances the surprise made them read it out loud for the whole group, but in some cases, they were optimistically biased. Therefore the information needs to affect them personally.

The concept teaches the participants new skills in terms of how to prepare easy, fast, healthy recipes. Each recipe had its own options so that they were able to customize it to their own wishes. This was taken very positive and they were eager to discover new tastes. One participant who was making a juice said: ‘this is good but it needs a little bit more lemon’ and added a piece of lemon.

The communication platform did not work as intended. This was due to certain reasons: (1) the participants were all in the same room and able to communicate outside the personal page, with a result that they were trading their assignments. (2) The participants were really focused on collecting all the colours within the amount of time available. This is not the case in the intended digital version of the concept. Participants were interested in seeing the results of others and found it fun to comment on it. In the feedback session, they mentioned that they were trying to make pretty pictures and that comments on their pictures could encourage them to continue with the assignments.

As described in paragraph 3.3, persona's were created to describe the differences of needs and wishes within the target group. During this session, the participants varied as well, with respect to cultural background, religion, food consciousness, skills and knowledge. The concept proved to be fit with the different levels of food consciousness, skills and knowledge but could be taken into account the cultural background and religion more by e.g. introducing cultural related recipes variations. This was not taken into account once designing the assignments, due to the fact that the participants were not going to 'cook', but prepares a small snack instead.

#### 4.3.5 MAIN INSIGHTS

- A very positive reaction on the concept, it was received very informatively and fun.
- A motivator to learn and improve their eating habits. All participants agreed that they could or could have used a tool like this.
- The concept needs to taken in to account the time and budget of the target group.
- Alterations on the concepts' architecture need to be made on knowledge transfer, the communication platform and how to incorporate cultural diversity. This was tested using rapid paper prototyping and not digital. Note that this part was not tested according to how the concept is envisioned.



Watch a compilation of this intervention on **vimeo**. Password: Thesivideos2018



Figure 26: image of a participant doing a challenge

## 4.4 INTERVENTION #2: BENCHMARKING

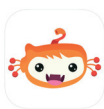
### 4.4.1 INTRODUCTION

The previous paragraph showed how the target group responded on the concept and if the user-product interactions were as intended. It showed that the core of the concept appeals to the target group, but alterations need to be made on the 'facilitating' part of the concept; the online platform. During the first intervention, this part wasn't digital and thus not online. During this intervention, the researcher seeks for other health, nutritional, pregnancy-related (gamified) Apps to learn more about 'how to realize this platform in a meaningful and logical way?' The objective is not 'reinvent the wheel' but learn from others. Since no Apps were found that match the core of the concept, eight apps were selected and categorized into the following three groups: Nutritional/health games, Nutritional Guide apps, Healthy pregnancy Apps. Note that, all categories representing an essential part of the concept. The goal is to collect the desirable features of the selected apps and convert them into the online platform (App) of the concept. Moreover in Appendix: 5.

### 4.4.2 SELECTED APPLICATIONS AND THEIR FEATURES

Applications were selected based on app characteristics, user interface features and content regarding (nutritional) health and how they relate to the desirable features of the concept. Keywords to search were: Nutrition, health, Pregnancy and gamification. Moreover, these apps can be found in Appendix 5.

#### Nutritional/Health Games



**1. Hello YOOP:** Hello Yoop is a health game for youngsters. YOOP is a virtual pet created to learn how to live healthy.



**2. 'Eicel zoekt zaadcel':** The game consists out of one simple task; to fertilize the ovum by bringing the sperm cells to the ovum and overcoming different obstacles while doing so.

#### Nutritional Guide Apps



**3. Fooducation:** This app offers recipes, a food journal and a supportive community to improve your nutritional habits.



**4. Kies ik gezond?:** A grocery-shopping tool that allows you to compare nutritional values of products and it provides advice for healthier options.



**5. Mijn eetmeter:** Nutritional diary that gives an overview of your daily, weekly (average) and monthly (average) nutrients.



**6. Wholesome healthy eating:** This app provides in-depth knowledge about nutritional values and nutrients. You can find delicious recipes from food bloggers, find other people and keep a food diary.

#### Healthy pregnancy Apps



**7. Hello Belly: pregnancy Tracker:** The app offers practical pregnancy tips, mommy yoga exercises and baby growth visuals from the womb.



**8. Glow nurture pregnancy App:** Glow Nurture is the world's most comprehensive pregnancy tracker, in addition, it contains a wide community in which you can be part of many different groups.

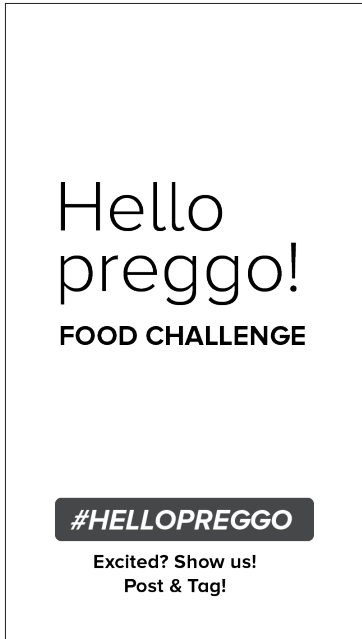
A list with desirable app features has been created based on the guidelines set up in 3.1.2 overview guidelines shows which desirable feature is apparent in what App, see *Figure 27*. The researcher will look at how these features work in those apps in order to synthesize these features into the concept.

### 4.4.3 TAKEAWAY

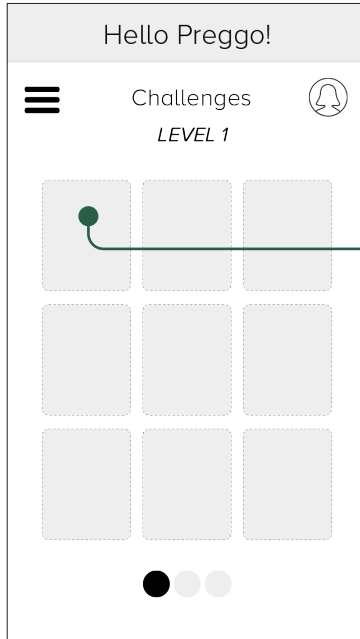
The synthesis took place during a 'think tank' session with fellow graduate students. *Figure 28* shows A framework that has been build that describes how the user navigates through the app. This framework will be worked out in the next chapter.

SELECTED APPLICATIONS	1	2	3	4	5	6	7	8
<b>Interface features</b>								
Communication platform (chat, post, forum)			✓			✓	✓	✓
Video, film, movies, animations	✓	✓					✓	✓
Attractive visuals	✓	✓				✓		
GPS	✓							
Internal search button			✓	✓		✓		
Push notifications			✓			✓		
Customizable	✓					✓		
Camera Access			✓	✓				
<b>Gamification</b>								
Mini Games	✓	✓						
Rewards	✓	✓						
Challenges (+ unlocking)	✓	✓						
Score	✓	✓	✓					
<b>(Nutritional) health education</b>								
Personal health page	✓		✓		✓	✓	✓	✓
Growth baby								✓
Layered Information about nutrition		✓	✓	✓	✓	✓		✓
Recipes			✓			✓		✓
Tips on preparation			✓			✓		✓
Video and film health education							✓	✓

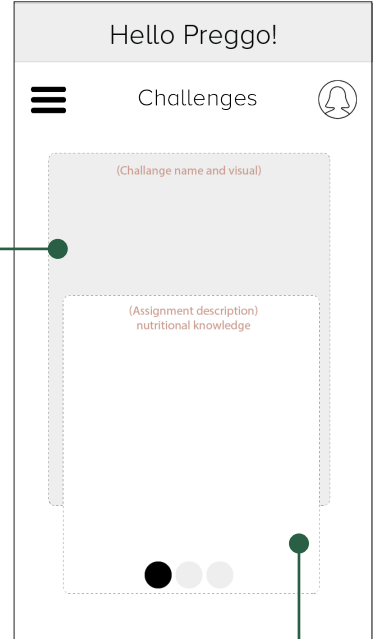
**Figure 27:** Desirable interface features in topic related applications.



This image represents the loading screen of HelloPreggo, with logo and visual.



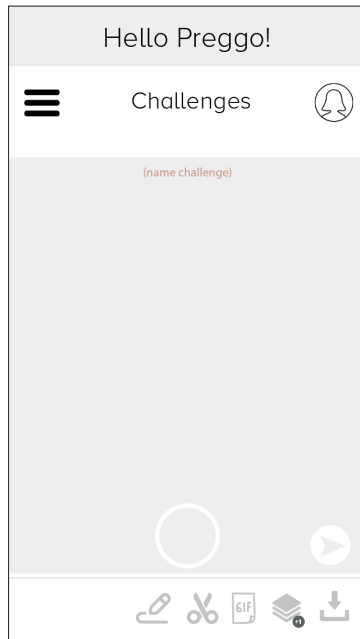
After setting up your account you will be directed to the 'main'screen, which are the challenges. There are three pages with each nine challenges.



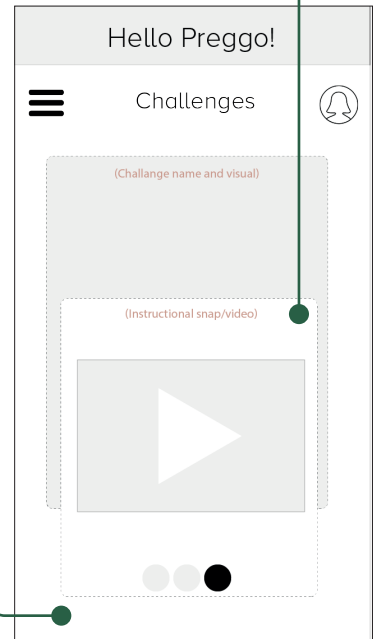
After selecting the first challenge (the only one that is open), nutritional information will be displayed about the topic.



When first signing in, the user is ask to scan the QR which is on the box. So that the challenges are matching the content of the box.

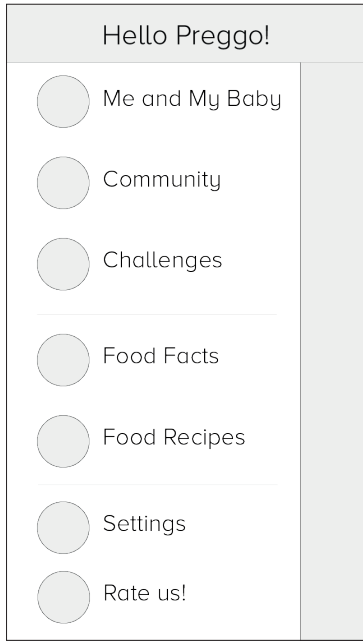


Notifications are used to indicate how much time is left to fulfil a challenge. A challenge is fulfilled after posting it in the community. Tools are available to stylize the image with gifs and layers.

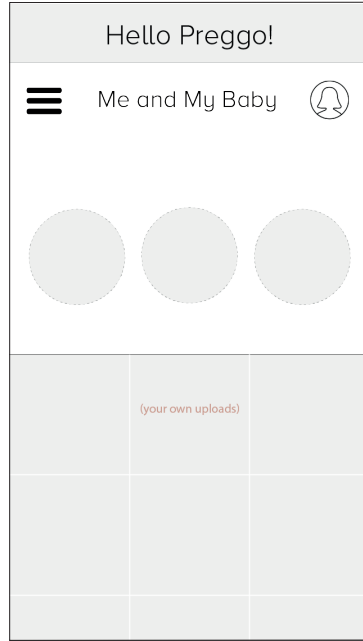


The user can swipe to go to the next page. The last page shows the assignment; tutorial of the recipe.

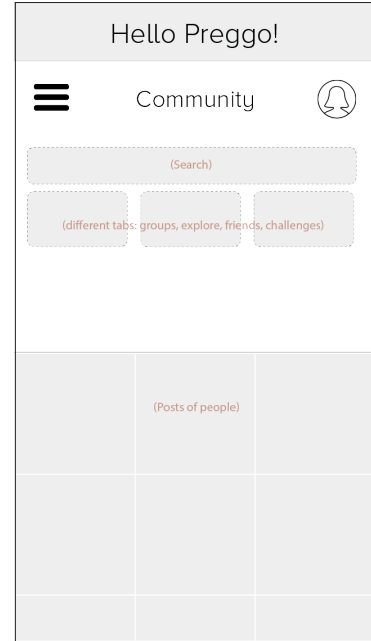
Figure 28: Main framework HelloPreggo App



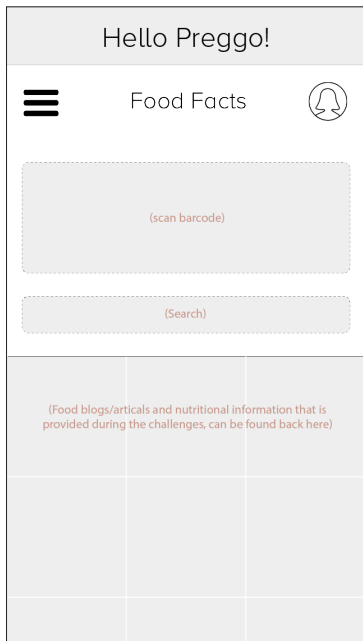
Tapping the menu sign will bring the user to the menu, displaying the App's main components.



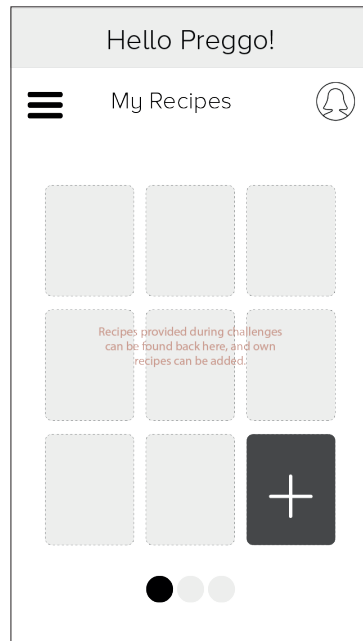
Me and my baby, describes the profile of the user. It delivers content and visuals about the baby growth, personal health and the posted images.



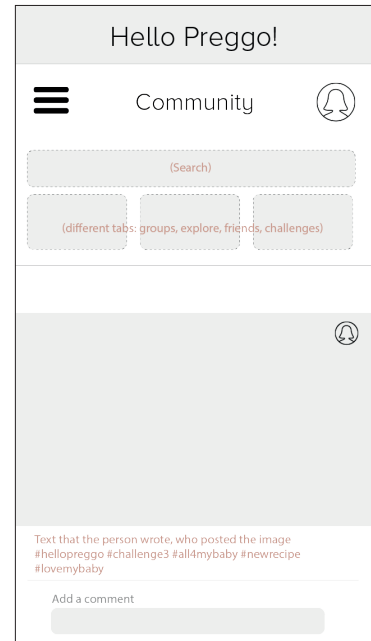
Within the community you can join groups, search specific posts or people. Once tapping on a image, it will direct you to more information about the post. There the user can comment.



Food Facts is an element that facilitates information about nutritinal values. The user can scan a barcode, once grocery shopping and directly sees wether this product is healthy for a pregnant women or not. Nutritional information from the challenges are gathered here, so that the user can always look it up.



Food recipes collects all the recipes gathered from the challenges. There is also a template available to make a recipe of your own. Afterwards you are able to share it within the community.



The post works as many other social media platforms, you can leave a comment. This will unlock a new challenge for this user. She will receive a notification.



HOME

1. ME AND MY BABY (PROFILE)

2. COMMUNITY

4. FOOD FACTS (BLOG)

↳ kennis v/d opdrachten  
↳ SCANNEN PRODUCTEN.1

3. FOOD DAIRY CHALLENGES

5. PERSONAL CHALLENGES

START/LOG!

Hello Prego  
#HELLOPREGGO

POSTED MESSAGES  
INDICATOR PROGRESS CHANGES  
WHO ARE WE (VS ANALISE THE INFO)

PERSONAL NEWSFEED  
SEARCH (LOW)  
THIS CHANGES, EXPLORE FE...

PEOPLE  
PM (CHAT)

IMAGES/SHIPPY  
TEXT

LEVEL 1  
9 CHALLENGES

FOODSCHNUR  
NIEKE NIJE NIJE NIJE NIJE  
SEARCH

Figure 29: Brainstorm on framework 'HelloPrego!' App

# CHAPTER 5 |

# DELIVER

Chapter five pulls the concept out of the papers and brings it alive. This chapter will build on the two interventions that have taken place in chapter four.

A third and final intervention will take place to evaluate the concept. This chapter will provide detailed visualisations and descriptions of the concept. Lastly, and most importantly, the chapter closes with a conclusion.

This chapter will provide:

- >> A detailed concept
- >> A prototype
- >> A usage scenario
- >> The conclusion of the concept

## 5.1 DETAILED CONCEPT AND PROTOTYPING

### 5.1.1 INTRODUCTION

The previous chapter ended with a clear structure of the application of 'HelloPreggo!'. This structure is comparable with the outer lines of a picture once drawing a picture. In this paragraph, the researcher is going to colour in the drawing, by giving content and design to the structure of not only the application but the gift box as well. While doing so, the researcher simultaneously prepares a prototype in order to evaluate the concept later on. To prototype the App, a program called 'Proto.io' was used.

The digital part of the concept, the App, has been divided into three main components: Challenges, Community & Me and My Baby. In addition, two supporting components were added: Food Facts and Food Recipes. The physical part of the concept, the gift box, is the activating and motivational component in the concept. All components will be elaborated in the following paragraphs with regard to the content and design. A start will be made with the logo design and colour palette.

### 5.1.2 COLOR PALETTE AND LOGO DESIGN

#### Mood board & Colour Palette

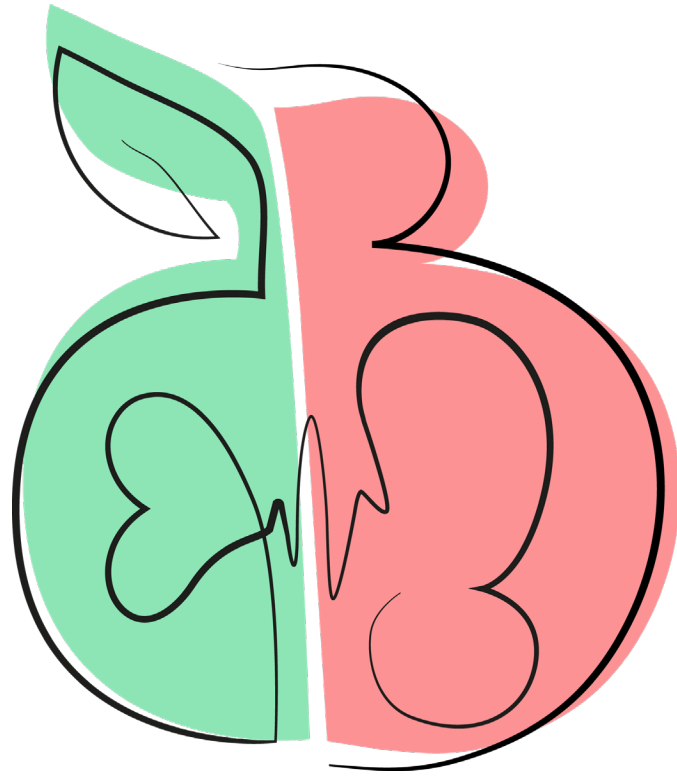
A mood board has been created to create an ambience for the look and feel of the app. Fresh and vivid colours were the base for this design and were inspired by a watermelon. The author decided to include a sketchy and handwriting style that is currently trendy. Combining the sketchy style with vivid colours created the 'youthful and juicy look'.

#### Logo and App icon

The idea behind this logo was to tell the story of 'HelloPreggo!'; how the love for your child can make you eat healthier. As you follow the lines you will find the apple being connected to the fetus through an umbilical cord. As for the App icon, this will be without the lines in order to keep it visually clean while maintaining the actual message.



Figure 30: Moodboard



#8AC8AA



#59B789



#F6BAC3



#4B9D7F



#F29599



Figure 31: colour palette and logo design



Figure 32: Brainstorm on framework 'HelloPreggo!' App

### 5.1.3 CHALLENGES

The ‘challenges’ component is the main feature in the App. The screen of this component will always appear first once opening the app since this is the core of the concept.

The time span of the ‘HelloPreggo!’ Food challenge depends on the quantity, intensity and duration of each challenge. Additional research has been conducted towards habitual change as part of achieving autonomous motivation (see paragraph 3.1.2 design guideline number 17). Research has shown that on average it takes 9 weeks or 66 days for a new routine to become a habit (Clear, n.d.). Based on this fact and the preferred timespan indicated by the participants during intervention #1, it was decided that the complete timespan of the challenge will be nine weeks.

The duration of each challenge varies between one, two or three days. Therefore, ‘HelloPreggo!’ consist out of 21 mini challenges, equally divided over three levels. The intensity as well as the duration increases as the levels continue.

#### Content

As discussed in the IV in paragraph 4.2.2, the content of each challenge consists out of the following:

##### 1. A topic (referred to as the chorus in the IV explaining the subject

The topics of the challenges are based on the Dutch ‘Voedingscentrum’, an organisation that provides information and advice on a healthy nutritional diet. This organisation introduced the ‘schijf van 5’, a guideline of five essential components of a healthy diet. The following five topics are derived from the ‘voedingcentrum’.

- Vegetables & Fruit
- Spreads and cooking fats
- Fish, Legumes, Meat, eggs, Nuts & Dairy
- Bread, cereal products and potatoes
- Drinks

In addition two topics have been added and labelled as ‘not too much, not too often’. These topics will advise on how to keep a balance between healthy and unhealthy foods. In total 7 topics have been selected for the challenges.

- Eating and drinking outdoors
- Cravings

##### 2. Gaining knowledge (referred to as the bridge in the IV) – learning about the subject

This part of the ‘challenge’ component is called ‘weet wat je eet’ (know what you eat). It provides knowledge about the topic with regard to nutritional values and nutrients or knowledge about finances and grocery shopping. As can be found in design guideline numbers 6 & 10 this support the need for knowledge within the target group. There is a strong focus on nutrition in relation to the baby, since that is the main value that needs to be highlighted (see guideline number 3 & 11). The amount of information is layered. For those how would like to learn more about the certain topic, there is an option to read more in-depth information. The basic information is provided as introduction to the assignment. Therefore, teenagers who are less interested still gain basic knowledge regarding the topic.

##### 3. Gaining skills (referred to as the verse in the IV) – such as preparing recipe

The final part of each challenge is the actual challenge. The steps mentioned above serve only as an introduction towards the actual challenge. Now that the user gained some information and received the tool from the gift box full with items, it is her task to complete the challenge. The challenges are diverse, not all challenges will be about preparing a dish and receiving a recipe. Examples of other challenges are quizzes, puzzles and tasks (see Appendix A5: intervention #1). As stated in the scope at the start of the project, no full content will be provided when it comes to the nutritional aspect. The information provided serves only as an example.

#### Design

The following screens have been designed to facilitate this specific component. An important aspect of the design was that it needed to be congruent with the style described in section 5.5.2; color palette and logo design; it needed to be fresh, vivid, youthful and meaningful. The screens below will provide an example of how the informational content of a challenge could look like. See *Figure 33* for an overview of the ‘Challenges’ screens.

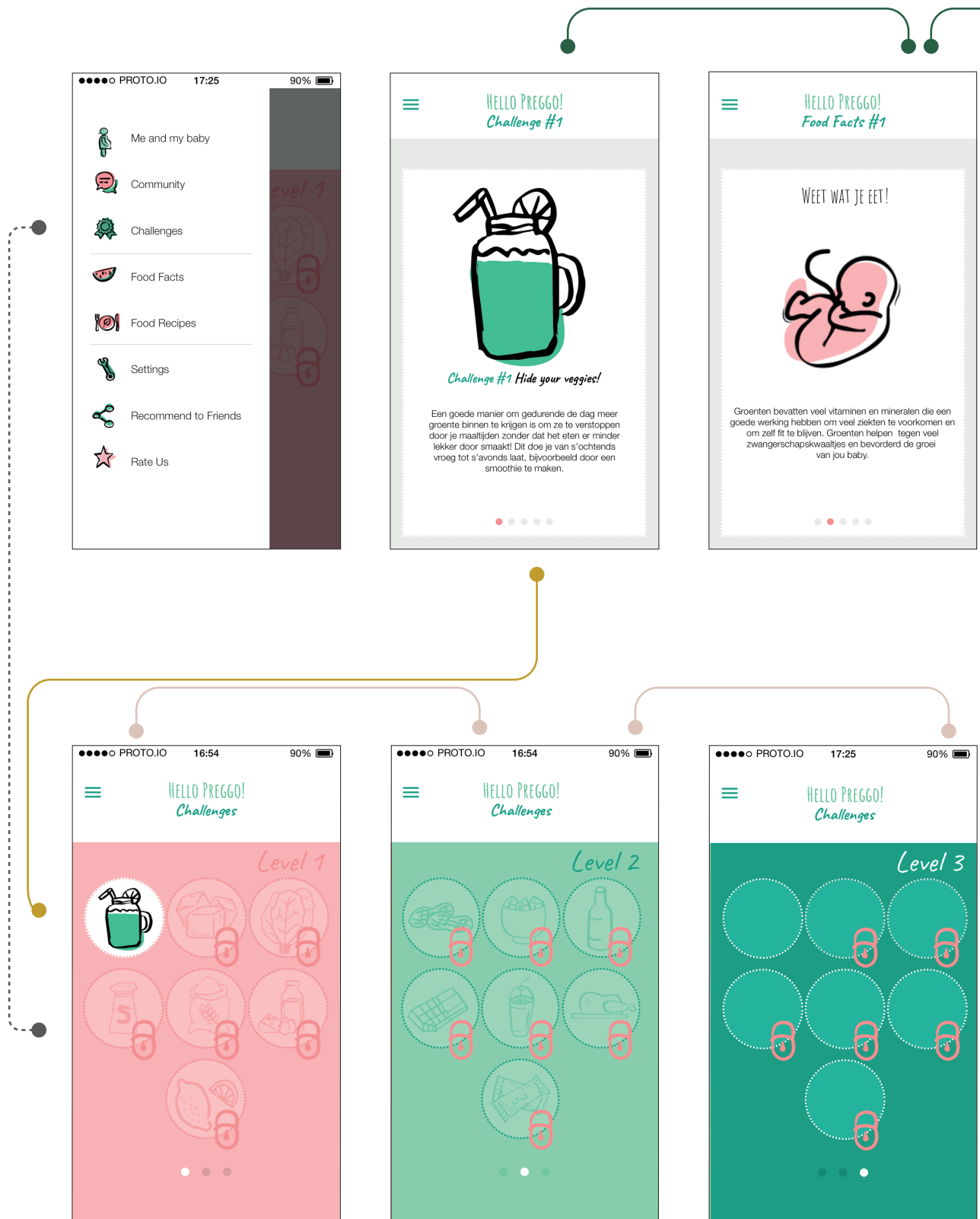
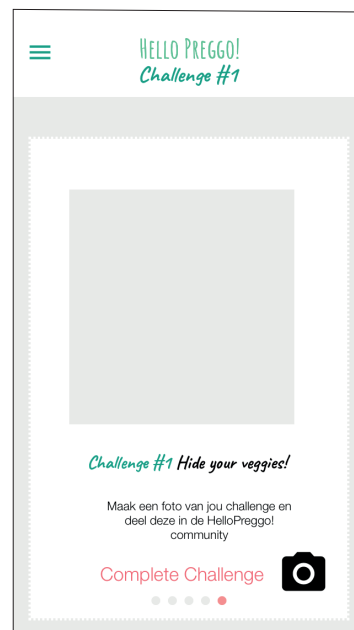
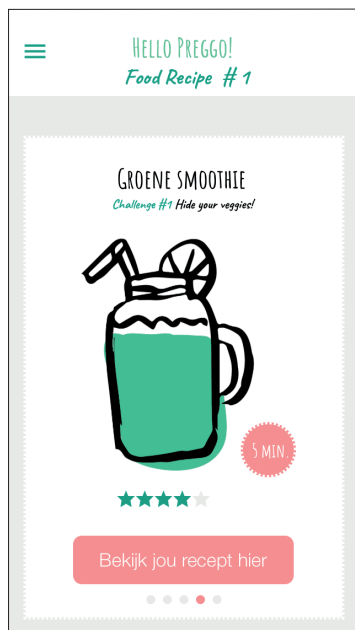


Figure 33: Screens 'Challenges'



### 5.1.3 COMMUNITY

The second component is the feature 'community'. This component serves as a place where young mothers-to-be can connect with each other. This is stimulated by the fact that all users (the young mothers-to-be) have to reply on each other's picture, in order to unlock the next challenge. As described in design guidelines number 2 & 5, there is a need for reconnecting with others and receiving positive confirmation. This component is facilitating both needs.

#### Content & Design

The content of the community is comparable with many other social media applications. Messages and Pictures can be posted and will be visible in a timeline. Others have the option to leave a 'comment' and 'like' the image that has been displayed. Then, since the image is connected to a challenge the software of 'HelloPreggo!' receives the signal to open the next challenge. In addition, there is a search option and subgroups to join. The following screens have been designed, see *Figure 34*.

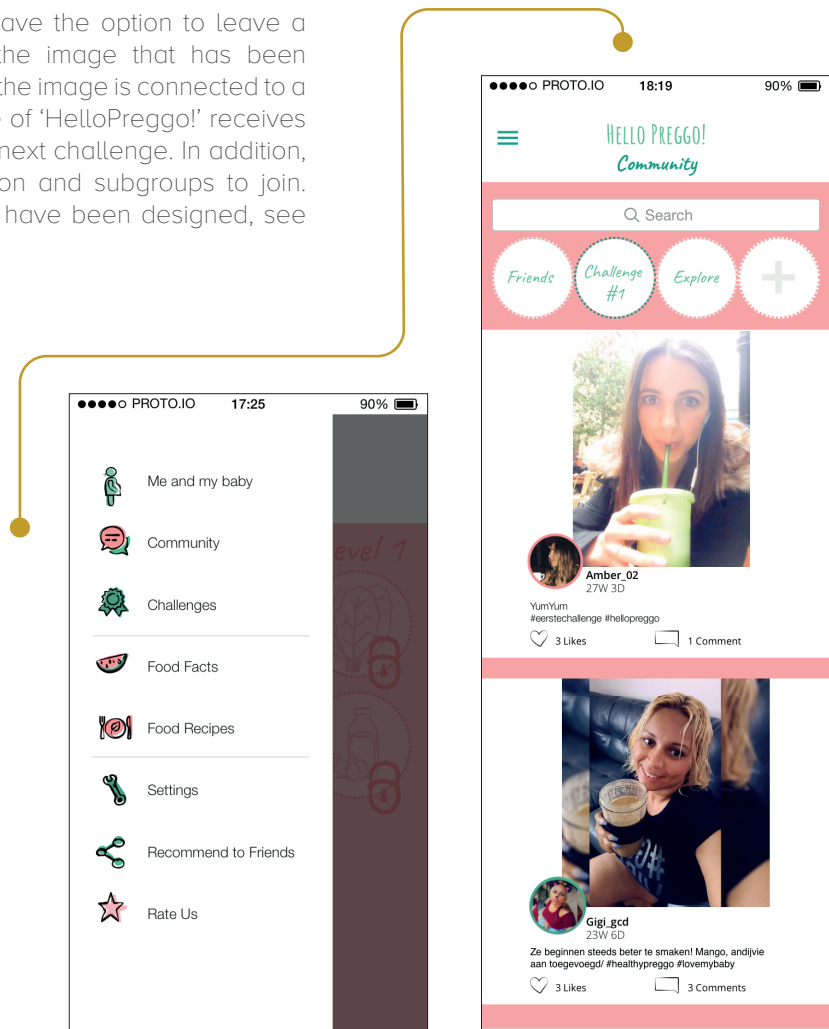


Figure 34: Screens 'Community'

### 5.1.4 MY BABY AND I

This component has been added to the concept in a later stage. During intervention #2 it became clear that every pregnancy application need to have at least a baby tracker, providing the current status of your baby's growth. Adding this to the concept highlights the main value even more and completes the overall objective stated at the start of this graduation project 'for the target group to better their food choices to improve the environment for fetal development'. The goal with this feature is that the target group directly connects their food behavior towards their baby's growth.

#### Content & Design

The content of this feature provides information about the current status of the baby; it's size, weight and new developments. It displays tips and tricks each week on how to be pregnant and healthy, including exercise during pregnancy. Note, that exercise lies outside the scope of this project and that the main focus always has been on nutrition. Moreover in the recommendations. See *Figure 35* for the screen designed for this feature.

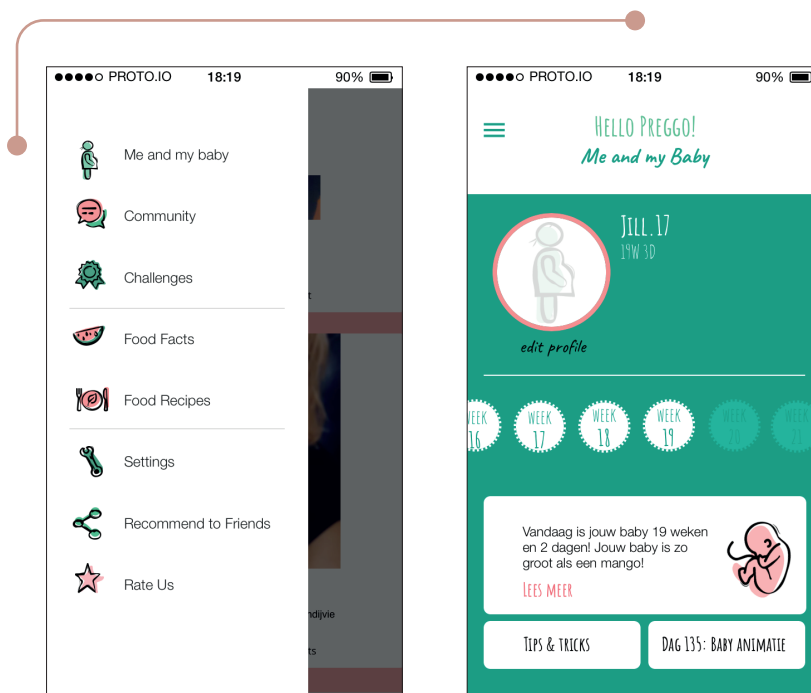


Figure 35: Screen 'My baby and I'

### 5.1.5 FOOD FACTS

The Food Facts component has been added as a feature to provide more nutritional information for those who like to learn more. As described in section 5.5.3: Challenges, each challenge starts with information. After completing the challenge this information can be found back in the Food Facts feature.

#### Content & Design

The content of the Food Facts consists out of a blog of all the collected information from the challenges. Another very handy instrument has been added to this feature as well; the option to scan your grocery items. During intervention #1 it became clear that there is a lot of misunderstanding and confusion on what a pregnant women is suppose to eat. This scanner is an instrument that uses a clear color indication on whether something is advisable to eat or not. In addition, it provides the nutritional values of the product, and if needed, healthier alternatives. See Figure 36 to see the screens of this feature.

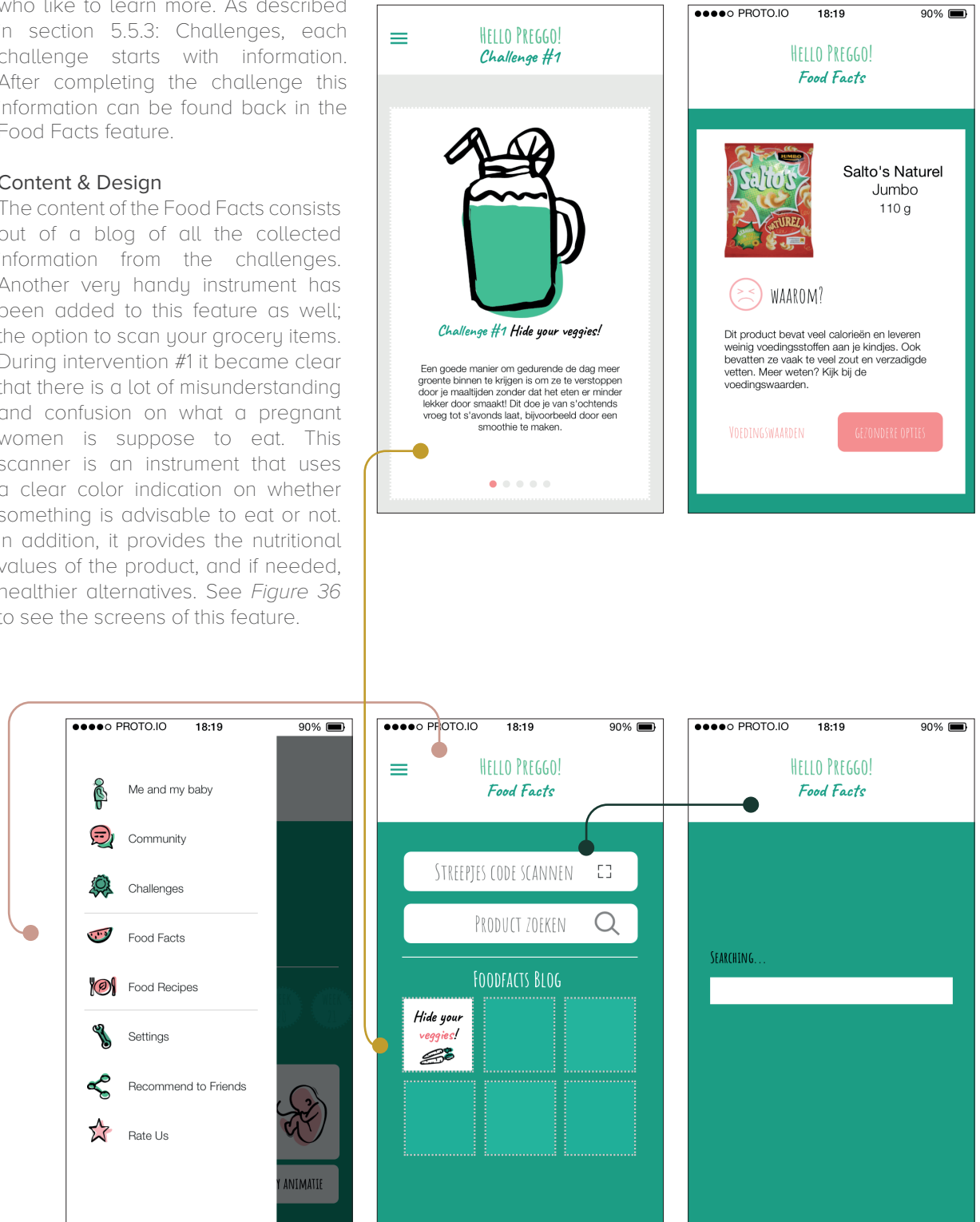


Figure 36: Screens 'Food Facts'

### 5.1.6 FOOD RECIPES

The food Recipes is a collection of all recipes gathered from the challenges. Similar to a cookbook all recipes can be found back including the ingredient list and preparation instructions. In addition, alternatives to the ingredient list can be found as well. See Figure 37 to see the screen of this feature.

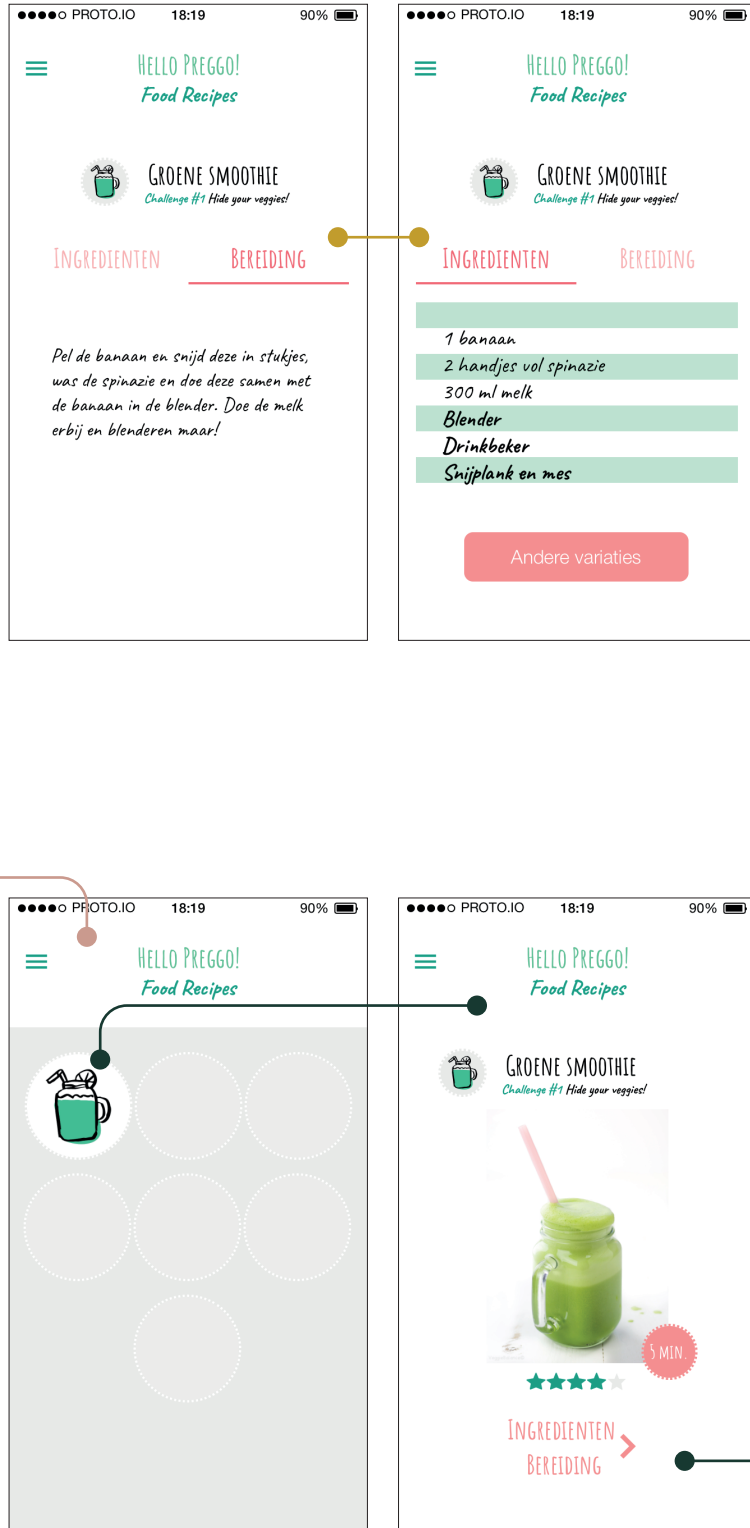


Figure 37: Screens 'Food Recipes'



### 5.1.7 GOODY BAG

Last but not least is the Goody bag, it is a separate component designed to activate and motivate the target group as described in previous paragraphs. Every challenge has its own item; a tool, something that is related and/or can be used during the challenge. A lot of thoughts has been put on 'how to connect the goody bag to the App in a meaningful way? And how to prevent the target group from opening all gifts in one time?'.

#### Content

The content consists out of 21 items. Since designing all the challenges lies outside the scope of the project, the paired items haven't been chosen as well. However examples can be given. It was chosen to layer the items, each layer functioning as restriction to open the next item, see *Figure 38*. Three packages have been created consisting out of 7 items. The seven items are wrapped up together in several layers. So when you open a new layer another item appears. The clue on where to open the next layer can be found in the introduction of the challenge. In this way the target group is restricted in a way to open the next item. However, if the user insists on opening the item, they can.

#### Design

During the prototype two different goody bags have been created, a shopper and a paper (looking) bag. In order to connect them with the app and to make them fit within the concept a fabric was used instead of real paper so that the bags are reusable and can be used as a grocery shopping bag.

It was chosen to use a natural but still fresh looking design. The crafted material used fits within the mood board. See *Figure 39* for the images of the bags.



Figure 39: image goody bags

## 5.2 USAGE SCENARIO

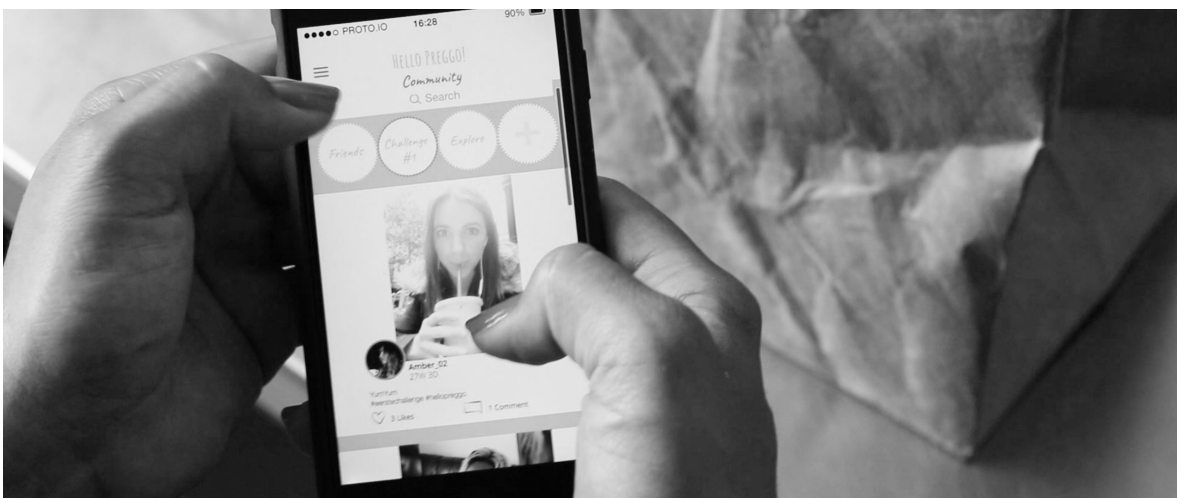
A scenario has been created that explains how 'HelloPreggo!' tool can be used. To enhance this scenario a movie clip has been made and can be retrieved using the QR code below or on request using the contact details.



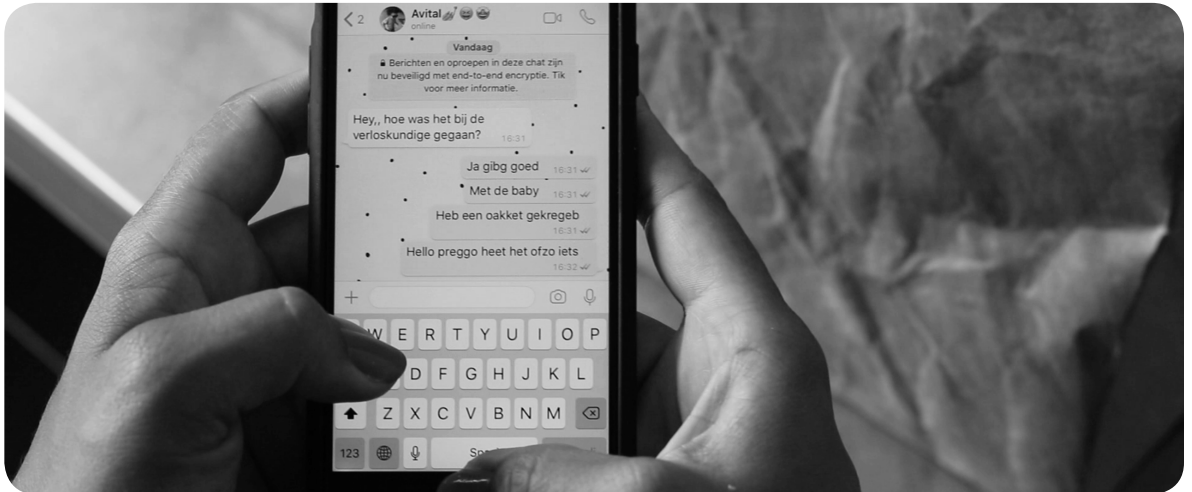
Watch the usage scenario on vimeo!  
Password: Thesisvideos2018



'Nice! Another free pregnancy gift box!. Let's have a look... a food challenge? I have never heard of that before. I am curious to see what this is. Ok step one: download the app, scan the QR code... sign up. Ok, I signed up.'



'Let's have a look around..., challenges... the menu... My baby and I. They even have a whole community inside this app. That's cosy!. Ok... let have a look at the first challenge.'



'[Pling a message arrives] Avital: Hey how did go at your check-up today? How is the baby doing? [answers] Hey, Aaavv thanks! The baby is doing fine, growing good. I got a pregnancy box from the midwife. It's called HelloPreggo! Or something. I'm just checking it out now.'



'Ok, where was I? O yeah, the first challenge. Ok, so now I'm allowed to open the first gift. Nice! This is the grocery list... let's go to the supermarket.'



'Oh, I forgot what I needed! Damn.. uuuh pregnancy amnesia. Lucky for me that the recipes can be found at the Food Recipes feature.'

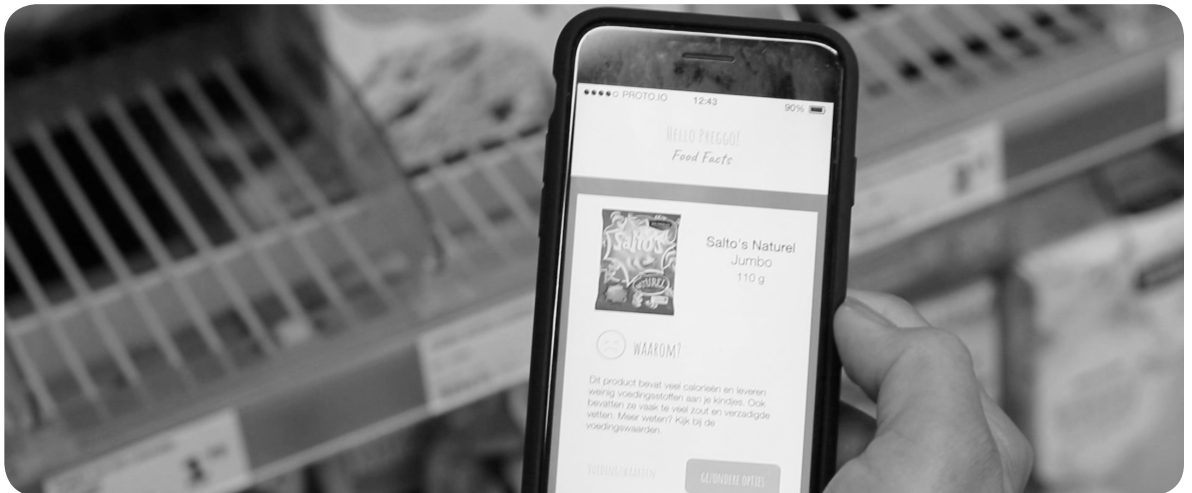


'Oh of course... bananas!'



'Let's find something nice to snack for this evening. I feel like eating crisps tonight wait, what does the food scanner say about this?'





'Oh so that is not that good I guess. See here healthier alternatives, maybe I should try that.'



'Ok let's make this smoothy, I think I can manage that, right?! A mixer, my item, a cutting board, a banana, milk and two hands full of endive.'



'Wait!! Can you eat endive raw?? I did not know that I can eat this raw.'



'I curious to find out how this will taste. Oh, wait! I first need to share a picture in the community. Something like this. #firstchallenge #willitbetasty. Ok shared!'



'Pff I feel exhausted! I'm going to relax and drink my smoothie. Hmmm its not bad at all! I do not even taste the endive. I curious to see the next assignment!'

## 5.3 INTERVENTION #3: EVALUATION

### 5.3.1 INTRODUCTION

This final intervention in this graduation project will evaluate the concept of 'HelloPreggo!'. The previous paragraphs in this chapter showed the prototype and a usage scenario. The prototype is a demonstrating prototype and not a prototype that fully functions. Some interactions, as envisioned in the interaction vision, cannot be measured fully. Therefore, a usage scenario has been created. This scenario displays the intended product interaction visually so that the target group can respond to that.

The main objective of this study is to find out if the product meets the intended Design Goal: 'To create a set of experiences that engages young mothers-to-be to mature towards a healthy nutritional lifestyle during pregnancy'. Sub-questions were established regarding the different components within the app, the overall design of the product and the likelihood of them using this product.

A session was held at Siriz Delft, an organisation providing shelter and guidance for the target group. Two brand new mothers, two soon-to-be young mothers and a counsellor joined the session. The usage scenario video was shown after which a semi-structured group interview was held. The complete research set-up and transcripts can be found in Appendix 7: Intervention #3.

### 5.3.2 FINDINGS

#### The first impression

The participants were asked for a first response after seeing the movie. The concept has been received very well, however, a few questions arose. Participant D responded: 'It's nice, something new'. Another participant commented positively and rose the question 'why this specific target group was chosen'. The counsellor asked 'when the app should be used in the pregnancy?'. These points were not clear.

Then the app was shown. Participants had time to discover the app on a mobile phone. The question arose 'But you cannot download it yet? Participant D asked. After explaining about this prototype the counsellor commented 'But we are curious to know when we can download the App?'

While participant B was playing around she positively commented on the looks of the app; 'the app looks nice!'

#### The challenges

A few questions were asked about the challenges. Three out of the four girls liked the fact that you can do food-related challenges at home and were likely to use it. They responded:

**Participant B: Personally, I don't think I would do that at home.**

**Participant C: Yeah, I think I would.**

**Participant D: Yeah I think I would as well, but it depends mostly whether I feel like it or not.**

**Participant E: Yes I would use it if I know that it's good for my baby.**

All the participants responded positively about the information about nutrition, how it affects the baby, and how this information was displayed.

**Participant B: I would read it. I am always interested to learn about the pregnancy and how it affects the baby.**

**I found that always interesting.**

**Author: So you would rather read the information and apply it yourself that using the challenges to do so.**

**Participant B: Yes exactly.**

Their thoughts about the clarity and design were equal. All agreed that it looked good, it was easy to use, and not hard to find out how it works. Participant B responded: 'I could not get lost in this app'.

Lastly, the participants were asked what they like as a challenge. It was a very open question and hard for them to answer. However, participant D answered: I think I like the assignments with unhealthy foods (using the food scanner). Things that I am allowed to eat... find something unhealthy but less unhealthy than my own chose.



**Figure 40:** Participant B interacting with the 'HelloPreggo!'App

### The community

The question about this topic was whether they could use a community. The first reaction on the community was positive although they are not sure if they would use it often.

*Participant D: Cosy!*

*Author: Would you like to use it?*

*Participant D: yeah I do, but I don't like to meet new people very often. But I do think it is cosy and nice. I like the idea behind it.*

*Participant B: But there are I think a lot of people (younger people) who could use a community very well, because... most of the time you do not know a lot of young mothers. I do, but most do not. Then it is nice that you can find people who also.., yeah.*

The participants were overall positive about sharing an image. Participant D says 'I think it can really motivate'. When asking for feedback about this component. They would like to see a chat function, so that that you can talk to others privately.

### Me and my baby

Feedback was asked about what this component should contain. All participants have used multiple pregnancy applications. The participants used these apps mostly to track that status of their pregnancy and the developments of the baby. The information was provided in 'text', which they enjoyed reading. Another app was used for the images of the baby's development. This information is what they would like to see in this component as well.

### The Goody bag

Two different bags have been created. The author emphasized its function within this concept. The question was asked if they would use the bag accordingly as intended. The clear answer was no. The participants rather have everything know, after which they decided if they are going to do a challenge. Receiving a gift after completing multiple challenges might work. The participants answered with the following statements.

*Participant D: Uh, I am too curious for this kind of stuff. [laughs] No that would not work for me. I would open everything in one time.*

*Participant B: That would also not work for me.*

*Participant D: I just want to know what is in the next package.*

*Author: What do you think that would work for you?*

*Participant D: Well, just put everything in the bag so that I can see it and if I need an item for a challenge that I could just use it.*

*Author: Ok. So this goodie bag does not have a lot of influence on whether you going to finish your assignments or not.*

*Participant D: No, it does not have an influence [laughs]*

*Author: If you had to do some challenges first in order to receive a gift would that work for you?*

*Participant F: Yeah then I would do it haha. For a free gift.*

*Participant D: [laughs] Yes I would do it*

*Participant C: Me too. Participant B: It depends on the challenges, but maybe.*

### Overall design and usage

The participants like the idea of a bag that can be used as a grocery shopping bag. The number 1 has the preference; it looks like a normal shopping bag. Participants agreed that they would use the bag for grocery shopping, it only needs the logo. The overall design has been received very well. The participants liked the logo and were calling out what they were seeing in the logo. Three out of the four participants would like to use 'HelloPreggo!'.

*Participant B: Honestly, I could not eat healthier because of an app. There is not one single app that can convince me to make a vegetable smoothie. That is really up to me. But that's me. But it could sometimes motivate.*

*Participant C: Yes, I would download it anyway, I do not know if it will work for me. But I would read it and try it.*

*Participant D: Yes, I would also download it. I would read a lot of information and I would do a challenge but only if I feel like it.*

*Author: Would it help you to eat healthier?*

*Participant D: Yes, I assume that when you read what it does to your child, that you will make improvements.*

*Participant F: I would use it when I see that it has a good effect on my baby.*

### Feedback counsellor

After the session, the counsellor was asked for feedback from a professional perspective. She said: 'I have listened to what they say and yes... I think this should be a working app. You should consider looking at crowdfunding possibilities to realize this app.'

The counsellor mentioned the following reasons why it should be realized: 'the app has a low threshold and is very accessible it tailors towards their needs. Having a community is very comforting and supporting. The app is very thorough; you can have this app instead of 6 different ones. I'll become thrilled when seeing the logo. I just think its great!'

### 5.3.3 DISCUSSION

The participants have responded positively, although they acknowledged that a 9-week program with 21 challenges would not work for them. Three out of the four participants would start, try and (perhaps) continue making the challenges. However, the goody bag does not have an influence on that. As participant B and D have stated, the information provided prior to the challenge does have a big influence on whether they are going to do a challenge or apply that information independently. Hence, creating a

direct link between nutrition and its effect on the baby triggers the action to make better food choices.

The food-scanner has been received very valuable. All participants indicated that this tool would be very helpful. This tool inside the concept gives them the opportunity to look for healthier alternatives. Participant D acknowledged that she likes to use this tool in the challenges.

Using the community differs per person. The participants admitted that there is a need for mutual support and understanding, this community could deliver this support. Important is that this component should contain a chat function so that private conversations are possible as well. As stated by participant B, the usage of this component might be age bound as well. According to her, it is less likely that they have friends with children as well. The counsellor expressed the need for such a community, as well.

Participant D stated that she is not the kind of person who likes to meet new people, though she might use the community to motivate others and look around out of curiosity. This indicates how users could use this component in different ways.

Pregnancy applications were used throughout the pregnancy for multiple reasons; pregnancy tracker, baby developments (mostly text but also visuals). All applications showed how the baby is developing but do not indicate what is needed for those developments. The participants agreed that they would like to receive this information.

As mentioned above the goody bag does not have an influence on the doing a challenge whatsoever. The question arises whether this should be a component inside the concept. And if so how should it work. The participants agreed that 'receiving a goody bag after completing (several) challenges, would serve as a better motivator than the current design.

Lastly, the participants were eager to download the app. The appearance and usage of the app were considered attractive. A discussion arose about crowdfunding and further developments. This showed sincere interest in the app and its functions.



Figure 41: Image of the 'HelloPreggo!' tool

## 5.4 CONCLUSION

### 5.4.1. BRIEF RECAP

The main objective of this graduation project was **‘to design a product or service that will support pregnant teenagers living in low- Socio-Economic Status (SES) to help better their food choices in order to provide the right environment in which a fetus can properly develop’.**

Thorough research has indicated several needs and values within the target group that have been taken into the design process of HelloPreggo! (as can be read in Chapter 2: Hear and learn). It became clear that there was a lack of daily activities and a need to be reconnected with peers. Their resilience during pregnancy and the value of being a mother has led them taking (passive) interest in their own food choices, however knowledge about why certain nutrition is beneficial was lacking. Insights showed the need for independence and the need to learn by experience, rather than being told what to do. This in turn, this could help them to overcome certain psychological factors often apparent within the target group. Overcoming their barriers to eat healthy can be achieved by ‘packing’ positive behaviour and highlighting their most important value: their (unborn) babies.

Those insights have led to the following design goal: **‘To create a set of experiences that engages young mothers-to-be to mature towards a healthy nutritional lifestyle during pregnancy’.**

To envision the intended interaction between the user and the product a metaphor was used. This metaphor described how all components are working together and what their function entails, using the metaphor of a stage performance (as can be read in Chapter 3: Define).

### 5.4.2 FINAL CONCLUSION

HelloPreggo! is tool designed to become more aware of food choices young future mothers are making during pregnancy. The facilitating app consists of three main components: challenges, community and me and my baby. Research showed that the challenges provide the opportunity to partake and learn about a certain topic. It provides clear insights on why certain nutrition is beneficial for the development of the baby. It triggers the target group to think about their food choices. During intervention #1, participants were completing those challenges and responded very positive on it. The participants in intervention #3 were shown the usage scenario, they were not sure of the fact that they will continue making those challenges independently. Further iterations have to take place to optimize the (long-term) usage of the challenges components, since the current goody bag cannot provide for that yet.

As for the community, this component was incorporated for mutual support. Positive comments received from peers and feedback for the mothers-to-be to regain self-confidence and self-esteem was triggered by the challenges. As indicated by the participants themselves and counselors, this is highly appreciated. Though, the interactions could not be tested. The idea of how this should work has been displayed and has been received well. This motivating element could extend the usage of the app. The ‘me and my baby’ component consists out of the necessary information the participants requested. The supporting feature of a food-scanner has been highly valued by the target group.

The overall concept, its features and design, was received as ‘thorough and complete’. It supports young mothers-to-be towards a healthier nutritional lifestyle during pregnancy. The long-term effect could not be measured due to the scope and the limitations of this project (see Chapter 7.2: Limitations). If further iterations take place this concept will deliver a complete experience to create and maintain healthy food choices throughout their pregnancy (see Chapter 7.3: Recommendations).



# CHAPTER 6 | IMPLEMENTATION

The success of implementing a new product depends on three aspects: The desirability, the feasibility and the viability. The previous chapters exhibited the desirability; it showed how a user-centred approach can be used to develop a concept that fits within the daily life of the target group. However, the feasibility, explaining the underlying technical aspects of the product and the viability, the business perspective representing whether the product is fruitful

and worthy or not, haven't been discussed yet. This chapter will briefly highlight those last two aspects.

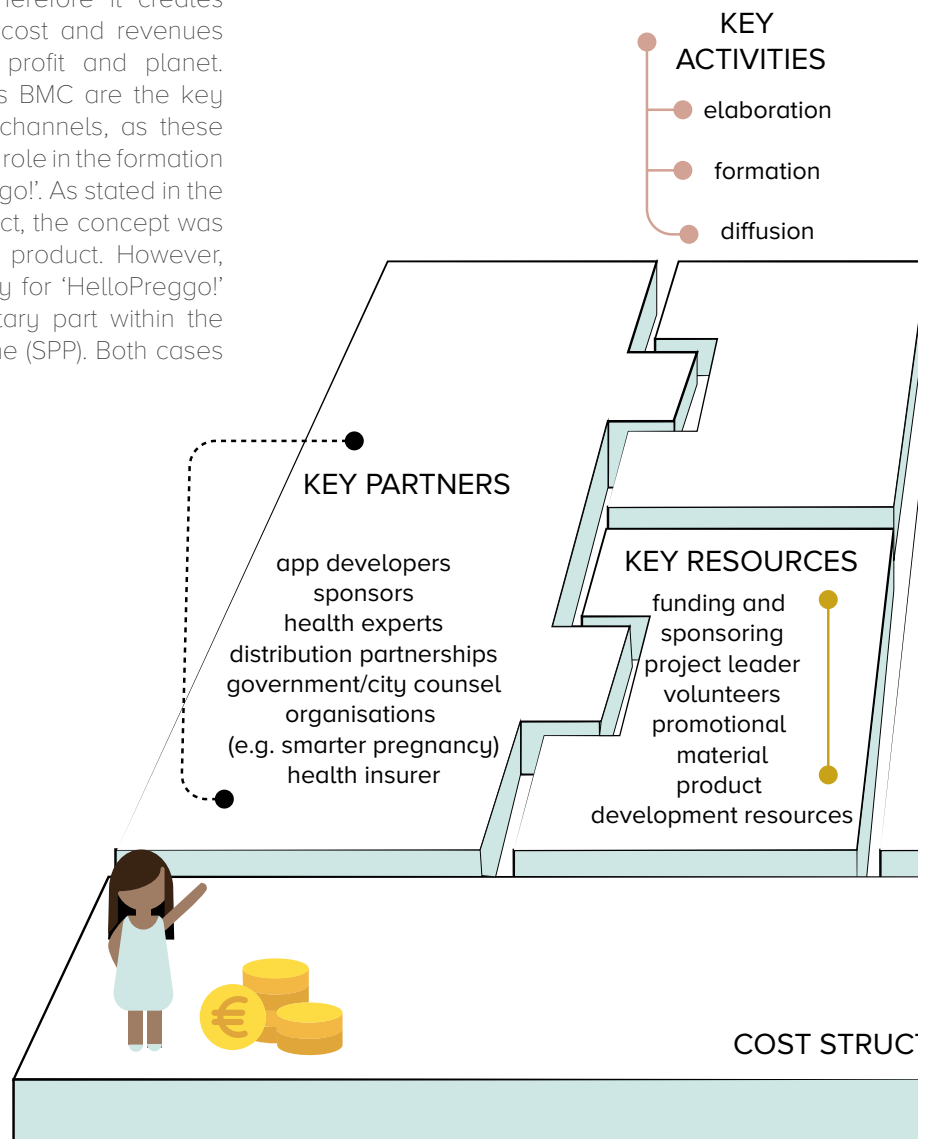
This chapter will provide:

- >> Business Model Canvass
- >> Marketing Mix

## 6.1 BUSINESS MODEL CANVAS

### 6.1.1 INTRODUCTION

The system behind 'HelloPreggo!' for it to operate has been set up with the use of the Business Model Canvas (BMC) created by Osterwalder and Pigneur (2010) and altered by Vastbinder, Kroesen, Blom and Ort (2012). Similar to the original BMC this model proposes a foundation for the complete network that should be set up in order to deliver the value proposition to the customer segment. In addition, it takes the social and ecological costs & revenues into account. Therefore it creates a complete overview of the cost and revenues structure regarding people, profit and planet. The main elements within this BMC are the key partners and key resources channels, as these respectively have an essential role in the formation and the diffusion of 'HelloPreggo!'. As stated in the scope at the start of this project, the concept was developed as a stand-alone product. However, keeping in mind the possibility for 'HelloPreggo!' to function as a complementary part within the Smarter Pregnancy Programme (SPP). Both cases have been explored.



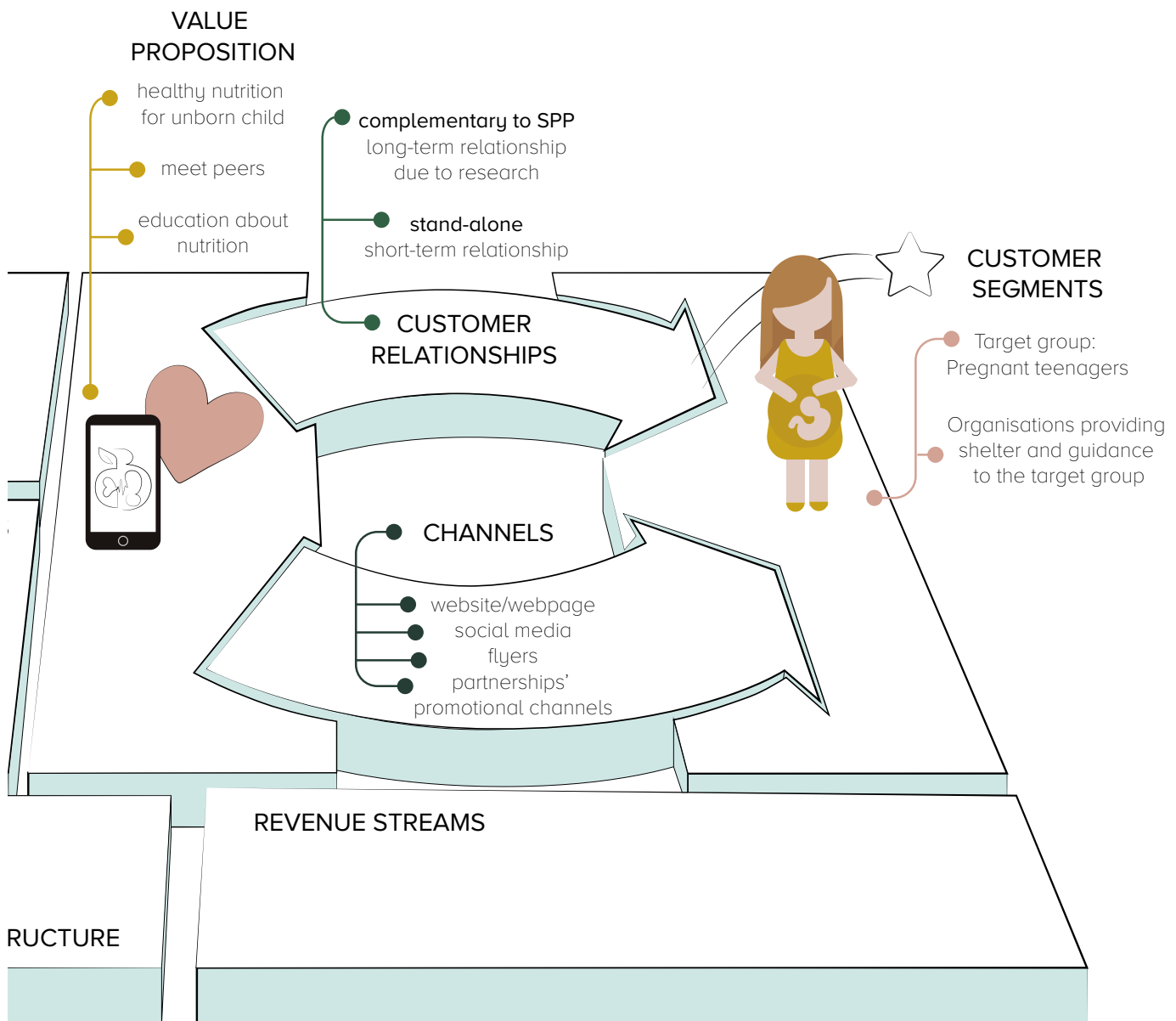


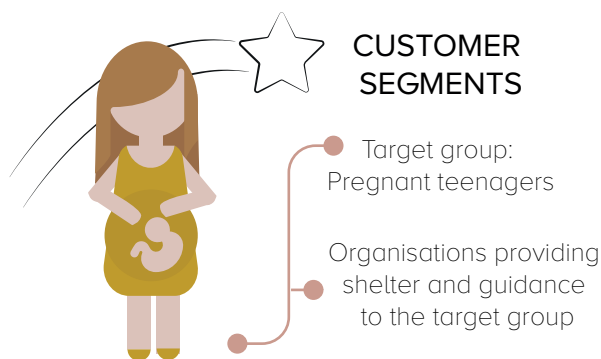
Figure 42: Visual of the Business Model Canvas

## 6.1.2 CUSTOMER SEGMENT

**Customer Segments Building Block** represents the different groups of people or organisations, which an enterprise aims to reach and serve.

The first customer segment is the target group that has thoroughly been discussed throughout the former chapters. As can be read in 3.2.1: The design goal, the focus of the research was on young mothers-to-be (from fifteen) until the age of twenty. Consequently, it is most likely that the concept fits best within this age range. Nonetheless, young mothers-to-be older than this age are also welcome to use this tool. However, it is important to note that the tool is not designed for women in their 30s and older. This is because the final design integrated a component of a community for mutual support. It is essential that the users of the app feel connected. This connectedness might not happen due to age differences and difference in stages of life. As can be seen in 2.1.2: demographics, figure 6 indicates the number of teen mothers in the Netherlands. The image displays that there were 1492 births in 2016, this number slowly decreases. Note that this number is not equal to the number of pregnant teenagers; taking into births to twins and triples. But also premature births under the 24 weeks of pregnancy; these are not registered (declaration of birth must be made with a (still-born) child at 24 weeks and older (Middendorp, 2016)). The amount of teenage pregnancies in the Netherlands has been estimated on 1500 girls a year.

Another customer segment consists of the organisations providing shelter and support for the target group. They have the opportunity to distribute the tool among their clients, but also have the option to include the tool within their program. In this way, the clients can start the challenge together under the supervision of the organisation if needed. A list of organisations can be found in Appendix 8: Business Model Canvas. It also indicates what organisations expressed their interest in the tool.



**Figure 43:** Visual Customer Segments

### 6.1.3 VALUE PROPOSITION

**The Value Propositions Building Block describes the bundle of products and services that create value for specific Customer Segments.**

The primary value proposition for the target group is that this tool helps them to eat healthier this will benefit their unborn child. There are more values (and needs) discovered throughout the conducted researches, and this was displayed in paragraph 3.1.2: Design guidelines. In the detailed description of the tool, in paragraph 5.1, can be found how these values are met in the tool. Apart from their health and that of their child, there are a few two more values highlighted here:

One of the results during the generative session is that there is a need for a group of people whom the target group can relate to, having friends or peers that understand them is being valued a lot, see 2.1.4: life as a pregnant teen. This value is met by including a community within the tool.

One of the results of intervention #1 was that the target group was clueless on what to eat and how to eat healthily, as can be read in paragraph 4.3, this tool provides that information using the challenges and food facts components of the app.

The primary value proposition for the organisations providing shelter and support is that this tool helps them to communicate about nutrition. Next, to housing, education and finances, this topic has a central focus in their counselling programme. Guest speakers are often invited to talk about nutrition, but this tool gives them the chance to learn by experience.

### 6.1.4 CHANNELS

**The Channels Building Block describes how a company communicates with and reaches its Customers Segments to deliver a Value Proposition.**

There are three main stages, when it comes to the channels that are important for this value proposition in order to be delivered to the two different customer segments: awareness, distribution and after sales.

#### Awareness

If the organisation behind 'HelloPreggo!' would be a self-standing organisation, it could use the following methods to create awareness.

- The use of a website.
- The use of a social medium such as Instagram. This platform is highly used within the target group. A way to create awareness using this platform is by give-away lotteries. The organisation can ask people to spread and share the message about this new tool called 'HelloPreggo!'. Among the group of people who have shared this, free 'HelloPreggo!' goody bags are distributed.
- Another way to create awareness is by using the promotional services of Key Partners, a link on their website or social media could extend the reach to attract the target group significantly.
- Starting a campaign through collaboration with organisations such as SIRE.
- Besides promoting HelloPreggo! online, there are the possibilities of promoting offline, using flyers. These flyers can be distributed towards the midwife practices and other organisations working with the target group.

If the HelloPreggo tool would function as a complementary part of SPP, the above-mentioned points could apply as well.

- In this case, SPP is the organisation behind 'HelloPreggo!', a page on their existing website could function as a way to provide information about this tool.
- The SPP is currently using social media services such as Instagram and could use this platform to create awareness of 'HelloPreggo!'.

#### Distribution

In both cases, stand-alone or complementary to SPP, the following distribution methods can be used.

- Distributing directly to the target group; the target group could use a fill-in form on the app, website or webpage. In this case, the target group has to pay for the sending costs which are €6,95.

Note that the target group does not pay for the content of the goody bag nor the app, however they are asked to pay the costs for transportation only to make sure that the product is valued by them; that it is something that they want to have.

- Distributing directly to the organisations; the organisations can then decide to collect the goody bags themselves from the depot or to let the bags be sent.

#### After sales

When needed the organisation behind 'HelloPreggo!' can reach the customer segment after the sale using the contact details filled-in when they applied for the goody bag. A database should be kept up to date in order to prevent misuse of the free goody bag.

### 6.1.5 CUSTOMER RELATIONSHIPS

The Customer Relationships Building Block describes the type of relationships a company establishes with specific Customer Segments.

#### Stand-alone

The relationship is short-term but secure towards the target group. The tool is designed as a self-assisting product, which means that after receiving the product no further information or services are needed. However, 'HelloPreggo!' can always be contacted using the app or website/webpage.

The target group needs to have a trusted and secured connection with the product-service. This is created in the way the customer joins the 'HelloPreggo!' App. When applying for the goody bag (that includes the QR activation code), contact details regarding the pregnancy are verified first in order to prevent misuse.

For the organisations, a long-term relationship can be established, as they continue to order new goody bags for new clients. In this long-term relationship personal assistance can be provided, for instance when information needed about how to include this tool in their own program.

#### Complementary to SPP

The relationship would be long-term if 'HelloPreggo!' would be included in their research program. The target group would be followed for a longer period of time to study the course of the pregnancy using 'HelloPreggo!'.

Key partnerships can be established with the other customer segment (the organisation providing shelter and guidance) as they use 'HelloPreggo!' within their program. Additional insights can be gained from the perspective of the professionals guiding the target group.

### 6.1.6 KEY PARTNERS

The Key Partnerships Building Block describes the network of suppliers and partners that make the business model work.

A list with potential Key Partners has been established. As for the government and organisations, partnerships can be established based on common goals. However, some partnerships have to be established based on financial agreements.

- App developers serious games.
  - E.g. GameLab TUDelft, Yellow Riders
- Sponsors for goody bag content.
  - Supermarkets, nutritional products brands
  - New baby products brands
  - Pregnancy brands
- Dieticians and health experts.
- Distribution partnerships.
  - Deverlokindige.nl
  - E.g. Postnl, DPD, Sandd
- Government/city counsels.
- Organisations.
  - Centrum voor jeugd en gezin
  - College perinatale zorg
  - Smarter pregnancy (if stand-alone)
- Sponsorships Healthcare organisations
  - E.g. Zilverenkruis.

### 6.1.7 KEY ACTIVITIES

**The Key Activities Building Block describes the most important thing a company must do to make its business model work.**

The key activities are depended on the different stages of implementation. As can be seen in *Figure 48* some stages have an overlap. The following key activities are planned for a timespan of six months.

**Stage 1: Elaboration.** The objective of this stage is to elaborate on all three aspects; desirability, feasibility and viability. The main activities during this stage that will be executed, led by an appointed person.

The concept needs a few iteration cycles using research & design:

- Nutritional experts need to get involved in several sessions to implement the nutritional content.
- Game designers need to be consulted and included in the session.
- Co-creation session with the target group regarding content and usage.
- The goody bag needs a few iteration cycles regarding function, usage, content and design.

App developers need to be involved:

- An indication of the budget starting cost and costs to maintain the app.
- App developers need to be included in several sessions (with game designers, and nutritional experts, and concept designer(s)).
- Create a database for the food scanner.

In-depth research regards the viability:

- Searching organisations for key partnerships.
- Searching for funds & sponsorships.
- Searching for government financial aid.
- Searching company partnerships.

**Stage 2: Formation.** The objective in this stage is to set key partners and key resources in place. The duration is two months.

- Applying and receiving financial aid.
- Setting up a team responsible for execution: team leader, (staff) and volunteers.
- Establishing key partnerships.
- Establishing the all Key Resources mentioned in section 6.1.8: Key Resources.

**Stage 3: Diffusion.** The objective in this stage is to diffuse the first batch of 'HelloPreggo!' and study its course throughout the batch. The duration is three months.

- Updating the food scanner database.
- Preparing goodie bags.
- Sending out goodie bags.
- Promoting 'HelloPreggo!'.
- Providing customer service.
- Updating 'HelloPreggo!' Content.
- Establishing new partnerships and sponsorships.

### 6.1.8 KEY RESOURCES

The Key Resources Building Block describes the most important assets required to make a business model work.

The following resources are needed in both cases, stand-alone or complementary to SPP:

- Funding and sponsoring
- Project leader
- Volunteers
- Promotional material

Product

- Product developer
- App developing team
- Knowledge regarding content
- Packaging material
- Goodie bag content

In addition, the following resources are specifically needed when functioning as a standalone organisation:

- Office and depot
- Website

In addition, the following resources are specifically needed when functioning complementary to SPP:

- Webpage

### 6.1.9 REVENUE STREAM

The Revenues Streams Building Block represents the cash a company generates from each Customer Segment (cost must be subtracted from revenues to create earnings).

#### Financial revenues

##### *Stand-alone*

The company behind 'HelloPreggo!' is a non-governmental organization its main goal are not the financial revenues, however, income must be provided in order to create a sustainable organisation. The organisation behind 'HelloPreggo!' pursues an intangible goal; the social revenues. *Figure 50* gives an indication of the financial revenues that needs to be generated.

##### *Complementary to SPP*

If 'HelloPreggo!' will function complementary to SPP, then the revenues will be gathered from research budgets. This will be handled internally since the author does not have access to this information.

#### Social revenues

The social revenues are very clear. The main revenue is that teenagers who are more aware of their food choices. In addition, depended per person, 'HelloPreggo!' may contribute to a healthier psychological wellbeing; gaining self-confidence and self-esteem as a young mother. As for the future generations, the product can have a positive impact on their (future) health.

#### Ecological revenues

The ecological revenues are minimal in the way that the concept is designed.

#### Intellectual revenues

In the case of 'HelloPreggo!' being complementary to SPP, the SPP would share their knowledge using 'HelloPreggo!' and research its effects and impact on teenage pregnancies and fetal development. This could lead to new intellectual knowledge.

Note that this revenues stream has been included by the author herself and has not been adopted in any BMC yet.

### 6.1.10 COST STRUCTURE

The Cost Structure describes all costs incurred to operate a business model.

#### Financial costs

The complete content is unknown; hence the exact costs of the product cannot be calculated. Based on the comparable pregnancies boxes, the bag is roughly estimated to have a value between €150 - €200; this includes the items the bag and the promotional discount coupons of the sponsors (Klantacties, 2018). Sponsors, organisations and the government cover the costs described below.

The biggest influence on the cost structure is determined by the variable costs. These are the investment cost to develop the app and the first batch size of the goody bags. A rough estimation has been made for a first batch size of 500 goody bags. As stated in 6.1.2: Customer segments, the target group's size has been estimated on 1500 teenage pregnancies a year. For a quick estimation, the assumption is made that those teenage girls get pregnant equally throughout the year (125 girls a month). As explained in 5.2 usage scenario the product is best to be used during the second trimester. The first month there are 375 girls (4, 5, and 6 months pregnant), the second month 125 girls (the new 4 month pregnant girls) and the third month another 125 maximum. In total 625 girls can be reached in a time span of 3 months.

The biggest investments need to be made for the development of the App. It is not a standard app, but need to have a database and a communication function for users to communicate. Due to a shortage of programmers within the Netherlands and Europa, costs of developing an app increase considerably (Van de Loo, 2017). As can be seen in *Figure 51* the total costs are estimated at €65.700,-

#### Social costs

Besides financial cost, this product may have several social costs. For example, jealousy might appear for those who can not receive and participate in 'HelloPreggo!'. Another example is the time and effort that volunteers may put in this product.

#### Ecological costs

Lastly, the author would like to include the ecological cost. The physical component of the concept, the goody bag, uses several layers of paper to wrap the items inside the bag (see 5.18: Goody bag). An excessive amount of paper is therefore used.

## 6.2 MARKETING MIX

### Introduction

The author of this thesis would like to briefly highlight the essential elements for implementation using the 4P's of the marketing mix. This gives a clear overview on what strategy will be used to communicate the concept of 'HelloPreggo!' to the outside world. This section can be seen as a summary of the concept and the implementation strategy behind it.

### Product

'HelloPreggo!' is a tool that engages pregnant teenagers to eat healthy during their pregnancy. The tool is developed as a 9-week programme, consisting of 21 different challenges. Each challenge provides information about nutrition and emphasizes the relation between nutrition and the development of their child. A challenge could be preparing recipe, doing a quiz or another assignment. In order to continue to the next challenge, you need feedback from other players. This feedback is provided in the community of 'HelloPreggo!'. In addition, the tool provides a food scanner. This scanner can be used during grocery shopping; it uses a colour scale to indicate the products' nutritional value. This feature provides alternatives for healthier options as well if needed. Apart from these components the app has a pregnancy tracker and provides information about the development of the baby in the 'My Baby and I' feature. To motivate and activate the target group a goody bag has introduced. This bag consists of an access code to enter the app and items that can be used during the challenges. The bag itself can be used for grocery shopping. As can be read in chapter 5.1: Detailed concept.

### Price

The complete content is unknown; hence the exact costs of the product cannot be calculated. The bag is roughly estimated to have a value between €150 - €200; this includes the items, the bag and the promotional discount coupons of the sponsors. Sponsors, organisations and the government cover the costs. Therefore the customers only have to pay the sending costs of a goody bag. This price is €6,95,-. The app can be downloaded for free.

### Place

The app can be downloaded from the AppStore for iPhones or PlayStore for android phones. The goody bag can be ordered online using the link in the 'HelloPreggo!' App or the website. Organisations and partners acquiring this product for their clients are allowed to gather the bags from the depot. As can be read in 6.1.4: Distribution.

### Promotion

'HelloPreggo!' will be advertised using different channels using; websites, social medium and flyers, as can be read in 6.1.4: Distribution.





# CHAPTER 7 |

# CLOSURE

This closing chapter reflects back on this graduation project. This chapter provides the limitations of the conducted research and the design process, and it suggests recommendations for further research and development of the concept. The recommendations are based on the results of the evaluation of 'HelloPreggo!'.

This chapter will provide:

- >> The limitations of the project
- >> The recommendations
- >> A reflection

## 7.1 LIMITATIONS

This graduation project has been executed in a timespan of six months. Throughout the conducted researches and the design of HelloPreggo!, a few limitations appeared that are noteworthy to mention.

### Target group

- It was difficult to reach the target group. Therefore, it was decided to contact organisations working with teenagers who are pregnant. Two, so-called teen-mother houses participated in the first researches. No clear information was found on teenagers who are pregnant and living independently. Therefore, several episodes of the documentary series about the target group, called 'Vier handen op één buik', were reviewed in order to gain a wider perspective. The information from the documentaries might have displayed a biased and prejudiced perspective. In addition, data might have been misinterpreted.
- In total, thirteen teenagers have participated in single or multiple researches in this graduation project. Due to the contextual factors apparent in the target group, organisations are protective in 'not to overload' their clients. Therefore, the organisations asked a selected group of teenagers to participate. Most of the teenagers were between 18-20 years. Three out of the thirteen girls were 17 years and younger. Therefore information about the younger teenagers' perspectives was missing.

### Conducted researches

- As mentioned in the scope no thorough research has been done on healthy nutrition during pregnancy, due to the limited time of the project. The generally available nutrition guidelines from the 'voedingscentrum' were used. The author acknowledges that having in-depth information about nutrition during pregnancy specifically could have influenced the working principle of HelloPreggo!.
- Interviews have been conducted with professionals in the field that gave clear insights about the target group from a professional perspective. However, interim feedback sessions with experts from different branches would have been valuable as well; e.g., serious game designers, dieticians and several organisations including Smarter Pregnancy. Due to limited time and resources, this has not been executed yet.

- Several feedback sessions have been carried out with the target group; during the context mapping session, intervention #1 and intervention #3. The sessions have been conducted in a group format. The perspectives of the participants might have been influenced by one another or might not be shared. Preferably, a combination of both group sessions and single interviews could have provided additional valuable information.
- The research was conducted individually, without the help and insights of others. Though pictures, video and audio recordings have been taken, valuable insights might have been missed or data might have been misinterpreted.

### Prototype

- A prototype has been created using Proto.io. This simulates the screens, the flow between screens and the 'look and feel' of the App, but it does not function. Due to constrictions in time and resources, a functioning prototype could not be realised. And the intended interactions could not be measured in this way. Since the intended interactions could not be measured using this prototype a usage scenario has been created. A movie displayed the intended usage to which the target group could respond. This has influenced the evaluation of the concept.

### Implementation

- Attention has been given towards the implementation of this tool, the Business Model Canvas was used for this purpose. This displayed the network behind HelloPreggo! concisely. It must be mentioned that this is not a full business plan, but rather functions as a plan to continue.
- The Business Model Canvas mentions two different cases; stand-alone and complementary to the Smarter Pregnancy Program. It must be noted that no information about the current organisation of the Smart Pregnancy Program was available, therefore rough estimations and assumptions have been made.

## 7.2 RECOMMENDATIONS

This paragraph will describe what needs to be done to improve 'HelloPreggo!'.

### Challenges

The core of the concept is its challenges. Whether a user decides to start a challenge depends on what the challenge entails and what the user gains when completing that challenge. The food scanner is a feature that could be used during those challenges. This feature has been proven to be very useful and appreciated by the target group. It is recommended to further develop the food scanner for pregnant women. In addition, the content of the challenges should be sorted out extensively, using repeated feedback from the target group themselves. Several experts should be included in co-creation sessions preferably; dieticians, game designers, midwives and guiding counsellors (of the target group).

### Reward

It is not always clear what the user will gain when completing a challenge. It should be clear that after each challenge new information on 'nutrition and baby development' will be provided. This information is highly valued in the target group. In addition, the goody bag was introduced as a motivator; since all items are handed-over beforehand it loses its worth as a motivator. The target group showed more interest in completing a challenge once a gift is sent after completing a challenge. More research should be conducted on external motivators; this can be sending gifts afterwards but also gifts inside the App.

The author has thought of implementing special 'HelloPreggo!' filters. The trend of using filters in the photographs (selfies) in a social medium has been huge, especially at the age of the target group. Obtaining special 'HelloPreggo!' filters that are fun and related to their pregnancy, can be a good motivator to complete a challenge. Due to time, this element has not been further elaborated yet.

### 'Community' and 'My baby & I'.

The function of both, the 'community' and 'My baby and I' component is clear. The target group acknowledges the usefulness of both components. The target group suggested adding a chat function to the community. Both components should be elaborated further. An app developer could review the current functions and overall layout of the community. Several experts should be consulted to provide content on 'My baby and I' regarding fetal development and nutrition; e.g. organisation

Smarter Pregnancy. Extra attention needs to be given towards the 'means' when communicating this information; looking at language usage and visual communication.

### Testing

It is recommended to perform an extensive usability research after implementing (several) suggestions mentioned above. In order to do so, a working demo version of the App should be developed. The author suggests conducting research with a wide range of ages and cultural background within the target group.

Note that applying these suggestions is an iterative process of research and design (see XX). The outcomes of the extended usability test have to be evaluated and previously made steps (regarding challenges, reward, community and 'My baby and I') might need further improvement.

### Implementation

The first suggestion for implementation of the 'HelloPreggo!' tool was described in paragraph 6.1, using the Business Model Canvas. This canvas gives a clear overview of the complete network, the author suggests using this technique to further elaborate the actual Business Plan. Due to the fact that essential information was missing, a rough estimation has been made about the finances. It is recommended to do extensive research on the finances. There are different ways to cover the costs of the development and implementation of 'HelloPreggo!' that hasn't been researched yet. For example, looking at 'business to business' models, were 'HelloPreggo!' only distributes to organisations. Those organisations can apply for a subsidy for this program or can find alternative ways to incorporate this into their programme. Another option is directly selling 'HelloPreggo!' to the target group using a 'Business to (direct) customer' model. In this case, the customer could try reimbursement from either the municipality or health insurer. Development costs of 'HelloPreggo!' could possibly be financed using crowdfunding. The suggestions should be further investigated.

### 7.3 REFLECTION

This graduation project started because of personal interest to design for pregnant women and (unborn) babies, due to the fact that I am a mother myself. Since my pregnancy, almost three years ago, I started to take extra care of my nutrition. Over the last two years, I did a lot of research on nutrition and healthy nutrition had become a high priority within my family, ever since.

Preliminary to this graduation project, a **research has been conducted on the Smarter Pregnancy Programme (SPP)**, developed by the Erasmus Medical Centre Rotterdam, the Netherlands. As can be read in the first chapter of this report, this organisation focuses on supporting women and their partners in the Netherlands before and during pregnancy by providing individual coaching on nutrition and lifestyle to increase the chance of pregnancy and to facilitate a healthy pregnancy. The goal of this research was to find how this programme works, how do they provide guidance to their clients and how do the clients respond on that? **What can be designed to attract more segments within the Dutch population? Is there room for an extra component in their programme? And if so, where should this be included?** As can be read in Appendix 1, I reviewed this platform. The conclusion was made to design a self-standing tool, however, taking into account the possibility that the final design could function as a complementary part to the SPP.

My mission for this graduation project formulated as 'to allow youngsters to realize the importance of healthy nutrition and to start making smart food choices not only for them but also for their offspring. After all, every mother wants best for her child.'

The first step of the graduation project was to seek contact with my target group; teenagers who are pregnant. This was a lot harder than expected. At that time, **I was not aware of those contextual factors often apparent in the target group.** Several organisations working with my target group were contacted and gradually the started replying. It became clear that this topic **'pregnancy and nutrition' has a big priority inside the different organisations.** Each organisation pays attention to this issue in their own way e.g. guest speakers, lessons and providing advice and guidance on nutrition inside a programme. The organisations were thrilled to hear about this graduation project. From an anonymous source, it became clear that

multiple **city municipalities were collaborating on conducting a large-scale research on pregnant youngsters (and/or with toddlers) and their nutrition.** And on 'what role does culture play in their nutritional lifestyle? Therefore, my personal mission was acknowledged.

Throughout the project, many teenagers who are pregnant (or were pregnant recently) have participated in several types of research. The **participants during the first intervention were enthusiastic** and confirmed their need for a concept like 'HelloPreggo!'. They responded **'I would love to have tried that out during my pregnancy'** and **'to be honest, I know I would have eaten healthier'**. Three out of the four participants who participated in the evaluation study would like to download the 'HelloPreggo!' app. In addition, the counsellor responded 'the app has a low threshold and is very accessible it tailors towards their needs. Having a community is very comforting and supporting. **The app is very thorough; you can have this app instead of six different ones.** I'll become thrilled when seeing the logo. I just think its great!'

This clearly indicates the importance of further development and testing. Therefore suggestions have been made, as can be read in the 7.2 Recommendations.

To get back to the SPP, can 'HelloPreggo!' be included in their programme? If so, how should it be included? And lastly, how can SPP benefit from it? From a personal perspective, **I would recommend to SPP to look into the possibilities of incorporating (parts of) 'HelloPreggo!', as it expands their reach and spreads their message towards new segments in the Dutch population.**

The concept fits very well within the objective and mission of SPP. Suggestions on how to include this tool can be read in paragraph 6.1: Business Model Canvas and 7.2: Recommendations. In addition, research can be conducted on the effects of this tool on teenage pregnancies and their (unborn) babies. This could lead to new valuable insights.



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## ABBREVIATIONS

<b>BMC</b>	Business Model Canvass
<b>DFI</b>	Design for Interaction Master (IDE master)
<b>DG</b>	Design Goal
<b>DUT</b>	Delft University of Technology
<b>FIOM</b>	Federatie van Instellingen van Ongehuwde Moeders
<b>IDE</b>	Industrial Design Engineering (Faculty of DUT)
<b>IV</b>	Interaction vision
<b>SDT</b>	Self-Determination Theory
<b>SES</b>	Social-Economic Status
<b>SPP</b>	Smarter Pregnancy Programme
<b>WHO</b>	World Health Organisation

## GLOSSARY

**Adolescence:** Transitional phase of growth and development between childhood and adulthood. The WHO defines an adolescent as any person between ages 10 and 19.

**Self-efficacy:** Self- efficacy is the belief in your own ability to successfully perform a specific behaviour.

**Optimistic bias:** ‘Optimistic bias’ occurs where people tend to ignore information i.e. about health risks because they perceive their own health risks to be lower than those of an ‘at risk’ member of the population.

**Cognitive dissonance:** Cognitive dissonance is a theory of social psychology in which an uncomfortable feeling is caused by holding conflicting ideas simultaneously. People may change their beliefs, attitudes and actions but in turn reduce their dissonance by justifying, blaming and denying the change that they have made.

**Emotional ambivalent:** A term used in psychology, which involves a behaviour involving opposing affective attitudes towards the same object or subject.

**Food behaviour:** An behaviour shaped by food, personal, cultural and social factors that create certain attitudes, perception and beliefs leading to what, how, where, when and why a person an food product consumes or not.

**Resilience:** Resilience in psychology is the positive capacity of people to cope with stress and keep their cool when problems or setbacks occur. This coping may result in the individual “bouncing back” to a previous state of normal functioning, or using the experience of exposure to adversity to function better than expected.



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