Designing for diverse insights: developing a menstrual tracking tool that can support <u>diverse users</u> in developing insight into their personal menstrual cycle.

This thesis focuses on menstrual tracking tools. These are tools that allow users to track their menstruation, menstrual cycle related symptoms and other (cycle/body/sexuality/health-related) aspects of their lives and offer predictions regarding menstruation, symptoms and fertile periods. Some include additional functionality such as informative articles, discussion forums or chatrooms.

Tracking tools provide a lens through which the user makes sense of themselves, which affects how they think and feel about themselves [1] [2]. Dissonances between the artificial version of the user 'inside' the tool and the actual user can cause the user to question themselves [3] and feel abnormal or alienated [4]. The aim of this thesis is to design a concept for a menstrual tracking tool that can support <u>diverse users</u> in developing insight into their personal menstrual cycle.

Firstly, a two-part literary research was conducted. The first part focused on discovering which issues arise in menstrual tracking apps due to assumptions in the app design. The issues that were found were:

Apps…
- …are too 'girly'
  - Infantilising
  - Stereotypically feminine
  - Assumptive of sexuality and sex/love life
- …do not (sufficiently) account for different user experiences and goals.
  - Assumptive of user goals
  - Assumptive of the way the user experiences their cycle
  - Not sufficiently accommodating different age groups
- …assume a need for privacy which leads to reinforcing stigma
- …stigmatise irregular cycles.
- …limit the development of the user's personal insight

The second part of the literary research focused on finding ideas and suggestions from literature that could assist in solving the issues found in the previous section. These ideas and suggestions could be divided into two types:

- Problem specific solutions
- Co-creation: increased user involvement through involvement during design, product personalisation and more freedom in implementation.

After this, participatory design sessions took place with 7 participants. The goal of these was to hear the unique needs and preferences of diverse users, following from their own unique experiences with their cycle.

From these sessions multiple insights were found to inform the list of requirements and to later provide inspiration during the design phase.

Once a list of requirements was formulated, the requirements were sorted using the MoSCoW method [5].

Based on the research and the list of requirements, the design phase started. An 'anti-persona' (contrary to the practise of creating persona's) was created: this shows the many ways in which users might vary and with this the variety of users the tool needs to accommodate to (figure 1). Furthermore, an overview was created on how the tool can support the development of insight into the personal cycle.

RELATIONSHIP STATUS: single/in a relationship/complex/...
SEXUALITY: heterosexual/homosexual/bisexual/...
SEXUALLY ACTIVE: yes/no
LIVING ARRANGEMENT: alone/with partner/with family/with housemates/...

CONTRACEPTIVE USE: none/contraceptive pill/IUD/sterilisation/implant/...
MEDICINE USE: thyroid medicine/ hormone therapy/chemotherapy/...
(MENSTRUATION RELATED) HEALTH CONDITIONS: infertility/PCOS/anorexia/chronic stress/endometriosis/...
CYCLE REGULARITY: (extremely) regular/(extremely) irregular/ regularity dependent on external factors/ unclear
KNOWLEDGE OF (THEIR) MENSTRUATION: very limited – a pro
WILLINGNESS TO LEARN ABOUT (THEIR) MENSTRUATION: the basics of their own cycle is enough – wants to know all there is to know
WILLINGNESS TO SPEND TIME ON TRACKING: limited – very willing

MENSTRUAL SYMPTOMS: none/PMS/headaches/low energy/sadness/...
SYMTOP INTENSITY: hardly there – large impact on daily life
TRACKING GOALS: wanting to learn more about own body/ better understanding of themselves/ trying to conceive or avoid pregnancy/ more insight into symptoms or health conditions/ clarifying influence of external factors/...
ATTITUDE TOWARDS MENSTRUATION: neutral/ interested/ ashamed/ open/ private/ positive/...

NAME: Noa/Johanka/ Althea/Joey/Gabriela / Hannele/...
AGE: young teen – approaching menopause
GENDER: female/ (trans)non-binary/ (trans)male/...

Figure 1 Anti-persona

Ideation started with creating mindmaps which assisted in exploring the context and functionality. After this, sketches were created, which were annotated with the thoughts that came up while

drawing. Out of three concept directions, one final concept was selected and developed further: the Cyme). Cyme consists of a physical (figure 2) and a digital app component (figure 3).

Using the physical product, the user reflects on their experiences from that day and tracks the symptoms (figure 4). The app is used to dive deeper into the cycle. The learnt knowledge can then be applied using the tool: when waking up, the user is instantly reminded of what phase they are in and what this might mean for them in terms of symptoms. The lamp is implemented in the user's

Figure 2 Cyme lamp on a bedside table   daily life, by being part of their environment and routines.
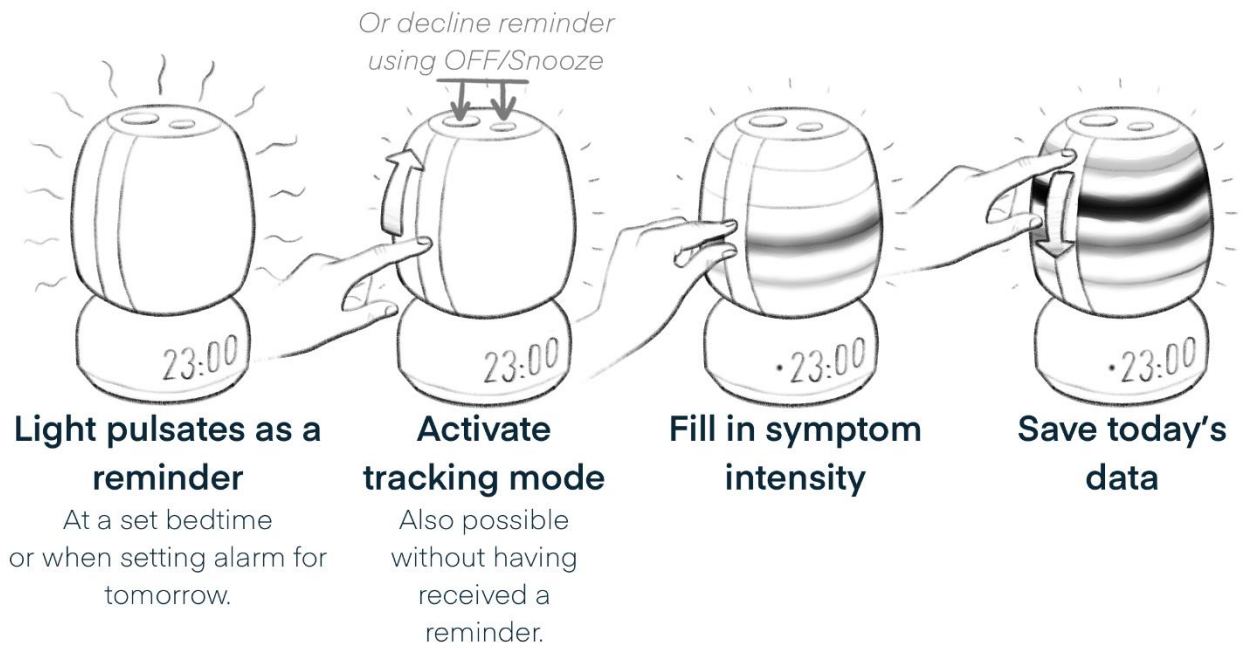
Cyme accommodates for different experiences with gender, goals, symptoms, relationship with menstruation, ages, wishes regarding privacy and sharing and different degrees of cycle regularity using a combination of different functions. This is done using problem specific solutions as well as through co-creation: involving users in design, allowing personalisation and freedom of implementation.

The concept was first evaluated by evaluating which functions support diverse users, then evaluated with the same participants as the participatory design sessions. After this the final concept was evaluated using the requirements list. The evaluation led to suggestions for both concept improvement and further research.
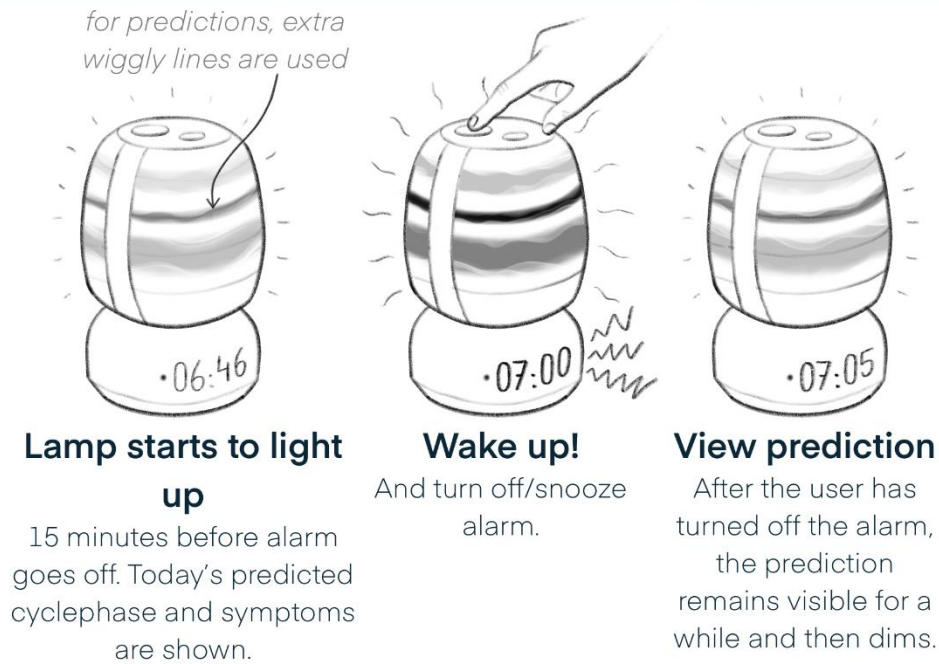

Figure 3 App design

Evening

Or decline reminder using OFF/Snooze

Light pulsates as a reminder
At a set bedtime or when setting alarm for tomorrow.

Activate tracking mode
Also possible without having received a reminder.

Fill in symptom intensity

Save today's data

Morning

for predictions, extra wiggly lines are used

Lamp starts to light up
15 minutes before alarm goes off. Today's predicted cyclephase and symptoms are shown.

Wake up!
And turn off/snooze alarm.

View prediction
After the user has turned off the alarm, the prediction remains visible for a while and then dims.

Whenever

Show last input symptoms
Cyme is turned on in setting 1

Show prediction
The prediction is shown when pressing the touch bar
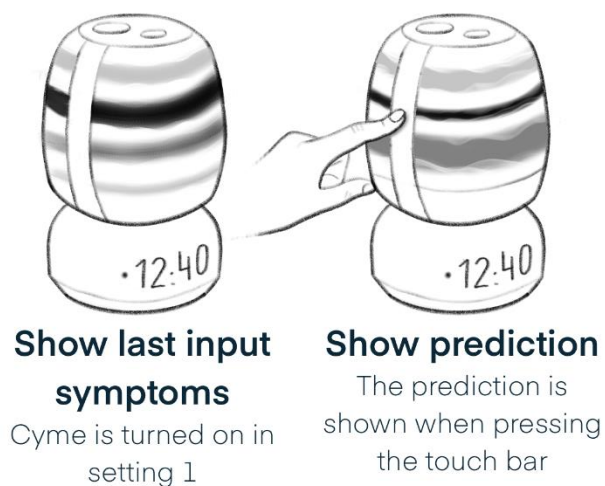
Figure 4 Interactions with the lamp

Bibliography

[1] S. Homewood, "Designing for the Changing Body: A Feminist Exploration of Self-Tracking Technologies," in *2018 CHI Conference on Human Factors in Computing Systems*, Montreal, 2018.

[2] S. Homewood and A. Vallgårda, "Putting Phenomenological Theories to Work in the Design of Self-Tracking Technologies," in *2020 ACM Designing Interactive Systems Conference*, Eindhoven, 2020.

[3] S. Homewood, "Integrating Menstrual Cycle Data into The Smart Home," 9 June 2017. [Online]. Available: https://core.ac.uk/download/pdf/147570034.pdf. [Accessed 28 April 2022].

[4] B. Corbin, "Digital Micro-Aggressions and Discrimination: FemTech and the 'Othering' of Women," *Nova Law Review,* vol. 44, 2020.

[5] K. Brush, "MoSCoW method," TechTarget, April 2020. [Online]. Available: https://www.techtarget.com/searchsoftwarequality/definition/MoSCoW-method. [Accessed June 2022].