AquaEpic
REPORT

Contents

A. Process summary

We identified and designed a novel solution for a reminder bottle to drink more water. This solution solved for the problem that our users needed to be reminded to drink more water based on their personal goals and lifestyle choices. We used the design thinking process to identify a real user need and designed a solution with the user in mind. We first created needs statements and empathy maps to align our team on the problem space and empathize with our users.

We then explored our end user in a user persona, which we used as a basis and anchor for defining our problem statement and driving our ideation stage. Once we explored different ideas for our solution, we decided to focus on a reminder water bottle for the prototype stage. During the prototype stage, we went through several iterations consisting of a low and mid-fidelity prototype that we then tested with end users. Once we received feedback, we could iterate once more and outline the future directions our project would take.

Overall, our iterative process took this form:
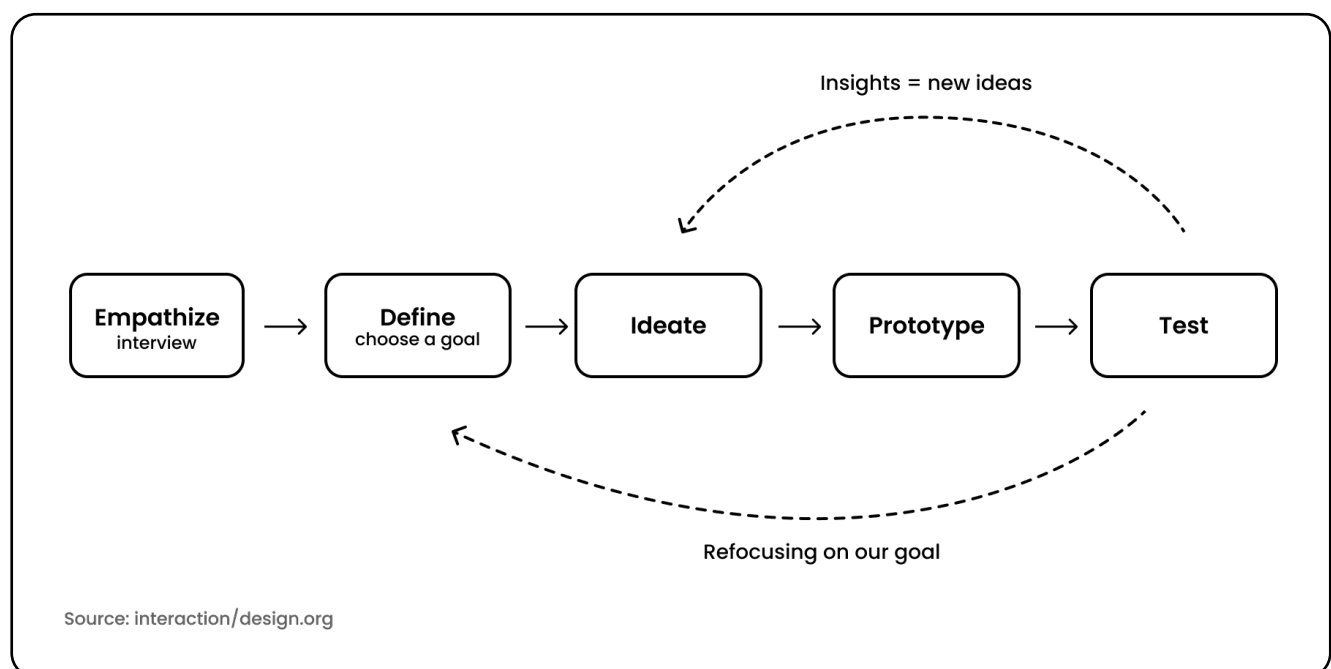
Iterative process

B. Empathise

Need statements

We started the design process by identifying the scope of our project. We spoke to FH students about their needs: one mentioned "I need a reminder to drink water". Then, we chose to focus on this aspect because it felt most universal and actionable for the time frame of the design process. We landed on the needs statement "Ricardo needs to be reminded to drink more water to maintain a healthy lifestyle."

Although we had a diverse set of needs, to begin with, we were limited by the user population that we gathered needs from - mostly FH students. Our directions in this project were influenced by the environment where we created and gathered ideas. In order to apply this idea to a wider user segment, we would need to conduct further needs investigations with a more diverse audience.

Empathy map

We then created an empathy map to align our user's pains and gains as a team. We focused on Ricardo, who is a second year computer science student at FH and who is dehydrated.

During empathy mapping, we explored different elements of what drinking enough water really meant to our end user. We considered taste, timing, utility, preferences and emotional states to understand the root cause of his problem and what solutions are needed to help solve that problem.

Empathy map

It all started with common frustration:

"I need a *reminder* to drink water"

Personas

Next, we wanted to explore the user profile we would be designing our solution for. In particular, we examined the process's actions, motivations, and pains by creating a proto persona. We brainstormed what demographic, contextual and value data our user would represent, his reasons for drinking water, his needs and blockers from achieving his ultimate hydration level. This activity was meant to center our team around the user whom we would be designing for and hone in on what parts of his hydration experience we wanted to focus on and help reduce friction.

Here, we will describe one of our final persona, based on Roberto, a student at FH Salzburg. He has a part-time job and likes doing sports. Overall, he has a busy schedule. He aims to stay healthy, and cares about sustainability but forgets to drink water. However, he would like to be more hydrated because he knows how much it is important for his health.

We tried to gather as much information as we could by talking to the students: their actions, motivations, pains... However, we were limited in time and resource and would have liked to be able to carry out a deeper user research activity to construct more precise user persona.
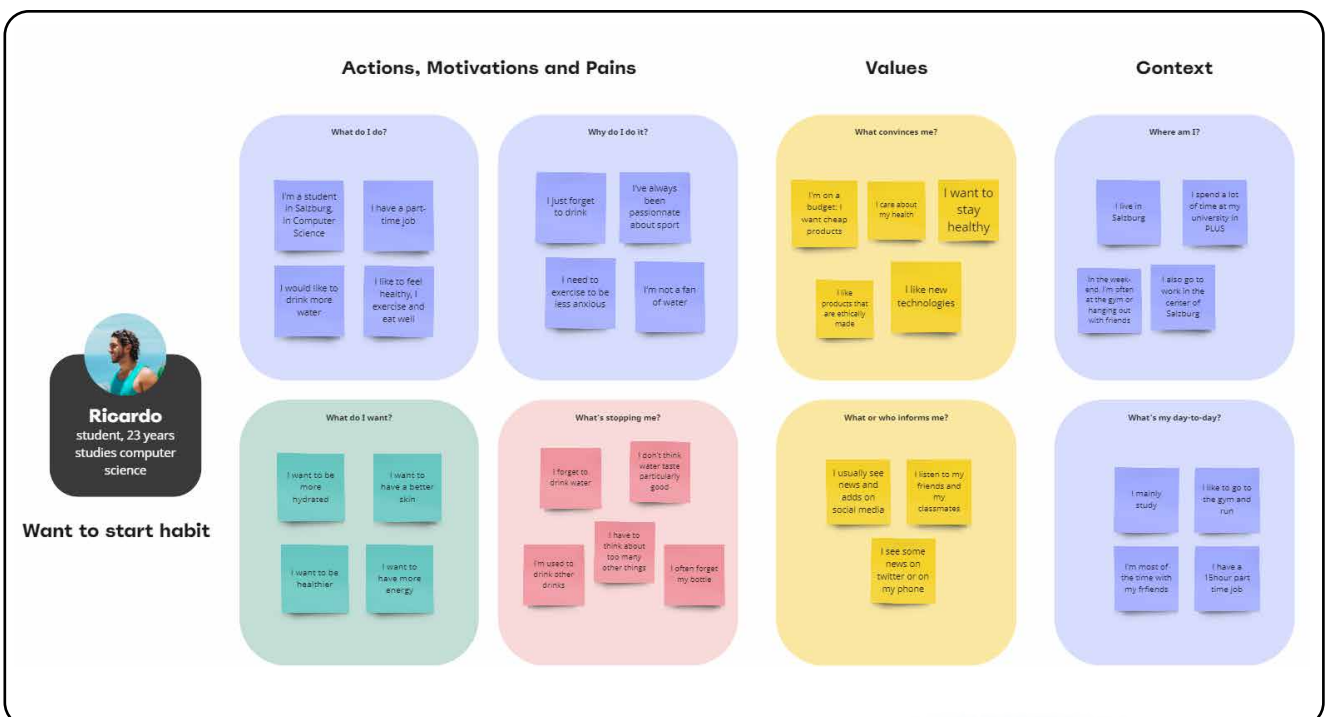
Persona

C. Define

Problem statements

Once we had a clear persona in mind, we categorized collected data across the *who, what, why & when* clusters; and used a SMART (specific, measurable, achievable, relevant, and time-bound) problem statement framework to arrive at our final problem statement.

We focused on a <u>specific</u> demographic of users who need a reminder to drink water, <u>measured</u> success based on whether the user was able to <u>achieve</u> their daily (self-determined) goal, and kept it <u>relevant</u> to their overarching focus on staying hydrated.

We aimed for early <u>February 2024</u> to propose a design solution for our problem statement.

Final problem statement: Design a solution for people who need a reminder to drink water in order to meet their daily water intake goals.

SMART goals	**Specific** People don't remember to drink enough water.	**Measurable** Success: users achieve their daily water drinking goals.
Achievable Users want to change their water drinking habits.	**Relevancy** Reducing dehydration and keeping healthy.	**Time-bound** By the beginning of February.

Who?

health-enthusiast

tech-enthusiast

anyone who wants to stay hydrated

all ages

What?

reminder to drink water

starting a habit of drinking enough water

maintaining the good habit to drink water

When/Where?

used everywhere, everytime

workplace/office

during outdoor activity

Why?

make people healthy!

people need reminder

dehydration = fatigue, dryness, kidney failure

start/maintain healthy habits

Problem Statement

1. **Specific:** People don't drink enough water, because they forget or just don't have the habit: it's a fact.
2. **Measurable:** we can measure the success : when the user ends up drinking enough water according to their personal goal.
3. **Achievable:** we can make the users drink more water with new products/reminders/modifications to their existing water drinking habits.
4. **Relevant:** based on our user interviews and personas, we found that dehydration is an actual concern.
5. **Time-bound:** we will propose a solution by the end of january.

Defining process

D. Ideate

Mindmapping
Once we agreed upon the user persona and problem statement, we were ready to explore what our design solution might look like.

What to build?
We explored ideas on what kind of product we wanted to design. Our primary focus was on using sustainable (preferably recyclable) materials for our potential solution. Additionally, we wanted to incorporate the 'reminding' functionality into a physical object that our users are likely to be already familiar with & already use it/carry it in their daily lives.

Here are a few ideas we explored:

- <u>Wearables</u>: A ring, wristband or pendant that will glow up to remind drinking water
- <u>Desk accessories</u>: A coaster or paperweight with a screen to show reminders & could also vibrate/move towards the user to get their attention.
- <u>Water bottle</u>: A bottle with a weight sensor to track water intake & light up as a reminder.
<u>Gamification</u>: To keep the user engaged, we took inspiration from our childhood water-based games to make drinking water into a game that users could play with their friends, challenge each other or have a friendly scoreboard.

Mind map

Inspirations

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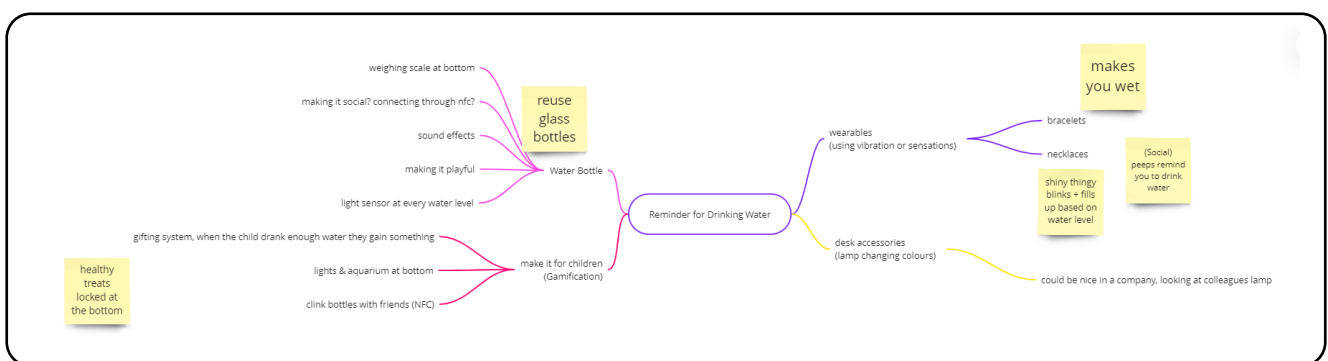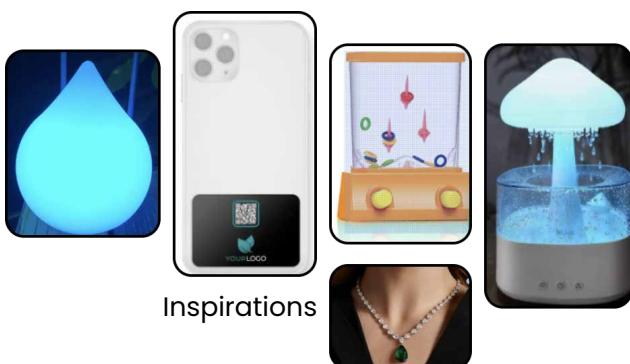
How to remind users?
The second stage of brainstorming was focused on exploring various mediums & forms of stimulus that could be incorporated as a 'reminder' for our users.

Visual: Multi-coloured LED could light up everytime the user drinks water, detected through a weight-change by weight sensor attached at the bottom of the bottle. The LED lights would start blinking if the user has not drunk any water in a specified time period (say, 2 hours); detected by no-change in weight of water over time.

Audio: Having an alarm that goes off when the user hasn't drank water in a specified time. This is helpful for when the bottle may not be in direct sight of the user, making it difficult to notice the blinking lights.
The audio can be customized to motivate the user like "Keep going", "You're about to reach your goal", "Only 200ml left to reach your goal", "Chug, chug, chug, chug".

Tactile: For users who would like a more discrete form of reminder in work/study environments where blinking lights or audio alarms could be potentially distracting for others present. Tactile stimuli like 'vibration mode' will be useful for users in such environments.

Eventually, we decided to use a recycled water bottle as the object and visual sensors to be used as reminders. We also brainstormed some gamification elements inspired by UNO cards (eg. send challenges to friends, leaderboard, custom colours, etc.) to be added to keep the users engaged and make their habit-building experience enjoyable.

E. First prototype

Sketch

We chose the water bottle with reminder colors as our first iterative prototype. We imagined a bottle with lights on the bottom, that would light and change colors to remind the user to drink water. The water bottle would track how far along they are to achieving that goal. At first, we also pictured that the bottle would work with a companion mobile application, where the users would put their drinking goals and connect with their friends. Then, we explored where the screen and reminder information would be displayed on the water bottle. We chose to put a screen on top of the cap, where the pourcentage of progress is displayed, as well as challenges.

We also thought about adding a companion mobile application because we wanted to create a connection between the users, through challenges. The sketch suggests that the user receives a notification: "one of your friend just challenged you to drink more!". We envisioned this competition as a way to convince the user to reach their goal. The sketch allowed us to explore and refine ideas about reminders (i.e. do we need a social element to drive user behavior) to user role in determining and using the bottle to their benefit (i.e. can a user reject a reminder to drink water?).

Paper prototypes

Once we had an initial idea as a sketch, we explored and refined it further using a paper prototype. For this, we used a water bottle to represent the water bottle prototype and colored paper to act as reminder lights. At this stage, we explored different designs for the light reminder (i.e. progress circle, several circles) and were able to exclude some of them such as displaying lights in the shape of forms (since water would distort the shape).

The paper prototype helped us to test out different design directions at a relatively low cost and high speed.

1. Sketch   2. Paper prototyping
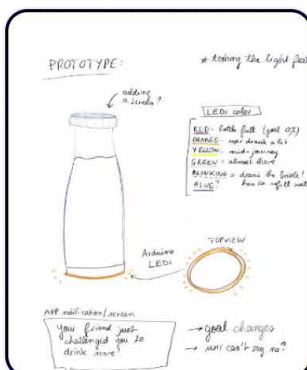
Low-fi prototypes

Once we established that we wanted a single light source as the reminder, we then increased the fidelity for the second prototype iteration where we used LED lights with the capability to change color via remote and we added a game element to inform the user of their progress and to enable higher goal adherence and success rates via a companion reminder application for their phone. We settled on having a screen on top to show the progress and enable the user to see challenges from their friends who are also using the bottle.

We also decided on a meaning for each color, from red meaning that they didn't drink at all to blue, meaning that they reached their goal.

3. Bottle prototype

F. User testing – 1st prototype

Test goal
In order to test our assumptions during the design process and to experience if our design will cover user needs, we wanted to understand the user mental model on the reminder elements (i.e. lights and game in the application/screen component to challenge to drink more).

Our assumptions were that the lights would act as a straightforward reminder and way to capture user attention while the companion application would provide a way to socialize the goal of drinking more water and enable our user to reach the goal rather than with just the color reminder alone. We also wanted to see if they could understand the meaning of colors and blinking lights.

Task questions
Our main task to test these assumptions was to have the user drink water until they reached their daily goal. During the task, they also received a challenge from a friend in the companion application. After completing the tasks, we wanted to know the user perception of the bottle and the companion app challenge. We used a Wizard of Oz testing: we switched the lights with the remote and triggered a notification.

Key learnings and recommendations
We learned that users interpreted different colors to mean different things and they were not sure how to associate color with a percentage left to drink to achieve their daily goal. We also found that users were unsure if they wanted to be challenged to drink more water as the goal was personal and fluctuated daily. Then, we decided to refocus ourselves on our primary goal: reminding people to drink water. We chose not to keep the companion application and to remove the competition and challenges.

We also received a recommendation that we found very pertinent: to have all the options directly on the bottle. To avoid weariness or forgetting to use the companion app, having all the settings (such as the daily goal) directly on the object is a solution we considered to be more appropriate.

We were then able to apply these learnings to another prototype iteration to allow for multiple feedback mechanisms(i.e. color + vibration) and using one color for consistency. As users were not very keen on a water drinking challenge in application form, we changed how users set the goal on the bottle itself, which would display on the top of the bottle as the day progressed. This new prototype will be described further in the F. Second prototype part.

User test 1

Reflections

The user testing process was important in understanding the viability of our concept and how users would interact with it. It was challenging to present a Wizard of Oz prototype outside of a context in which a user would actually use the device, leading to users providing more speculative feedback.

User testing feedback allowed us to pivot away from a companion application as a means of feedback and behavioral activation and focus on strengthening the main feedback channel (color) and interacting with the bottle instead. Overall, user testing was crucial to our iterative process: it allowed us to get back to our main goal and not get lost in too many features.

G. Second prototype

After receiving feedbacks, we decided to iterate again and improve our bottle with a second prototype. We refocused on our main goal: reminding users to drink water every day.

First, we changed the way users could set their goals. Since we didn't use a mobile app anymore, we added a dial on the bottom with a drop-shaped button on the bottle. Then, users can turn the dial to set their daily goals every morning and press the drop-shaped button. After a day, the bottle resets all settings, and the dial goes back to zero.

We kept the top display from the previous prototype but removed the challenge part. Now, the top display only shows the user's progress. Concerning the reminders, we kept lights as feedback. We added vibrations as a second feedback, to make sure that the user would still be reminded even if they can't see the bottle.

How does the bottle work in version 2.0?

1. Setting Up:
The bottle is full of water, and progress is at 0%. The user rotates the dial to set up the daily goal.

2. Drinking Water:
When the user drinks water, the percentage on the top display changes (can go from 0% to 100%)

3. First step of reminder:
If the user forgets to drink, the bottle will remind them by lighting up slightly until it reaches a bright color.

4. Second step of reminder:
If the user doesn't see the first reminder, the bottle will start blinking and there will be vibrations to bring more attention.

5. Goal achievement:
When the user achieves their daily goal, the bottle blinks in several colors to show their success.

Daily routine:
Start this routine every morning by setting up your goal.

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To save energy, the bottle won't always have lights on. The lights will only be on when the user interacts with the bottle, and when there are the reminders or goal achievements phases.

Second prototype

Testing the second prototype.
To check how well the new bottle works, we asked different people to try it out and tell us what they thought.

During the testing, we gave users several tasks:
      Set up a daily goal
      Drink water during the day
      Follow reminders
      Achieve their daily goal

After the second round of testing, we got positive feedback. Users especially enjoyed turning the dial to set their daily goals. They also liked the new design, saying it was easy to understand. They still had some questions about the progress in percentages and were concerned with the placement of the dial, worrying that it wouldn't fit well into their bags. We would take that into consideration for a potential third prototype.

User test 2

H. Future directions

About future improvement, we are still thinking about the challenge part to gamify this bottle. Here, we wanted to be efficient and to secure the reminder part. But we consider that challenge is also a way to be engaging and to convince people to do something. It would be a path to explore, trying to figure out how to integrate gamification: potentially incorporating rewards, badges, or friendly competitions among users.

We would also like the top screen to have more features, we were for instance thinking about personalized messages. We could also allow users to customize their experience, including the ability to choose different LED light patterns, set unique reminders, or personalize goal-setting features Here, the question of a companion app is raised again. Overall, we would need more tests to understand which aspects really matter to the user and which are superfluous. We could also implement smart hydration alerts based on external factors like weather conditions, physical activity, or health conditions to provide more personalized reminders

Finally, we would like to make sure that the product is accessible to a broader audience, considering factors such as different user abilities, languages, and cultural preferences.

I. Challenges

Overall, we really liked doing this project and trying to find a solution for our targets. We did struggle with some parts, which made us learn a lot about the design thinking process. One of our issues was that we focused a lot on practical issues: we had ideas and imagined a lot of possibilities, but when we didn't know how to achieve it technically, we were stuck and it was complicated for us to imagine an interactive object based on something we don't master (i.e electronics or programming). Then, we got a bit lost with our goal and tried to add many options, so we had to focus again on our main goal and make the choice to go back to one of the first steps of the process. Finally, we would have loved to be able to do more user tests to get more insights but this limitation is linked with the time-constraints.

Stay
hydrated!