



UCD School Of Information And Communication Studies
Scoil An Léinn Eolais Agus Cumarsáide UCD

**DATA COLLECTION & DATA VISUALISATION
FOR**

PRE-THERAPY

ASSESSMENT PRACTICES

PROJECT TEAM

Tian Xia

Balika Kannan

Guangnan Zhang

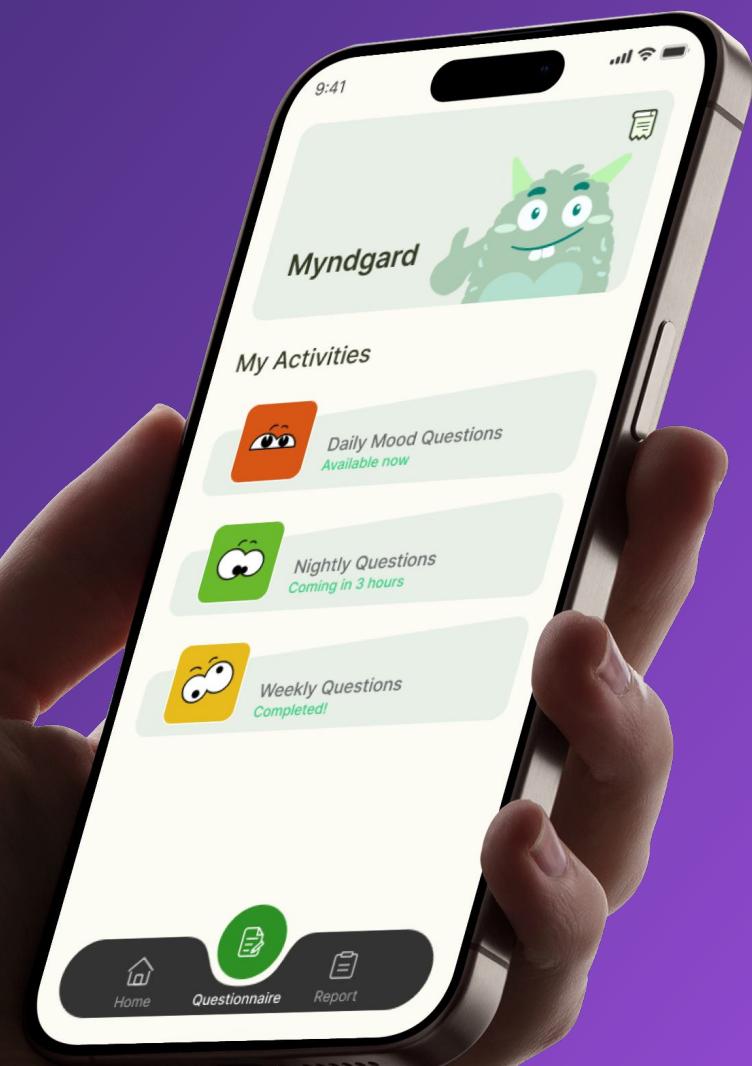
Trang Kim

PROJECT PARTNER

Dr. Sean Kelley

Co-Founder of Myndgard

**UNIVERSITY COLLEGE DUBLIN
HCI DESIGN PROJECT 2024**



2024

12 WEEKS

Pre-Therapy APP Design

PORTFOLIO

LOGO

DESIGN

RESEARCH

INTERVIEW

PROTOTYPE

My Role

Design Lead

Tools Used



Acknowledgment

I would like to express my deepest gratitude to my project supervisor, Dr. Kevin Doherty, and teaching assistants, for their invaluable guidance, support, and encouragement throughout this project. Their insights and expertise have been instrumental in shaping the direction and success of my work.

I am deeply grateful to our partner, Dr. Sean Kelley from Myndgard, for giving us the opportunity to tackle this challenge, which has been an invaluable experience.

I also wish to thank the faculty and staff of College of Social Sciences and Law at University College Dublin for providing a stimulating academic environment and the resources necessary for my research. Special thanks to my teammates and friends who offered their assistance, feedback, and moral support during this journey.

Lastly, I am profoundly grateful to my family for their unwavering support and belief in me, which has been my source of strength and motivation throughout my studies.

Go Raibh Maith Agat!

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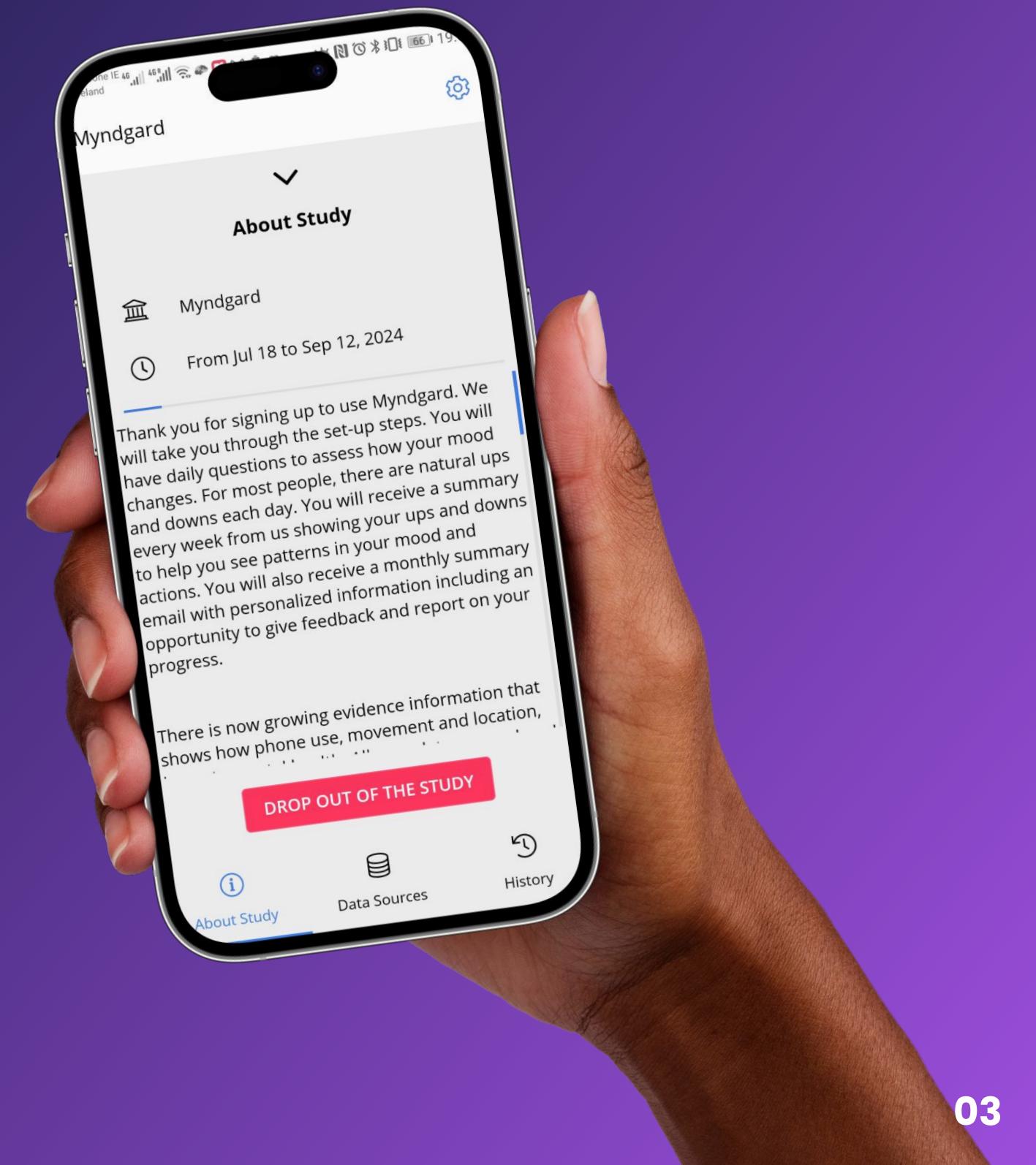
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Project Overview

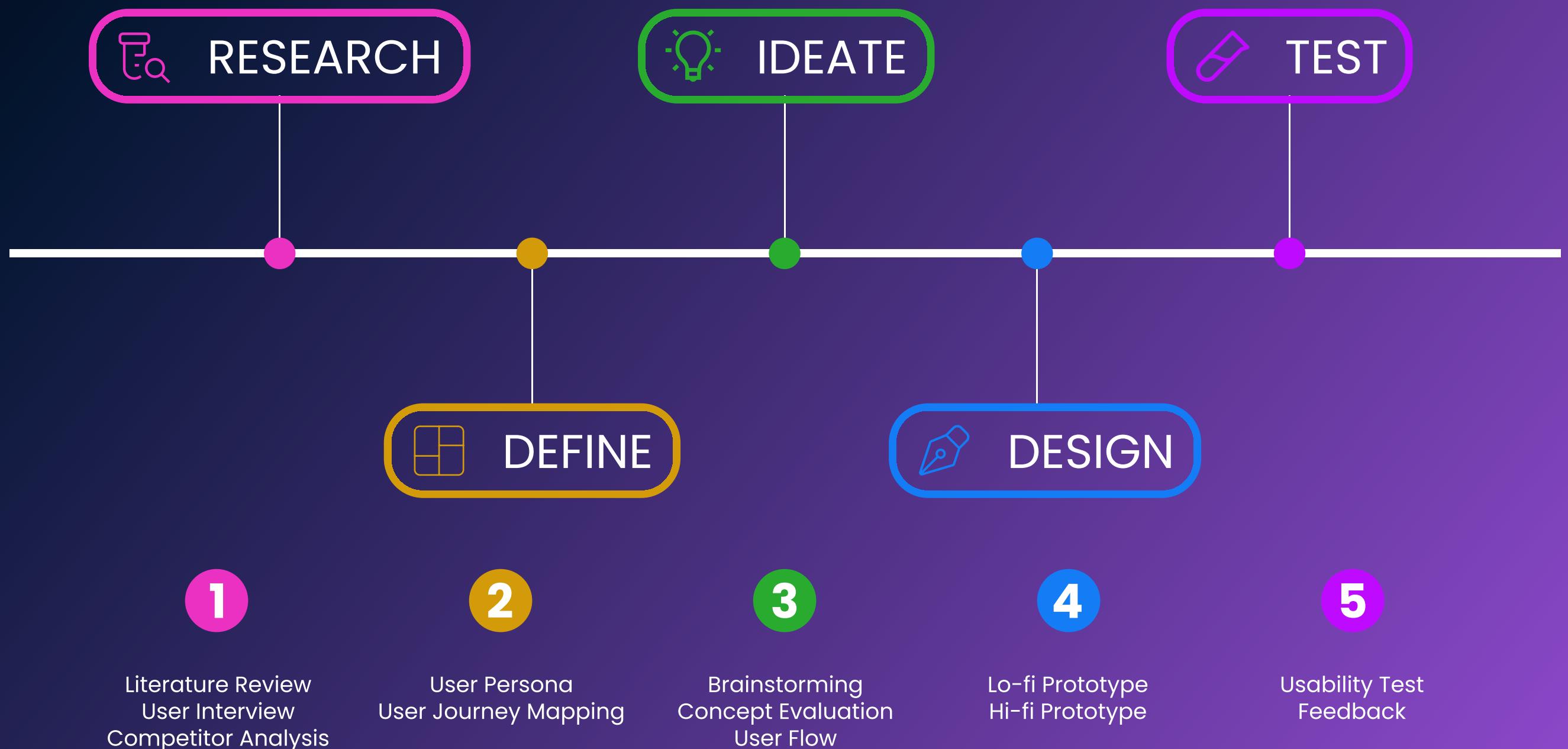
Myndgard developed an app to track and assess the mental health status of users during use, and to improve the efficiency of the entire mental health treatment process by analysing the data collected during pre-therapy. We tried to optimise the user experience of the app to increase engagement and efficiency of pre-therapy.

Project Task

- Gather qualitative feedback from professional participants (therapists and clinical psychologists) on the usefulness of the Pre-Therapy Report, and from non-professional participants (students aged 18 to 25 with therapy experience) on the usability of questionnaires and the weekly feedback report.
- Re-design the client-facing application to improve long-term client engagement, focusing on data collection through questionnaires and providing access to weekly reports and the Pre-Therapy report for therapists.



Process



01 / INTRO

Personal Introduction



Tian Xia

Hi! I'm Tian, a person who is passionate about UX/UI design, coding and AI technologies.

I am currently a master student of Human Computer Interaction with a background in engineering. I have experience in mechanical design, interaction design, website design and development. I have also developed a keen interest in game design and 3D modelling.

I am a proactive, self-motivated, energetic person, willing to work with and learn from others through teamwork.

Skills

- Figma
- Adobe Illustrator
- Adobe Photoshop
- Python, C
- Javascript & HTML

Education

University College Dublin
Human Computer Interaction
2023-2024

Northwestern Polytechnical University
Aircraft Design and Engineering
2016-2020

Experience

Northwestern Polytechnical University
Research Assistant

02 / INTRO

Team Member



Jack of few trades, aspiring to become master of (more than) one. Background in Engineering.

Balika Kannan



Guangnan Zhang

Background in Animation Design Experience in documentary film and animation.



Trang Kim

Transitioning from customer-focused Communications to Experience Design, Growing interest in Human-AI collaboration.

Team Partner



Dr. Sean Kelley

Co-Founder of Myndgard

Expertise

Developed A New Method For Using Language On Social Media To Monitor Changes In Depression.

Created An **AI Algorithm To Predict Mental Health Conditions**, And Assess Potential Clinical Usefulness, Based On Language Used On Twitter.

Designed **A Mood Tracker** ('Multi-Mood') Within Neureka, A Non-Profit App For Research Into Brain Health.

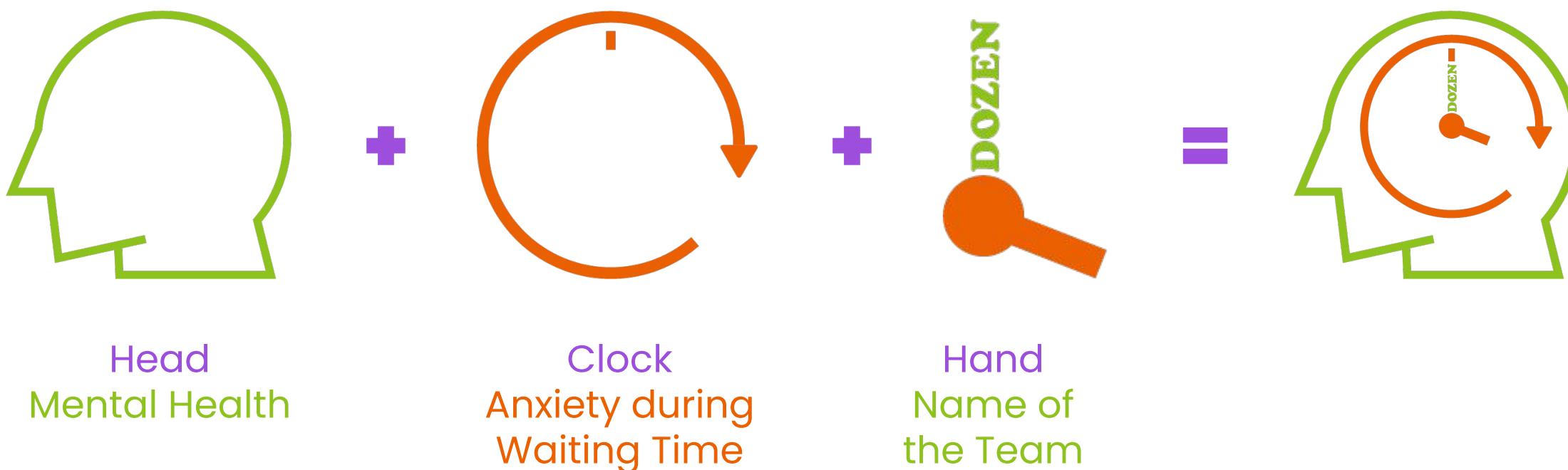
Developed A **Prediction Algorithm** For Alzheimer's Disease In England And Identified The Effect Of Depression On Cognitive Decline.

03 / INTRO

Logo Design



As we are team No. 12, we came up with the special name "Dozen", which means 12. The team logo consists of two parts, a head and a clock (one of the hands is our group name "Dozen"), representing mental health (green colour) and waiting time for therapy (red colour, representing anxiety).



04 / INTRO

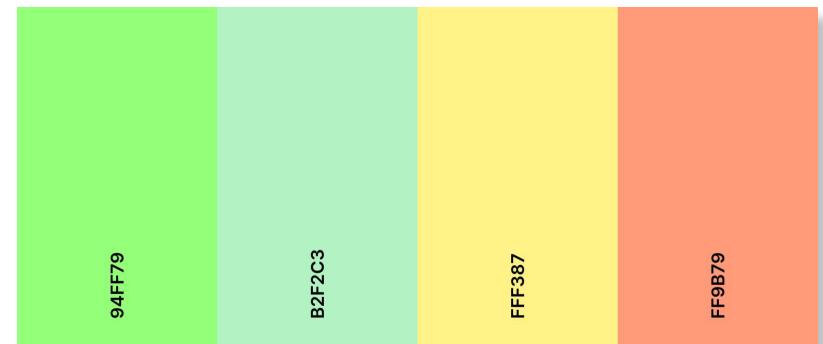
Colour Palette

Team Portfolio

Main



Other



Individual Portfolio

Main



Other



05 / INTRO

Typography

Poppins

Name	Font Weight	Font Size	Line Height
Heading 1	Black	40px	120%
Heading 2	Black	40px	120%
Heading 3	Regular	20px	120%
Paragraph	Regular	20px	120%
Paragraph S	Regular	14px	120%
Paragraph Highlight	Bold	14px	120%
Button Text	Regular	14px	120%
Footnotes	<i>Italic</i>	14px	120%

01 / Research

Context

The proportion of the Irish population with unmet medical needs rose from 1.7% in the pre-pandemic period to 2.6% in 2022, exceeding the average for the European Union (EU). According to the OECD and the European Observatory on Health Systems and Policies (2023), waiting lists, high travel expenses, and excessive costs are to blame for the increase in unmet medical needs.

The Health Service Executive (HSE) in Ireland has developed the "Sharing the Vision" strategy to provide evidence-based, recovery-oriented, and trauma-informed mental health services, with a focus on lived experiences, while also exploring digital health technologies to promote awareness, support access to services, and enable early interventions (Department of Health, 2020).

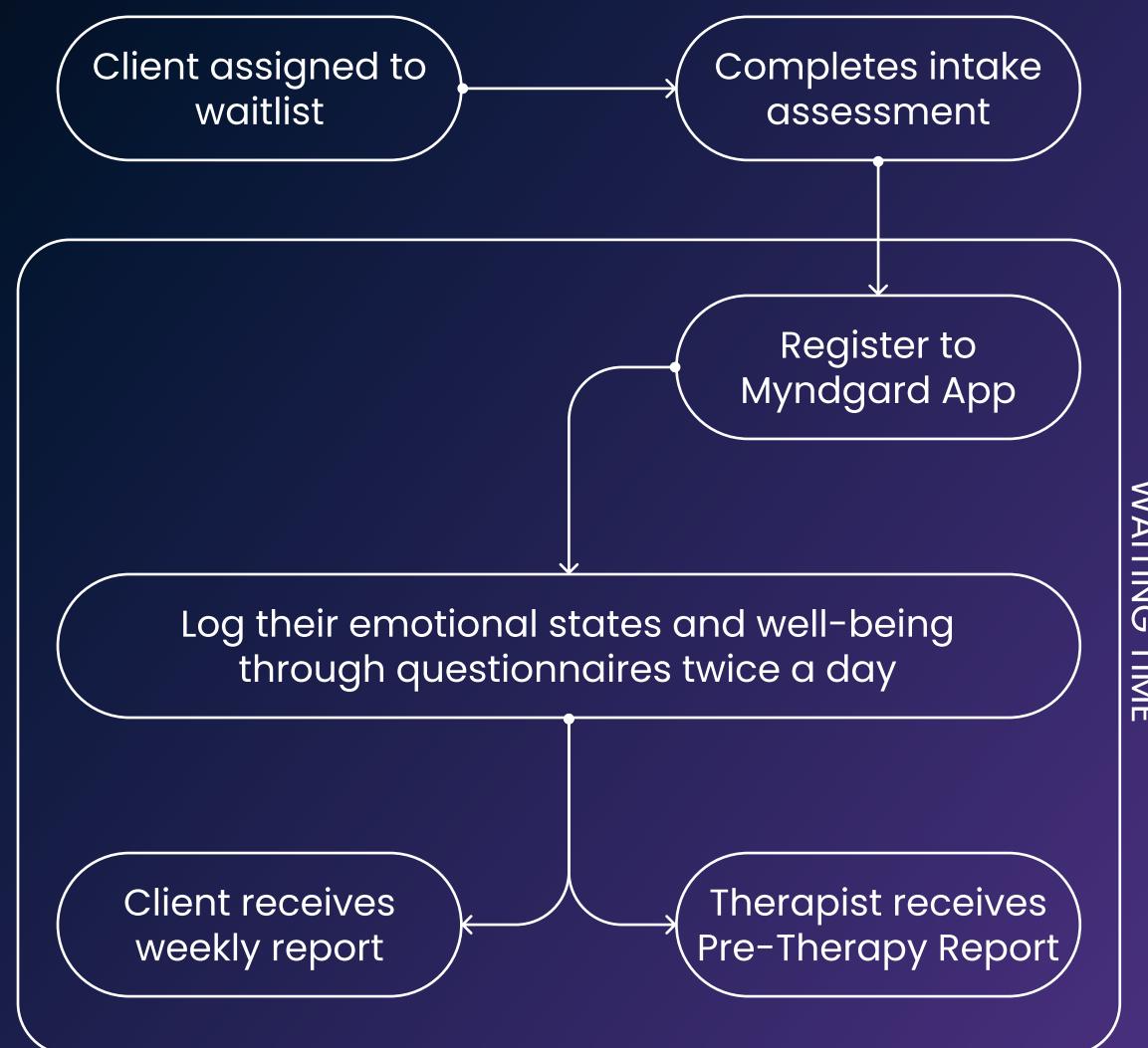


-by teamwork

01 / Research

Context

Our partner's company Myndgard has already developed a waitlist programme to support therapists and their clients during the waiting list period.



"A better understanding of experience supports design"
(Doherty & Doherty, 2018)

-by teamwork

02 / Research

Literature Review

We divided the entire literature review section into four themes: data collection, data visualisation, self-report and health technology, with each of us responsible for one of the sections, and I mainly focused on the data visualisation part. We also worked together to go further on ecological momentary assessment, improvement strategies, diversified data to explore, and etc.

Data Visualisation

Clarity and Comprehension: Kim (2022) highlighted the importance of ensuring the effectiveness of visualisation for users with different levels of health literacy and digital skills, and emphasised the need for interactive and customisable visualisation, as well as real-time visualisation based on wearable and mobile technologies, to help users better understand their health data and make informed decisions.

Customisation: Tailoring visualizations to meet the specific needs and preferences of different users, including varying literacy and numeracy levels.

Interactivity: Incorporating interactive elements that allow users to explore data in meaningful ways without overwhelming them (Dominika et al., 2021).



-by Tian

02 / Research

Literature Review

Self-Report

Self-reports are used to capture user experiences but are complex due to the influence of perception, bias, and memory. Kahneman and Riis (2005) differentiate between the experiencing self, which lives through moments but may not fully recall them, and the remembering self, which reconstructs memories and can distort the overall experience, as seen in how negative events at the end of an experience can overshadow positive aspects, leading to cognitive illusions.

Ecological Momentary Assessment

Kahneman and Riis (2005) apply the concepts of the remembering and experiencing selves in well-being research, where Ecological Momentary Assessment (EMA) is used to capture moment-to-moment lived experiences, particularly in Human-Computer Interaction and mental health system design. Doherty et al. (2019) explored using mobile devices for self-reporting depression in pregnant women, highlighting user engagement as crucial for the feasibility of such technologies, which involves minimizing user burden and addressing challenges like reactivity, data validity, and visualization.

-by Balika & Guangnan & Kim

02 / Research

Literature Review

Enhancement Strategies

To enhance patient engagement, researchers have explored various strategies, such as personalized feedback and using incentives. Tailoring the frequency and timing of assessments to fit individual patient routines can also improve adherence (Chakaipa et al., 2023 & Dominika et al., 2021 & Increase Patient Engagement in 2023: Definitive Guide | Mend, 2024).

Diversified Data to Explore

The PSYCHE project, developed by Paradiso et al. in 2010, focused on tracking both physiological and behavioral data to aid in medical diagnosis. Physiological data included metrics such as heart rate, breathing patterns, and blood pressure levels, while behavioral data encompassed movement, activity levels, sleep patterns and quality, and social engagement and interaction patterns.

Meanwhile, Bently et al. in 2013 explored the connection between well-being data (such as weight, sleep, and step count) and contextual data (like calendar events, location, and weather). Through a field trial with 60 patients, they demonstrated how these combined insights could be used to promote personalized understanding and self-awareness, encouraging better self-care and management of health.

-by Balika & Guangnan & Kim

02 / Research

Literature Review

Key Findings

Compliance and adherence issues, technical problems, privacy concerns, ethical considerations, and context-related response difficulties are common challenges in EMA & ESM implementation.

Visualisation must ensure clarity and comprehension especially for those without technical backgrounds. Incorporating interactive elements that allow users to explore data without overwhelming them is crucial for effective communication.

Wearables track physiological data in real-time, aiding in monitoring mood and stress, while voice-activated assistants enable hands-free data entry, benefiting those with disabilities.

Design for Care needs to consider users' needs and accessibility while ensuring empathy and ethics in supporting vulnerable populations effectively.

Challenges

Accuracy and Reliability: Ensuring that wearable sensors and voice recognition systems accurately capture and interpret data.

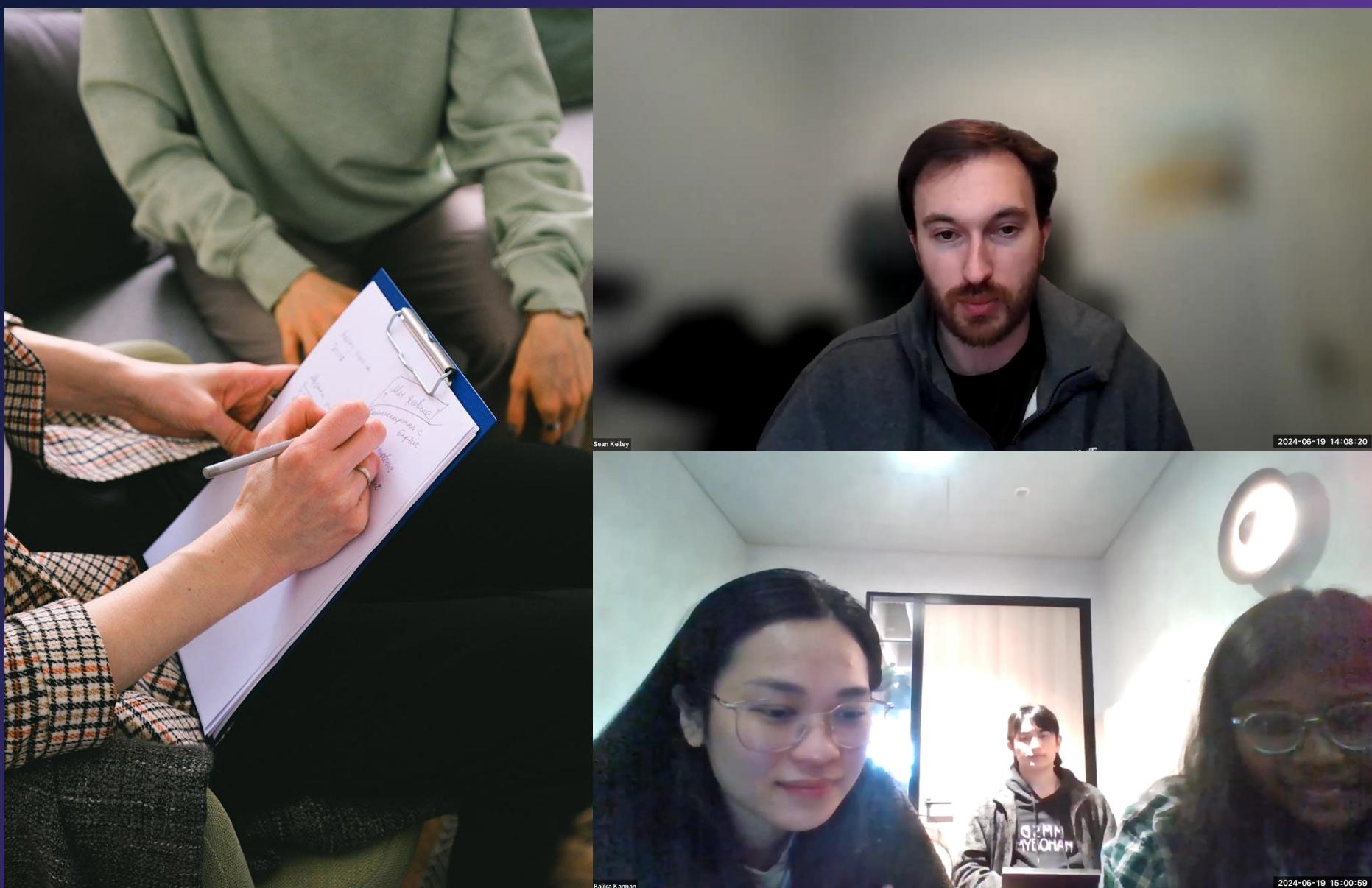
User Acceptance: Patients may be hesitant to use new technologies due to privacy concerns or lack of familiarity.

Data Integration: Integrating data from various devices and platforms into a cohesive and actionable format for healthcare providers (Brandon et al., 2015).

03 / Research

Interview

In order to get more user feedback and professional opinions on how to improve the current problems of the myndgard pre-therapy app, we organised several interviews with clients and therapists. Participants were invited to use the app to experience part of the pre-therapy process and give their opinions on how it could be improved from both a non-professional and professional perspective. The interviews were conducted both online and offline.



-by teamwork

03 / Research

Interview for Therapists

Despite our constant efforts, recruiting therapists proved difficult, and we were unable to find participants for our study.

Due to time constraints, we decided to base our decisions on literature review and to consult our partner, Dr. Sean Kelley. Dr. Kelley, who has extensive experience working with therapists and holds a PhD in Computational Psychiatry, served as a proxy for therapists in our study.

In recent conversations between our partner and the therapists, they expressed concern that these digital tools would not be used or too difficult for clients.



Therapists' Perspective

- Improving the engagement and experience of the clients, hence, would answer this concern of the therapists.
- Key insights from our interviews with participants representing the clients would then guide our design solution.

03 / Research

Interview for Clients

We conducted a series of recorded interviews with clients and used the transcripts to summarise their views on both the questionnaire and the graphic design.

Clients' Perspective

01

Clients appreciate pre-therapy support and not being left alone

"Maybe you can reach out to and offer me something like a strategy for those bad scenarios. Don't leave me alone with that. Those bad feelings." (P3)

02

Clients feel more motivated knowing how their therapy experience can be improved

"So if this is for my therapy session and is for my curing. I think I will be happy to fill that. I just lack of motivation if it's not directly connected with my therapy." (P4)

03

Clients want to understand why they are being asked to do what they are doing

"Maybe stating why they are taking this information would help. Because if you're expected to fill in this information you're like what is it for." (P2)

04

Clients wonder how the System can actively help them

"I would appreciate, because if I can wait and I can take this message and practice myself, and to ease my, you know, anxiety or depression and other." (P4)

03 / Research

Interview for Clients

Clients' Perspective

05

The questionnaire/reports shouldn't do what therapists do

"I think I would tell my therapist. Just forget this report, and I want to discuss the feeling I just recently have maybe just the day before the therapist appointment." (P4)

06

Busy lives and critical mental health states can decrease motivation

"when I started to go to my first therapist, it was super difficult for me to just get out of my bed. I don't think someone would have the mental ability to answer the questions." (P1)

07

Clients struggle with quantifying and defining their emotion

"Those scales were also a little bit confusing, because I didn't know how much value am I adding, if I move a little bit to the right, or something like that scale was not very clear for me." (P3)

08

Clients worry about how questionnaires reflect their mental health accurately

"I feel like these variations in my mood doesn't show like the under current of what is going on in life right [...] It might not be reflective with how I truly feel sometimes" (P2)

03 / Research

Interview for Clients

Clients' Perspective

09

Clients expect a warmer tone in communication

"But this tone of voice that is like 'complete the survey', I will be completely put off by that, as well, you know, it has to be kind." (P3)

10

Direct phrasings that describe negative emotions can be triggering

"At the time I started my therapy such a question can, I would answer it but that could be potentially triggering to me but again that's based on what I would have been" (P1)

11

Clients are interested in the relationship between their mood and daily life factors

"For example, there was a graph about how how I was feeling [...] and the sleep hours. That would be interesting if you let me compare those 2 the same graph." (P3)

12

Clients are interested in tailored interaction to their issues

"A questionnaire that would help me maybe feel heard can help potentially than just random questions that take information that would start thinking what this information for." (P1)

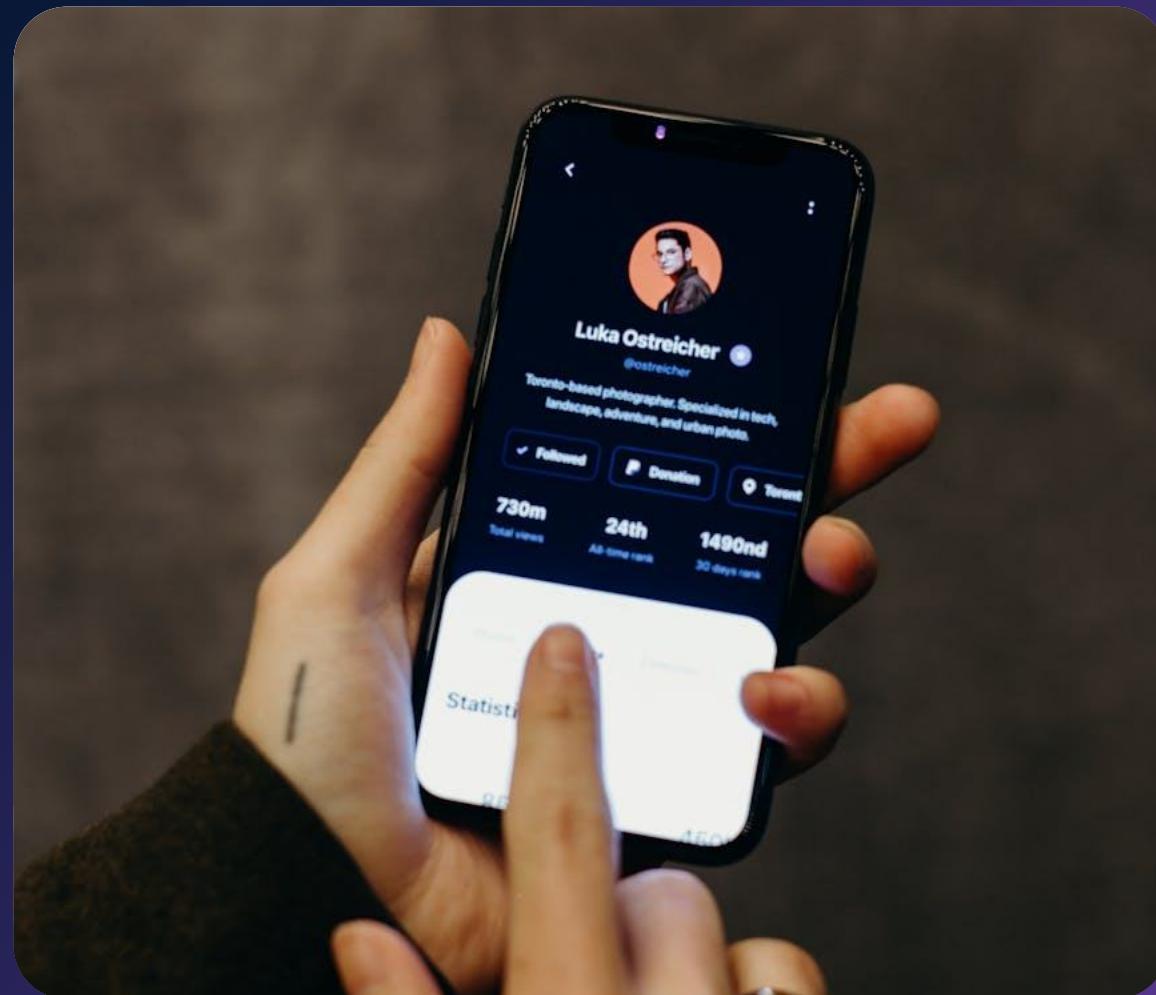
03 / Research

Inspiration of Interview

Previously, based on our partner's brief, we focused heavily on designing the system for longitudinal engagement. However, throughout the interviews, we discovered a deeper challenge that hinder engagement:

- When interacting with Myndgard, **clients lacked intrinsic motivation**; they didn't fully understand why and how it would directly benefit them.

This inspired a major shift to a more **client-centred** approach. Beyond improving the system, we need to redefine its role in our clients' lives and translate that role into the design.



"While early experiences seemed to relate mostly to hedonic aspects of product use, prolonged experiences became increasingly more tied to aspects reflecting how the product becomes meaningful in one's life" (Karapanos et al., 2010)

01 / Define

User Persona 01



Sarah Thompson

Age: 30

Gender: Female

Occupation: Marketing Manager

Location: New York City, USA

Bio

Facing increasing anxiety, Sarah is on a long waiting list for therapy. She needs to manage her symptoms during the wait and prepare for effective future sessions.

Motivations

- Understand her anxiety better.
- Use the waiting period to gather insights for her therapist.

Behaviours

- Tracks mood and anxiety daily.
- Uses educational content and self-assessments to prepare for therapy.

Pain Points

- Concerned about worsening symptoms.
- Wants a productive waiting period.

-by Tian

01 / Define

User Persona 02



Michael Reynolds

Age: 42

Gender: Male

Occupation: High School Teacher

Location: London, UK

Bio

Struggling with depression and burnout, Michael is on a waiting list for therapy. He wants to manage his condition and gather useful insights before starting therapy.

Motivations

- Prevent worsening depression.
- Reflect and prepare for therapy.

Behaviours

- Journals regularly for future therapy.
- Uses pre-therapy exercises like CBT modules.

Pain Points

- Concerned about the wait's impact on his mental health.
- Needs productive pre-therapy engagement.

-by Tian

02 / Define

User Journey



03 / Define

Current Issues

After conducting a literature review and user journey research, we analysed Myndgard's current approach to pre-therapy and summarised several factors that currently affect user engagement and pre-therapy efficiency.

The Platform

- Currently using a 3rd party application (Avicenna) for clients.
- **Issue: Limited control over user interaction.**

The Context

- Emotional state is self-reported on mobile device.
- **Issue: Users may be unable to respond to questionnaires due to their situations**

The Experience

- Two daily mood questionnaires, evening assessment for sleep and weekly assessment to measure depression & anxiety.
- Use a variety of question formats: 0-100 scale, 1-10 Likert Scale questions.
- **Issue: Dropped engagement Redundant questions and potential burden to clients.**

The Outcome

- Current report for therapists and clients are in PDF, presenting all data.
- **Issue: Therapists have limited time to scan through an information-heavy PDF.**

01 / Ideate

Main Goal

From a data collection tool ...



... to a platform that lets clients feel heard and supported



The current system serves as a data collection tool that collects clients' data about their emotional state during the waitlist period to generate weekly reports and pre-therapy reports to inform therapists' treatment planning.

The solution aims to improve clients' therapy experience by utilising the waitlist period for clients to:

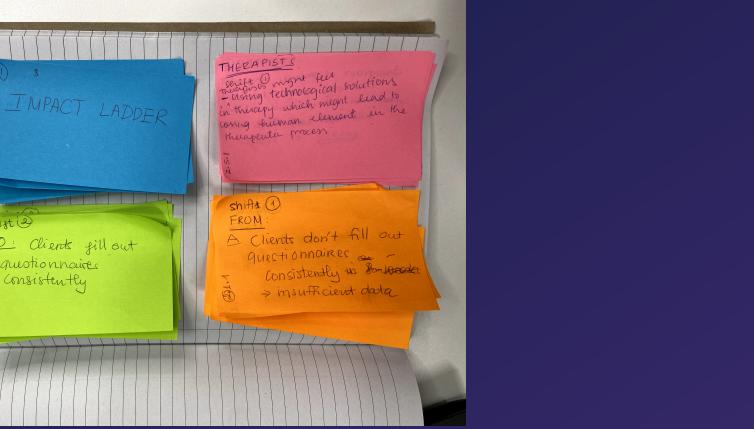
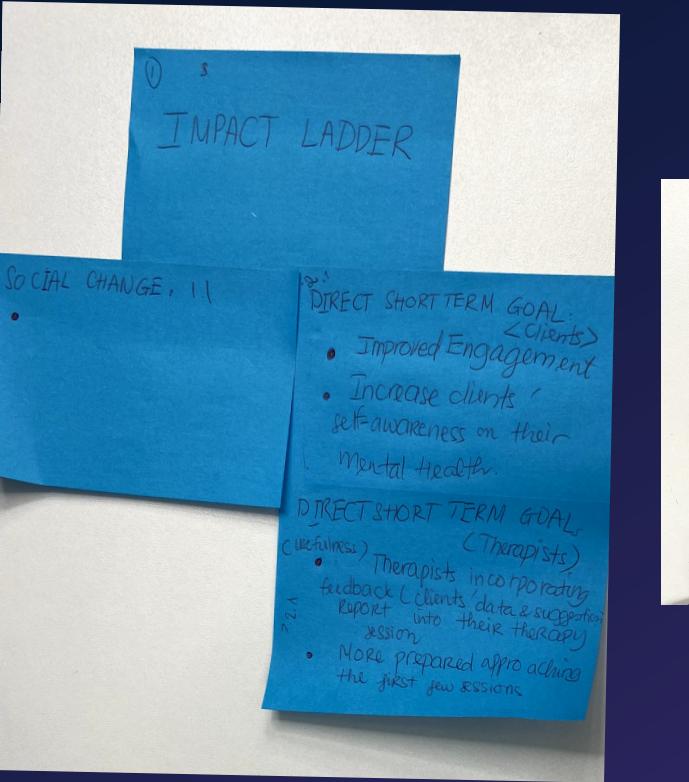
- Actively share emotional data for personalized therapy.
- Better understand emotions' daily impact.
- Get tailored support while waiting for therapy.

02 / Ideate

Ideation Process

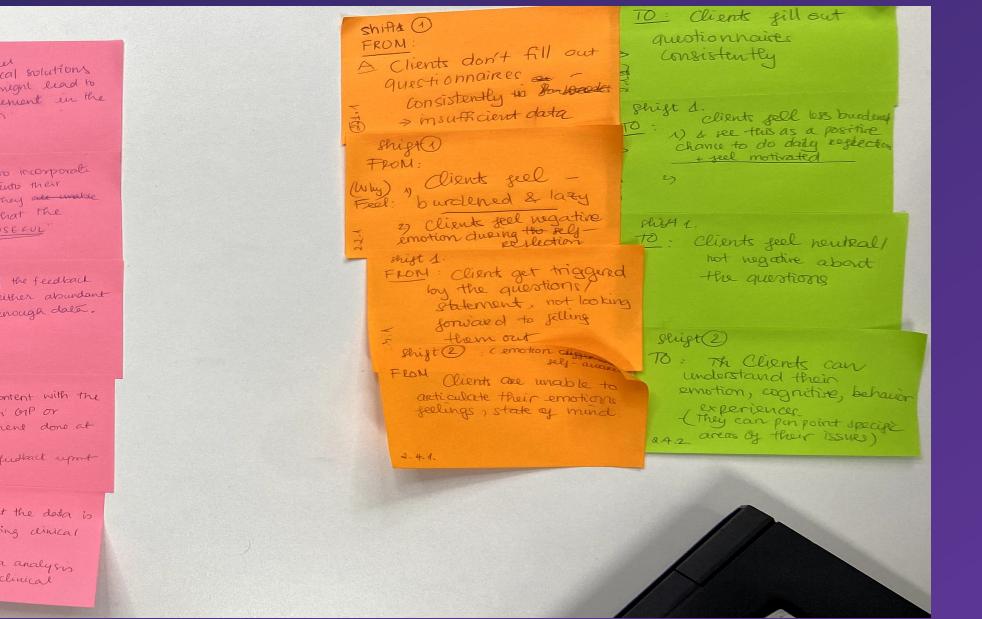
The Impact Ladder

Based on our framing of the design challenge and initial understanding of the participants, we defined and reviewed our key outcomes. We focused on the direct short-term goals due to the focus to improve an existing system.



The Key Shifts

From conversations with our participants about their interaction and experience with the current system, key challenges and insights emerged. This allowed us to outline the key shifts required to drive our solution to the desirable outcomes.



Concepts Generation & Evaluation

The key shifts, combining with insights from interviews and findings from literature review, informed our development of concepts. Each member generated 1-3 concepts focusing on:

- The questionnaires
- The weekly report

We then came back to the impact ladder and the key shifts to evaluate the concepts.

From: Clients not filling out questionnaires consistently.

To: Clients are motivated to fill out the questionnaires consistently.

From: Clients are unclear how the system can actively help them.

To: Clients are aware of the system's purpose.

From: Clients dislike the questions and dread completing the questionnaires.

To: Clients feel supported when expressing negative emotions.

From: Clients find it difficult to quantify and defining their emotions.

To: Clients feel comfortable quantifying and defining their emotions.

From: Clients find it difficult to see the connection of some data in the weekly report to their mental health.

To: Clients can understand the correlation between different factors in their life and their mental health.

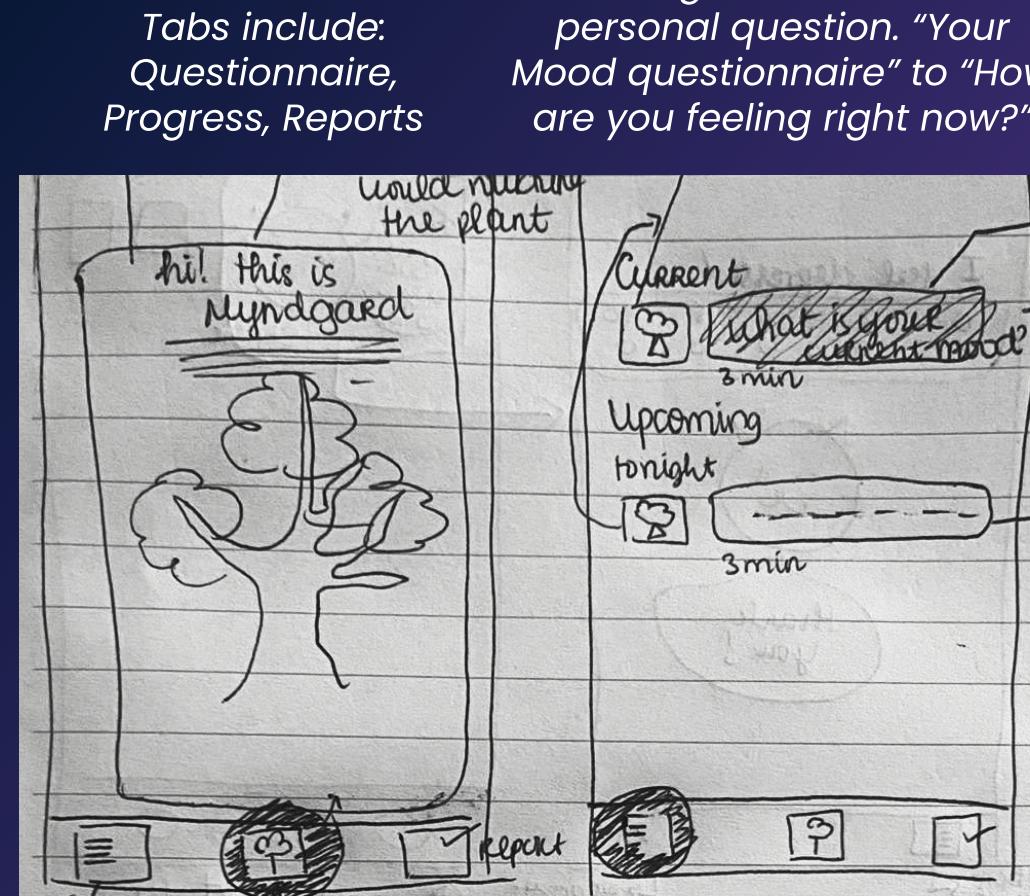
-by teamwork

03 / Ideate

Brainstorming for Questionnaire

In brainstorming for the questionnaire design, we focused on elements and features that would make our product meaningful to the clients' needs.

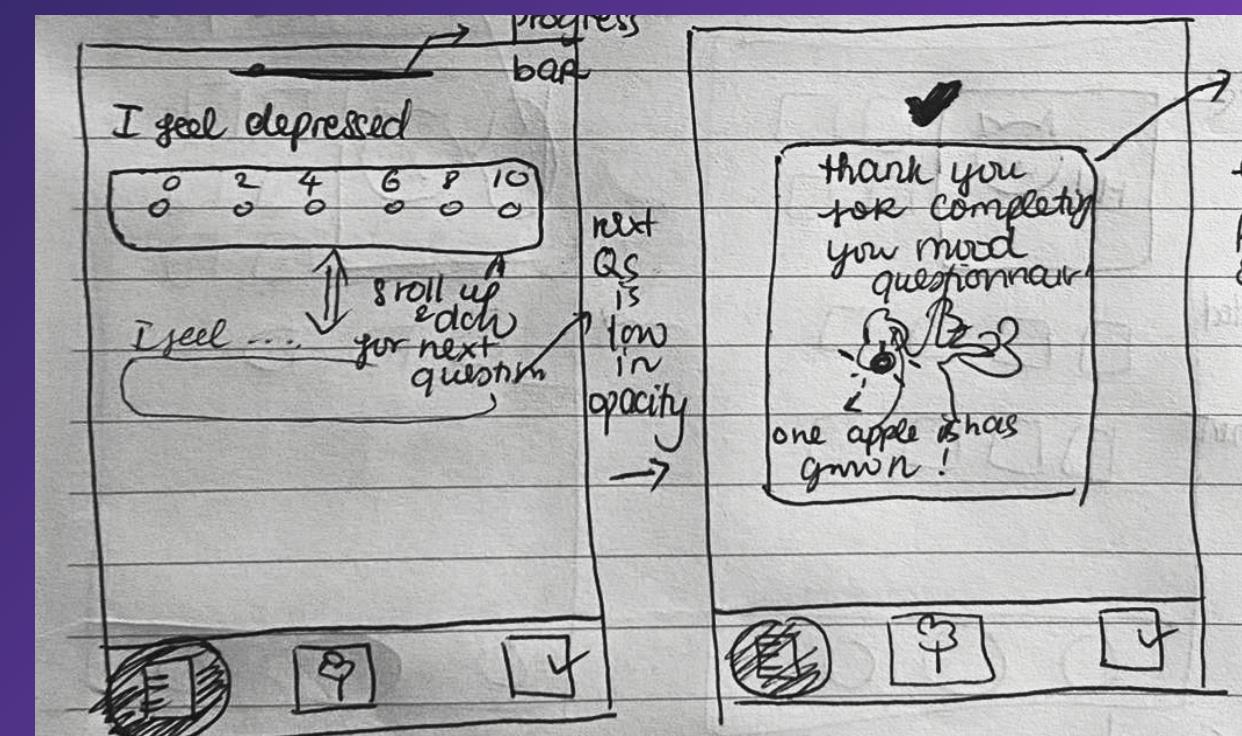
Tree of Reward



Change titles to more personal question. "Your Mood questionnaire" to "How are you feeling right now?"

Options in a scale of 0 - 10, tap to choose instead of sliding

After completion, evident of progress and encouragement is shown



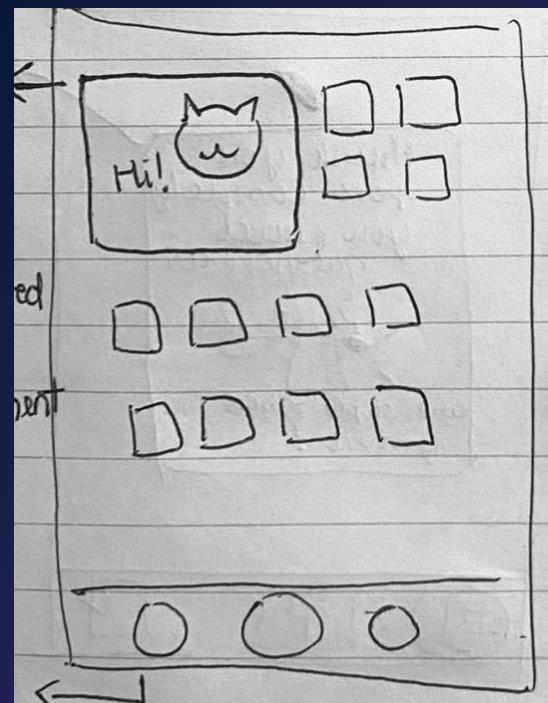
-by Kim

03 / Ideate

Brainstorming for Questionnaire

Micro-Interaction

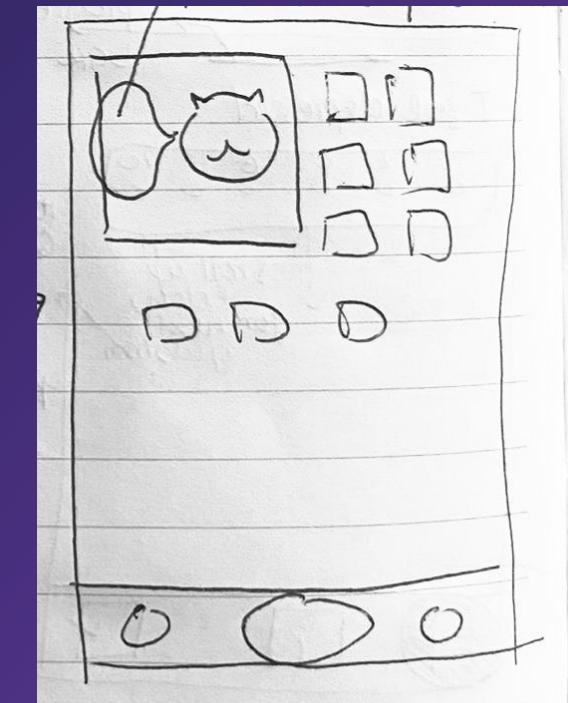
Widgets as micro-interaction



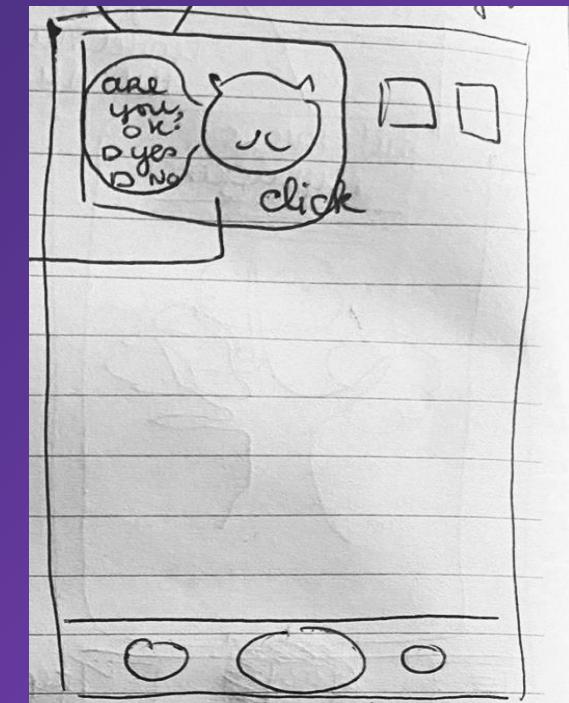
After questionnaire completion,
a pop up of encouragement is shown



Prompt to answer questions



Singular question on widget to reduce burden in extreme cases



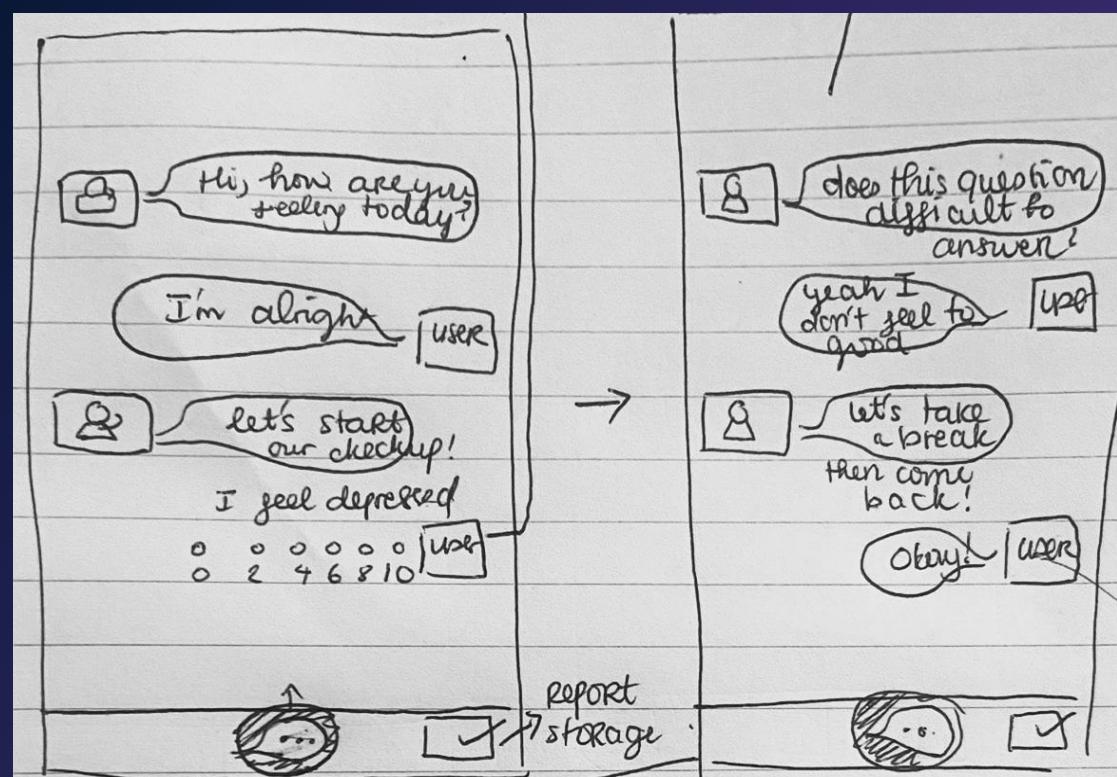
-by Kim

03 / Ideate

Brainstorming for Questionnaire

Everything Conversation

The questionnaire is reformatted into a conversation

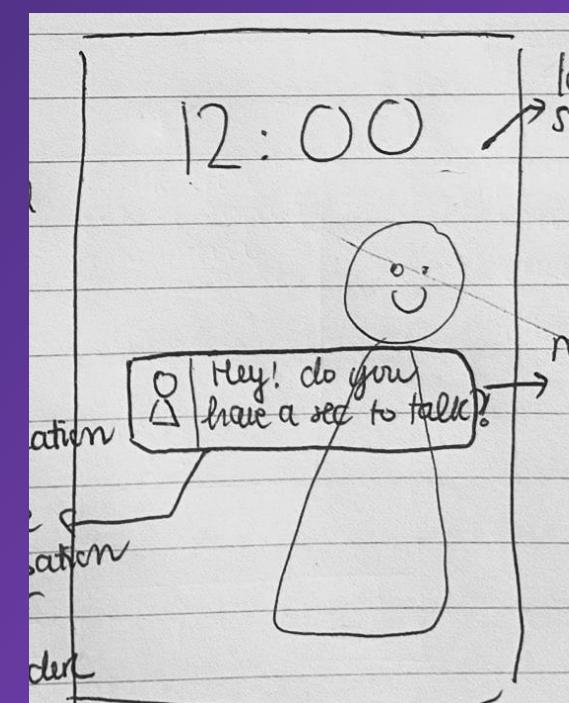


Occasional check-up on potentially triggering questions

Voice record feature for users



Notification that initiate conversation rather than a reminder

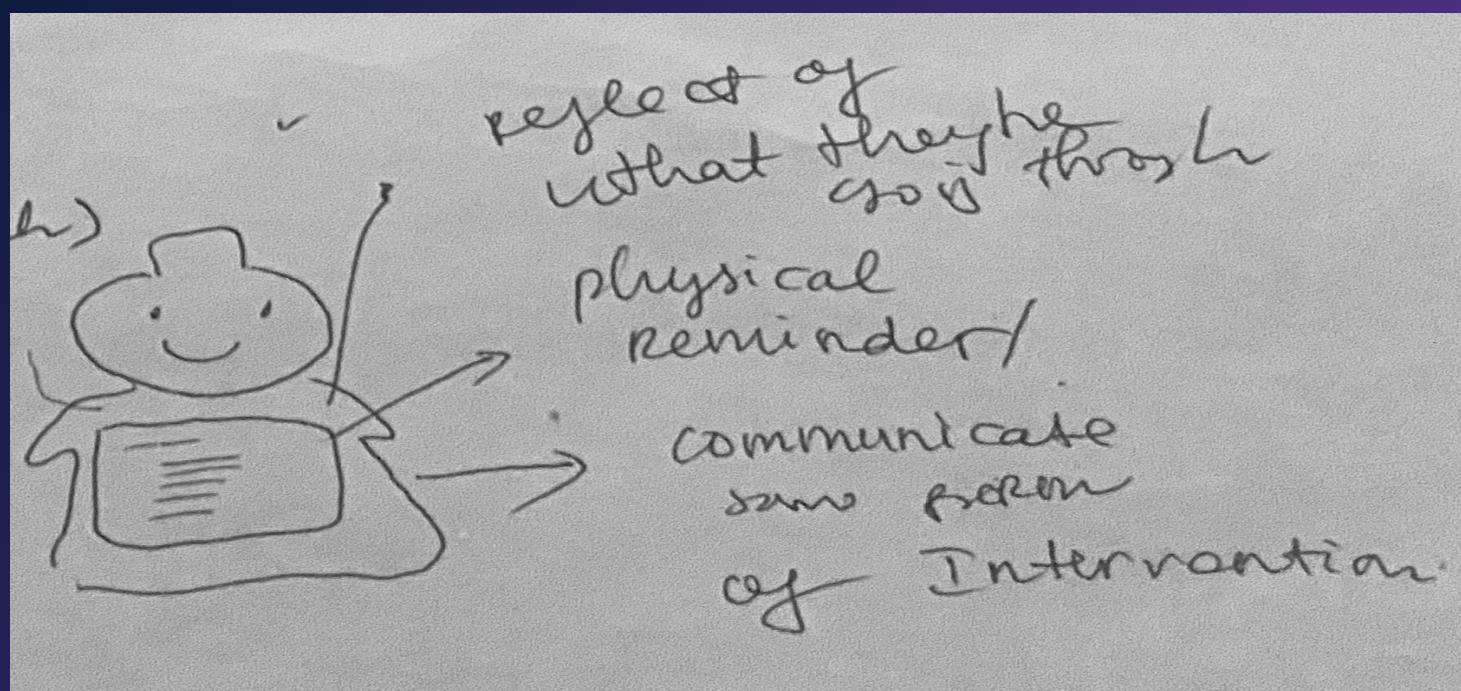
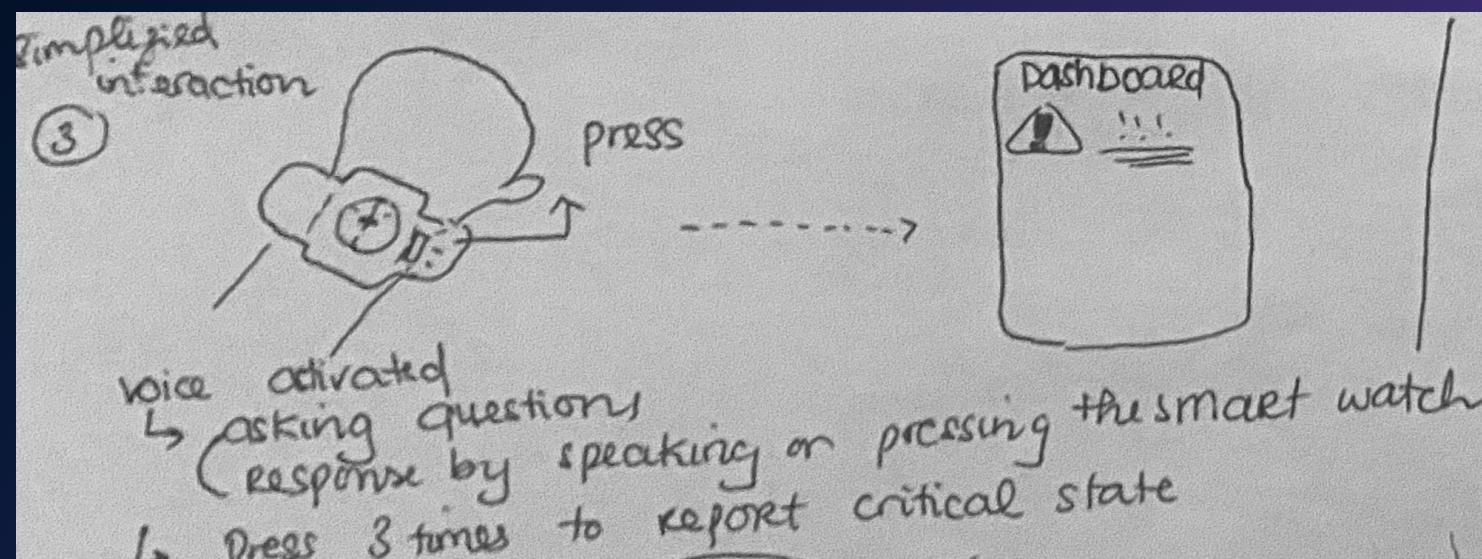


-by Kim

03 / Ideate

Brainstorming for Questionnaire

Beyond Mobile Interaction



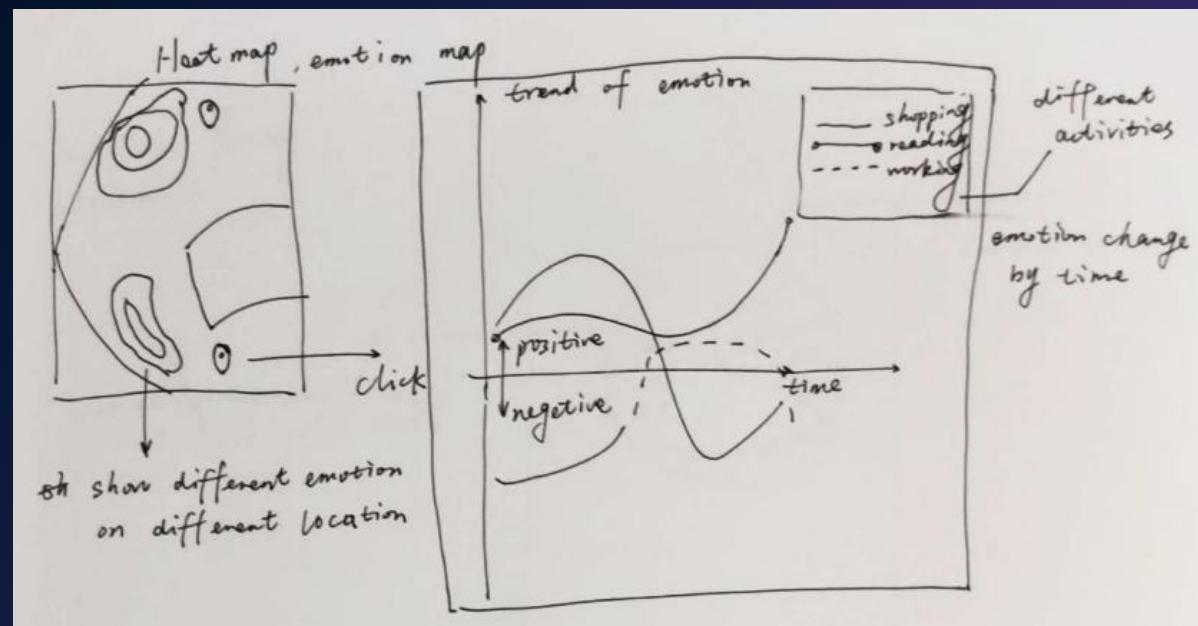
-by Balika

03 / Ideate

Brainstorming for Interface

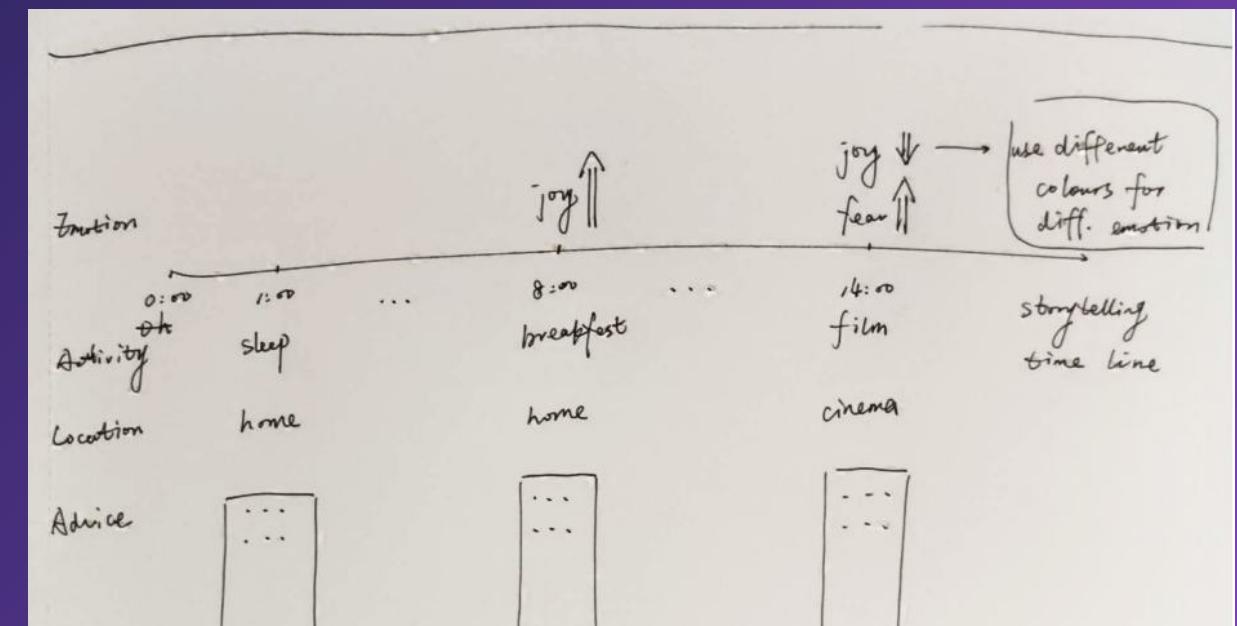
We explored visualisation ideas that strengthen clients' understanding of their emotion and its relationship with their daily life.

Emotion Heatmap



The emotion heatmap shows emotional intensity in different location intuitively, also the use of a dual-axis chart that shows activity time (e.g., social media use time, exercise time) on one side and mood changes over the corresponding time period on the other side.

Emotion Timeline



Add a story line feature to the chart to show the back story and specific events (e.g., work stress, family events, etc.) behind mood changes to help users better understand the reasons for mood changes.

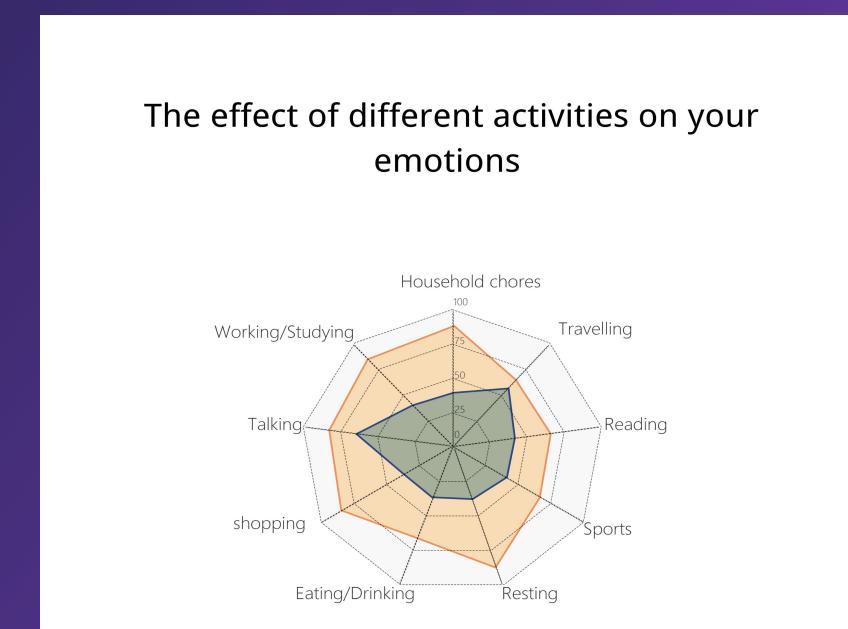
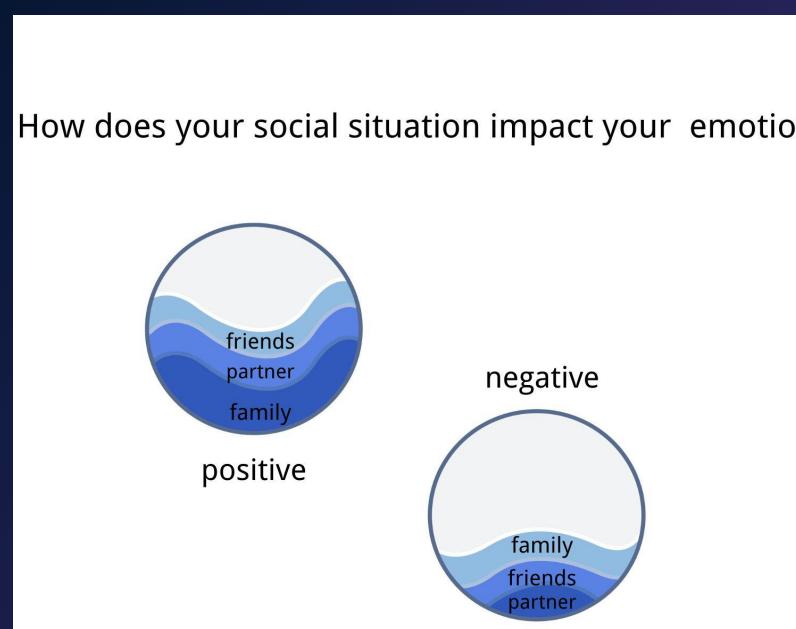
Combine mood trend graphs and recommendations in one chart, with important recommendations and action points (e.g., reduce social media time, increase exercise) labelled directly on the mood change curve.

-by Tian

03 / Ideate

Brainstorming for Interface

Comparative Visualisation



The idea is to use waves to indicate the extent to which client's social situation is affecting their emotions. The higher the waves, the deeper the impact.

A radar chart can demonstrate several activities that effect emotions. Compared to bar charts, radar charts can give clients a more intuitive understanding of how different activities affect their emotions.

-by Guangnan

04 / Ideate

Risk Consideration

The risks we are aware of regarding how these ideas could fail are:

Some of the solutions may not be available to clients who don't have access to different modalities

Some of the solutions may not be feasible considering the technological resources of the partner.

The data analysis process and validity may be compromised when changing the questions or the answer formats.

To minimise these risks, we outlined three conditions that are required for our final solution to be effective:

Accessibility

The solution is easily accessed by the majority of clients.

Feasibility

The solution can be implemented with the technological resources available to our Partner.

Stakeholders' Needs

The solution answers the needs of clients.

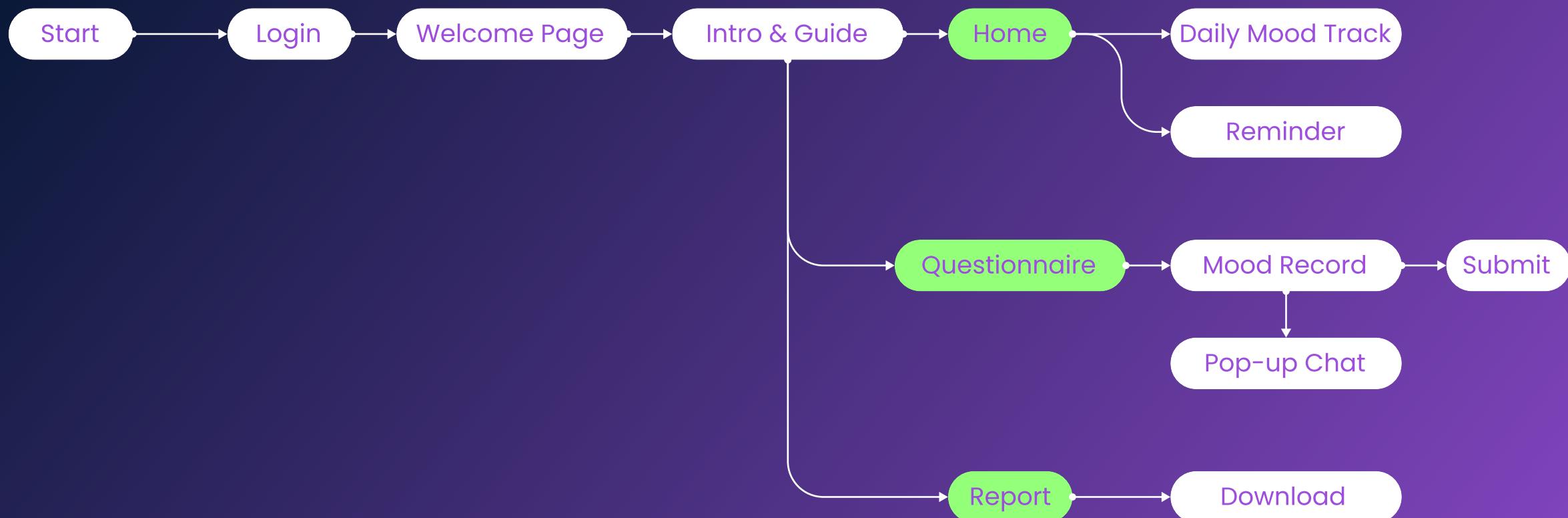
To fulfill these conditions, we decided to develop a mobile application - a Myndgard 2.0 from the current system and integrate different elements from the initial concepts to make the product experience more engaging and meaningful to the clients.

05 / Ideate

User Flow

Based on the brainstorming concepts, we designed a user flow with several new functionalities, including:

- A Clear guide of Myndgard's role and purpose.
- Conversational and encouraging style to shift the mood to sharing about their feelings.
- Opportunities for deeper understanding of clients' emotion.
- Personalised Micro-Intervention based on Questionnaire Data and App usage Data.



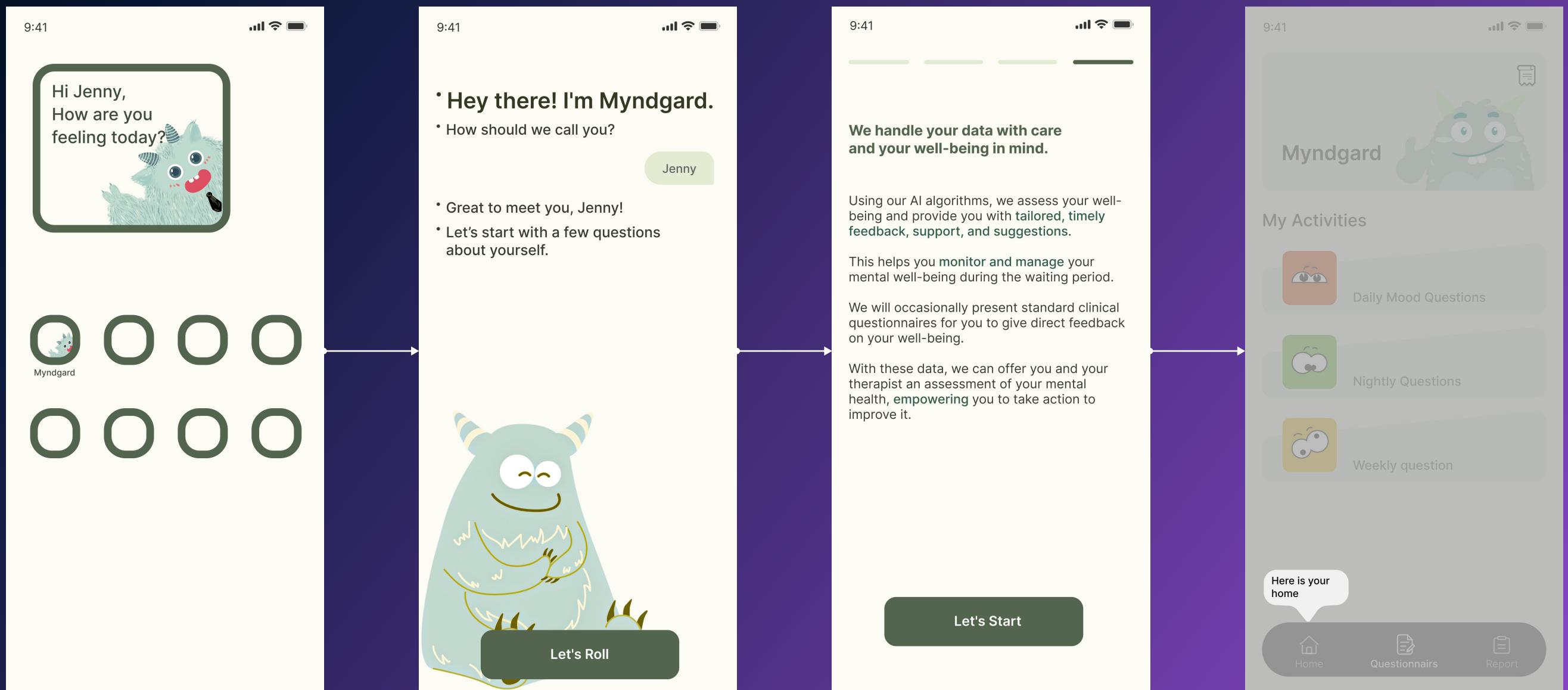
The user flow here isn't the entire workflow of the app, it's just a demonstration of the main changes in functionality.

-by Tian

01 / Design

Hi-fi Prototype

Onboarding

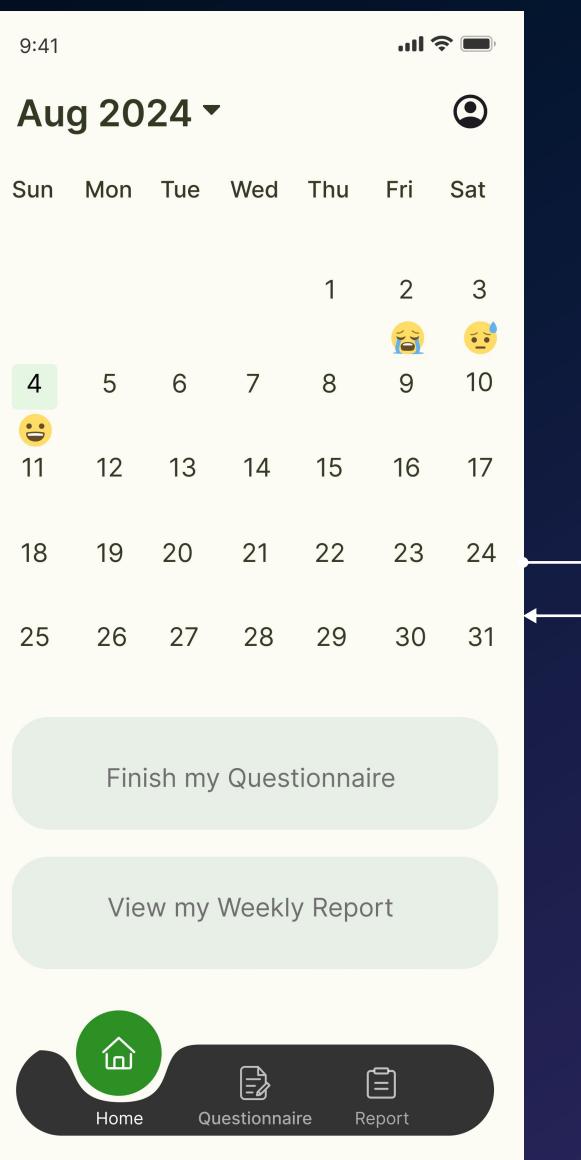


-by Tian & Guangnan

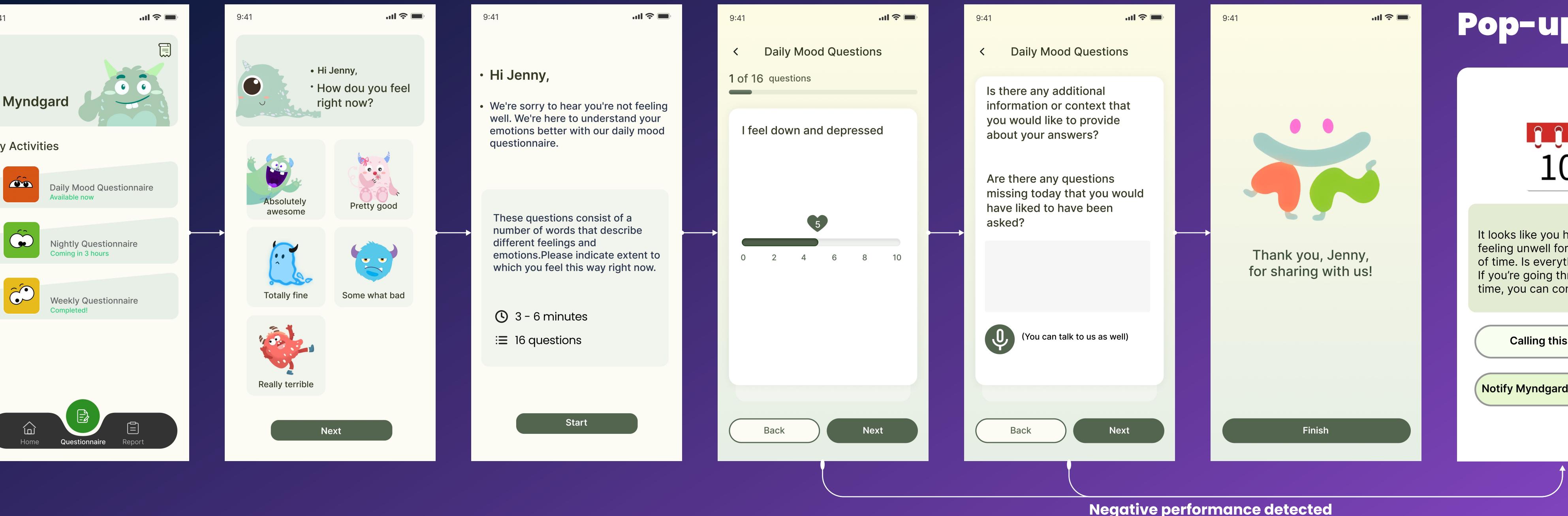
01 / Design

Hi-fi Prototype

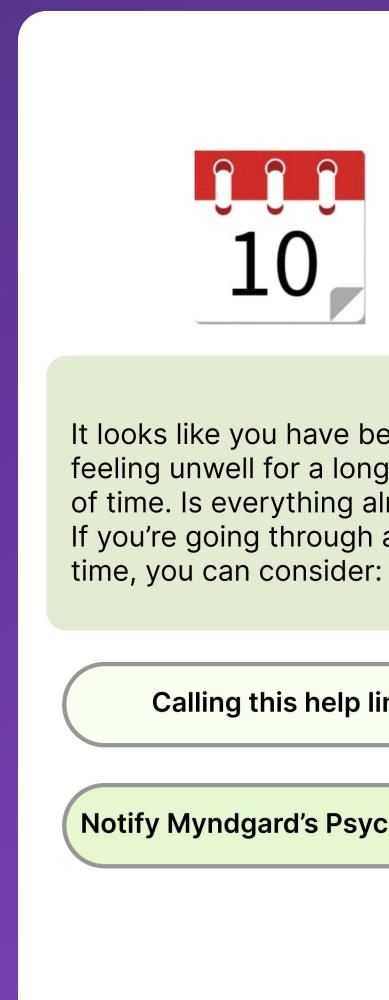
Homepage



Questionnaire



Pop-up Warning

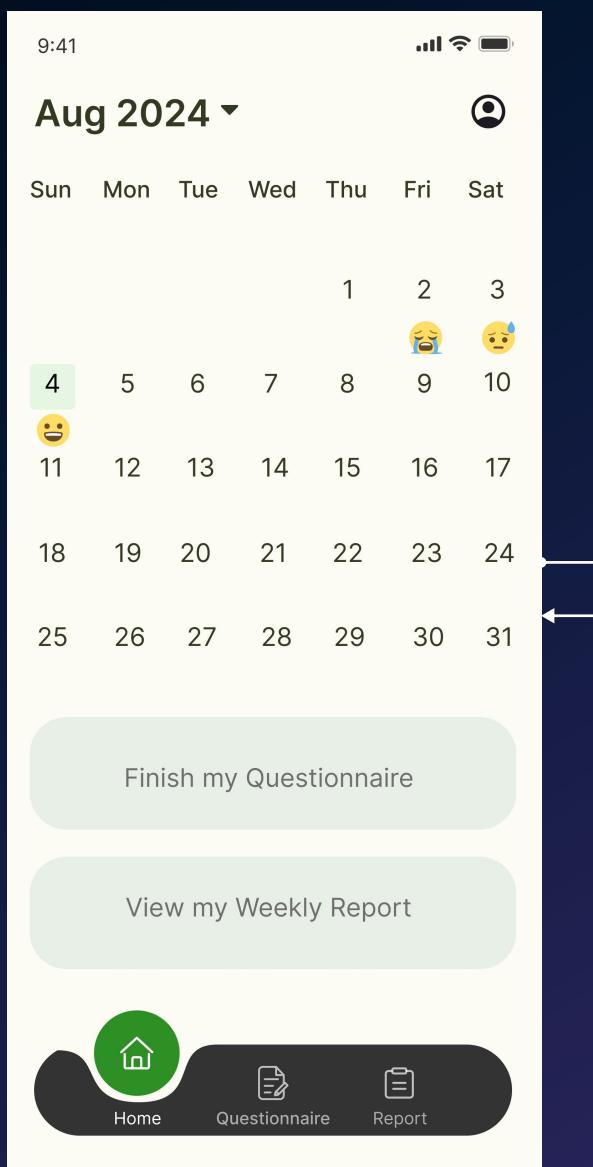


-by Tian & Guangnan

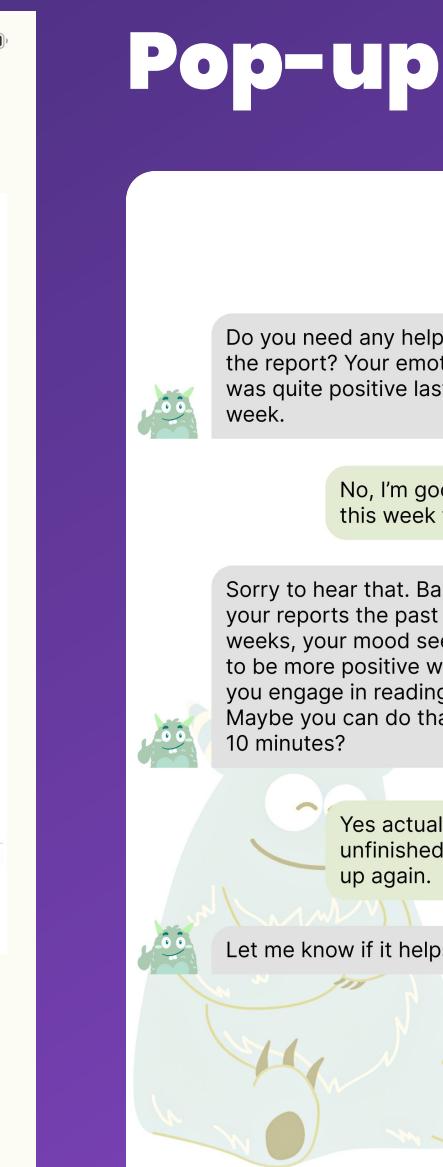
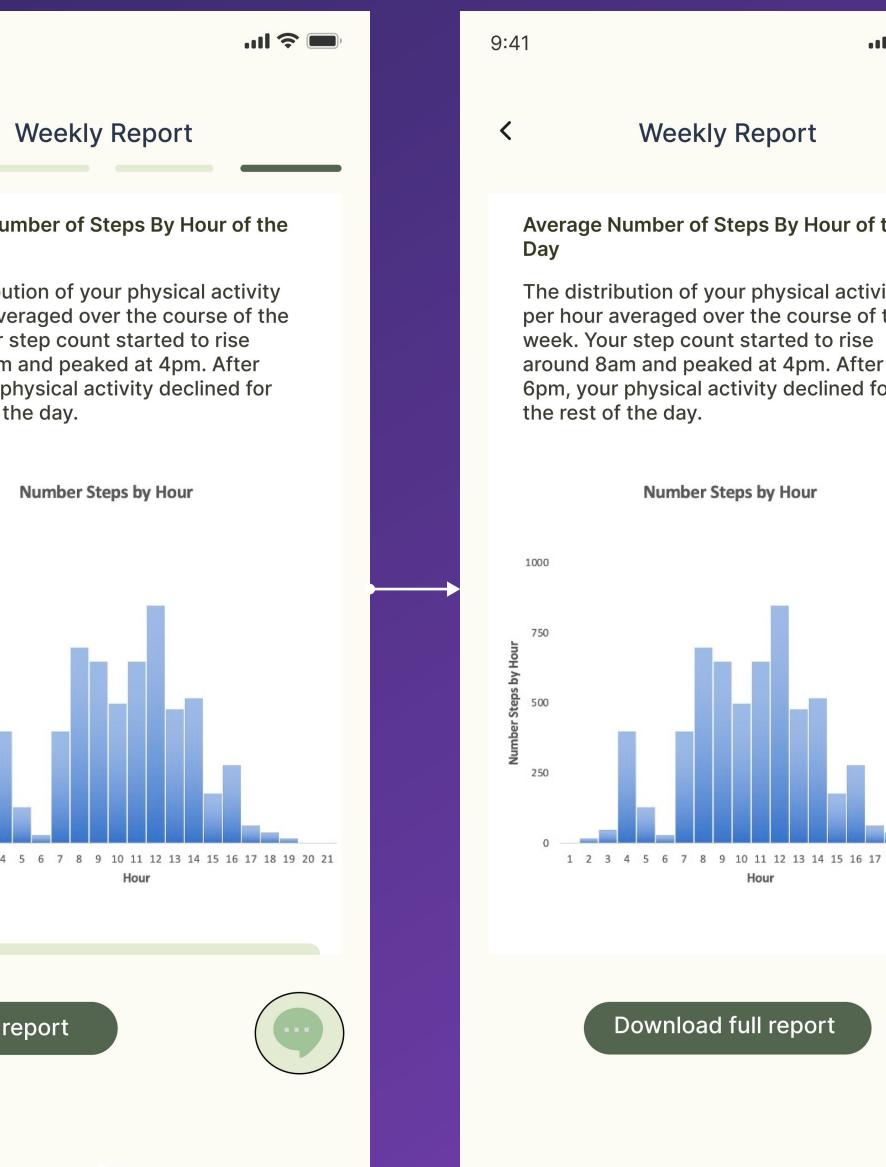
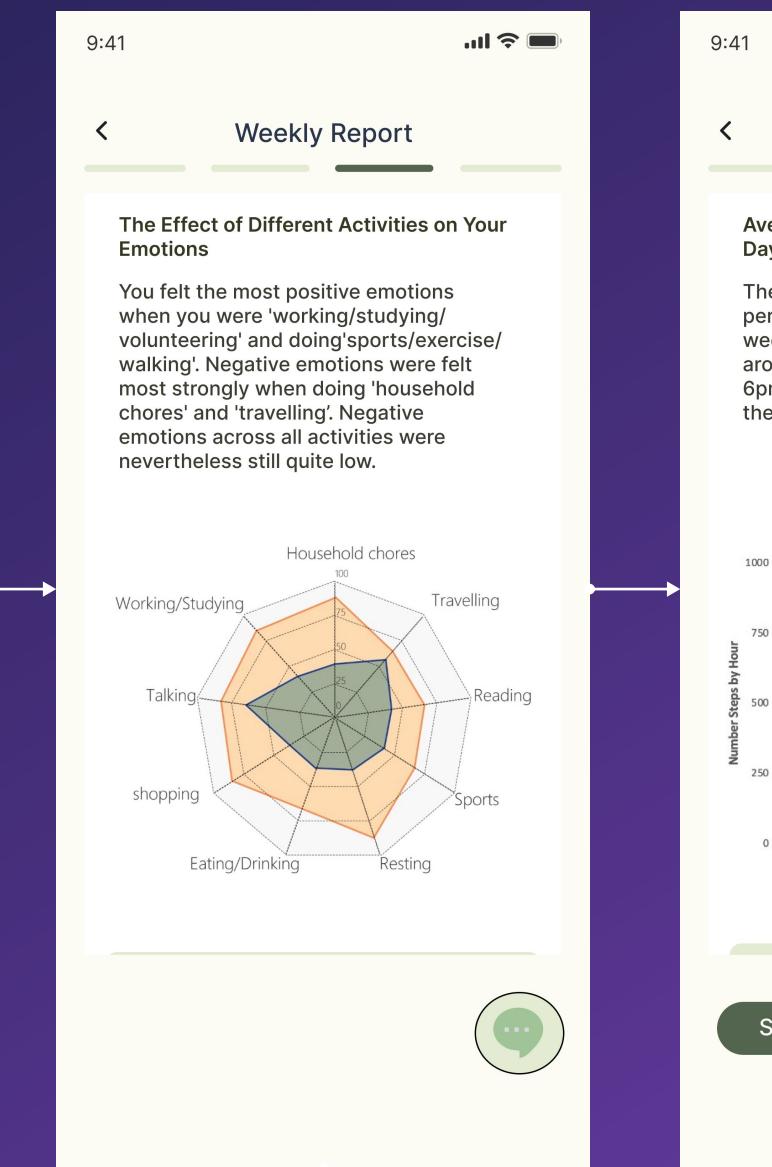
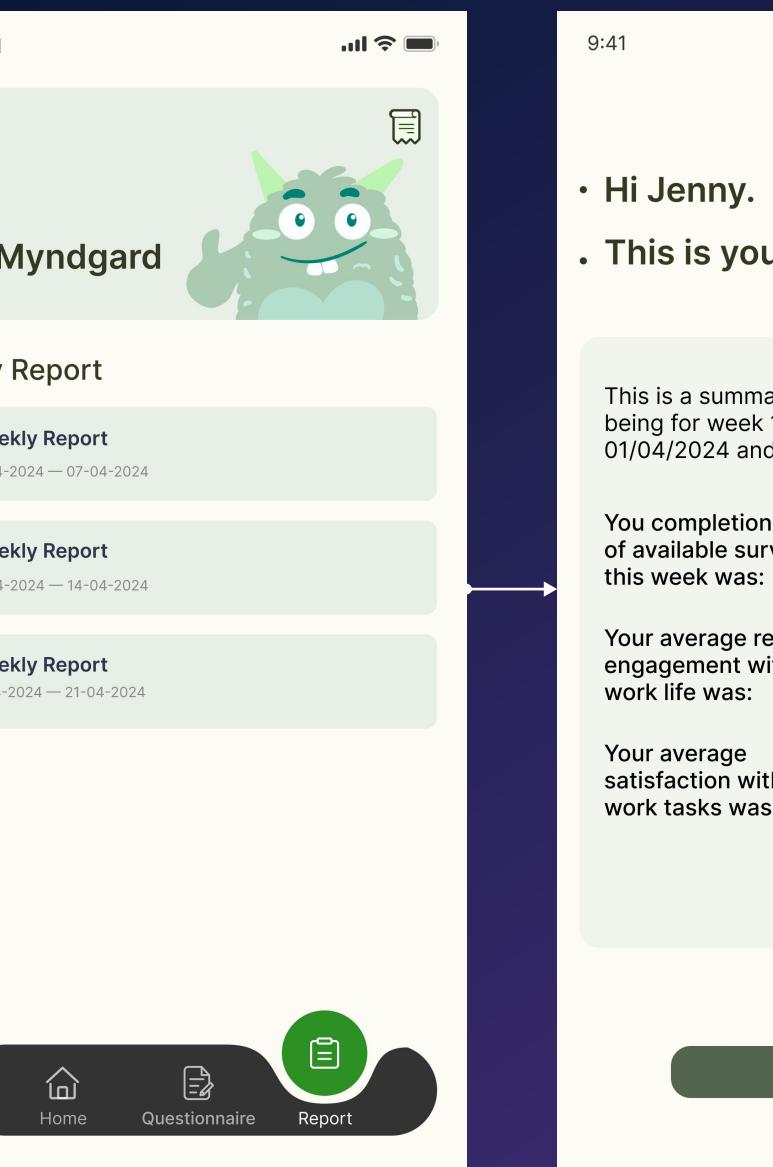
01 / Design

Hi-fi Prototype

Homepage



Report



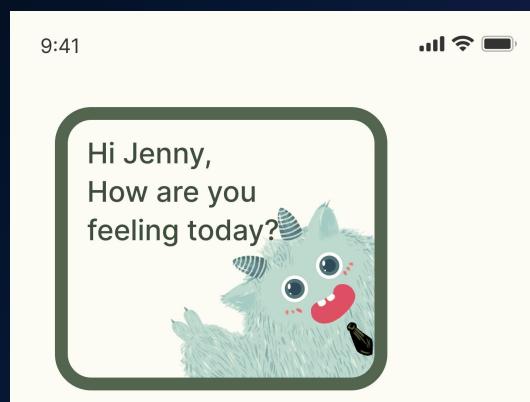
Chatbox

-by Tian & Guangnan

01 / Design

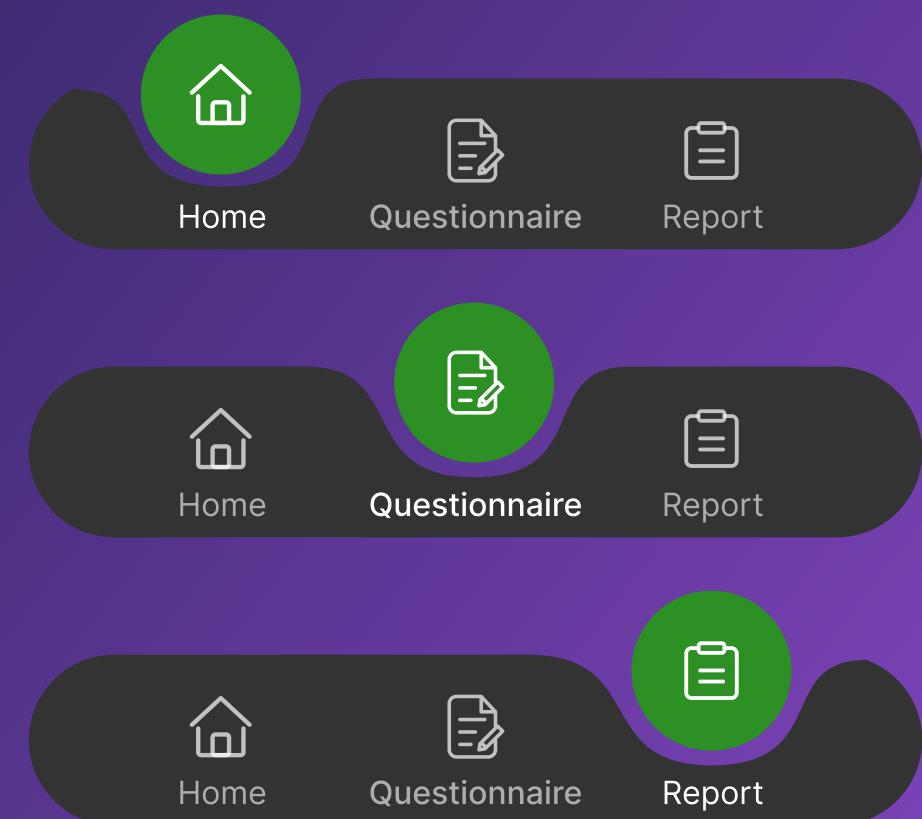
Hi-fi Prototype

Widget

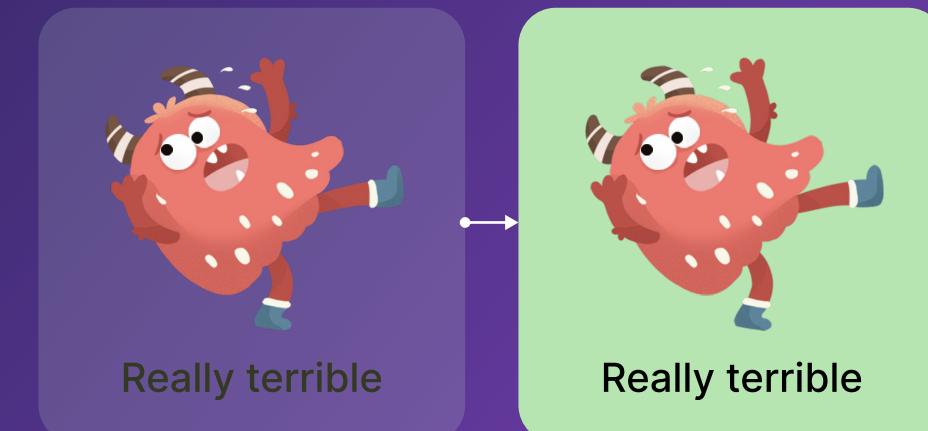
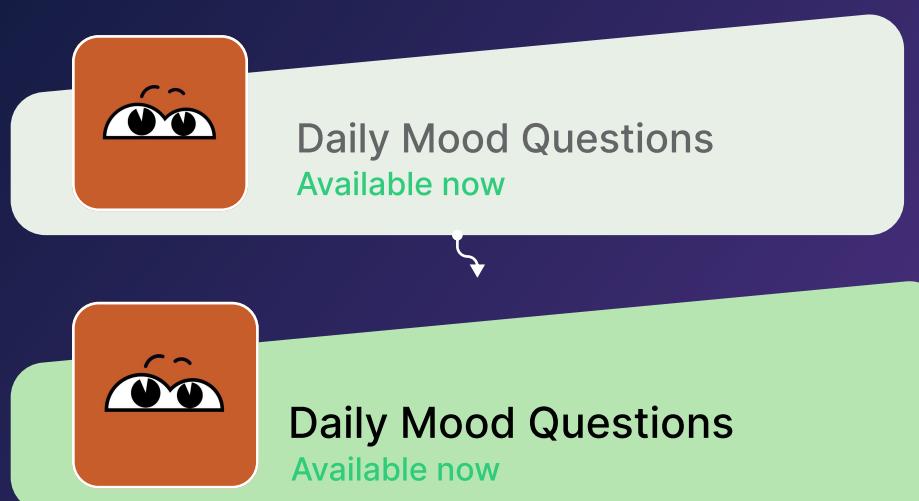


Optimal notification delivery:
Notifies or prompts clients to fill out the questionnaire using widgets. A friendly tone will be used when reminding users to complete the questionnaire.

Navbar



Button Hover

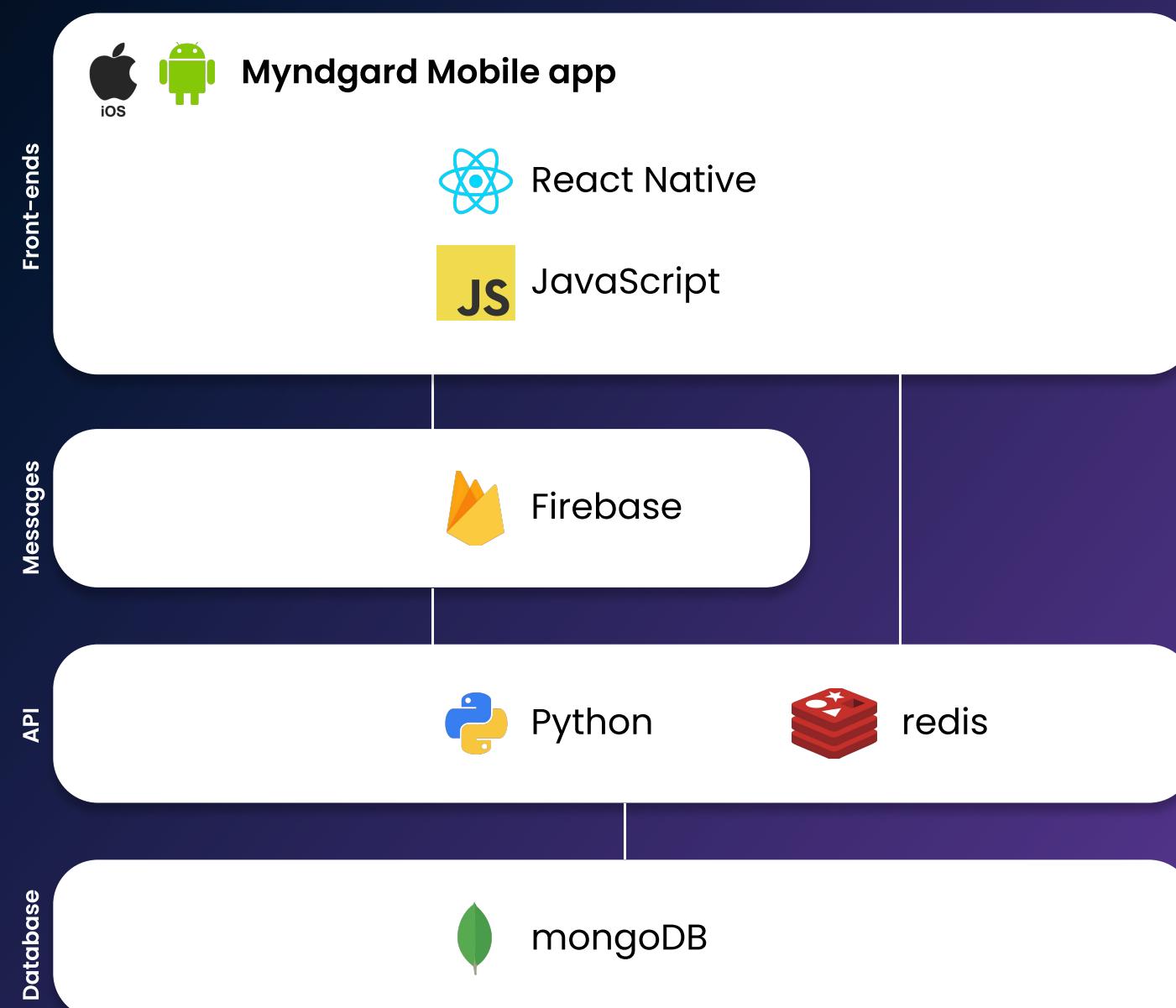


-by Tian

02 / Design

Implementation

Architecture



- The mobile front-ends for Android and iOS can be built using React Native and JavaScript, enabling a single codebase for both platforms. JavaScript libraries like D3.js and Intro.js can enhance user experience by providing data visualization and a guided tour of the app, helping users familiarize themselves with its features. The Myndgard app's data can be stored in a MongoDB database, a high-performance NoSQL option, with MongoEngine ODM facilitating smooth interaction with the database.

- The backend API can be built with Python using the Flask framework to handle HTTP requests and provide RESTful services. Redis and Celery can manage timed tasks with distributed queuing. Firebase Cloud Messaging can send notifications from the backend to users' mobile devices, with all additional data accessed via HTTPS. The Pandas library can be used to analyze user data and dynamically adjust questionnaire timings, enabling personalized user experiences. Additionally, AI technologies like Dialogflow or Rasa can be integrated for a chatbot feature to provide real-time support and emotional assistance.

-by Tian

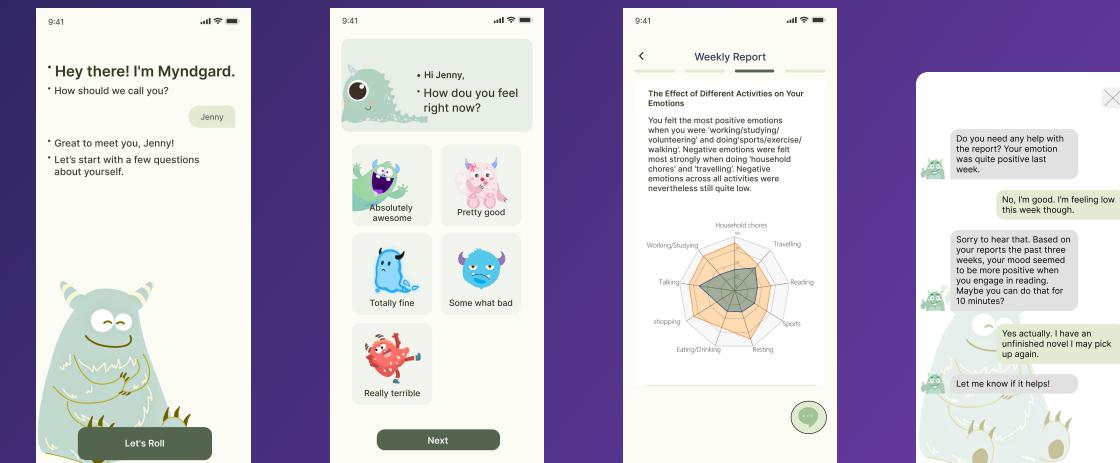
01 / Test

Usability Test

Task Identification

We identified four key tasks for the live test:

- Onboarding
- Answering questionnaires
- Going through the report
- Interacting with the conversational agent

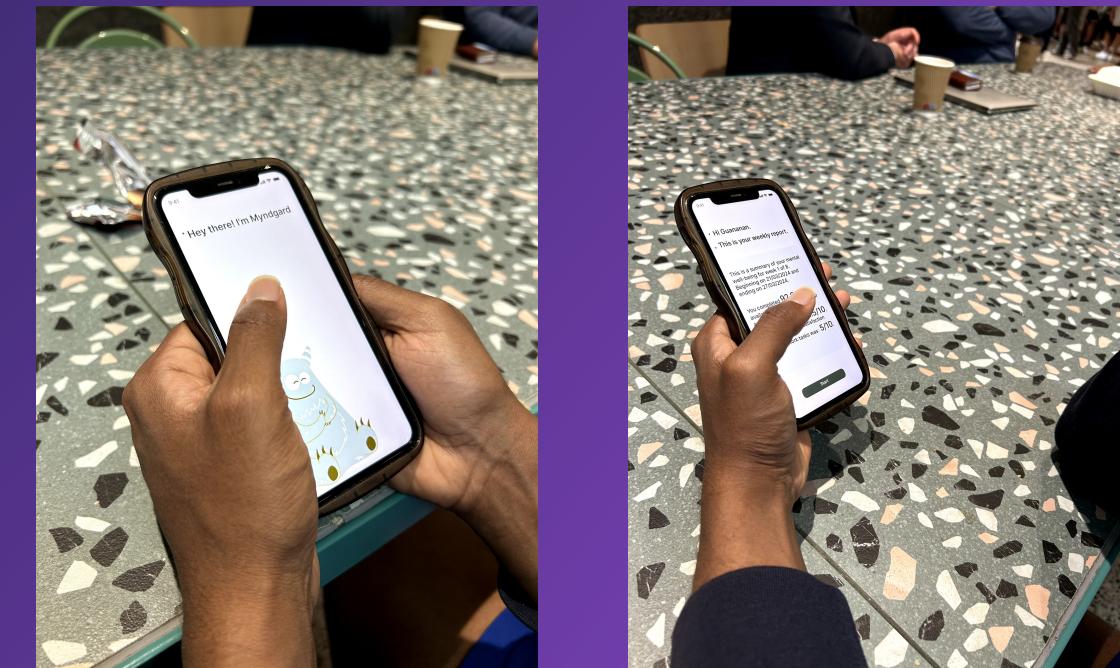


Live Test

We gathered in the meeting space and interacted with the hi-fi prototype at the same time.

After the test, we discussed our experience completing the tasks and identified:

- Painpoints
- Observations



Feedback Consolidation

We gathered everyone's feedback and identified key areas of improvements for: The usability of the application, Visual design, Feature functionality & information

-by teamwork

01 / Test

Usability Test

Pain Points

- There is no control or starting point for the slider, which caused confusion for testers initially.
- The multiple-choice questions had too many options, which made it time-consuming to go through all of them.
- The first two screens of the questionnaires didn't have a back navigation button, testers felt they were forced to finish the questionnaires in one go.

Observation

- For the onboarding screens as 'stories', testers were not sure whether to slide or tap from one screen to the next.
- The onboarding screens were helpful, but testers preferred the information to be more concise with some imagery.
- The initial guide covered only basic features, but testers wanted more detailed tutorials on specific functions.
- The reminder about the questionnaires' availability was helpful, but testers realised they were not informed of the fixed time frame for each questionnaire.

Addressing these concerns in the future will be important for increasing the application's usability.

01 / Appendix

References

- Bentley, F., Tollmar, K., Stephenson, P., Levy, L., Jones, B., Robertson, S., ... & Wilson, J. (2013). Health Mashups: Presenting statistical patterns between wellbeing data and context in natural language to promote behavior change. *ACM Transactions on Computer-Human Interaction (TOCHI)*, 20(5), 1-27.
- Brandon A. Gaudiano, Ethan Moitra, Stacy Ellenberg, and Michael F. Armey. 2015. The Promises and Challenges of Ecological Momentary Assessment in Schizophrenia: Development of an initial experimental protocol. *Healthcare* 3, 3: 556–573. <https://doi.org/10.3390/healthcare3030556>
- Chakaipa, S., Prior, S. J., Pearson, S., & Van Dam, P. J. (2023). Improving Patient Experience through Meaningful Engagement: The Oral Health Patient's Journey. *Oral*, 3(4), 499–510. <https://doi.org/10.3390/oral3040041>
- Department of Health. (2020). Sharing the Vision: A Mental Health Policy for Everyone. Retrieved from: <https://www.gov.ie/en/publication/2e46f-sharing-the-vision-a-mental-health-policy-for-everyone/>
- Doherty, K., Marcano-Belisario, J., Cohn, M., Mastellos, N., Morrison, C., Car, J., & Doherty, G. (2019). Engagement with Mental Health Screening on Mobile Devices. Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems. <https://doi.org/10.1145/3290605.3300416>
- Doherty, K., & Doherty, G. (2018). The construal of experience in HCI: Understanding self-reports. *International Journal of Human-Computer Studies*, 110, 63–74. <https://doi.org/10.1016/j.ijhcs.2017.10.006>
- Dominika Kwasnicka, Dimitra Kale, Verena Schneider, Jan Keller, Bernard Yeboah-Asiamah Asare, Daniel Powell, Felix Naughton, Gill a Ten Hoor, Peter Verboon, and Olga Perski. 2021.
- Increase Patient Engagement in 2023: Definitive guide | Mend. (2024, March 20). Mend. <https://mend.com/resource/the-definitive-guide-to-increase-patient-engagement-in-2023/>
- Jardine, J., Nadal, C., Barry, M., Snow, D., McDermott, F., & Robinson, S. (2024). Design for the Long Now: Temporal Tools for Navigating Ethics in HCI. Designing Interactive Systems Conference. <https://doi.org/10.1145/3656156.3658392>
- Kahneman, D., & Riis, J. (2005). Living, and thinking about it: two perspectives on life. In Oxford University Press eBooks (pp. 284–305). <https://doi.org/10.1093/acprof:oso/9780198567523.003.0011>
- Karapanos, E., Zimmerman, J., Forlizzi, J., & Martens, J. (2010). Measuring the dynamics of remembered experience over time. *Interacting With Computers*, 22(5), 328–335. <https://doi.org/10.1016/j.intcom.2010.04.003>
- Kazdin, A. E. (2007) Mediators and mechanisms of change in psychotherapy research. *Ann. Rev. Clin. Psychol.*, 3, 1–27.
- Kim S-H. A Systematic Review on Visualizations for Self-Generated Health Data for Daily Activities. *International Journal of Environmental Research and Public Health*. 2022; 19(18):11166. <https://doi.org/10.3390/ijerph19181166>
- OECD and European Observatory on Health Systems and Policies. (2023). State of Health in the EU Country Health Profile 2023. Retrieved from: https://health.ec.europa.eu/state-health-eu/country-health-profiles_en
- Paradiso, R., Bianchi, A. M., Lau, K., & Scilingo, E. P. (2010). PSYCHE: Personalised monitoring systems for care in mental health. In 2010 Annual International Conference of the IEEE Engineering in Medicine and Biology. <https://doi.org/10.1109/iembs.2010.5627469>
- Wichers M, Simons CJP, Kramer IMA, Hartmann JA, Lothmann C, Myint-Germeyns I, van Bemmel AL, Peeters F, Delespaul P, van Os J. Momentary assessment technology as a tool to help patients with depression help themselves. *Acta Psychiatr Scand* 2011; 124: 262–272. DOI: 10.1111/j.1600-0447.2011.01749.x

02 / Appendix

Interview Guide for Non-professionals

Recruitment Process

We conducted four interviews with participants meeting the following inclusion and exclusion criteria,

- They have **previously** been in therapy but are **not currently** receiving treatment.
- They have been on a **waitlist**.
- They have **no active diagnosis**.
- They are students aged **18 to 25**.

To recruit the non-professional participants:

- We reached out to acquaintances who met our criteria.
- **Posters** with a QR code were posted around campus to reach a broader audience.
- Our partner, Myndgard, also announced the recruitment on their [LinkedIn](#).

Multiple responses were recorded in the recruitment survey form. Only those who met our inclusion criteria were prompted to complete our demographic survey. Upon receiving the survey results, our four-member team verified that the participants met the criteria. Five participants were confirmed to meet the requirements. After obtaining informed consent, interviews were scheduled based on the participants' availability. Three out of the five scheduled interviews were conducted in person in a private space at University College Dublin, ensuring a comfortable environment for participants to share potentially sensitive information. One interview was conducted online via Zoom. One participant did not attend the scheduled interview. Audacity was used to record the interviews for later transcription.

A limitation of the study was the availability of the questionnaires, which were accessible only during a specific time period. Additionally, the questionnaires disappeared after being filled out, preventing participants from reviewing them later. In cases where participants wanted to see the questionnaire again, a recorded version was provided.

In-person interviews:

Participants evaluated the tool using the interviewer's Myndgard account and printed out the weekly report to mimic clients' experience. Participants were shown videos of the other questionnaires (Sleep and Weekly).

Online interviews:

Participants were shown videos of the questionnaires and the pdf form of the weekly report. The videos were replayed, paused and rewound based on participants' requests.

02 / Appendix

Interview Guide for Non-professionals

Interview Procedure

01

Introduction to our Research Study

02

Questions about the expectation during the waitlist period

03

An overview of Myndgard and their process

04

Participants interact with the questionnaires

05

Evaluation of the questionnaire

06

Participants interact with the weekly feedback report

07

Evaluation of the weekly feedback report

08

End of the interview

02 / Appendix

Interview Guide for Non-professionals

Interview Questions

Data collection process

Expectation during the waitlist period

1. If you were to be on a waitlist for therapy, what would your aspirations be as regards to communication or interaction with your service provider during this waiting period?
2. If you were to be on a waitlist for therapy, is there a reason why you would want to share information before attending a therapy session? If yes, what information would you want to share with your therapist?

Evaluation of the questionnaire

Comprehension

3. What are your initial thoughts and reactions as you go through this questionnaire or report? Please describe them in detail.
4. Are there any aspects of the questionnaire that confuse you? If so, please explain.
 - What additional information, not included in this questionnaire, do you believe would be beneficial?
 - Conversely, what information do you think is redundant?

Design

5. What are your initial impressions when looking at this questionnaire? For example, about the wording, arrangement of questions or options, design of selectors (such as sliders)...? What about the length of the questions?
6. Are there any aspects of the questionnaire that you find challenging or require more time to answer?
7. After reviewing the questionnaire, would you be willing to complete it if the questionnaire was released twice a day for a period of 8 weeks in the future? If not, why?

Interaction/Experience

8. With the introduction of Myndgard, how would you feel if they are associated with your therapy provider?
9. Regarding the format of answering questions, which type of response format do you prefer? Why?
10. For some open-ended questions about your emotional state, do you have any suggestions for other response formats?

02 / Appendix

Interview Guide for Non-professionals

Interview Questions

Engagement

11. How often would you like to complete these questionnaires for them to be useful? For example, participants currently complete the questionnaire over a period of 8 weeks.
12. If you were to receive multiple notifications to answer questions about your emotional states throughout the day, would you feel motivated to answer them?
 - (Follow-up) What factors would motivate you to complete the questionnaires on a daily basis?
 - What reasons or factors do you think would hinder your completion of the questionnaires on a daily basis?
13. Have you ever used any well-being app that allows you to log your emotional/mental states? If yes, can you please describe your experience using the application?

Evaluation of the weekly report

Visualisation

14. What are your first impressions of this report? Would you like to read through it and share your thoughts on how it makes you feel?
15. What do you think are the most effective design elements in the report?

Comprehension

16. At first glance, what information/insights can you get from the report?
17. How satisfied are you with the use of charts and graphs in the Myndgard report? Is it presented in a way that can be easily understood at first glance?
 - (Follow-up) Which information are you finding difficult to understand and need further clarification?

Usefulness

18. If you were to receive this report weekly before your first therapy session, do you think the data in this report would change your interaction with the therapist?
19. Do you have any concerns with the data presented in this report?
20. What are some types of data not presented here that you would like to see in the report and why?

02 / Appendix

Interview Guide for Professionals

Recruitment Process

We planned interviews with participants meeting our following inclusion criteria:

- They are **therapists**, preferably those experienced with **teenagers**, **students**, and **young adults**
- OR they have experience with **clinical psychology** including psychology professors and trainee psychologists
- OR they are the members of our Partner's organisation, **Myndgard**

To recruit the professional participants,

- We reached out to over 20 therapists from the Irish Association for Counselling and Psychotherapy directory via Email.
- Our partner, **Dr. Sean Kelley**, also reached out to therapists at a psychology conference.
- We also joined the '[Coffee with Your Therapists](#)' **podcast**, hosted by a member of the Myndgard team, Patt Flynn, to promote our study to their therapist listeners

02 / Appendix

Interview Guide for Professionals

Interview Questions

Additional Data to include

Therapy approach and practice - info and how they get it

1. Can you share the types of therapies you are currently practising? (e.g., DBT, CBT, ACT?).
2. Can you describe your current process of conducting client consultations from the pre-therapy period to the first sessions?
 - What are your aims in the early stages of the therapeutic relationship?
 - What information, if any, would you seek to gain before consulting a client?
 - Follow-up: How do you currently receive that information?
3. When you meet a client for the first time, how often would you seek access to any information about them in advance of your first conversation?
 - What forms would such information take?
 - How would you obtain it?
 - What are your objectives in capturing this?
 - How would you make use of this information?
4. What are your thoughts on using clients' intake assessment information in preparing your consultations?

Usage of data & Decision Support tool - optional

5. What support are you currently having in the entire process of client consultation from start to finish?
 - How have these tools specifically helped you? Are there any ways in which you feel digital tools could play a more supportive role in your process? Please describe these issues in detail.
 - (optional - follow-up if 1. is yes) Are there any resources currently assisting you with client consultations before the first meeting?
 - If yes, can you describe these tools in detail?
 - If not, do you receive information and track client status before the first meeting? If yes, how do you receive such information?
6. What kind of data about the clients do you gather before your first consultation with your clients?

Myndgard's role in their practice

explain how Myndgard works

As shared, Myndgard is a platform that helps collect information about clients' mental state for 8 weeks before their first consultation.

7. Can you imagine such data providing value to you in your practice? And if so, in which respects?
8. Is data in this form simply not an aspect you consider in your practice?
9. How do you make use of clients' data?

02 / Appendix

Interview Guide for Professionals

Interview Questions

Needs for clients' data

What info they want to know before the first session

10. Is there any information in particular that you feel your therapeutic practice might benefit from knowing in advance of that first meeting with a client?
11. Do you create a personalised plan for each case? If yes, what information helps you create a personalized plan for each case?
 - (follow-up) What information do you find helpful to be updated in real-time? What types of information do you need daily/weekly/monthly?
12. (optional) How do you typically manage information about a client before and after a consultation? (Mobile phone, computer, tablet...)?

And, why?

Myndgard's questionnaire - Optional based on time limit

13. What do you think about the clients filling out two questionnaires daily?
14. What do you make of the phrasing of these questions. Is this information useful? What forms of reflection would you imagine this would lead clients to engage in? Is this valuable in your view?

Evaluation of pre-therapy report

Visualisation

15. Describe your initial impressions when viewing the report.
 - What types of information would you pay attention to or look for first?
 - At a first glance, what information/insights can you get from the report?
16. What are your impressions of reading Myndgard's chart/graph designs? Have they helped you obtain the necessary information?
 - Do you tend to interpret information through charts/graphs or through written descriptions of results? Why?
 - What visual features do you consider essential in a report?

Comprehension

17. After reviewing the report, which data points are you finding difficult to understand and need further clarification?
18. Has the report's data met your information needs regarding clients? If not, why?
19. What would you look for in the data? And what conclusion you want to make from the data?

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Interview Guide for Professionals

Interview Questions

Usefulness

20. If you were to receive a pre-therapy report before your first meeting, How would the information provided in the pre-treatment report relate to your initial assessment of the client? Why?
 - What information have you not received yet from the report that you would like to receive?
 - What types of information should the report omit that have already been presented? Why?
21. Share any thoughts you have on improvements or feedback for the report.

03 / Appendix

Future Work

Kazdin (2007) highlights the importance of a strong association between therapeutic intervention, mediators of change, and therapeutic outcomes. With this in mind, a randomised controlled trial (RCT) could be conducted to determine if there is a causal relationship between clients using Myndgard during waiting period and any resultant behavioural changes.

Assessing the use of Myndgard not only during the waiting period but also after the client has completed therapy, to monitor their well-being and track signs of remission (Wichers et al., 2011).

Further refine the design and functionality of the newly built system based on insights from the therapists. Or even Undesign (or non-design) the application, if necessary (Jardine et al., 2024).

Ethics

Design systems to complement traditional care without promoting individualization, while considering the social impact of technological changes (Wichers et al., 2011; Jardine et al., 2024).

Simplifying EMA designs can lead to invalid data and unintended effects; addressing these issues is key for the application's sustainability (Doherty et al., 2020).

Life-logging may cause negative reflections and emotional distress; identifying and mitigating these risks is crucial (Doherty et al., 2020).

Ensure sensitive and passive data is encrypted and not shared with third parties to protect against data breaches.

04 / Appendix

Discussion

As the first project in which I was mainly involved and responsible for the design part, this project not only gave me a lot of design knowledge and skills, but also made me realise the importance of collaboration. As the famous saying goes, "Alone we can do so little; together we can do so much."

Working within a team always presents unique dynamics, and this project was no exception. Our team was composed of individuals with diverse skills and perspectives, which was both a strength and a challenge. Initially, it took time for us to find our rhythm and establish effective communication channels.

Initially, due to the lack of clear division of tasks, each team member focused on the parts that interested them, leading to low collaboration efficiency. After identifying this issue, we promptly adjusted our strategy by holding weekly meetings, assigning specific tasks, and actively using online collaboration tools to improve efficiency and ensure everyone's engagement and alignment with the content.

In the literature review section, human-computer interaction (HCI) technologies related to mental health significantly broadened my perspective, allowing me to consider what constitutes good user-centered design from different angles. Design is not just about the design itself; it also includes the preceding stages such as research, defining, ideation, and other user research activities. Only by thoroughly understanding the needs of users can we design functions that meet their expectations.

Moreover, since our project's research involves a vulnerable group, it is essential to prepare comprehensive data privacy and risk management measures.

05 / Appendix

Conclusion

As HCI professionals, amidst complex challenges, we have realised the importance of staying rooted in the values and principles of human-centred design.

This enabled us to redefine the product's role in users' lives, shifting the focus from merely reducing burden to enhancing prolonged engagement, while fostering ownership, self-agency, autonomy, and empowerment for the clients.

To drive engagement in mental health technology solution is to pay careful attention to the context of interactions, the emotions that influence users' experiences, and the elements that make those experiences truly meaningful.

06 / Appendix

Participants Demographics

Participants	Age	Gender	Background
Participant 1	25	Male	Student
Participant 2	23	Female	Student
Participant 3	28	Female	Product Designer
Participant 4	23	Female	Student, Majored in Psychology

Presentation of Hi-fi

[https://www.figma.com/proto/TL3vtzLyfTpSLgddX3K6gU/Hi-Fi-\(Copy\)?page-id=0%3A1&node-id=18-215&viewport=737%2C395%2C0.09&t=rEqBkCNV8fp47eBX-1&scaling=scale-down&content-scaling=fixed](https://www.figma.com/proto/TL3vtzLyfTpSLgddX3K6gU/Hi-Fi-(Copy)?page-id=0%3A1&node-id=18-215&viewport=737%2C395%2C0.09&t=rEqBkCNV8fp47eBX-1&scaling=scale-down&content-scaling=fixed)

07 / Appendix

Team Portfolio Design Overview

