Re-imagining the female monthly cycle:

Resource tool for learning and self-management

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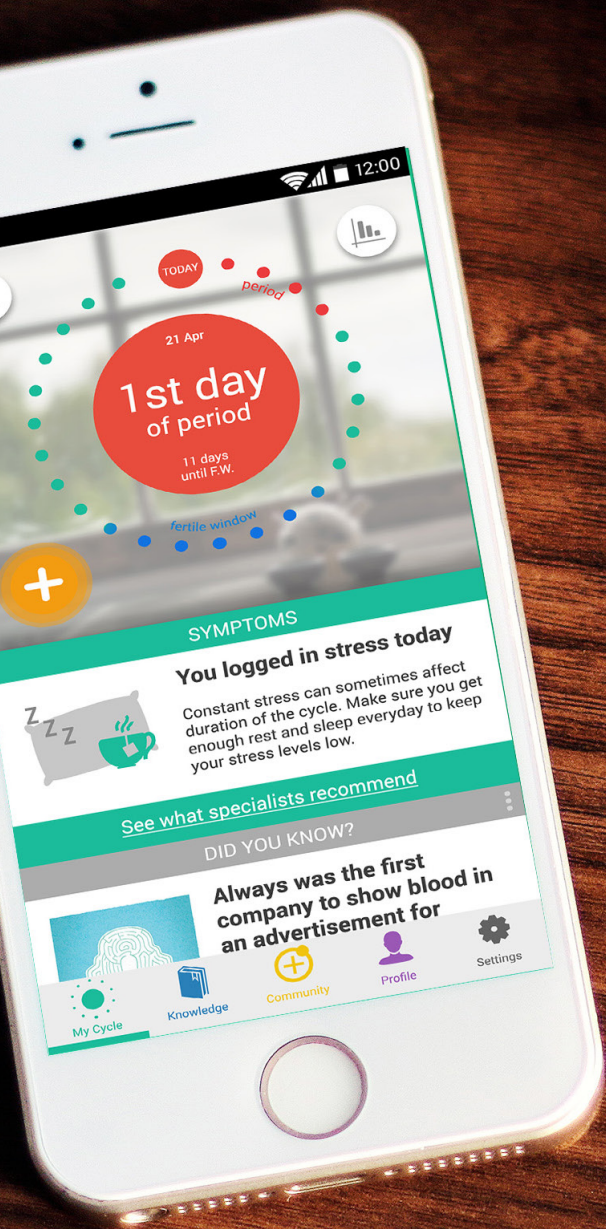
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My Cycle

Contents

12:00

TODAY

period

21 Apr

1st day
of period

11 days
until F.W.

fertile window

SYMPTOMS

You logged in stress today

Constant stress can sometimes affect duration of the cycle. Make sure you get enough rest and sleep everyday to keep your stress levels low.

See what specialists recommend

DID YOU KNOW?

Always was the first company to show blood in an advertisement for

My Cycle   Knowledge   Community   Profile   Settings

Abstract

This design project aims to create a resource of menstrual cycle related topics to be used by younger women in order to raise awareness of the importance of having healthier menstrual cycles.Various physical and psychological experiences were researched in the various stages of the project and the main issue persistent in the report stood out to be the careless or negative attitude towards menstrual cycles' psychophysical processes. This can lead to worsening of the symptoms during the menstrual cycle. A discovery of this issue led to further research into the available educational resources currently promoted in both scientific and non-scientific communities. The result was that most of the resources were 'objectified' and lacked explanation .The aim is to incorporate social factors and contexts into biological education through interactive and easy-to-follow solutions. This report details the stages of research and development for the project.

Keywords: Menstrual cycle, health, awareness, education, pms, menstruation, stigma, women, reproductive system

1. Introduction

The menstrual cycle is visualised in a multitude of representations but one key issue stands out – how do those depictions shape society's perception of menstruation, PMS, ovulation or any other phase and what useful information do they provide? At the moment, biological cycles are represented in a much objectified manner that denies any environmental or social contributions to these processes.

There are various ways the connection of women's overall health and reproductive system can be improved; an obvious option is educating them about general processes of the menstrual cycle. But tailoring the general information to persons' experiences would have more positive effects. In this report, the author talks about the current attitudes of women towards their menstrual cycles and explains why certain changes need to be applied. The author has identified five main concerns and five desirable outcomes for the final solution.

The aim of this project is to help women facilitate the transition from the below concerns with an informative, positive and self-managing approach.

2. The Design Brief

2.1.   Objectives of the Project

The objectives of the project are to draw a stronger connection between women's body and reproductive system through a digital interface.

2.2.   Timeline

-       For the week commencing 8 December 2014, formal presentations will be held of the project and an   interim   report completed. 2D design proposals will also be presented at the same time.

-       For the week commencing 20 April 2015 the Major Project Report, final design and log book will be submitted by 12 noon, Tuesday 21 April in Design Exhibition Centre.

2.3.   Final Deliverables

The main deliverable for this project is a functioning prototype of the digital service interface. It will depict the design solution to the problems presented. This could be in the form of a smartphone application or in the form of a website. Supporting materials or tutorials will be provided toassist the user to utilise the service.
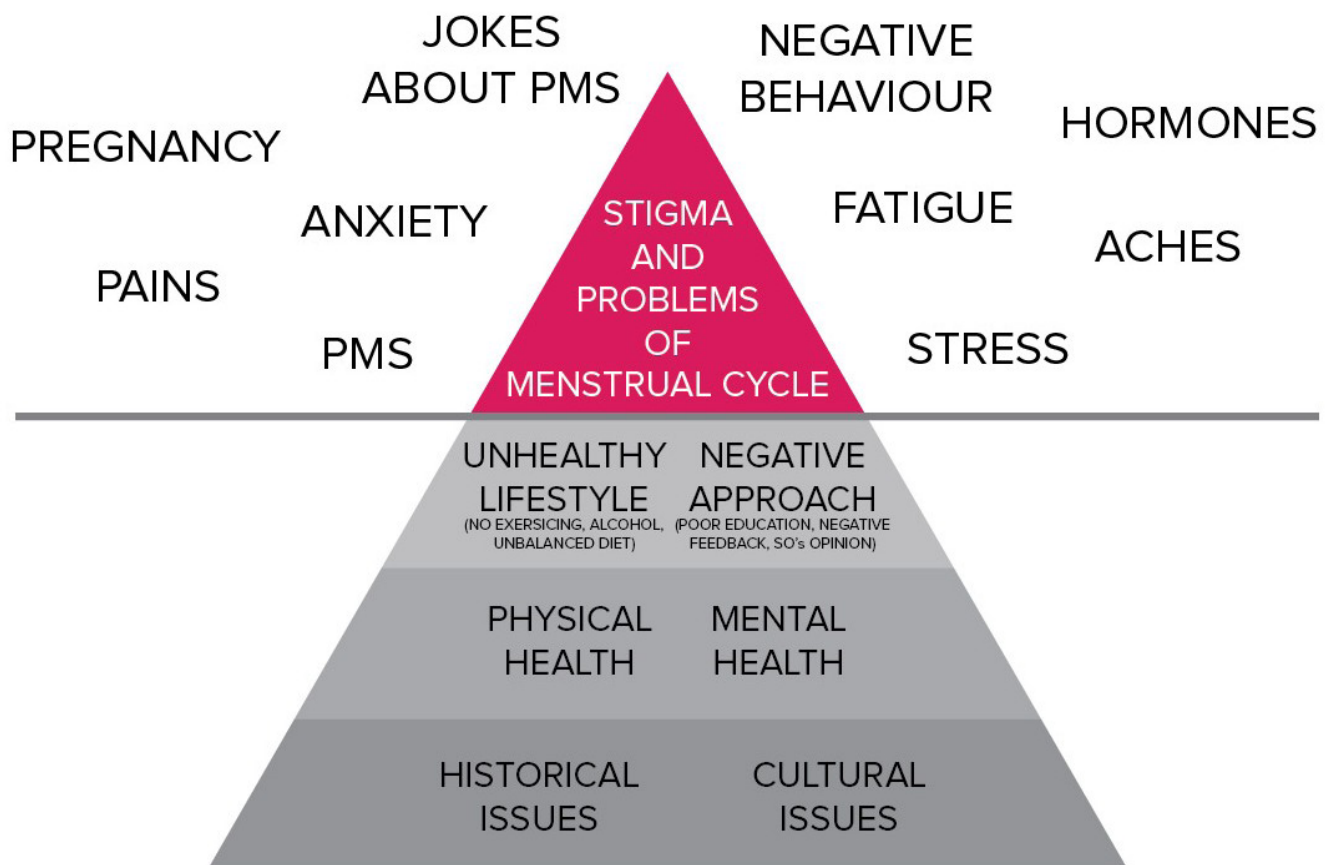
3. Research

3.1. Menstrual Cycle

3.1.1. PMS

Women have different experiences during their menstrual cycles. Unfortunately, bad emotions and feedback have much stronger affection on people's minds than good ones (Baumeister, 2001). When the author asked women about their thoughts on the menstrual cycle, they would mostly talk about their bothersome pains, moodiness or negative experiences appearing before or during menstruation. Furthermore, it is rare to hear women talking about positive and even blissful experiences linked to their menstrual cycle (Moloney, 2010). One of the main shifts towards stigmatised attitude developed after Robert Frank (1931) has established the termin (concept) of Premenstrual Tension and later when Dalton (1964) received wide attention in the press after bringing her research about Premenstrual Syndrome to the world. Premenstrual Syndrome remains a very popular theme of discussion amongst scientists as well as the wider community. While the etymologyof PMS symptoms is still uncertain (Dickinson, 2003), PMS has become a vital part of social and sexual lives of today's women.

There are many discussions happening about whether PMS should be considered a disease or a natural process of the menstrual cycle. In some cases women associate their inadequate actions with PMS and often use it as an excuse for inappropriate behaviour (Tavris, 1992). Some women are socially conditioned to expect PMS and report their symptoms accordingly (Tavris, 1992), therefore it is important to look at the full menstrual cycle to be able to analyse the real emersion of these symptoms. It is important to understand that patterns and intensity of symptoms are individual for each woman and can be affected by various risk factors such as high caffeine intake and dietary limitations (Johnson, 2008; Scholten, 2008). Stress is also one of the factors that highly precipitates menstrual cycle and ovulatory function (Fenster, 1989).

JOKES
ABOUT PMS

NEGATIVE
BEHAVIOUR

HORMONES

PREGNANCY

ANXIETY

STIGMA
AND
PROBLEMS
OF
MENSTRUAL CYCLE

FATIGUE

ACHES

PAINS

PMS

STRESS

UNHEALTHY
LIFESTYLE
(NO EXERSICING, ALCOHOL,
UNBALANCED DIET)

NEGATIVE
APPROACH
(POOR EDUCATION, NEGATIVE
FEEDBACK, SO's OPINION)

PHYSICAL
HEALTH

MENTAL
HEALTH

HISTORICAL
ISSUES

CULTURAL
ISSUES

Figure 1. Origin of stigma and problems of menstrual cycle

3.1.2 Stigma

Other theories suggest that the stigmatised attitude towards menstrual cycles lies behind its cultural and historical facts (*Fig.1*). For the first time womens' abnormal menstrually-related mood and physical disorders were mentioned in the writings of Hippocrates. According to him, psychophysical disorders appeared as a result of hysteria, the disease of the wandering uterus. Much later, in the medieval times, when possession by the devil was the subject for persecution by the Church, women were considered more susceptible in being heretic and practising witchcraft than men (Veith, 1965).

In the classical age, French physician Jean-Martin Charcot first mentioned hysteria as a neurological disease. He alleged that hysteria was caused by psychological trauma which could be treated by using psychological means. However, later Freud argued that the symptoms of hysteria were signs of unresolved psychological or sexual conflicts. He also mentioned that hysteria was an attempt for women to deal with social and economical inequalities (Bennett, 1978).

Our knowledge of the menstrual cycle has mostly developed from the 19th century discussion of gender depiction. In the late 19th century association of hysteria and menstrual cycle was used as an argument against women who were willing to join the workforce (Snowden, 1983). Even when industrial jobs became available to women, the majority of public discussions were focused on menstrual-induced weaknesses rather than unsanitary and stressfull environments where women used to work (Ames, 1986).

3.1.3. Symptoms

The author believes that with every year, less attachment is shown amongst younger women to their menstrual cycles. Considering all changes in the past, more women became inclined to suppressing their menstruation and natural symptoms rather than accepting them. In a recent survey women admitted that they are not ashamed of their periods, however, they are bothered by the impact of menstruation on their daily activities and would prefer not having it at all. At this point, women are seeking for a medical solution restraining their symptoms and menstruation in order to achieve undisturbed sexual and social lives (Greenberg and Riesmann, 2006).

The author finds it difficult to argue with today's society on the fact why menstruation should be accepted as it is when women do not want to cognise their bodies. Perhaps if women were given a dissimilar perspective of menses, they would change their current perception of menstrual cycles. Women who have active sexual lives might be more interested in facts about endometrium lining. Its function within menstruation is to provide antimicrobial protection against urinal infections sometimes summoned by unprotected sex (King, 2003). For women who are planning of having long-term oral contraception, it would be useful to know that in some cases medications can cause endometrial atrophy (Deligdisch, 1993).

*Figure 2. Theat Level Wine (iCustomWine, 2014)*

3.1.4. Coping

The appearance of subsequent menstrual symptoms can be caused by normal ovulatory function as well as environmental factors (Dickerson, 2003; Liu, 2004) One of the studies showed that smoking, alcohol consumption and physical activities can modify the menstrual cycle outcomes such as worsening of symptoms (Liu, 2004). Nevertheless, the market still offers products specifically targeted to instantly ease PMS symptoms such as Threat Level Wine and PMS chocolate (fig. 2; fig. 3).

Current market offers diverse remedies and products to use for instant relief from PMS and menstruation symptoms. Figert (2005) divided the market into '3 P's' – products, pills and prescriptions. Over-the-counter PMS remedies market is currently expanding for menstrual pains; pharmaceutical companies are trying to attract customers by redesigning packaging of simple analgetics such as ibuprofen and paracetamol for specific purposes (Mintel, 2014). 'Nurofen' is one of the examples that offer two separate products where one is sold as usual Ibuprofen and another is designed specifically for period pains. However, after looking into both products, it is evident that the Nurofen Period Pain pack is twice as more expensive than simple Nurofen Ibuprofen (Nurofen, 2014) containing the same 200mg dosage of ibuprofen. PMS and period became part of a viral marketing ploy that creates more attention and awareness of a company, brand or product thusdirectly increasing sales and revenues. The further development of these PMS related products clearly shows a rising demand, women are still seeking for effective and instant relief solutions.

3.1.5. Passive Approach

According to the latest research, most women prefer pharmaceutical methods for coping with pain, aches or other symptoms. The amount of women who use non-pharmaceutical or alternative methods is significantly low. Only some women chose exercising or using low-sodium diets to ease their symptoms (Öztürk, 2011).
One of the possible reasons for these facts could be the inability for women to get guidance from nurses or doctors at any time. Patients who were able to receive educational materials on the biologic basis and occurrence of premenstrual symptoms reported an increased sense of control and relief of symptoms (ACOG Committee on Practice Bulletins, 2007).
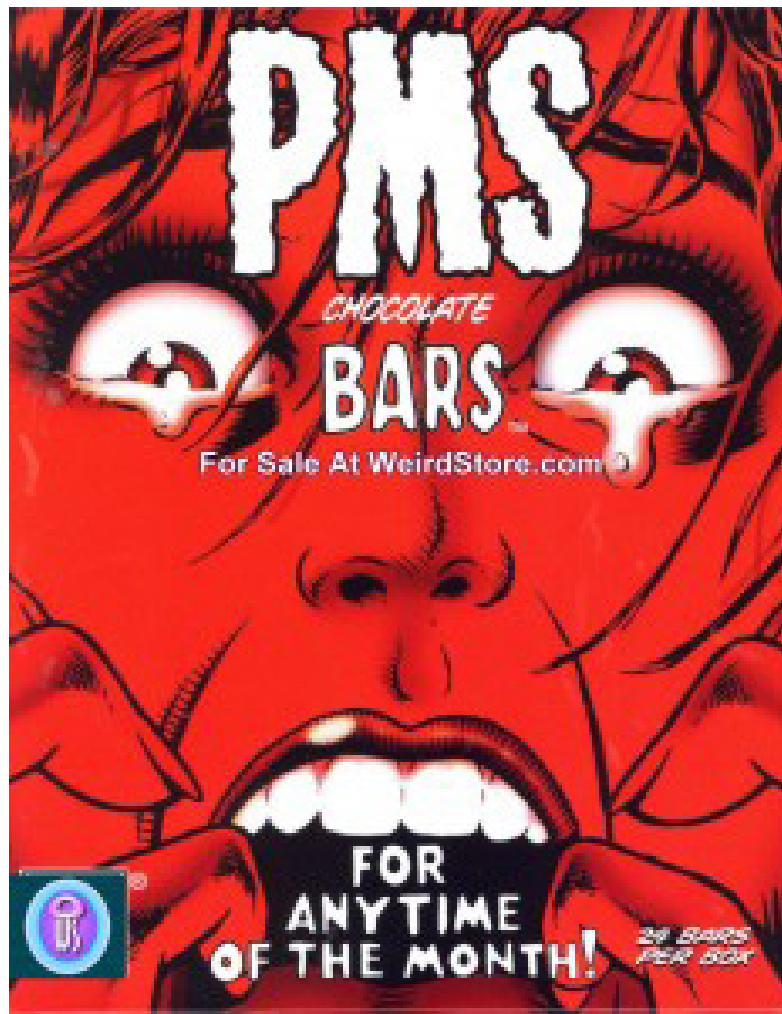
Figure 3. PMS Party Theme Bars (Weirdstore, 2014)

3.1.6. Conclusion

Current misunderstandings occurred because of the lack of research and education about menstrual cycles. This has led to careless attitudes of women towards the reproductive system. Today, where any kind of information is available to the general public, it is important to guide women to exploring these resources and making individual assumptions. This project plans to provide a solution that could capture a bio-social phenomenon of the menstrual cycle.

3.2. User Target Market

3.2.1. Identifying the User

To identify the user target market an initial study was carried out to find out what age range is affected most by the menstrual cycle processes. A questionnaire, which can be found in the Appendices of this Report 11.3., was carried out with members of the public to gather in depth details about users' current knowledge and experiences with menstrual cycle processes, and recognise the problems people face so that they can be addressed.

It was particularly important to understand their scenarios and to notice common similarities that could be seen in everyone. These then helped to narrow down the user target market to a specific area for the project, looking at who is most affected by these issues.

The primary research revealed that females aged between 16-25 years experienced at least one of the physical or psychological symptoms during and before the menstruation. This might be possible due to various facts and conditions such as not being able to record the patterns of their symptoms or a complete disbelief that these symptoms or moods can or should be controlled.

3.2.2. Personas

The personas were developed for this project to cover the needs of various individuals. Personas are all within the age range of 16-30 years old. They are specific to the target market and they have been categorised into three problem areas: Genetic Condition, Irregular Cycle and PMS. These areas cover the majority of women who would benefit from this product, as they all at some point have had negative experiences that they are willing to avoid in the future. They were all using period prediction software to be aware of symptoms and moods that will interfere with their social and personal lives.

Genetic Condition

Name: Anna Smith
Age: 19
Cycle: Regular

Anna has been diagnosed with Endometriosis of first stage(see appx) when she just turned nineteen. She follows a healthy and active lifestyle since she started to play football at age 10. Her first period came at 14 years which seemed to be normal but in several years she started to get severe abdomen pains. Anna was not aware of her condition until she went to the gynaecologist in her town who could tell her that she might have Endometriosis.
Anna is terrified by the fact she might not be able to get rid of pains at all and has to carry this burden until she gets pregnant and gives birth. She is constantly looking for advice from her friends or professionals but they only feel sorry for her as no one has had similar experiences to hers. Looking for advice online only terrifies Anna as it only tells the worst case scenarios or treatments like hysterectomy (appx.).

Irregular Cycle

Name: Emma Walden
Age: 23
Cycle: Irregular

Emma is a first year Business and Management course student, who loves to go out with her friends, drink alcoholic beverages and enjoy the time by meeting new people. She follows an active sexual life, and has intercourse 2-3 times a week. To fit within the social circle, Anna occasionally took contraceptives to avoid pregnancy. Her period became irregular and caused lots of mood fluctuation and stress,so her doctor recommended recording all concerns in a calendar, which she never took with her because of being afraid that her friends will see it and judge her.
Emma is concerned how these fluctuations affect her body and if her period is ever going to be normal again. She believes that menstruationshould never exist and considers discussing alternative ways to suppress her periods.

PMS

Name: Natalie Lynch
Age: 29
Cycle: Regular

Natalie is a production manager in a London-based engineering startupcompany. She loves her job even though at some point it becomes very stressful. Before her new menstrual cycle begins, Natalie believes that she always becomes more stressed, tired and sometimes angry. Considering the fact that her job requires full attention at out-of-office hours, Natalie prefers to take remedies such as Paracetamol or Ibuprofen to relieve the symptoms.

However, Natalie started to take more medicine with each upcoming cycle. She became concerned as soon as her menstrual pains worsened and medicine wasn't effective anymore.

3.2.3. User Research

To get the idea of current knowledge and opinions about menstrual cycle, a series of online surveys and interviews were conducted with members of the public.
An online survey which can be found in Appendices11.3.,was conducted for the purpose of this project in which there were 100 participants, with the age varying between 16 to 55 years. The aim of the survey was to realise women's current knowledge and opinions on menstrual cycle processes, which were answered by a series of simple questions. The general feedback that was received from this survey was that women rarely pay much attention to their menstrual cycle processes and seldom find importance in managing it. Most women admitted to not having periods at all if it was possible.

Only 11% of respondents admitted that they somehow enjoy their periods, whilst the vast majority admits that it is something they have to deal with.

46% of women feel that men have an advantage of not experiencing menstruation.

69% of women are not ashamed of buying menstrual products.

A third of the women prefer not to talk openly about their periods.

Women are familiar with general menstrual cycle processes but struggle to recognise medical terminology or the cause of some issues.

30% would want to get rid of their periods at all.

73% never considered cutting on sweets or salty foods before their period.

Women would take painkillers in order to reduce cramps.

A group session was arranged with two young women both aged 22. Both respondents were students and carried out very active social lifestyles, part of which involved drinking and smoking. The intention of this general discussion was to discover what they knew about their health and changes they would like to make in their lives. Before the conversation started, the author shared her own experience and knowledge of menstrual cycles to support the discussion and make participants feel more confident when talking. The following answers are actual quoted responses of the respondents.

What do you want to know about your body or cycle?

1: *"I want to know where I am at with my body. My body does change and it's funny how my acupuncture therapist says that you can get cold or hot at certain days. She asks me questions like how do you feel, do you feel like stress. She makes me more aware when she talks to me and asks me these questions."*

2: *"One of the things I would want to know is..as I haven't had my period for a year, how this fact actually affects me. I have no idea if it's a good thing or a bad thing.."*

After you've talked to a professional about it, have you made any changes in your lifestyle?

1:*" My routine hasn't changed too much but I just noticed when she said. I usually get heat up before my period, some people usually get colder and she [therapist] said if you're warm, you have to wrap up [in clothes]. You know, it's about circulation and everything. But I just drink tea anyway, but I do get stressed. I lose track sometimes though."*

1: *"I've been sick for couple of times, really. And when I come to her, she lets me know what damage I do to myself, especially my liver. She usually touches it around. I think it [acupuncture] works with me. "*

Do you have any symptoms appearing before or during menstruation?
2: *"I never get stress or any PMS so I can't tell how it affects me."*

1: *"I don't really get period cravings. I do like it [period] though even if it's painful"*

How do you manage your periods?

1: *"I always lose track [of a cycle] and then forget to make changes. I just go with the flow."*

2: *"My period is completely messed up. I've got an implant and at the moment I have had my period for three weeks. It's usually really light but still annoys me. I won't have it for three months and then get it for a month time."*
Would you prefer getting rid of your period completely?
2: *"Yes. Since I've got my implant, but then it [period] came back."*

What was the main reason you've put an implant?
2: *"Because I have a boyfriend."*

Would you still use other contraceptives?
2: *"Yeah, I still got a pill but I am the worst at remembering things, so I forget to take pills when needed."*

Have you discussed it with your boyfriend?
2: *"Yes, obviously we did."*

Was he the one who recommended getting implant for you?
2: *"No, no. But obviously, we didn't want to have kids so I've started taking a pill but my period was still going so I decided to switch."*
Have you had any lessons in school about women's reproductive system?

1: *"Yeah, They were really basic. Some people did get it but I couldn't. "*

If you had a chance right now to have a session to ask anything about this topic, would you go there?
1: *"Yeah, I guess from professional point of view.Useful for the future me."*
2: *"If it was related to you, just about me and what's going on inside me. But it would be basic stuff; I would probably know everything about it."*

What basic stuff?
2: *"Stuff about contraception."*

Do you feel better about yourself after this discussion?
1: *"Definitely, I'm glad I am more aware of it."*

Summary

This conversation gave the designer insights of how young women care about themselves and if they are aware about internal processes happening in their bodies. They were concerned about their health when problems appeared, but have no trustful source of information available when they are not attending their therapist or general practitioner. Also, women are interested in learning more about the origin of their abnormal behaviour and other symptoms as long as it is in the context relevant to them. One of the contestants admitted that even if she won't need that information now, she will definitely find it useful in the future.

3.2.3. Summary of the Target Market

The main age range will be young women aged 19 to 29. The project is aimed at women who have had menstruation and cycle related symptoms. Future solution is intended for women who are concerned about their menstrual and reproductive health and are seeking for help when professional care is not available. Still, if women are unsure, it is suggested for them to discuss the use of the design product with their local practitioner or gynaecologist.

3.3. Market Research

The author looked into various existing educational models and tracking systems that allow women to analyse or be informed about their menstrual cycles. In this section, the author tries to identify why current educational systems failed to explain extensive facts about the menstrual cycle.

3.3.1. Educational Materials

There two main diagrams that are used for menstrual cycle introduction and representation.

Linear representations (fig. 4) are mostly used in biology books and educational depictions (Mellion-Williams, 2007). Most of the models contain information about endometrium, ovulation and hormone levels. This particular method is not common for lay-literature because of lack of information around hormonal fluctuations in non-scientific communities.

A circular diagram (fig. 5) depicts the average 28 day cycle in a calendar format. This model represents common stages of a menstrual cycle such as menstruation and ovulation giving a sense of fertility peak stage. On the other hand, it does not provide personalised or adjustable content and can be only used for introduction purposes in local health clinics.

There are plenty of resources available online about menstrual cycle related topics. One of them, NHS, provides some facts and stories linked to menstrual cycles, lists frequently asked questions and recommends treatments approved by doctors (NHS, 2014). This information could be part of the future solution, but considering the young age of targeted users, this format of presentation might not be attractive enough.
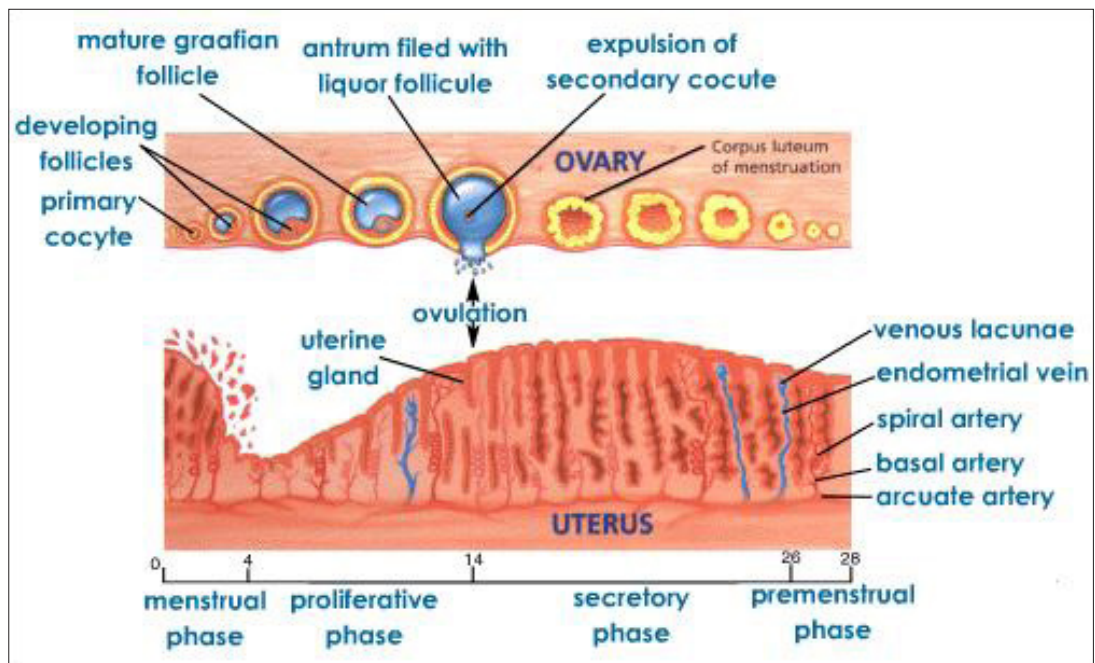
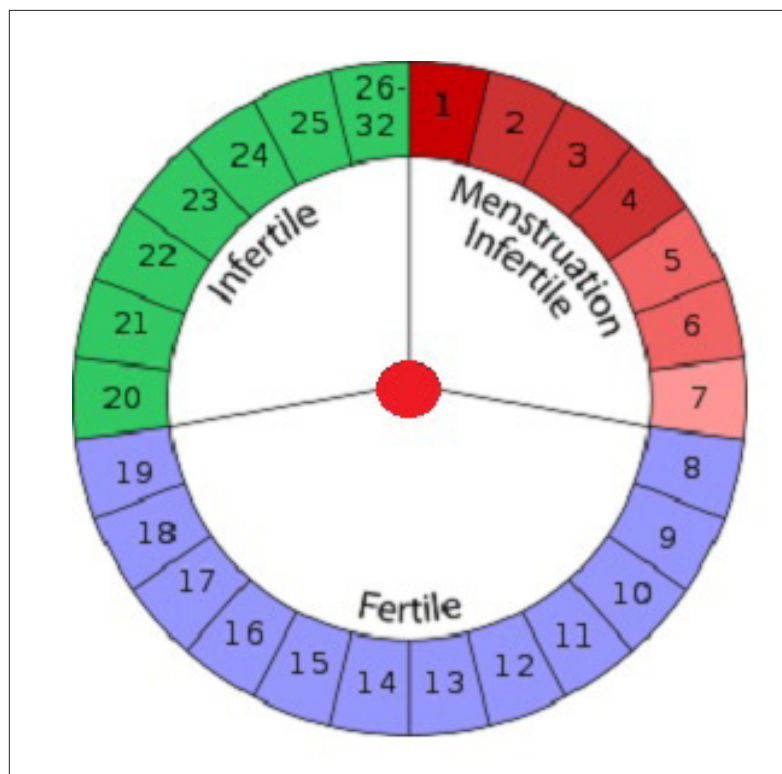*Figure 4. Menstrual cycle process with labels (TutorVista,2014)*

Figure 5. Fertility Cycle Diagram (Ygraph, 2014)

3.3.2. Management Tools

Period calendars or trackers are widely available on the software devices application market. The investigation was also held towards fertility and pregnancy management applications. As they are directly linked to the menstrual cycle processes, it was important to consider the structure of all existing solutions as they could potentially be useful for other user groups (pregnant women, women trying to conceive, women after pregnancy). There are plenty of management tools available on the market and here is the list of market leading competitors:

Glow

Glow (Glow, 2015) is an ovulation calculator, period and fertility tracker (fig. 6). It contains accurate ovulation and fertility charts and has extensive log for period, mood, symptoms, sex and medication. Glow also has an innovative feature of synchronising data with other health applications like MyFitnessPal (MyFitnessPal, 2015) and Google Fit (Google Fit, 2015), directly exporting information from the daily log information. However, there are several downsides of the Glow app which found to be not suitable for targeted users. Even though Glow promises to provide insights throughout the journey whether it is for a woman trying to get pregnant or avoiding pregnancy, some of the suggestions were misleading.

Two female participants were asked to use Glow application on a daily basis for 3 days at some point before or during their period. They have mentioned some positive and negative aspects of the app. Both women evaluating the app chose the "Avoiding Pregnancy" setup. One of the participants enjoyed the fact that it informed her about general menstrual cycle phases but was annoyed by constant (almost daily) notifications about taking precautions during sexual intercourse. For woman who is not having an active sexual lifestyle and has nothing to log about intercourse, these notifications were irrelevant and sometimes disturbing. (Appendices 11.4.)

One of the contestants also mentioned her experience within the Glow Community. She described her experience as "completely random and sometimes terrifying". From one of the screenshot examples of Community Top posts, it is clear that current topics can be completely irrelevant and undesirable to see for the user. The Community allows women to post any issue in questionor poll formats about any concern but interviewed users were completely uninterested in this type of
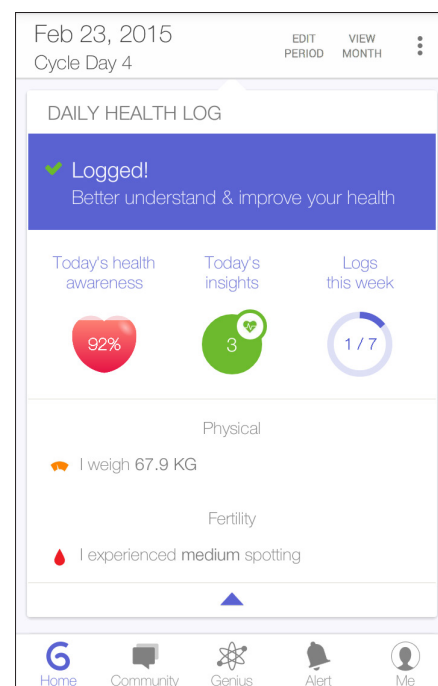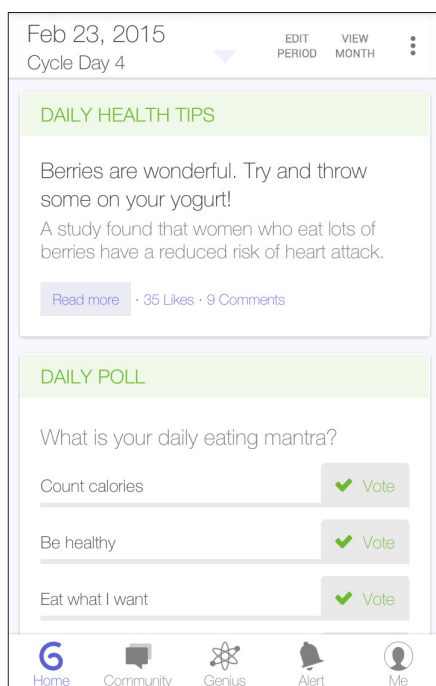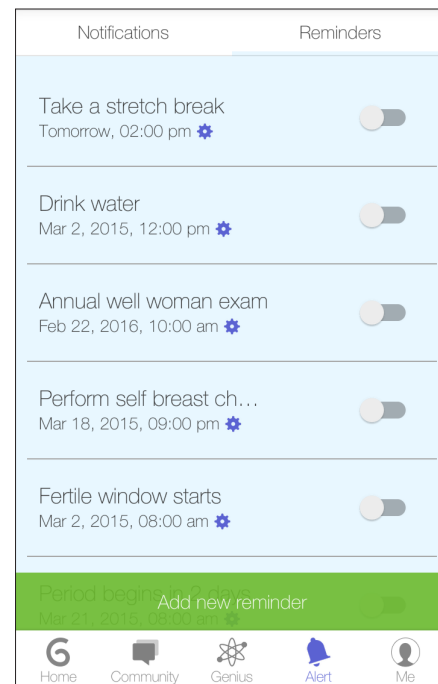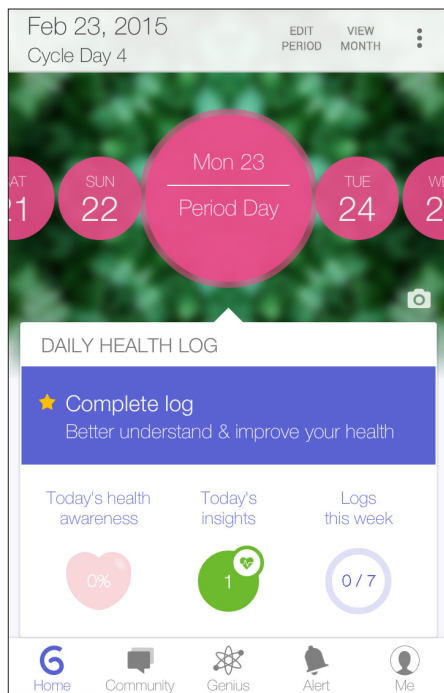
Figure 6. Glow Ovulation and Period Tracker
(Glow, 2015)

information in provided context. Women admitted that they feel uncomfortable about seeing other women's problems if it is completely irrelevant to them.

Clue

Clue (fig.7) is a simplified version of a period tracker and cycle management tool. Within the application users can review the current cycle period and fertile window predictions. According to Clue, there are five main records ("Period" meaning menstrual flow scale, "Pain" meaning physical and mental pains, "Sex" meaning sexual drive, "Mood" meaning emotional state, "Fluid" meaning occurrence of cervical fluid and "Tags" for personalised tags) that has to be completed on a daily basis. Calendar view is provided for more convenient view on previous logs and future menstrual cycle predictions. The interface of the app is simple and contains minimum navigation which makes the managementtrouble-free.

This app is suitable for women who got used to constant updates on their menstrual cycle but for the chosen user group this app contains no triggers for visiting the app on a daily basis or information about why putting in your symptoms and notes is important for them. The support section only provides suggestions on application usability issues.

Kindara

Kindara (fig.8) is mainly a fertility tracking device that focuses on women being able to track their symptoms to predict when is the best time to get pregnant or have unprotected sex. The advantage of this concept is that before opening the application the user has to go through pre-set instructions on how to track and analyse data on a daily basis. It uses the Fertility Awareness Method with a specific set of principles tomake women aware when they are most or least fertile.

One of the disadvantages of the service is located in its interface. According to some comments received on Kindara, the interface was the downsideof the whole service. They felt as they had to provide an extensive list of medical information and analyse it through a rough looking graph.
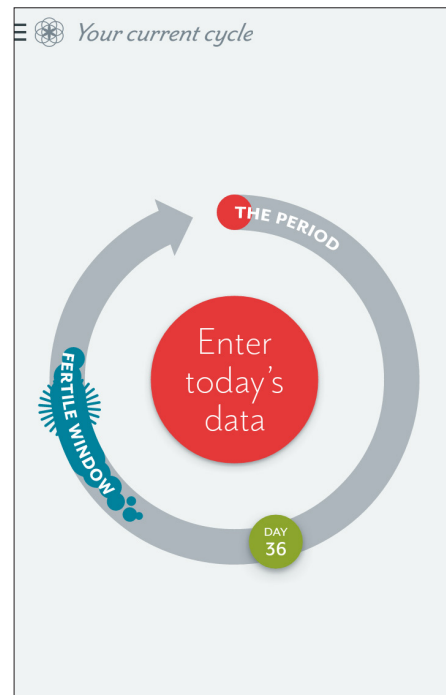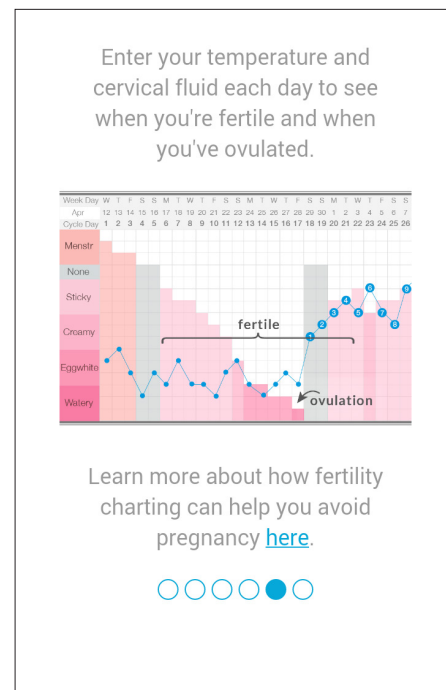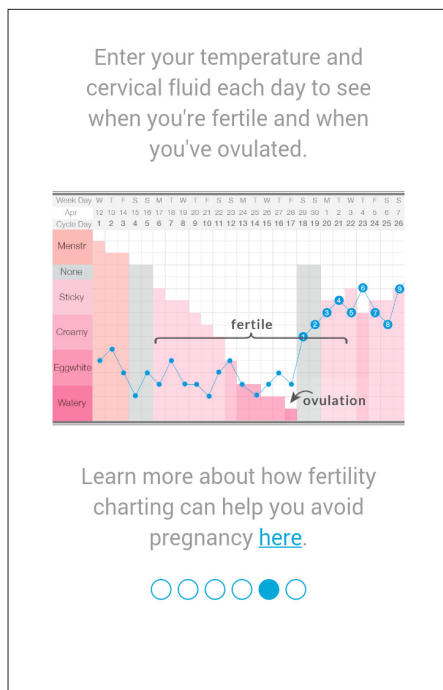
Figure 7. Clue Period Tracker (Clue, 2015)

Figure 8. Kindara Fertility Tracker
(Kindara,2015)

Ovia Fertility

Ovia - Ovulation and Period tracker (fig. 9) promises to help women getting pregnant easy by using their specific application setup. Ovia has a personal digest page with general suggestions based on your log.

Several comments mentioned in Appx were given from the user testing of Ovia applications on its usability and interface. The user enjoyed the bright colours of the interface but had issues on identifying the information displayed about the current menstrual cycle state. Also, the user mentioned the excessive amount of information displayed in the news feed. Also, some suggestions appeared completely unrelated and sometimes even too persistent.

3.3.3. Wellbeing and Health Support

For further market research well-being, nutrition and exercising management products were also reviewed. These digital applications provide no description or support of the women's reproductive system but are highly valuable for their lifestyle and health management features.

Your. MD

Your.MD (fig. 10) is a smart health assistant and symptom checker. The user is able to tell the software what's wrong by typing in current feelings and the provided results should be linked to your symptoms. This product is a great example of establishing communication and understanding between the user and information resources. It also has an option to set a code for people who want to protect or hide their data from others.

Google Fit

Google Fit (fig. 11) is a simple and smart activity tracking application. It allows the user to set goals in amount of steps or activity duration every day. The motivational aspect of this app is to compete with your friends and complete your daily goal activities.
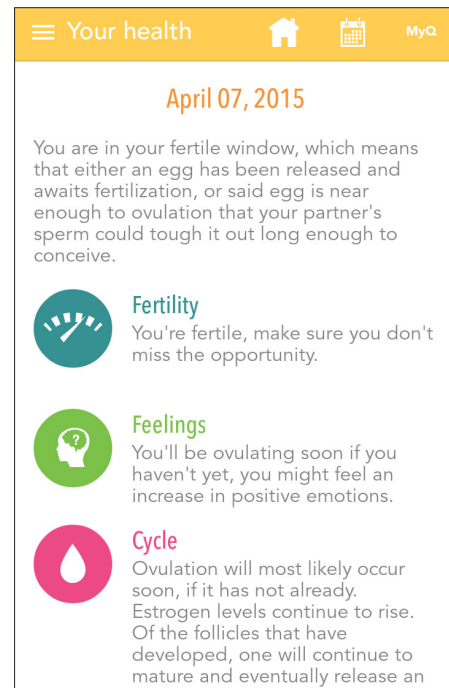
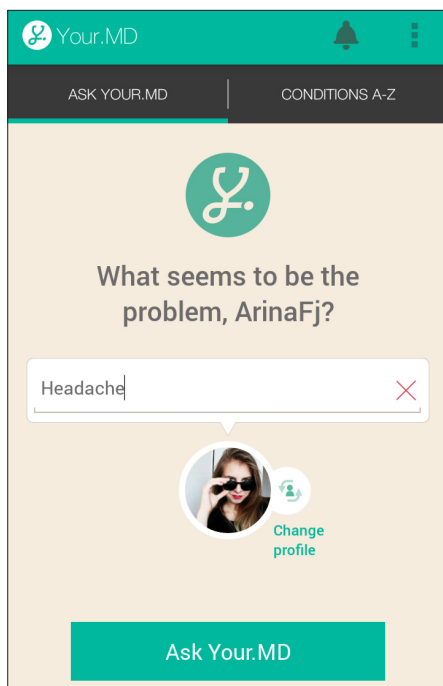*Figure 9. Ovia Fertility Tracker (Ovia,2015)*
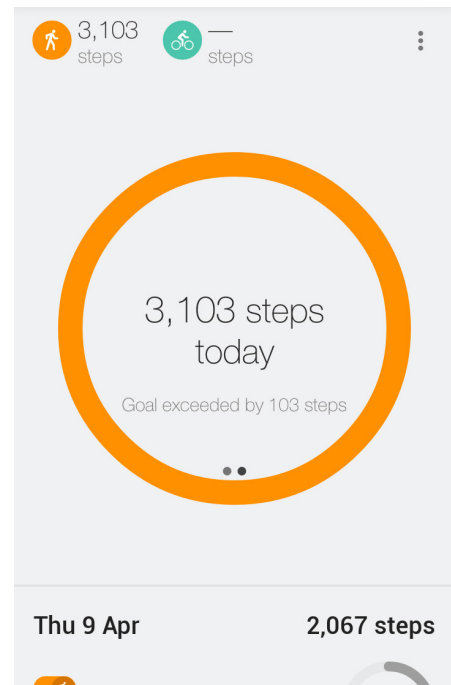

Figure 10. Your.MD Symptom Checker (Your. MD,2015)

Figure 11. Google Fit Activity Tracking (Google Fit, 2015)

3.3.3. Summary of Market Research

General educational resources provide a lot of "objective" knowledge but never contain any personal experience. There is no connection for women with their understanding of menstrual cycle. Women are not provided with a choice - either they are provided with an average solution or information that cannot be applied for specific situations. Giving comprehensible visual representation of these facts would facilitate the understanding and learning of fundamental facts about the menstrual cycle.

In all digital applications users are able to input their symptoms, pill intake, weight and menstruation days while the application is able to analyse and predict the date of an upcoming period or ovulation. The disadvantages of several of the above mentioned applicationsis that all data is analysed based on an average menstrual cycle length and status. Moreover, users are able to input their symptoms but have no clue what information symptoms can provide and how it is possible to manage them.

Even though applications like Glow and Ovia are able to analyse personal information, most of provided assistance is generalised and has minimal or no relevance to the user. They do give all-purpose suggestions on how to tackle certain issues but never tailor it to the user preferences. Moreover, the community side of most of the products had a question and answer format which some users were not satisfied with. Even if the suggestions were made by other women and could potentially be useful for the current user, the trust issue still remained.

3.4. Design Principles and Considerations

After carrying out an extensive user and market research, the designer formed five design principles to consider when designing the new product.

3.4.1. From PMS to Menstrual Cycle

By giving women the ability to analyse symptoms from an environmental or social perspective during the whole cycle could help in identifying the occurrence of PMS symptoms and possibly preventing them by taking according measures. This project aims to give biological knowledge of menstrual cycle phases and symptoms in social and environmental contexts.

3.4.2. From stigma to positive approach

These past facts may not have affected women's physiological side of the menstrual cycle but they played an important role in forming the foundation for today's negative perception of menstruating women. Knowledge of the menstrual cycle will be incomplete if these historical and social facts will be disregarded in the future educational programs. With these historical facts, the author is willing to show women that current stigma was based on incomplete biological knowledge of menstruation and PMS in the past. In today's society, when health and historical resources are available to the public, women must be able to rethink and discuss their attitude towards menstrual cycles.

3.4.3. From Symptoms to Signals

The appearance or disappearance of menstrual cycle symptoms can indicate current changes in a woman's body that could be caused by various factors. Instead of associating symptoms with a mental or physical condition, they should look at them as informers or protectors of the body's current state. This project aims to present this ideology with biological facts in a sociological context.

3.4.4. From Coping to Managing

It appears to the author that women are not knowledgeable regarding the effect of medicines, drinks or foods on their bodies which may lead to worsening and continuation of monthly symptoms. Instead of trying to hide these symptoms with analgetics or foods, it is important to educate women to assess their PMS or menstrual symptoms and also provide a guide for those who are highly concerned of their health condition. The future design solution should incorporate different ways of managing women's lifestyles in regards to menstrual cycles. Hopefully, this solution will raise awareness of the importance of having a healthier body in the future.

3.4.5. From Passive to Proactive Approach

The idea of the future solution is to provide resources approved by health care institutionscontaining pharmaceutical and non-pharmaceutical as well as other treatment methods for women suffering from mild to severe menstrual symptoms.

3.4.6. Considerations

The designer has made a decision to a use smart phone digital platform for the further concept development firstly for the user's convenience. Today, people spend on average 3.5 hours a day on their phones looking at news, connecting with their loved ones or just listening to music and surfing their social media platforms. (SalesForce Marketing Cloud, 2014). The mobile technology and smart phones in particular have become a central part of our lives. Moreover, the product will be better understood amongst existing products in the digital marketplaceand serve as a great platform for receiving user feedback.

This user feedback will directly affect the product's further development as the interconnected and on-demand nature of the app marketplace allows immediate connectivity between producers and users.

4. Design Brief and PDS

4.1. Design Brief

Background/Contextual Issues

The menstrual cycle as a part of the reproduction system has devaluated in women's minds and is almost never viewed as a part of the regular function of women's bodies.

Overall Goal

The overall goal is to raise awareness about the significance of menstruation, ovulation and other cycle phases in women's lives, and educate about the importance ofmaintaining a healthier lifestyle to manage menstrual cycle processes.

Initial Concept

The proposed solution will be a resource of menstrual cycle related information intended for women's personal use.

Defined Design Solution

The final concept will be an interactive and practical digital platform, which will encourage developing an individual management approach to menstrual cycle phases. It will provide a flexible and engaging prospect for women to discover a variety of processes occurring in their reproductive systems. It should be suitable for personal use. The concept may be used with or without the support of a registered health practitioner but the user is recommended to consult with their local health or well-being practitioner if having any doubts.

Target Market

The final design is intended for young women aged between 19 and 29 preferably with sexual experience and who are serious about learning and managing their menstrual cycles. The design is for women who are seeking for a practical advice when professional care is not available. The solution should be suitable for the described personas with 'Genetic Conditions', 'PMS' and 'Irregular Cycle'.

Research

There needs to be extensive research into preferable menstrual related topics of discussion and the psychology of graphical communication targeted towards young adults. There should also be research of interactive features to be used with multimodal educational systems.

Time Scale

- Final Design Portfolio will be submitted on April 21 2015
- Final Viva will be delivered on 18th May 2015

4.2.   Product Design Specification

Purpose

-       The product should educate appropriate users about the menstrual cycle.
-       The product will provide an opportunity to self-managing menstrual cycle related   symptoms.
-        The product should be able to be used on a daily basis to assess any increase or decrease of symptoms.

User
-       The product will be suitable for younger women aged between 19 and 29.
-       The product should be easily used by untrained adults, predominantly women with sexual experience and menstrual symptoms, but should also be suitable for middle to late adolescents.

Environment

-       The product should be compatible for use on smart phone devices.
-       The product should be suitable for the use in private.
-       The product should be suitable for use in an outdoors environment.
-       The product should be suitable for use at home.

Visual Specification

-       The product interface should be intuitive and understandable.
-       The product interface should be multimodal.

-       The product style should be respectful to any culture.
-       The product interface should provide real-time feedback from the device in order to acknowledge the user action.
-       The product interface should meet the user's needs.

-        The product interface should be able to engage the user to explore features of the menstrual cycle topics.
-        The product interface should consider a privacy element system.

Safety

-        The instructions about the product use have to be provided.

Market

-        The final solution is intended for the UK market.
-        The final solution is intended for Android or Apple market users.

Deliverables

-        There will be a report detailing the design process of the final solution.
-        There will be a working prototype of the final design solution.
-        There will be a fully developed wireframe of the prototype.
-        There will be walkthrough instruction provided.

Timescale

-        All the abovementioned deliverables will be completed by April 21 2015.
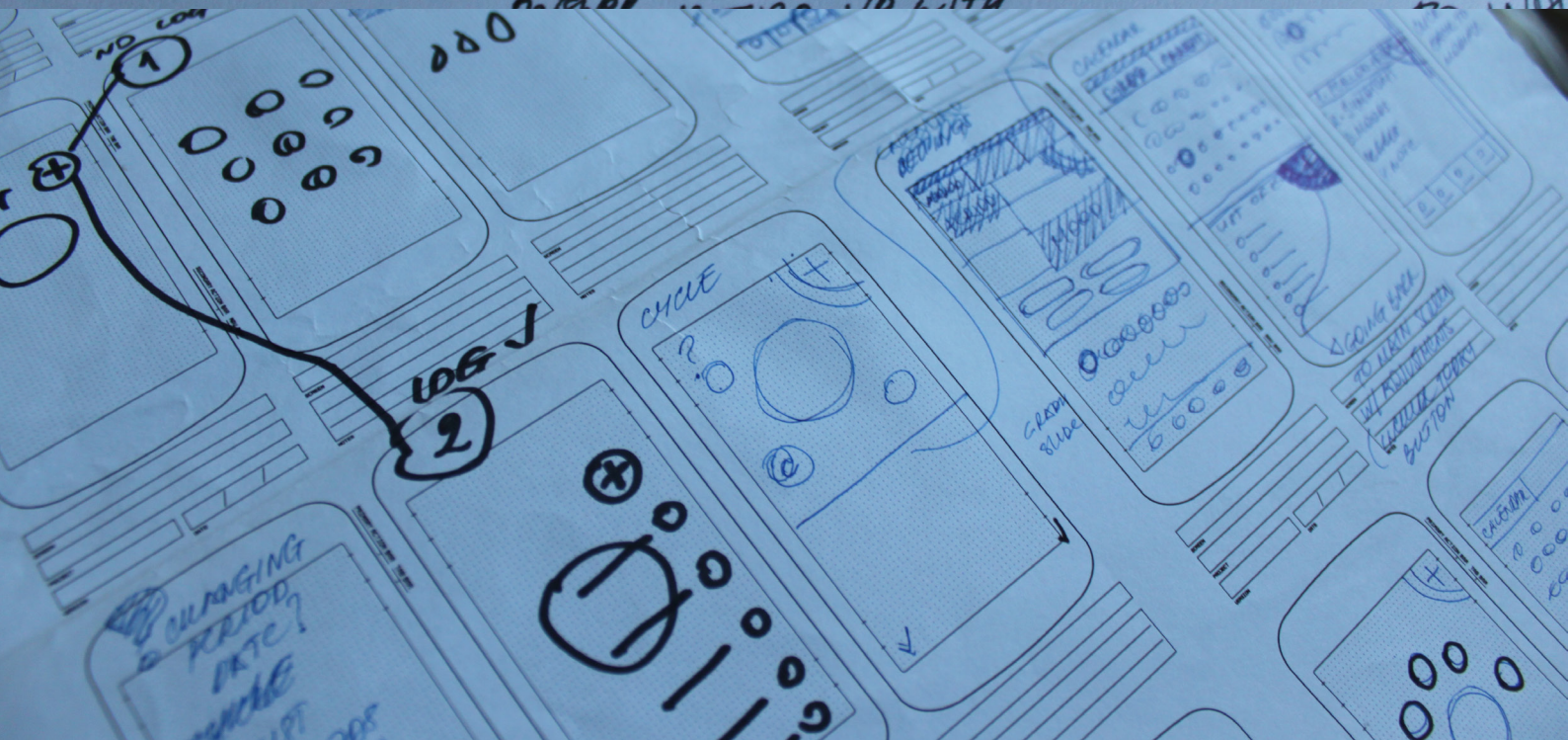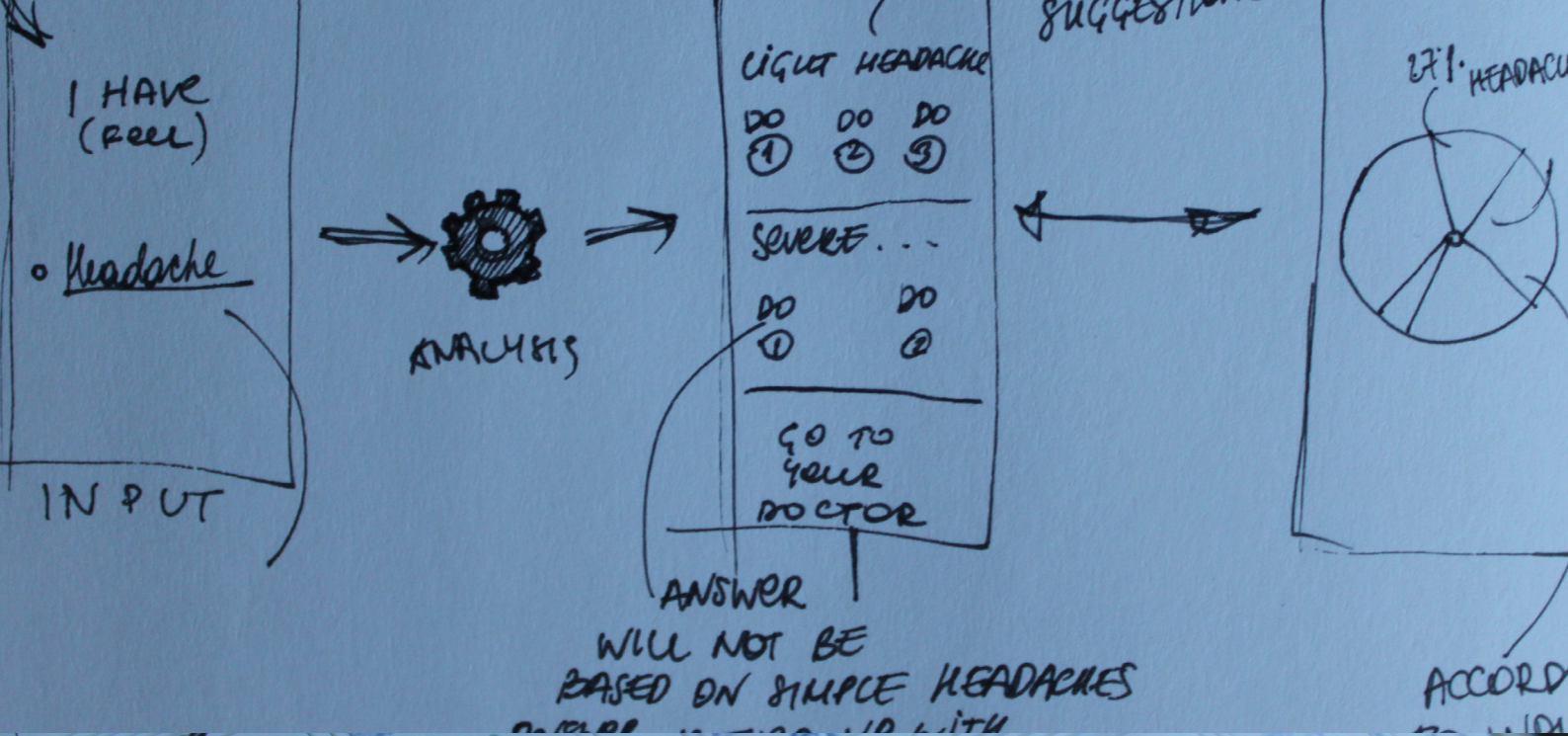
5. Design Development

5.1. Structure and Content

Taking into consideration that every single woman has different experiences and concerns appearing during the menstrual cycle, the designer had to make sure that all needs from various scenarios would be met and have a potential of extension to other user groups.

5.1.1. Period Tracker

When designing a product that has to produce output tailored to users' needs, it is important to have a platform that collects all quantitative data to be later transformed into qualitative information. Period and ovulation prediction applications work in a similar way - they take one's personal cycle duration along with last date of their first period day and calculate an average prediction for the next three months.

Period tracker option was chosen to be the base for the future solution as it is a widely recognisable platform for collecting data related to mainly menstrual and then overall health. The core structure of the collectable data will be as follows:

- **Length of the menstrual cycle**
(visual representation of the cycle duration).
- **First and last days of previous menstruation**
(base for building predictions of the next cycle).
- **Menstrual Flow**
(confirmation for appearance or absence of the menstruation – beginning of the next cycle).
- **Physical and psychological symptoms**
(basis of self-evaluation of currently appearing symptoms for immediate or future examination).
- **Mood**
(basis of self-evaluation that could potentially trigger the changes in the following cycle).
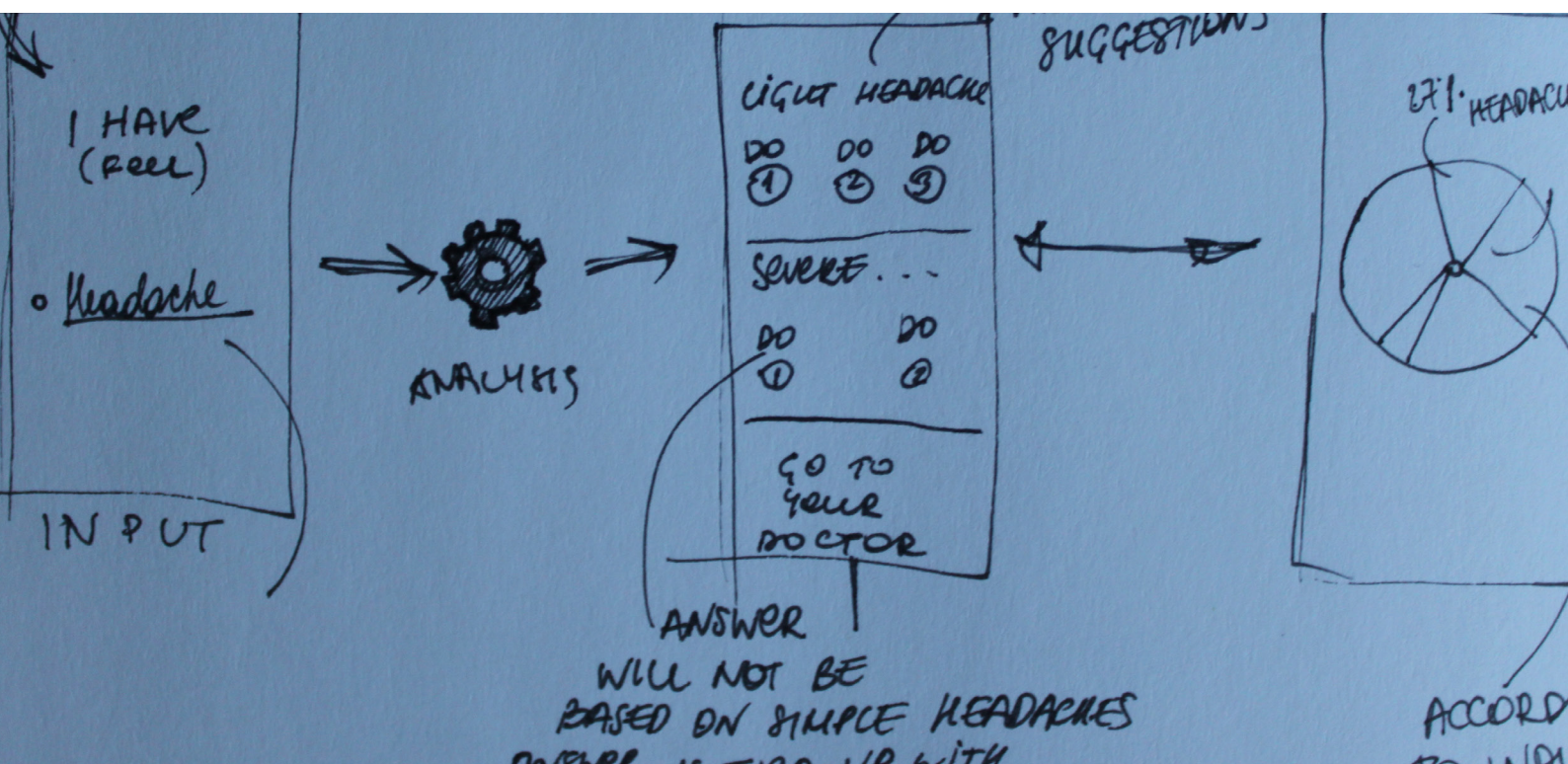
This structure will appear on a prototype for initial testing. The list was extended to fit personas and their scenarios.

However, taking into consideration that research in this particular age group has shown that women are less inclined to planning a future family and the product itself is aimed at allowing women to monitor their health, some of the information will not be tested or analysed for the purposes of impregnation. This includes topics such as cervical fluid, intercourse, pregnancy tests, basal temperature, fertility and ovulation.

However, said topics will be relevant for those not looking to get pregnant in the nearest future and other extreme case scenarios. They will also be included as a visual element for users to be able to recognise any side-effects and also for comparison purposes with other apps.

The following data was included:

-      **Cervical Fluid**
This data will not only be useful in predicting the next fertile window and ovulation, but also in identifying if the endometrium lining was somehow damaged. This option can be used to produce information that would be relevant to the current cervical fluid state.

-      **Intercourse**
Intercourse log can be useful for women with a sexually active lifestyle. If they try to avoid pregnancy or willing to get pregnant, they need to make sure that every intercourse was noted for future precautions.

-      **Sleep, weight and temperature**
The quality and duration of sleep can dramatically affect users' performance and can generally cause feeling of lethargy, irritation, tiredness and confusion. It is important to understand that "the quality of sleep achieved is directly proportional to the amount and quality of the next day's productivity." (Talk of Sleep, 2011).
Change in weight and temperature has to be noted for fertile window predictions as well as showing the overall health state of a person.

5.1.2. Educational Materials

The project aims to educate the user about the reproductive system and overall health, thus general supporting materials should be provided in the application for users to explore.

Previous user studies showed that some women struggled to identify the purpose of the menstruation and other cycle phases. However, during interviews, when asked what they would want to learn about the menstrual cycle, womenrefused to learn more about generic menstrual cycle knowledge as they stated it's not essential and irrelevant at their age and lifestyle choice anymore.

The designer decided to leave the choice to the user. The platform would provide all common information about menstrual cycle, symptoms and reproductive system processes, but users should be able to specify their search for their needs.Sources of information would be coming from certified health organisations with external links provided.

5.1.3. Community

As mentioned previously, the idea is to provide personalised suggestions to the users but in already existing applications this experience was not working/met due to the facts being generic and irrelevant to the users' current status or need. The community platform would be the only way to personalise suggestions as real people would serve as a source of information, not automatically sent messages from the application algorithm.

The relevant posts would be suggested to the user with several methods. First and the most fundamental one would be based on keywords and hashtags assigned to each post when it is being created. That would simplify the search for relevant content. The person who creates the content can specify keywords for the user's reference.Content of posts would vary according to the origin of the message thus the structure has to be built for it. The structure will make the navigation easy and recognisable so the users would know what to expect within each post.

This community is built for all women; however posts from professionals, therapists, general practitioners will be encouraged. Users would be able to create the content themselves and further testing will be held to see what kind of content they would want to share. This section will be the main focus of further user testing after the first prototype is built.

5.1.4. Settings

The success of the application's recommendations is mainly dependant on customisation as well as the right set up of the application. In this case, the designer had to make sure that the user will have a back-up plan and could set up preferable features such as saving the application information on external storage so the data won't be lost. Also, within the Settings page the user will be able to adjust cycle preferences that were setup in the beginning if she feels that it is needed.
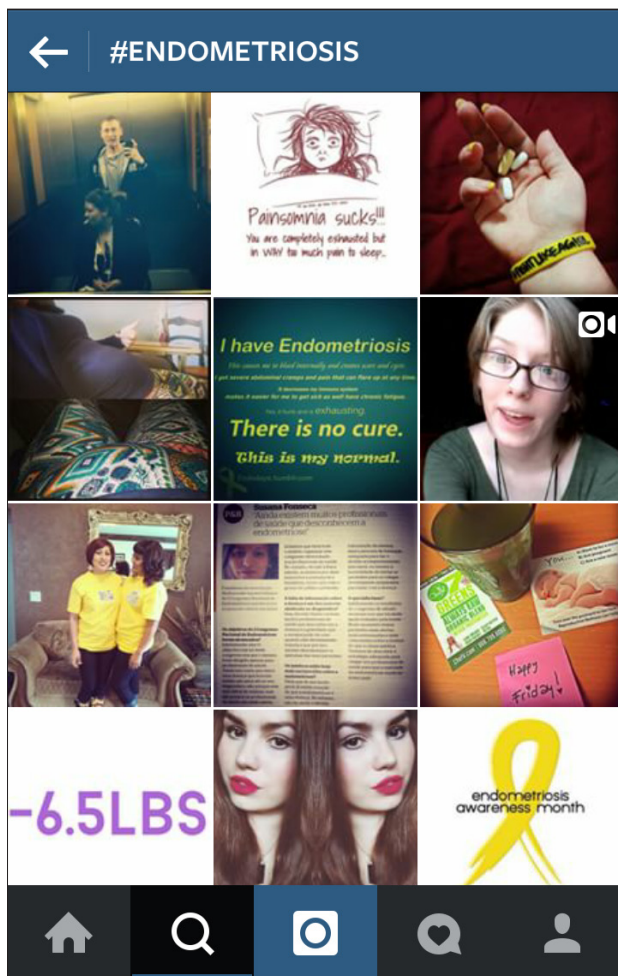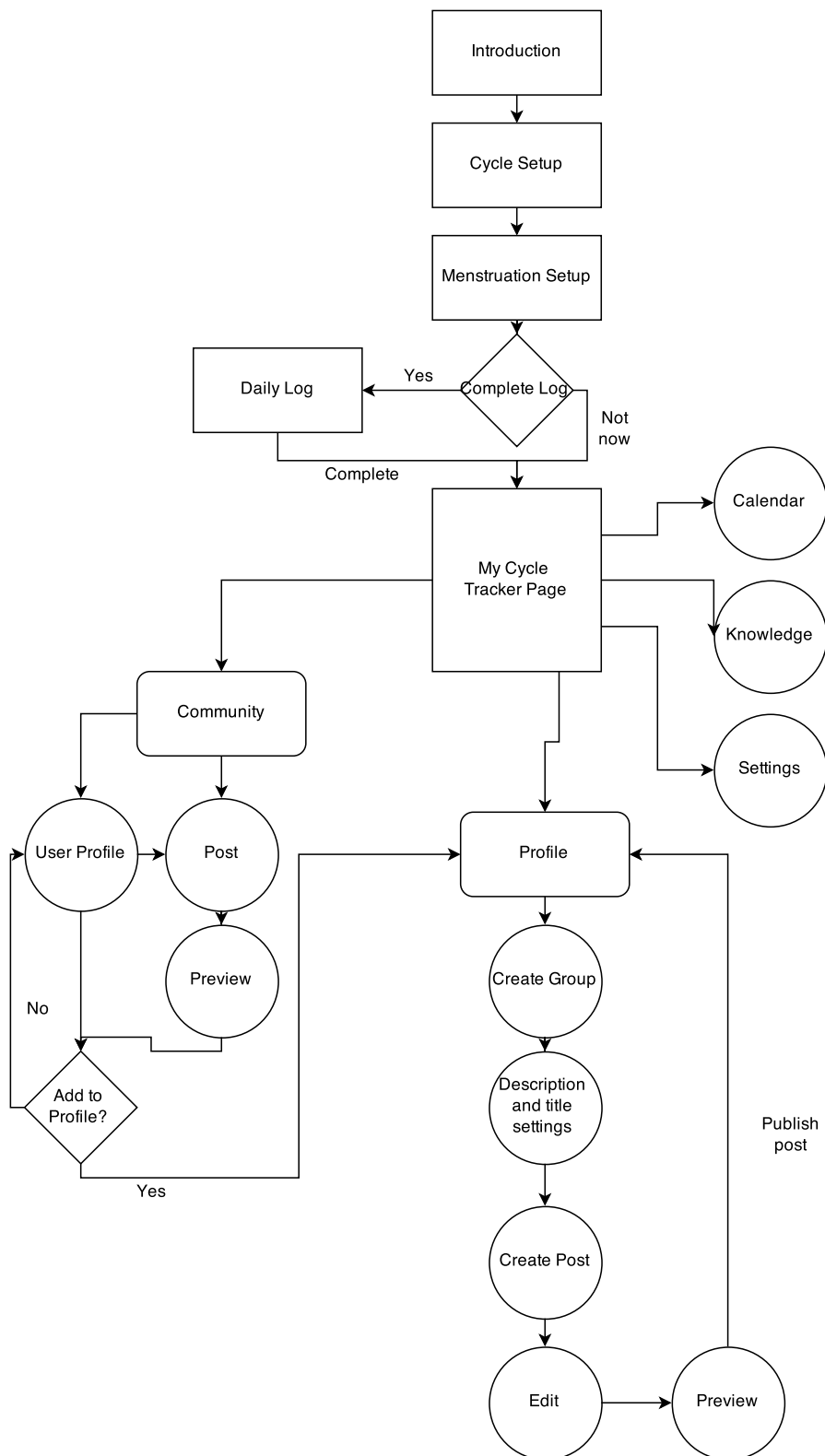
Figure 12. #Endometriosis post (Instagram, 2015)

The community idea, sharing experiences and tips came from women who were diagnosed with Endometriosis which is rarely curable. These women, experiencing endless menstrual pain and infertility issues never gave up on their bodies and share their strength and positiveness.

If they can stay positive with almost no chance of being cured, so why other women can not?

5.1.5. Walkthrough Diagram

```
                              ┌─────────────────┐
                              │  Introduction   │
                              └────────┬────────┘
                                       │
                              ┌────────▼────────┐
                              │   Cycle Setup   │
                              └────────┬────────┘
                                       │
                              ┌────────▼────────┐
                              │ Menstruation    │
                              │     Setup       │
                              └────────┬────────┘
                                       │
                   ┌─────────┐   Yes  ◇─────────◇
                   │Daily Log│◄───────│Complete Log│
                   └────┬────┘        ◇─────────◇   Not
                        │                  │        now
                 Complete                  │
                                  ┌────────▼────────┐
                                  │   My Cycle      │────►( Calendar )
                   ┌──────────────│  Tracker Page   │
                   │              │                 │────►( Knowledge )
              ┌────▼─────┐        └────────┬────────┘
              │Community │                 │          ( Settings )
              └────┬─────┘                 │
          ┌────────┼──────┐       ┌────────▼────────┐
     (User Profile)  (Post)       │    Profile      │◄──────┐
          │        │              └────────┬────────┘       │
          │     (Preview)                  │                │
         No   ┌────┘              ( Create Group )       Publish
          │   │                          │               post
          ◇───────◇                (Description and
          │Add to │                 title settings)
          │Profile?│                      │
          ◇───────◇                 ( Create Post )
              Yes                         │
                                   ( Edit )──►( Preview )
```

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5.2. User Interface Development

5.2.1. Interface Design Rules

Eight golden rules of interface design taken from 'Designing the User Interface.' (Shneiderman and Plaisant, 2011). These principles were adapted to the criteria of the project to ensure key principles were being adhered to when designing the user interface.

- Strive for consistency

Ensuring the application has consistent sequences of actions, colour scheme and layout throughout the navigation; use of identical terminology and consistent commands employed throughout
the prototype.

- Enable shortcuts

Reducing the number of interactions for the frequent users to increase the pace of
these interactions.

- Offer informative feedback

For every operator action, there should be some system feedback. For frequent and minor actions, the response can be modest, while for infrequent and major actions, the response should be more substantial.

- Design dialog to yield closure

Sequences of actions should be organized into groups with a beginning, middle, and end. The informative feedback at the completion of a group of actions gives the operators the satisfaction of accomplishment, a sense of relief, the signal to drop contingency plans and options from their minds, and an indication that the way is clear to prepare for
the next group of actions.

- Offer simple error handling.

Designing the system so the user cannot make a serious error. If an error is made, the system should be able to detect the error and offer a simple solution for handling it.

- Permit easy reversal of actions.

Relieving users' anxiety by making clear that errors can be undone. This encourages exploration of unfamiliar and fairly new options to the user. The reversible units could be done as a single action or a complete group of them.

- Support internal locus of control.

Designing the system to allow space for exploration and make the users the initiators of actions rather than the responders.

- Reduce short-term memory load.

The limitation of human information processing in short-term memory requires that displays be kept simple, multiple page displays be consolidated, window-motion frequency be reduced, and sufficient training time be allotted for codes, mnemonics, and sequences of actions.

5.2.2. Information Architecture

Using rules and guidelines from 'Designing for Mobile Part 1: Information Architecture' by UX Booth, the designer was able to assign tools for establishing the information hierarchy before developing any visual elements.

-        Tabbed View (fig. 13)

Pros
This pattern was chosen to deliver the main application structure because of its ability to provide multitasking characteristics to the user mobile experience. This would allow the user to quickly walk through and understand the complete functionality of the app when it's first opened. Also, knowing that there are at least three different information structures, the designer had to provide a quick access to any of the above consideredstructures.

Cons
This method does not work well with complex structures. The designer has built two prototypes with both tabbed and list view menu options for initial prototype testing. Later it was decided to go with a tabbed view as list one didn't work quite well with some of the users as they experienced issues to identify the purpose and hierarchy of listed sub-categories. Also, some users were not able to find a hidden side menu which was due to information clutter on some pages or not being able to recognise the menu icon.
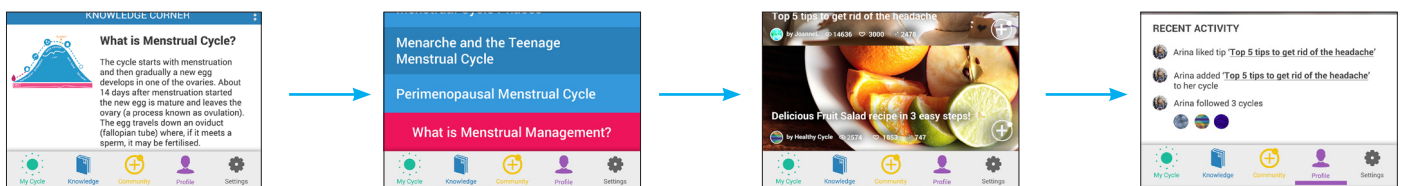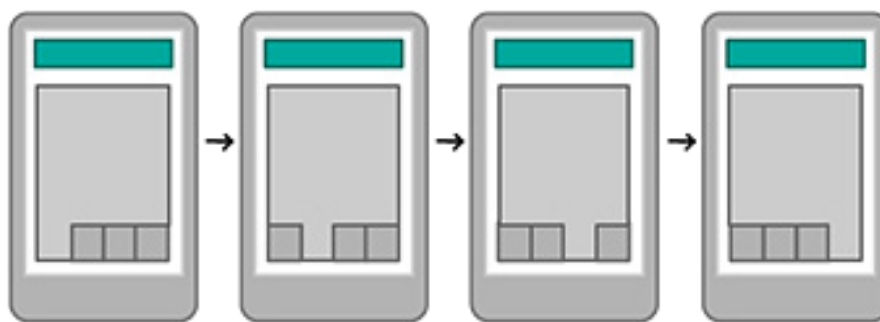
Figure 13. Tabbed View

-        Filtered View (fig. 14)

Pros

Filtered view is ideal for navigating and specifying information that the user needs. This option was chosen for Knowledge and Community screens where sub-layers of information were present and without the search option would require a big effort and additional actions to find information.

Cons

Because of the information complexity, displayed content may appear very difficult to pick up from the first try. When viewed on a mobile device, the user might need to spend a bit more time to fully digest the displayed information. The designer had to consider simplifying the information by providing more depictions; however, in some context, it was not applicable due to the nature of the article. The knowledge section uses external information sources, and in some cases it would be difficult to find an imagery supporting the displayed paragraph. It also applies to the Community page where people are able to create their own posts but if the description image or tags were not set up, the search would have to be more specific and would require more thought from the user.
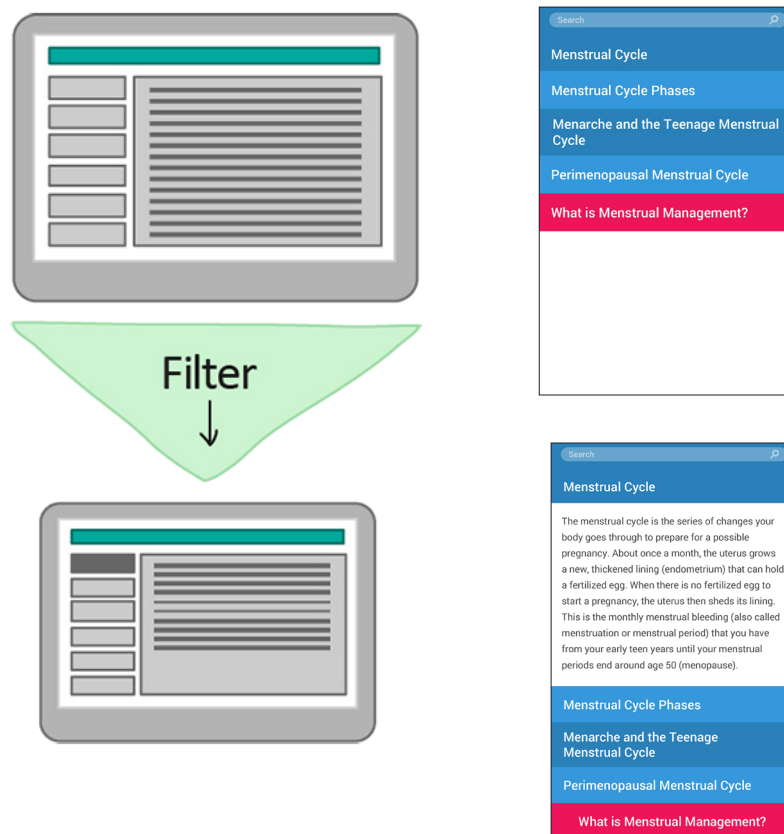
Figure 14. Filtered View

- Nested Doll (fig. 15)

Pros

The Nested Doll pattern was chosen for specific elements of the application to guide users in a linear fashion to more detailed content. When users are in difficult conditions this is a quick and easy method of navigation. It also gives the user a strong sense of where they are in the structure and power to continue further actions or take a step back. In pages such as Calendar, Charts, Daily Log, these menus were thought through so the user could easily change the direction of research. For example, if they made a mistake in entering the wrong article, they can always come back to previous screen to find what was originally searched for. It also worked quite well in Community post display as the user didn't have to go through all previous screens to go back to the main description page.

Cons

There is a potential risk that this type of navigation could stop the user from exploring information. When building a prototype, the designer has to be careful and pay more attention of when, why and how often the user would go back or go forward when exploring the application. Results from initial application walkthrough observations showed that 'Back' button was used quite often mainly because the user forgot or could not allocate the side menu from the first prototype.
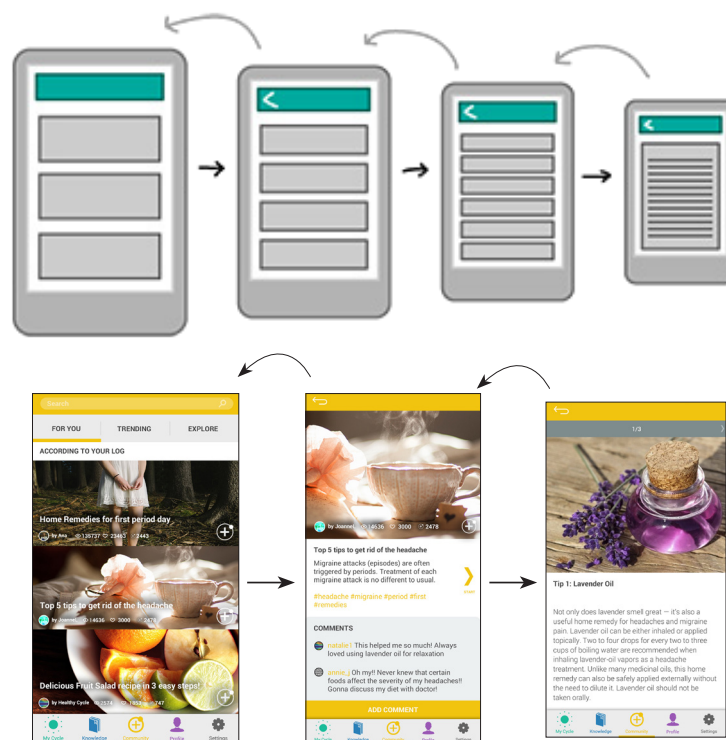
Figure 15. Filtered View

5.2.3. Colour Palette

The designer started by refining what purpose colours would serve in the application and how the above information can be built around it. As the structure and initial concept is text-heavy, the designer had to develop a simple yet contrasting colour set (fig. 26).

Moreover, the user's opinion on existing interfaces was taken into consideration for the colour palette choice. They mentioned that having colours like pink, red, and baby blue would make them less attracted to it as they associate these colours with childish and very "girly" products. The reason behind this opinion is that they would notto open a period tracking application in front of others as they might recognise its purpose by just looking at colours and icons.

The designer chose five primary that would facilitate navigation between different application groups. Android Developers Colour guides (Android Developers, 2015) were used as guidelines to improve visibility of certain interface elements. Each colour would be assigned to the content structure so the user could use it as a reference for easier navigation. For example, green colour is a default colour for My Cycle part. Every piece of information that is related to the My Cycle homepage will have green title bar at the top (Calendar, Charts). When user switches to another information source, it changes the colour depending on the category it is allocated to.

5.2.4. Typography

The designer researched on variety of fonts to increase the readability of information content. The typeface choice is essential as it can facilitate screen purpose and understand the information provided. Roboto typeface was chosen for several reasons:

-      It was specifically developed by Google Developers to appear in high-quality resolution on variety of screen sizes.

-      It has the widest library of typeface appearance (bold,light,medium,italic) that can categorise the importance of displayed information.
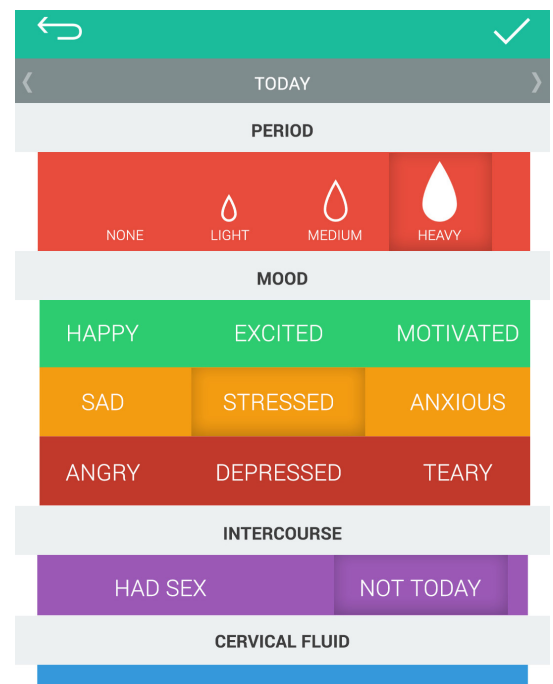
Figure 16. Colour Palette and its use within the prototype

Roboto Roboto, text size large 5px

My Cycle / **My Cycle**
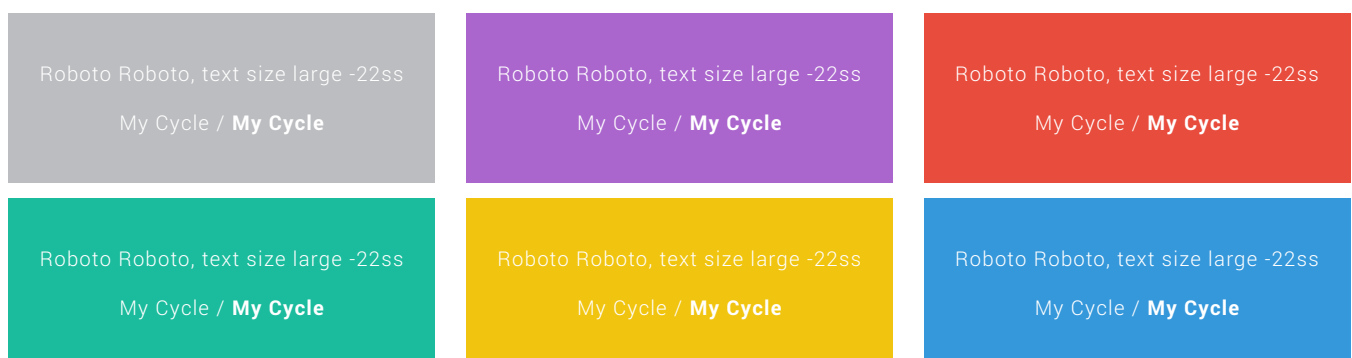
Figure 17. Roboto Typefont

5.2.5. Styling

As the amount and types of information would be fairly new to the user, a specific styling had to be developed. The designer has decided to investigate recognisable elements from trending UX/UI examples.

- Yummly (fig.18)

Yummly is a recipe application which allows you to collect, save and organise your favourite recipes. Yummly has a very distinctive user interface as it mainly contains imagery. Even though the recipe instructions are mainly outsourced from different websites, the interface was built around the most important element of the recipe – images which show how the dish would look after preparing it.

- Trusper (fig. 19)

Trusper is an application that allows users to discover and share tips on daily life with friends and family (Trusper, 2015). Presentation of the tips has clear and step-by-step structure, recommending the user to pay attention to displayed information piece or imagery.

Considering the fact that one of the main contents of final design contains suggestions from professionals and other community users, the design elements that Trusper uses for creating and previewing posts would benefit of using a recognisable interface.

- Google Plus (fig. 20)

Google Plus is a social network based on exploring the community and adding more people, groups and interest to your circles. The user is able to create their own cycles (groups) where similar interests and people can be displayed as soon as you add them to the same circle.

As the idea for the solution is to have a suggestion based platform with potential connection with other community users, the designer decided to use basic and recognisable circle elements as an example for this project.
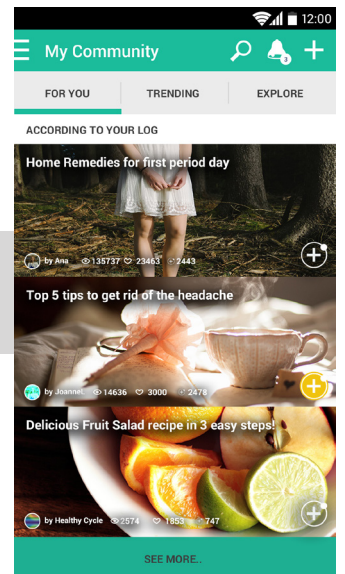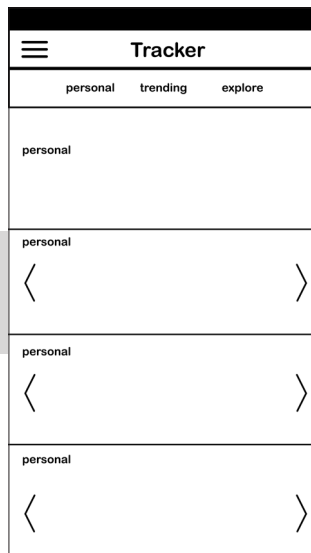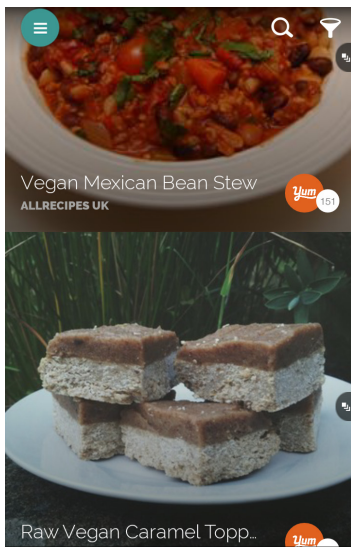
Figure 18. Yummly
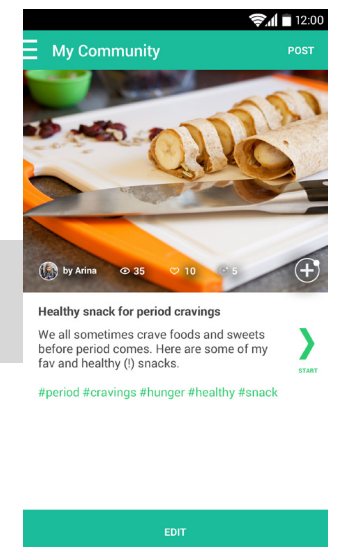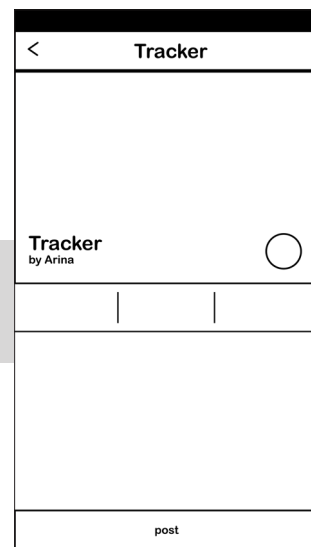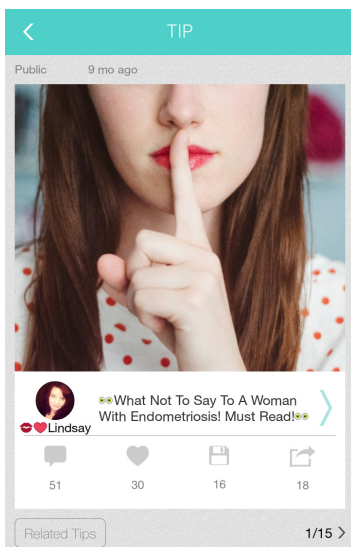
Figure 19. Trusper
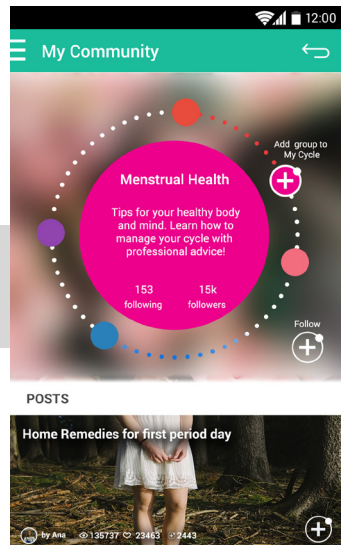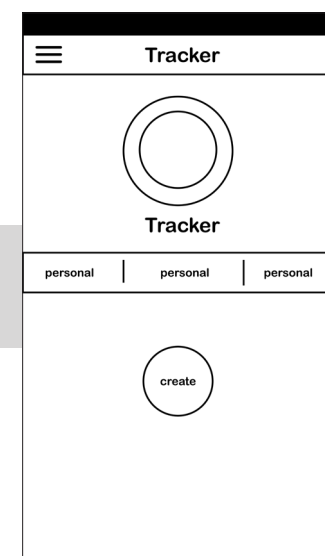
Figure 20. Google+

5.2.6. Emotions and Icons

As some elements of this application require quick recognition, the designer accurately considered graphical elements to be added to the navigation.

One of the elements that had to be tested out was completing the daily log. The aim was to create a trigger for women to pay more attention to logging in their symptoms and mood data. From the market research it was discovered that text-based symptoms record was the least preferable option, so the designer tried to introduce icons and simple graphical elements to go with the daily log.

Two main daily log screen concepts were developed for user testing purposes. Advantages and disadvantages of both concepts are described below:

-       Complete Log (fig. 22)

Pros
The idea of this concept is to provide as much as possible information for the user. This approach appeared desirable to women who wanted to track most of existing logs. The comparison graphs would be built according to this log. For example, the colour indicators on the mood log would correspond in the charts menu so the user can compare the positive or negative moods to the cycle phases and other logs.

Cons
Initial user testing showed that for some women having so many entry options was unnecessary as there was no need for them to track certain symptoms. Even though the designer tried to minimise the amount of text displayed, it was hard to avoid text-based logs and scientific language.
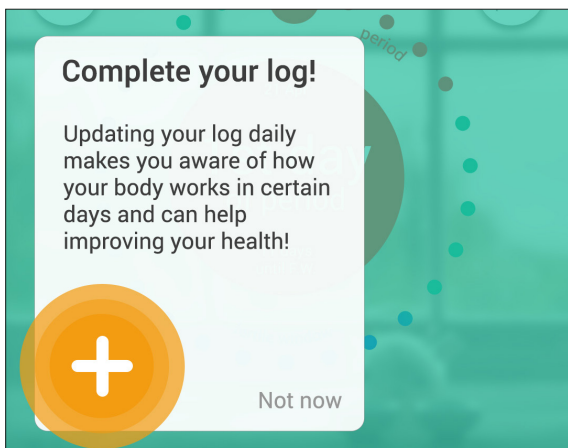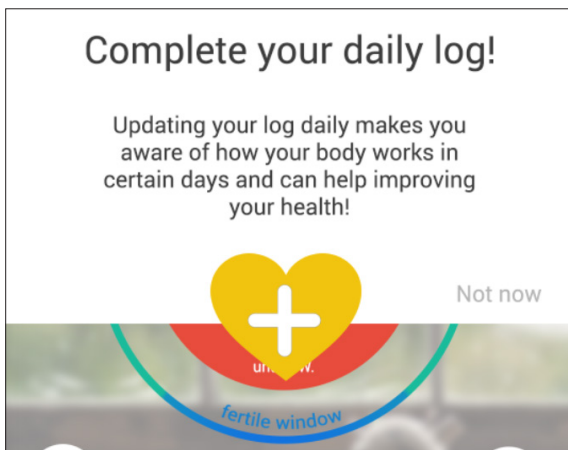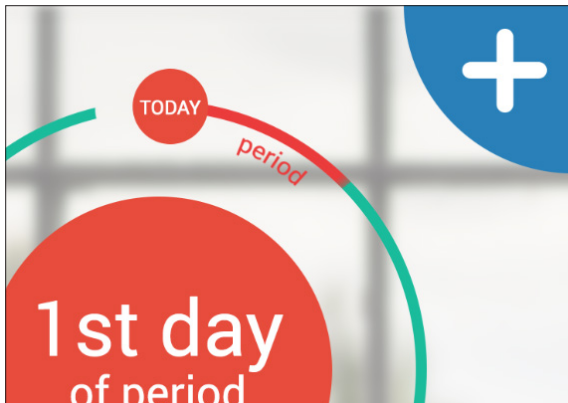
Figure 21. Comlete log button variations

Figure 22. Complete Log

-        Imagery Log (fig. 23)

Pros

This concept was developed from the idea of self-reflecting. By using emotion icons, the user was able to compare their mental or physical state with simplified emotions and images. One of the comments on the initial imagery prototype was: "It seems like the application cares about you" which clearly showed immediate emotional and sincere connection to the application.

Cons

The disadvantage of this option is the navigation system. If counting all logs that need to be displayed, it would become very difficult to get complete daily log information from the user. Besides, making choice and swiping between screens would make the process twice as long which may make the user irritated and confused. With this method, a chance for getting false log is much higher than in previous one, as users have time to think through their choice and adjust it if they are not satisfied with the profile it creates.

The designer had a tough decision to make whether to leave full customisation to the user or create an emotional connection with the user but risk the quality of recorded information. The designer went towards the Complete Log option in the initial and final prototypes, leaving the choice to the user, whether they do or do not need to track certain symptoms or moods. However, the second concept was put into consideration for further development and will be tested within the final wireframe prototype.

Complete your daily log!

Why? It helps us to more accurately predict your next cycle and you to be more aware how your body works in certain days.

Symptoms?

cramps	acne	sore breasts
cravings	diarrhhea	headache
sex drive	insomnia	nausea

3 out of 3
● ● ●

skip

Complete your daily log!

Why? It helps us to more accurately predict your next cycle and you to be more aware how your body works in certain days

Flow?

spotting	light	medium	heavy

2 out of 3
● ● ●

skip

Figure 23. Imagery Log

Complete your daily log!

Why? It helps us to more accurately predict your next cycle and you to be more aware how your body works in certain days

Mood?

shocked	happy	sad
excited	angry	sad
stressed	shocked	meh

1 out of 3
● ● ●

skip

5.2.7. Charts Arrangement

The designer has also considered how the previously logged information should be displayed to the user. A special chart was made where the user could compare their menstrual cycle to other log information within the chosen time period. The user has a choice of reviewing one or several pieces of information at once. (fig. 24). For example, the user can compare their mood and menstruation to better understand if the changes in cycle were caused by a stressful state or not.

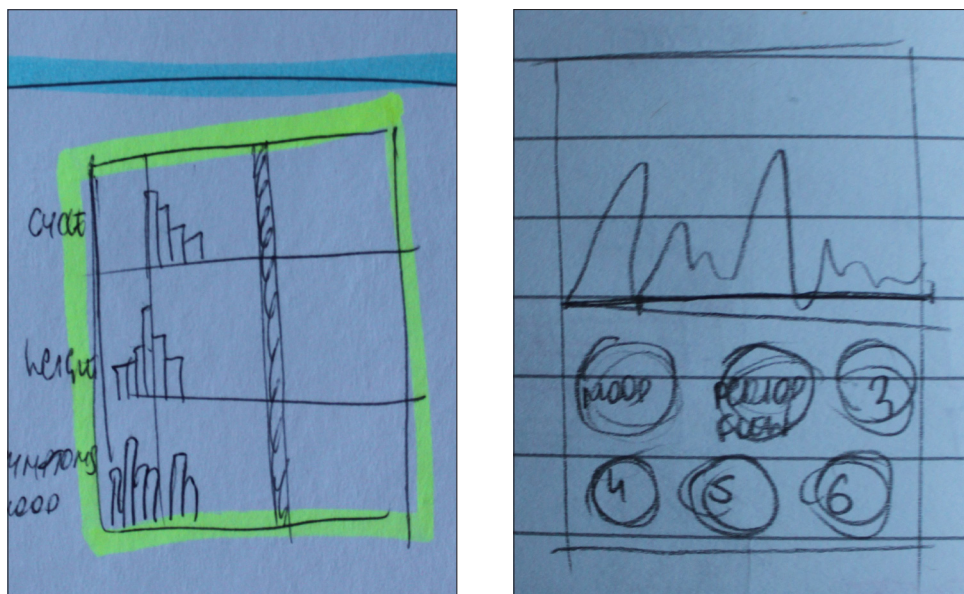The designer considers this method much easier to follow as most of the information is represented visually and can be compared to multiple processes. (fig. 25)
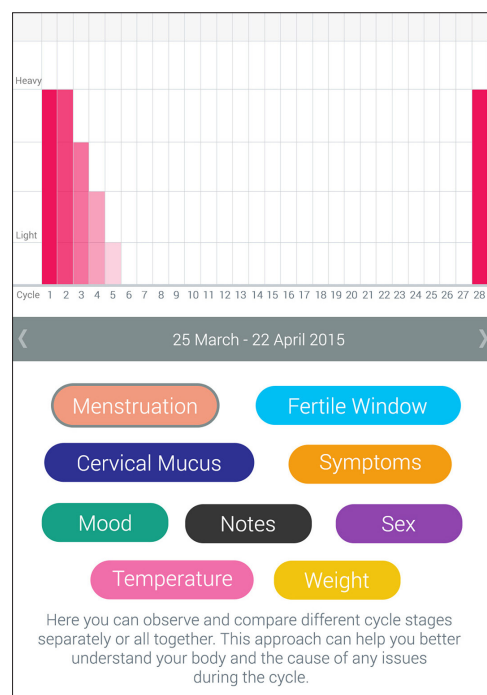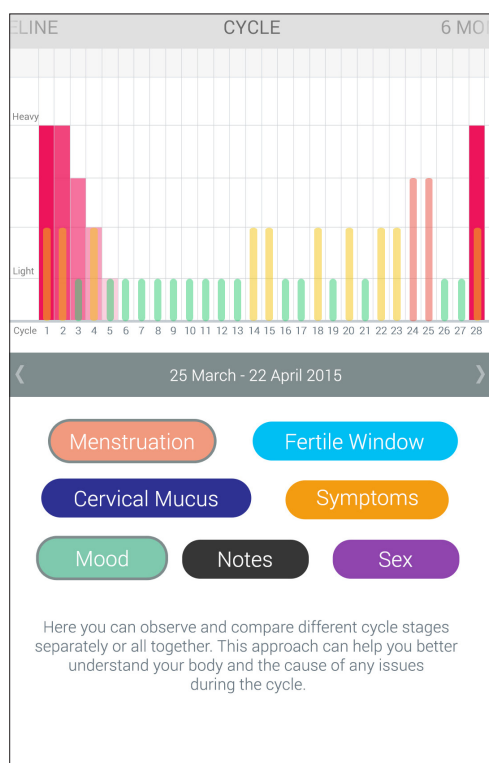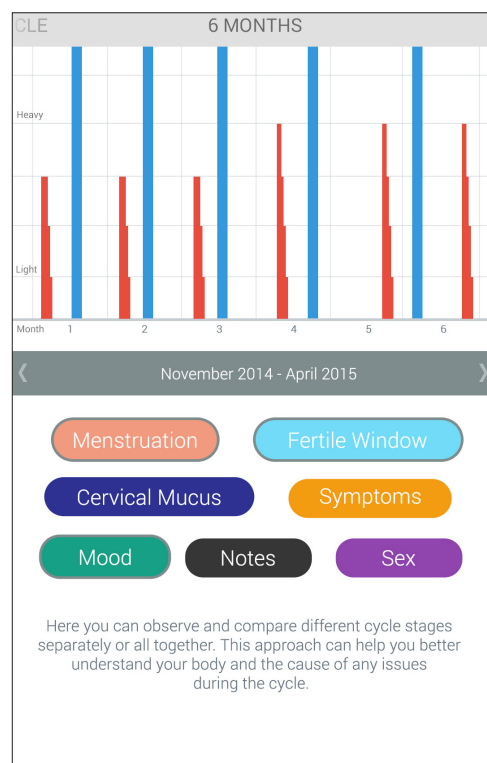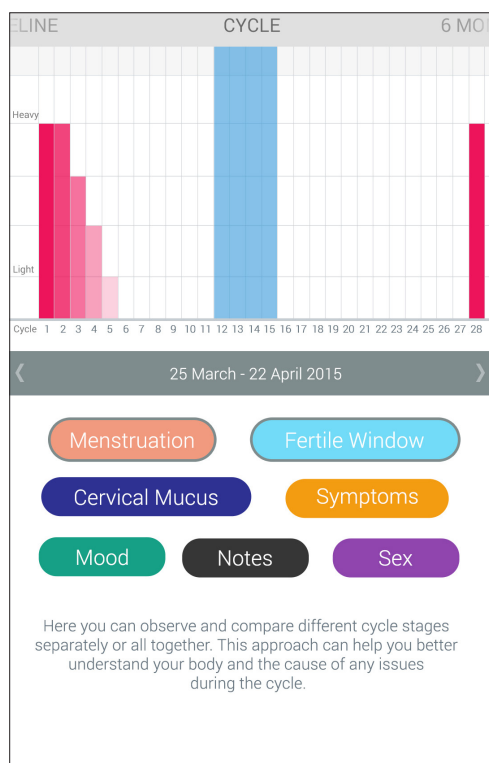

Figure 24. Initial sketch ideas

Figure 25. Charts variations

5.2.8. Branding

For the user to be able to identify the product on the market, logo and icon elements were developed for the final product prototype. The inspiration was taken from the visual appearance of the cycle and how it goes around repeatedly (fig. 26). Also, plus was added to symbolise not only health but also how much could be added to it. (fig. 27) My Cycle name was taken for the brand name for closer relation to womens personality and body.

5.2.9. Language

Appropriate language (fig. 28) had to be developed for the user to be more comfortable whilst using the application. While a simpler language would be much more preferable, scientific terminology had to be used where necessary in order to maintain thoroughness in delivering a certain message to the user. However, the focus was on making the technical aspects appear easier to understand by careful implementation of simplified descriptions.
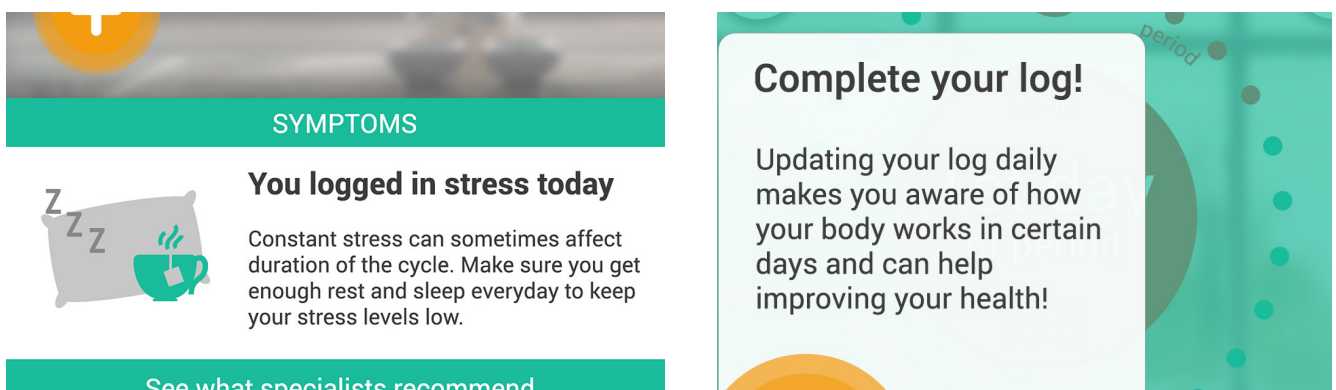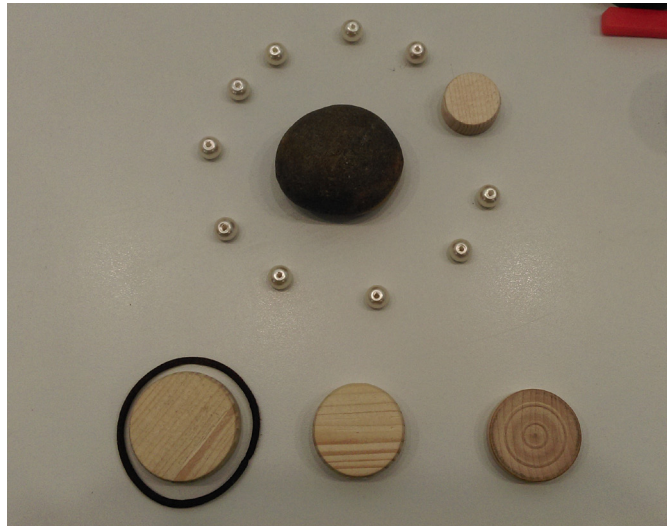

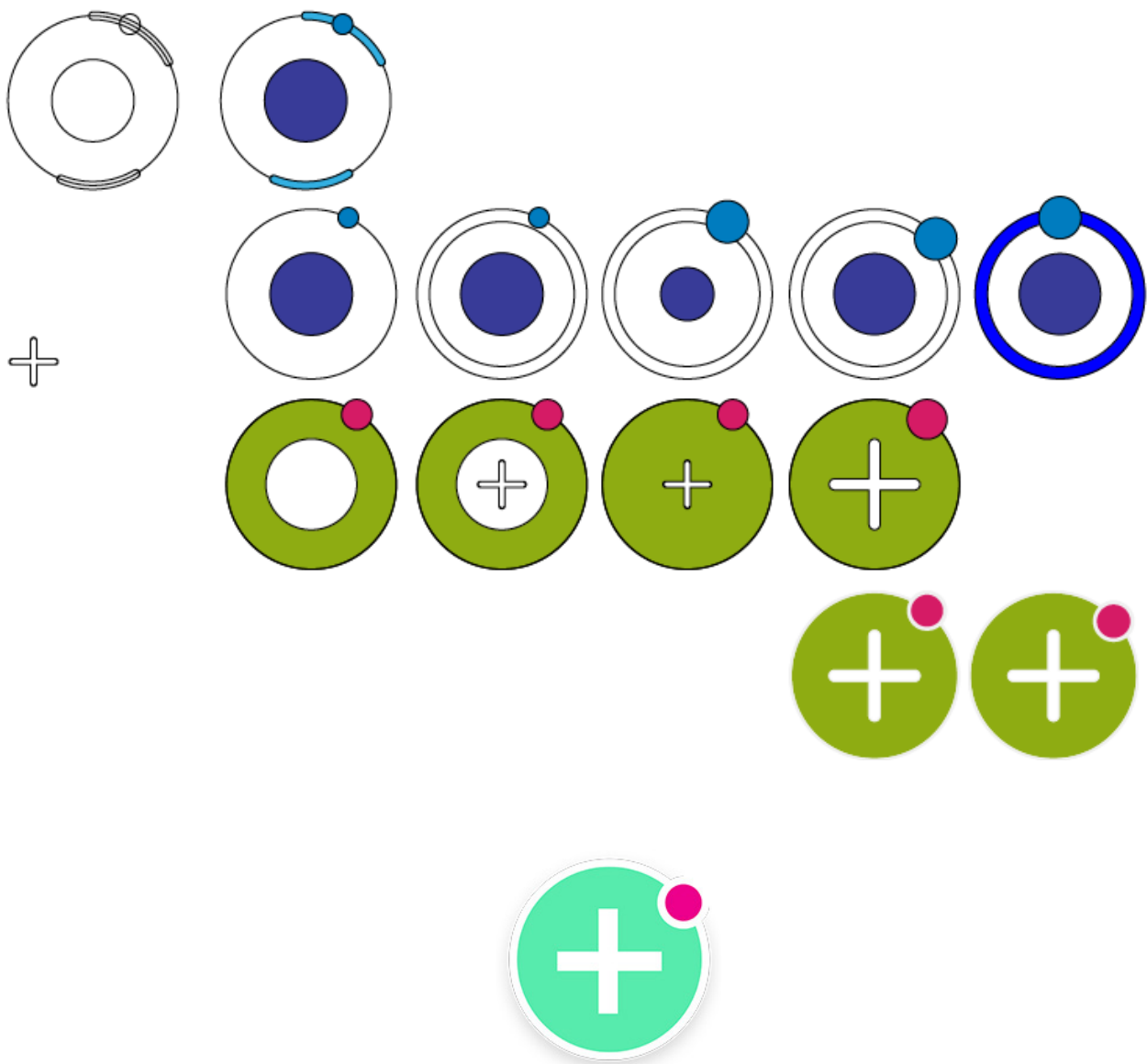*Figure 28. Language Examples*

Figure 26. Thinking with objects

Figure 27. Branding Development

5.3. Technological Development

Using the right platform for developing the concept would define the user's understanding of the overall feel and look of the design. Also, the designer had to consider the platform that would allow making quick changes to the interface or navigation so further user testing could be held.

5.3.1. Invision

Invision (fig. 29) is a new online platform that allows designers to build application or website prototypes for any digital device. The platform requires minimum programming skills allowing the designer to build quick and fully defined prototypes. Invision platform helps representing the interface and overall feel of the application. The platform also allowed reviewers to view and use the application 'live' whilst being in development in order to suggest usability changes, etc. Invision platform was used for prototyping the application and collecting user feedback.

5.3.2. Adobe Photoshop

Advanced visual elements of this app required a platform that would easily align and transform visual elements of the design. Adobe Photoshop (fig. 30) is based on pixel manipulative software where the designer can build desirable imagery in appropriate screen resolutions.
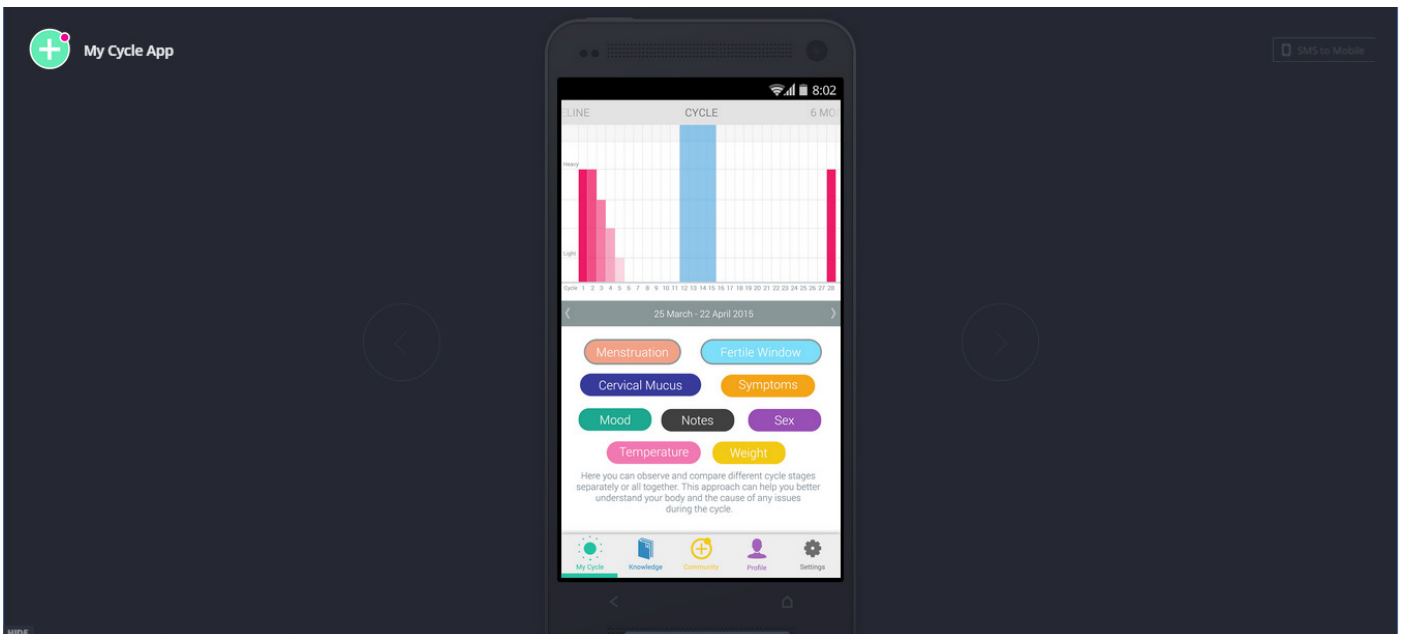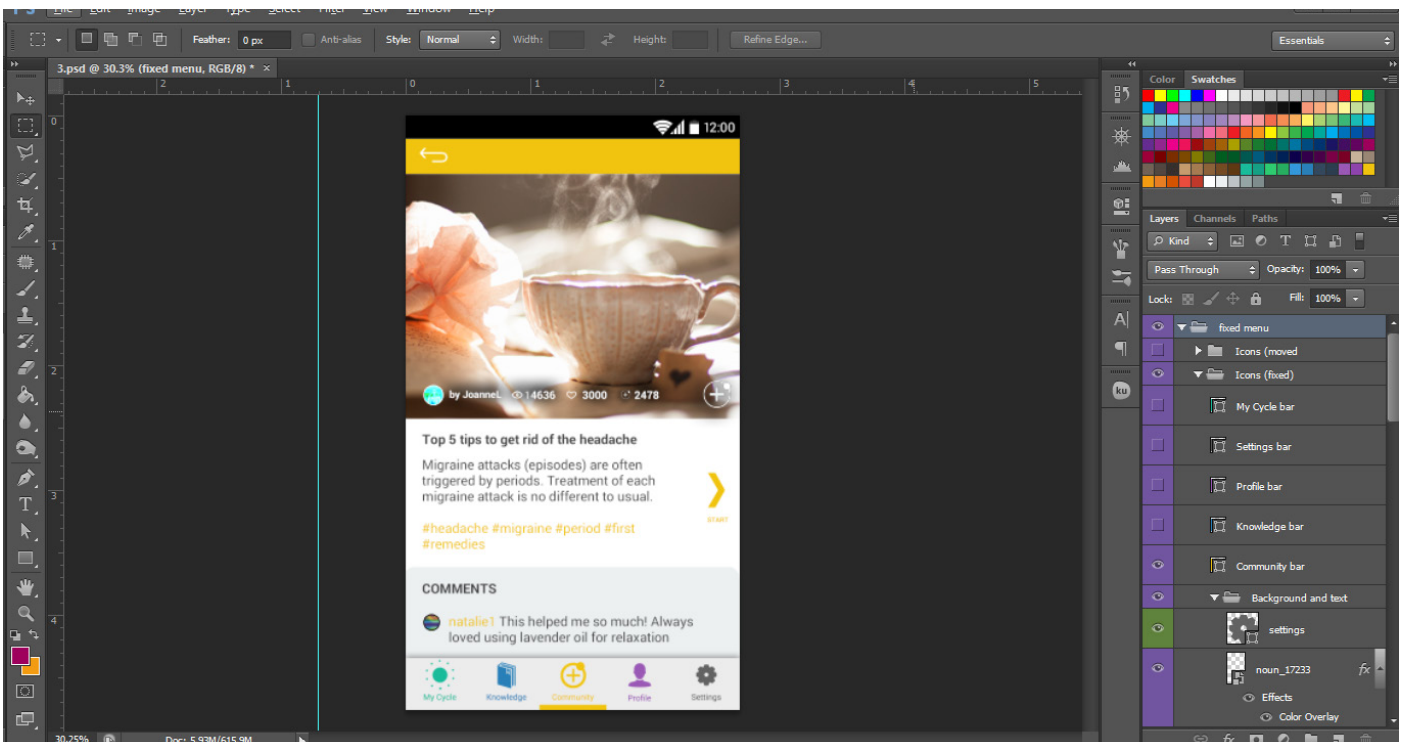
Figure 29. Invision Prototype

*Figure 30. Photoshop development work*

5.4.   First Prototype

5.4.1. Usability Testing

First prototype was tested within the online community and in series of contextual interviews and recorded walkthroughs. (fig. 31)
However, there were some issues that limited the user to fully express their opinion on most prototype features. The main issue was the inability of prototyping software to provide all proposed designed interactions and navigation of the screens. For example, screen 2 and 3 contained elements that had to be dragged along the screen but were substituted with instant replacement action. Furthermore, some pop-out tabs that were supposed to appear only once at the initial stage, were appearing every time the user went back to the screen menu. The designer believes that with providing prototype instructions users could ignore the minor disabilities of the app, but some feedback could have been affected by the described features.

An anonymous feedback survey was arranged to collect initial feedback on the application's overall idea, as well as whether this design is desirable within the targeted user group. The survey contained a link to the Invision prototype and comment boxes with several questions (Appendix 11.2.).
The most common feedback from all respondents was received on the overall view of the application. Most of them were satisfied with the colours, images and icons displayed in the prototype.One of the participants also mentioned that she was using Glow ovulation tracker but admitted that the overall feel of the My Cycle concept appeared more interesting "clean, easy to follow".

As the idea is fairly new and has a lot of features, the designer arranged interviews with application walkthrough (fig. 1). Before the user could go through, the designer asked general questions whether the user is familiar with menstrual management applications and if they had issues with finding relevant information to their menstrual cycles. This method was effective for collecting general feedback on usability and desirability of the concept. The designer was able to see how clear the navigation was to the user and how well they understood provided instructions and the purpose of each information piece.
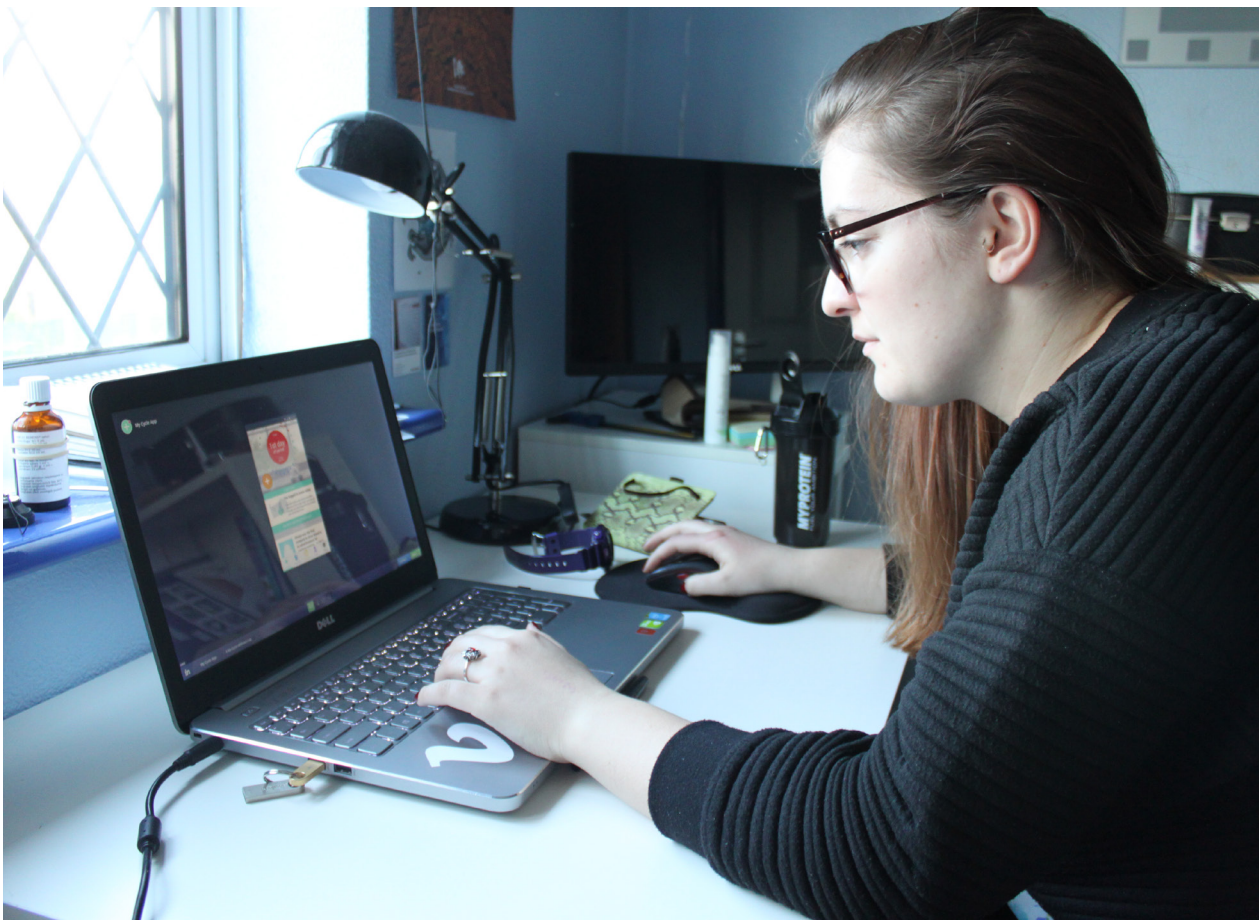
Figure 31. Walkthrough tests with users

5.4.2. Proving Principles

After the initial feedback stage which included the app walkthrough, it became evident that there are two distinct user groups who would consider using the product.

-      Period Tracker Users

Some women preferred using the app for comparing their own symptoms in one graph (no education needed). It has been further suggested that the ability to compare the menstrual cycle with and without separate symptoms would have been very useful. It would give them a new way of considering how their body copes with their menstrual cycle.

-      Community Users

Others explored the community features to educate themselves what professionals and other people offer for tackling symptoms and moods. Women have admitted that the option to look for answers to certain questions they might have on their period by browsing through materials submitted by professionals in related topics is a neat feature. The majority have informed the designer that they would use this function when in need of suggestions or further information. Although, not many have considered creating their own posts due to not wanting to share their personal experiences. However, that said, it has been noted that such topics from other women would have been read and considered, if posted.

5.4.3. Design Progression

Above comments from the final user research proved that the service could offer a solution to interest women in managing their cycles. However, for this to be feasible in today's competitive market the investigation would need to be performed on a much larger user group. This would take place in further development stages.

6. Evaluating the Design Process

This project ended up to be an extensive project with many elements and layered information. Not only was there the area of needing to educate women positively by providing a refreshed view on how to follow one's health and taking it serious rather than as a given, there was also the electronics and implementation side of it all. The product being split into two main parts, the management tool and the community, all made this project a big challenge.

The project changed direction several times due to either discovering new products within the market that already existed, or due to user preferences and usability feedback which have benefited the final outcome in the deliverables. Testing and feedback collection for this type of project is very time consuming, complicated and requires plenty of resources to achieve the right test conditions.

7. Further Development

7.1. ExpertEvaluation

A professional evaluation was performed withseveral design expertsassessing the final project and suggesting improvements that could be made.

Kajsa Sundeson, Design Strategist, Ocean Observations, Sweden (fig. 32)

"Great job, seems interesting. Looking forward to see the final result!".

"I like the cycle, I like the visuals a lot. It seems like a good idea of combining different types of content but maybe you should think through how you do that to make it less confusing, condensed and have even more natural flow of information because now it is kind of spread all over the place".

Samir Fors, Interaction Designer, Ocean Observations, Sweden

"Starting from the user needs, I don't think it is an app that I would spend a lot of time in meaning it should be easy to navigate to the rest of the content without going into different menus".

"You have to somehow to catch users attention here [My Cycle page, Appx] for them to spend some time on this and the community. That's why I also think it would be nice to have the Community stuff here [My Cycle page, appx] and it would be changing a lot. It might be from your friends, it might be very specific to your issues".

Figure 32. Kajsa and Samir, MEX Conference 2015, London

Joshua Stehr, Design Analyst, We Are Experience, United Kingdom

"Most methods for period tracking are focused on the period itself and symptoms related to that, helping to conceive a child or avoiding pregnancy, there is not much consideration for the entire menstrual cycle. This idea is something that can become a tool for women from their first period until their menopause and maybe even beyond. It can provide great education and support for women of any age in managing their cycles, and the mood swings, symptoms and other cycle related factors that come with them."

"This is a great opportunity to build a habit-forming product that facilitates positive behaviour change. The key challenge exists in creating a frictionless experience that emphasises to users that they must invest time and effort in the product to get the most out of it; forming a habit around completing a daily log is the vital to its success. Once this challenge is conquered women can be empowered by professionals and the community to see their cycle in a positive way. It can offer more personalised insight into their own cycle and find techniques and advice from others who experience similar symptoms and issues."

"Another possibility may be that the user receives a daily notification to complete their daily log at the same time, rather than having to physically go into the app to receive a trigger"

"It would be useful to show how the graph looks on different days of the cycle - push the graph to its extremes - what if the user has a very long cycle, what if they have a very short cycle - what does it say when the user is not on their period"

7.2. Customisation

The most challenging part of this project was to satisfy every need even though the targeted user group was very specific. When one is dealing with human's health, anything could happen and the designer has to prepare a solution for these unusual circumstances.

More detailed customisation will take place in further development. Such health conditions as ovarian cysts, endometriosis, hormonal imbalance, diabetes, chronic migraines and many more have to be considered to be able to specify recommendations and tips for women having these conditions.

Even though one of the personas had endometriosis with minimal severity, the suggestions might not fit everyone if the level of severity is from mild to severe. At this stage suggestions might not help as the only way to improve the state of women's health is to go through an extensive medical examination with a possibility of surgical intervention.

For these particular situations the application has to be more intuitive and alarm the user if something in their menstrual cycle goes wrong. Moreover, it would need to have a fixed communication channel with the doctor in case the user has an emergency.

7.3. User Group

This project took a turn towards women of young age focusing on self-education and raising awareness about the importance of managing menstrual cycle processes. However, the bigger gap was later discovered in a much younger user group.

During the interview people were asked on where they learnt about the menstrual cycle processes and how useful it was for them.Most of them confirmed getting very brief introduction to menarche (first menstruation) and reproductive system at ages 10 to 12. Provided knowledge was a generic introduction to the menstrual cycle and was never described to them in a different, more lifestyle
related context.

One of the cases that the author was told about was when a teenage athlete had her spine damaged and was never able to do sports again because of not being aware of body and hormonal changes caused by the development of reproductive system.Usually, female athletes engaged in intensive training show an increased frequency of menstrual irregularities too (Bonen ad Keizer, 1984).

Even by just providing generic information of how development of the reproductive system might be developed within common lifestyles in younger girls, it would show the menstrual cycle from a completely different perspective.

7.4. Wearable Technology

The future of wearable devices in tracking health is already here and combining existing platforms with innovative designs can drastically improve our quality of lives.

During initial stages of the design development, the designer was also looking at the compatibility of wearable technology with My Cycle application. (fig. 33) The advantage of syncing these products together is to minimise users' stress from constant reminders to complete daily log or revisiting the application too often. Wearable devices like Olive (Olive, 2014) could automatically update stress levels; Jawbone Up (Jawbone, 2014) can send out activity and sleep duration to My Cycle software. Ringly (Ringly,2015) could be set up to send customised reminders in preferred days or times to the user.

All-embracing user and market research would be carried out to find a cost-effective and working solution for the chosen user group. By just mentioning this concept direction to Glow online community raised quite a lot of interest (appx) which could potentially grow in a separate project of designing a wearable technology piece to make women more aware of their menstrual health.
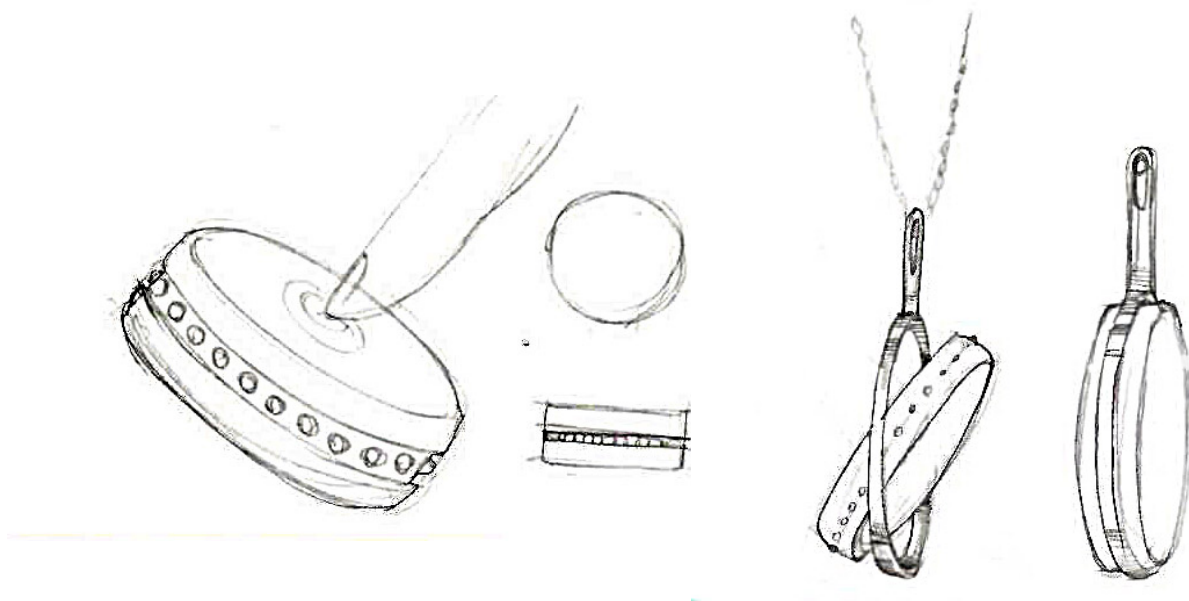
Figure 33. Wearable Device prototype for monitoring data for My Cycle app

8. Conclusions

8.1. Research

The research stage of this project was conducted thoroughly and meticulously. The different triggers were looked at in depth for changing human behaviour; however it was felt that these areas could have been looked into more as a lot of time was spent aiming at meeting user needs and desires.

Making the user comfortable talking about such sensitive and still stigmatised topic was the biggest challenge so far. Because of the sensitive nature of the topic, the chance users have not been completely truthful with their answers is relatively high.

More research could have been conducted into the interface and navigation development side of the project too. It was explored, but it could have gone to greater depths.

8.2. Design Development

The design development stage of the project has produced an application prototype with the ability of navigating and exploring the concept. Fully developed wireframes aided in the testing and final prototype refinement to determine the usefulness of the product. The development was strong and produced a wide range of concepts.

If there had been more time it would have been useful to make a fully developed brand and include all interface functionality in the final prototype.

8.3.   Final Design

The final design was quite successful, even with limited functionality the user proved the principle of using triggers to change the behaviour of the user.

However more time could have been considered over the final interface elements with appropriate branding as well as final design could be developed in professional software allowing the user to experience all interactions as they would be real.

8.4.   Evaluation

The evaluation stage of the project was not as in-depth as it could have been. There were areas that could have been explored in greater detail, such as the final responses from users about the final functionality and interface.

However the testing needed to cover this project properly has been outlined and analysed and considered. The further development was explored quite thoroughly.

9. Acknowledgements

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11. Appendices

Glow

1.   "At first I thought it was looking good but after couple of days logging in, Glow send me constant notifications on when I can get pregnant or have sex. It's like it tried to force to have sex everyday when it's possible.".

2.   "So much text, I sometimes got confused what Glow tried to suggest for me. Very text-heavy interface"

3.   "When I went to the Community page, I was terrified from topics that were displayed. Miscarriage, pray for me? My man left me, what should I do? and most of them are like that. And I really don't want to share my menstrual problems with other women, they are not professionals to give me proper advice".

Clue

"What should I do if I don't have PMS? Why it's showing that I have something before my period?"
"I like these icons, they look cool. But I want to see more choices than that."

Kindara

"I think I am not that crazy about my sexual life to spend months to figure out when to have unprotected sex. Plus measuring temperature every single day in 5am would make me crazy, forget about it. I don't think this app is made for me."

"This interface looks so old! And why I need to share my diagram with other people? Why would I ever do that? It's only for me and my doctor".

"Do I have to fill it [records] all in by myself? Looks like something that my doctor would only use"

Ovia

"I love these colours and simplicity of interface, doesn't look like one of these girly period trackers with flowers, childish colours like pink."

"So many posts at the home page, I hardly read any but it seems that some of them were interesting. Especially tips on sex and eating healthy."

Summary

Would you use this app?
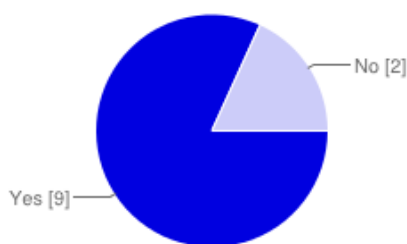
Yes	**9**	81.8%
No	**2**	18.2%

Why would you use or not use this app?

I like the idea of logging my moods and "symptoms" throughout my cycle. I'm not that organised and I would never do it myself, but I like the idea of an app to help you notice patterns

easy to use, helpful

I have a IUD and I don't have my periods

I presume that it would track and save(!) my period dates, etc, and that it would help me during my visits to gynecologist. It could be also useful when planning to start a family. Usually I myself feel my period 3-4 days before, so the date would not be so relevant for me. I would also browse, at least at the beginning some articles about different relevant things, but am not sure that I would do it on a constant basis. The idea is really great! For people to stick with this app I think you should consider adding some social aspect - do not know what kind exactly.. Maybe some forum, where women can give advises - medical experts, etc, or something else. People should have some strong social connection to stick with it.. It would be also cool if this app would remind the user to fill in "my log", because me for example - I would forget!

I already have an app that does the same thing (Period Tracker). The only difference seems to be that there are blog posts to look at but I would not spend my time reading about other people's period experiences. Periods are something that I get on with - they happen every month but I do not want to read about them in depth or be faced with in depth information on them when I go in to input my dates/symptoms. I also don't like the use of language such as cervical mucus - It sounds very clinical and not something that I would want to log when worded in that way. Perhaps if there was a passcode to enter so that I knew that people would not be able to read about the state of my 'cervical mucus' - eurgh. The app I use also has far more extensive options - it allows weight, temperature, contraceptive pills/reminders and a notes section to all be inputted. I would not switch for my current app to this one as, although it looks nicer, it is an app that I am on very rarely and would not be spending time navigating around to get informative blogposts etc. My app also has a calender view so I can quickly see an overview of my months and flick between them - this is far easier to use when showing a doctor. My current app is

something that I use only to quickly input information so that I can look back on or show to my
doctor. (I also don't like the tender breasts icon, it looks like a smiley with saggy eyes!)

looks really helpful

Beautiful design Arina! Really love it, I use Glow but this is beautiful. Clean easy to follow design

Was the navigation clear for you?
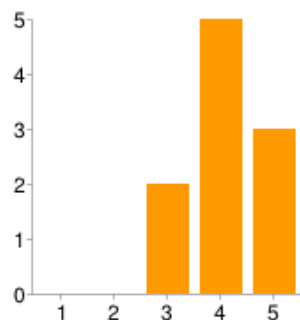
1	**0**	0%
2	**0**	0%
3	**2**	18.2%
4	**5**	45.5%
5	**3**	27.3%

Which part(s) of the app you liked the most?
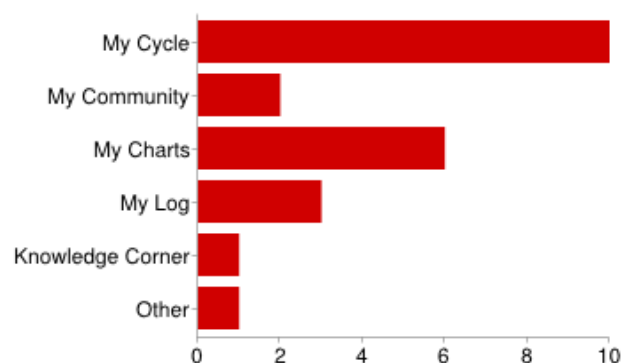
My Cycle	**10**	90.9%
My Community	**2**	18.2%
My Charts	**6**	54.5%
My Log	**3**	27.3%
Knowledge Corner	**1**	9.1%
Other	**1**	9.1%

What would you use this app for?
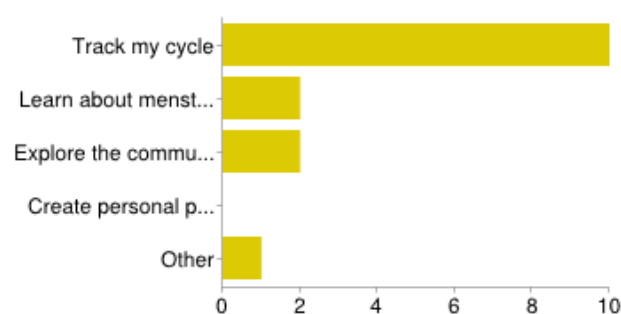
Track my cycle	**10**	90.9%
Learn about menstrual cycle and reproductive system	**2**	18.2%
Explore the community for tips and other posts	**2**	18.2%
Create personal posts	**0**	0%
Other	**1**	9.1%

Daily Log screens

Which Daily Log screen you prefer?
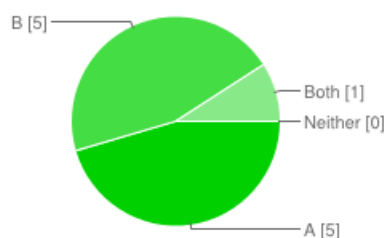
A	**5**	45.5%
B	**5**	45.5%
Both	**1**	9.1%
Neither	**0**	0%

List THREE things you LIKED in this app

Colorful, Clear, Easy to use

Design Information was there if needed Navigation

the visual, navigation

interface design

The graphics were clear and appropriate. The tone of voice and information available in manageable bits. The concept.

the idea

The overall look The 'My Cycle' page

List THREE things you DIDN'T LIKE in this app

Sometimes I wasn't sure what was being asked or the point of the page. Some of the information areas were too long. I don't think I would read that much in an app. Was there a back button?

'CERVICAL FLUID/MUCUS' - eurgh. The option to write your own posts - why can't people just get on with having their period instead of talking to strangers about it? If there was any concern I would talk to my doctor. It would just turn into something like Yahoo answers where information is published with no professional input. Surely the menstrual cycle information is very basic and most women know how they work. You are taught it in school. Seeing it each time you log into the app will not boost your knowledge only become an annoyance seeing the same information over and over again. There is no calendar view.

nothing

is it only about the cycle?

Wordy in the knowledge section

List THREE things you would IMPROVE in this app

I have mentioned in the beginning section.

Have a navigation bar or a graphic review of your cycle on some screens (like the daily log - maybe show what you logged on that day of your last cycle?)

Search function Could you customise sections? Eg if you didn't want knowledge

dont know

add something more for example track the weight

What is your age?

Answered: 100   Skipped: 0

Do you use a menstrual calendar to track your menstruation and ovulation phases, mood swings and other symptoms?

Answered: 97   Skipped: 3

Please indicate how strongly you agree or disagree with following statements

Answered: 86   Skipped: 14

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree	Total	Average Rating
In some ways I enjoy my periods	39.53% 34	39.53% 34	9.30% 8	11.63% 10	0.00% 0	86	1.93
Menstrual periods is just something I have to put up with	2.33% 2	4.65% 4	6.98% 6	59.30% 51	26.74% 23	86	4.03
Men have a real advantage in not having the monthly interruption of a menstrual period	0.00% 0	2.33% 2	23.26% 20	27.91% 24	46.51% 40	86	4.19
I am embarrassed when I have to purchase menstrual products	36.05% 31	33.72% 29	16.28% 14	11.63% 10	2.33% 2	86	2.10
I prefer not to talk openly about my menstrual cycle	9.30% 8	26.74% 23	32.56% 28	24.42% 21	6.98% 6	86	2.93

Indicate whether the statements are True or False

Answered: 86   Skipped: 14

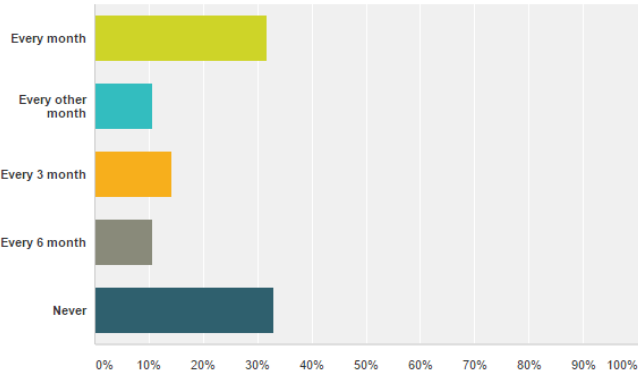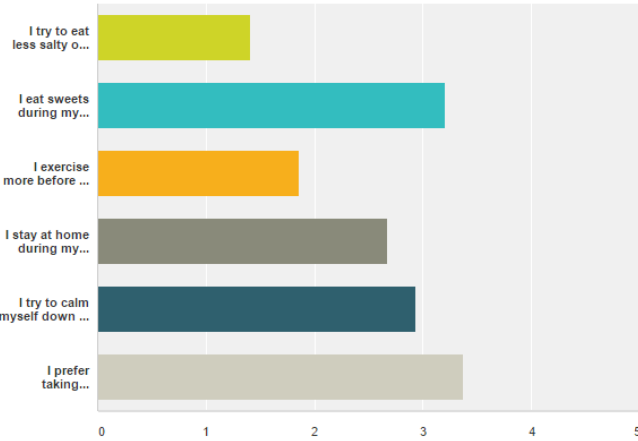|	True	False	Total	Average Rating
Pain during menstruation is "normal"	77.91% 67	22.09% 19	86	1.22
PMS symptoms can be controlled only by medicine	19.77% 17	80.23% 69	86	1.80
PMS is caused by stress	27.91% 24	72.09% 62	86	1.72
Stress can affect the length between periods	88.24% 75	11.76% 10	85	1.12
Nutrition can affect the length of time between periods	79.07% 68	20.93% 18	86	1.21
The luteal phase is the first phase of menstrual cycle	34.12% 29	65.88% 56	85	1.66
Excessive production of hormones cause menstrual cramps	56.47% 48	43.53% 37	85	1.44

If you could choose how often you have a period, what would it be?

Answered: 85   Skipped: 15

Assign these statements to a preference scale

Answered: 83   Skipped: 17

	Never	Rarely	Sometimes	Very Often Often	Always	Total	Average Rating Rating
I try to eat less salty or sweet snacks before my period starts	73.49% 61	14.46% 12	9.64% 8	2.41% 2	0.00% 0	83	1.41
I eat sweets during my period to make me feel better	10.84% 9	16.87% 14	30.12% 25	25.30% 21	16.87% 14	83	3.20
I exercise more before my period starts	49.40% 41	25.30% 21	16.87% 14	7.23% 6	1.20% 1	83	1.86
I stay at home during my period	19.28% 16	27.71% 23	26.51% 22	19.28% 16	7.23% 6	83	2.67
I try to calm myself down if I start feeling nervous/stressed during my period	18.07% 15	13.25% 11	32.53% 27	30.12% 25	6.02% 5	83	2.93
I prefer taking pain-killers than bearing my period pains and aches	12.05% 10	15.66% 13	24.10% 20	19.28% 16	28.92% 24	83	3.37

What symptoms do you have before your menstruation? Please provide the level of severity of your symptoms or choose 'None' if a symptom doesn't apply to you.

Answered: 80   Skipped: 20
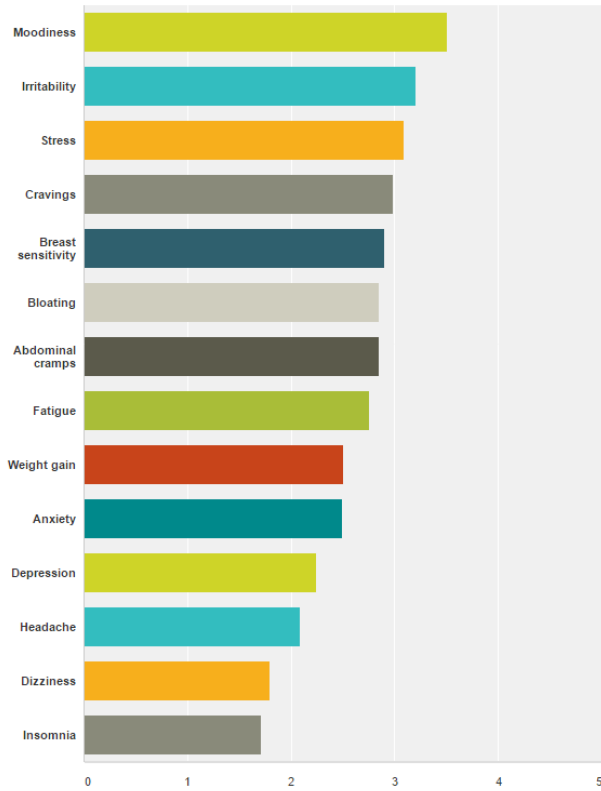
	None	(no label)	Moderate	(no label)	Severe	Total	Average Rating
Moodiness	13.75% 11	8.75% 7	22.50% 18	22.50% 18	32.50% 26	80	3.51
Irritability	26.25% 21	5.00% 4	17.50% 14	25.00% 20	26.25% 21	80	3.20
Stress	13.75% 11	20.00% 16	28.75% 23	18.75% 15	18.75% 15	80	3.09
Cravings	20.00% 16	10.00% 8	36.25% 29	18.75% 15	15.00% 12	80	2.99
Breast sensitivity	25.00% 20	12.50% 10	26.25% 21	20.00% 16	16.25% 13	80	2.90
Bloating	26.25% 21	15.00% 12	22.50% 18	20.00% 16	16.25% 13	80	2.85
Abdominal cramps	22.50% 18	15.00% 12	31.25% 25	17.50% 14	13.75% 11	80	2.85
Fatigue	22.50% 18	20.00% 16	26.25% 21	21.25% 17	10.00% 8	80	2.76
Weight gain	30.00% 24	22.50% 18	25.00% 20	11.25% 9	11.25% 9	80	2.51
Anxiety	30.00% 24	22.50% 18	26.25% 21	11.25% 9	10.00% 8	80	2.49
Depression	35.00% 28	23.75% 19	27.50% 22	10.00% 8	3.75% 3	80	2.24
Headache	48.75% 39	16.25% 13	18.75% 15	10.00% 8	6.25% 5	80	2.09
Dizziness	57.50% 46	16.25% 13	18.75% 15	3.75% 3	3.75% 3	80	1.80
Insomnia	62.50% 50	18.75% 15	8.75% 7	5.00% 4	5.00% 4	80	1.71

What symptoms do you have during your menstruation? Please provide the level of severity of your symptoms or choose 'None' if a symptom doesn't apply to you.

Answered: 75   Skipped: 25
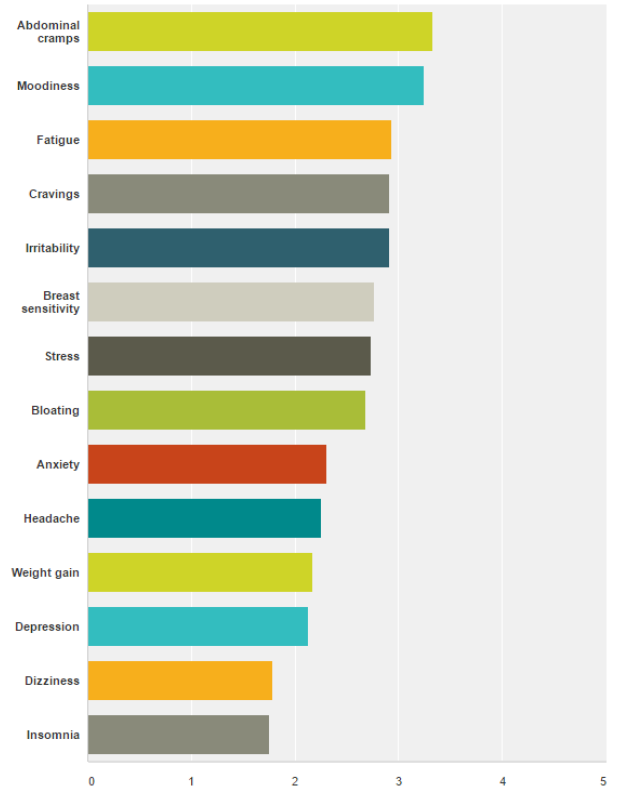
	None	(no label)	Moderate	(no label)	Severe	Total	Average Rating
Abdominal cramps	14.67% 11	9.33% 7	25.33% 19	29.33% 22	21.33% 16	75	3.33
Moodiness	14.67% 11	14.67% 11	26.67% 20	18.67% 14	25.33% 19	75	3.25
Fatigue	24.00% 18	10.67% 8	26.67% 20	25.33% 19	13.33% 10	75	2.93
Cravings	20.00% 15	21.33% 16	24.00% 18	17.33% 13	17.33% 13	75	2.91
Irritability	25.33% 19	14.67% 11	24.00% 18	16.00% 12	20.00% 15	75	2.91
Breast sensitivity	32.00% 24	12.00% 9	18.67% 14	21.33% 16	16.00% 12	75	2.77
Stress	25.33% 19	16.00% 12	30.67% 23	16.00% 12	12.00% 9	75	2.73
Bloating	30.67% 23	12.00% 9	29.33% 22	14.67% 11	13.33% 10	75	2.68
Anxiety	45.33% 34	16.00% 12	13.33% 10	13.33% 10	12.00% 9	75	2.31
Headache	45.33% 34	14.67% 11	17.33% 13	14.67% 11	8.00% 6	75	2.25
Weight gain	44.00% 33	22.67% 17	14.67% 11	9.33% 7	9.33% 7	75	2.17
Depression	49.33% 37	14.67% 11	18.67% 14	8.00% 6	9.33% 7	75	2.13
Dizziness	60.00% 45	14.67% 11	17.33% 13	2.67% 2	5.33% 4	75	1.79
Insomnia	61.33% 46	17.33% 13	12.00% 9	4.00% 3	5.33% 4	75	1.75

Feedback Form - Juliana

Day 1

How much you were satisfied with app services today?	Very Dissatisfied (1) ○ Dissatisfied (2) ○ Neither Satisfied nor Dissatisfied (3) ● Satisfied (4) ○ Very Satisfied (5) ○
What were your log inputs?	Tired No exercising Sleep 8hr
Any comments?	Looked at the comments list and tried to think if I should put more emotions in my log. Probably thought too much about it.

Day 2

How much you were satisfied with app services today?	Very Dissatisfied (1) ○ Dissatisfied (2) ● Neither Satisfied nor Dissatisfied (3) ○ Satisfied (4) ○ Very Satisfied (5) ○
What were your log inputs?	Heavy Flow Medium stress emotional
Any comments?	Tips about stress were so general I don't want to exercise on a period day, I can barely move, why it showed me?

Day 3

How much you were satisfied with app services today?	Very Dissatisfied (1) ○ Dissatisfied (2) ○ Neither Satisfied nor Dissatisfied (3) ● Satisfied (4) ○ Very Satisfied (5) ○
What were your log inputs?	Medium Flow Headache
Any comments?	Never saw the Community page. But the fact that Glow sends me news about having sex or getting pregnant at the right time, frightens me a bit.

Feedback Form - Paulina

Day   1

How much you were satisfied with app services today?	Very Dissatisfied (1)	Dissatisfied (2)	Neither Satisfied nor Dissatisfied (3)	Satisfied (4) ●	Very Satisfied (5)
What were your log inputs?	No emotions, no stress Sleep 7hr Alcohol one glass
Any comments?	Such a big list of symptoms. I thought it was nice it warned me about drinking, even though there was a lot of reading.

Day   2

How much you were satisfied with app services today?	Very Dissatisfied (1)	Dissatisfied (2) ●	Neither Satisfied nor Dissatisfied (3)	Satisfied (4)	Very Satisfied (5)
What were your log inputs?	Medium Flow Backache Cramps Sensitive 8hr sleep
Any comments?	It recommended painkillers straight away. I personally prefer not to take them, I can handle it with tea and chocolate.

Day   3

How much you were satisfied with app services today?	Very Dissatisfied (1) ●	Dissatisfied (2)	Neither Satisfied nor Dissatisfied (3)	Satisfied (4)	Very Satisfied (5)
What were your log inputs?	Medium Flow 7 hr sleep
Any comments?	Went to the Community page. Was terrified with what I saw. Posts about abortion, cheating and hiding pregnancy from boyfriends. This is not where I would look for help.