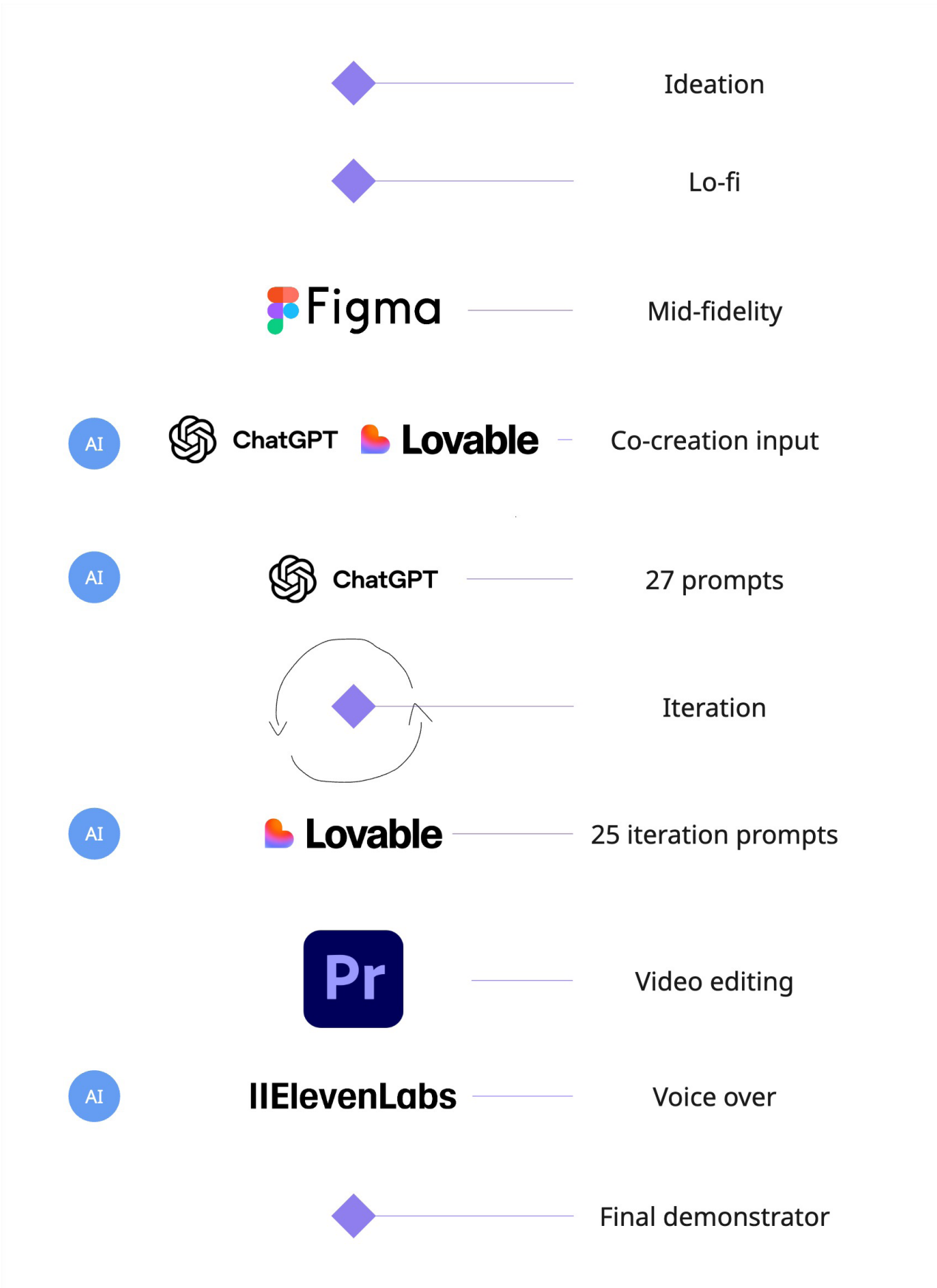


# 13

## **Appendix**

# A - AI Declaration Final Prototype

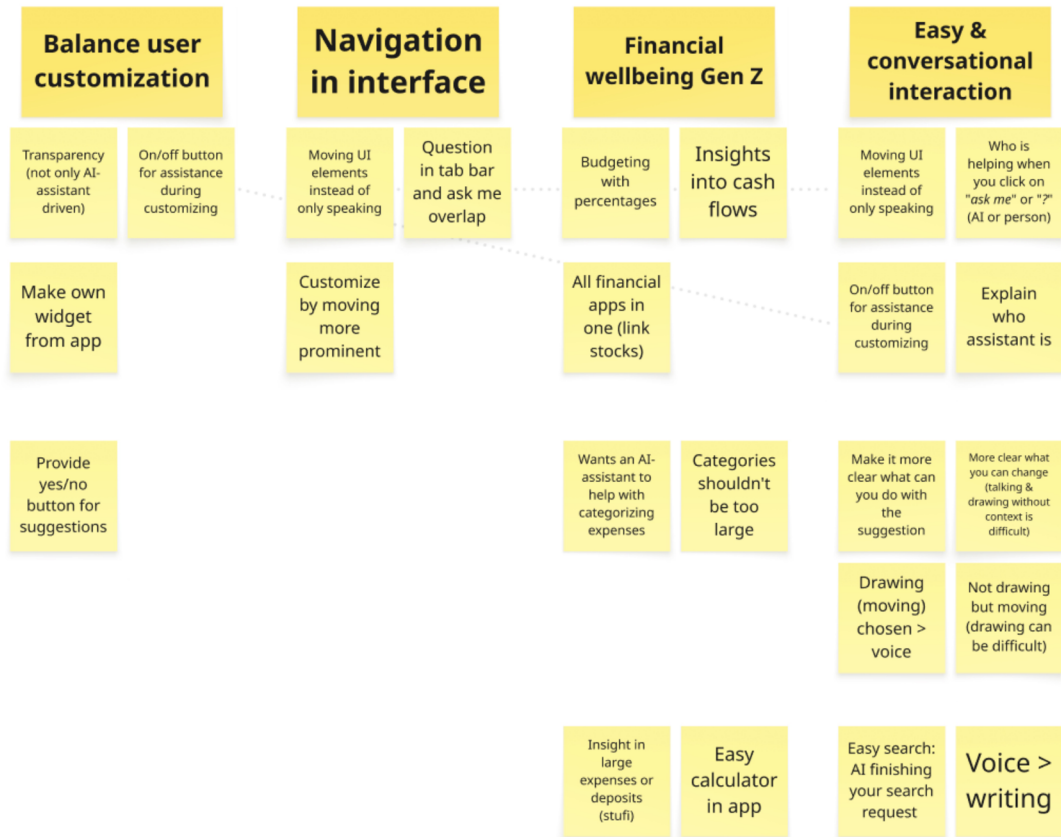
## A.1 Development Process



## A.2 Example from prompt to Lovable output



Manual input in ChatGPT (1st iteration)



I want to create a perfect Lovable prompt. Can you please help me?

I'm designing a mobile banking app that includes options to customize the UI yourself as a user. This is a future concept in which malleable software will enable users to customize their UI. This app should be simplistic and clean looking. The landing page should just have a search bar, 1 widget for debit account and 1 widget for savings account, an 'customize' button, and a 'home' button and 'profile' button at the bottom. When a user clicks on 'customize', there should be options to move widgets yourself, speak to an AI-assistant or chat with an AI-assistant.

The following interaction principles are very important: - Balance user customization and AI/Data-driven personalization - Financial wellbeing Gen Z - Navigation in interface - Easy & conversational interaction

Based on low-fidelity prototype testing, I gathered some results already, which I added in the picture. Please include these findings in the prompt.

**Create concepts, visuals, interactions, or copy for a future mobile banking app designed for Gen Z, built on malleable software that allows users to customize their UI. The app is simple and clean, with a landing page containing a search bar, one debit widget, one savings widget, a “customize” button, and a bottom nav with Home and Profile. When users click “customize,” they should be able to move widgets manually, speak to an AI assistant, or chat with an AI assistant. Manual movement should be the most prominent. Keep interactions transparent, conversational, and easy. Always clarify whether the assistant is AI or human, and allow the user to turn AI assistance on or off.**

**Integrate these user insights:**

- Users want transparency and manual control—not only AI-driven changes.
- Provide yes/no buttons for suggestions.
- Users prefer moving UI elements over speaking or drawing.
- Customization tools should be easy to find.
- Categories should not be too large; cashflow insights should be simple.
- Budgeting with percentages is preferred.
- Link all financial apps including stocks.
- Provide an easy calculator.
- Voice > writing when necessary.
- Users need clarity on what can be customized.
- Make navigation clean, avoid overlap between “ask me” actions and interface interactions.

**Follow these design principles:**

- Balance user customization with AI personalization
- Support Gen Z financial wellbeing
- Provide intuitive navigation
- Ensure easy & conversational interactions
- Minimalistic, calm, modern UI aesthetic



Create an interactive mobile banking app concept for Gen Z, built on malleable software that allows users to customize their UI. The app should be simple, clean, and minimalistic. The landing page must contain a search bar, one debit-account widget, one savings-account widget, a “customize” button, and a bottom navigation with Home and Profile only.

When users click “customize,” they should be able to: Move widgets manually (this should be the most prominent option) Speak to an AI assistant Chat with an AI assistant

Interactions must be conversational, transparent, and easy. Always clarify whether the assistant is AI or human, and allow users to toggle AI assistance on/off.

#### User insights to integrate

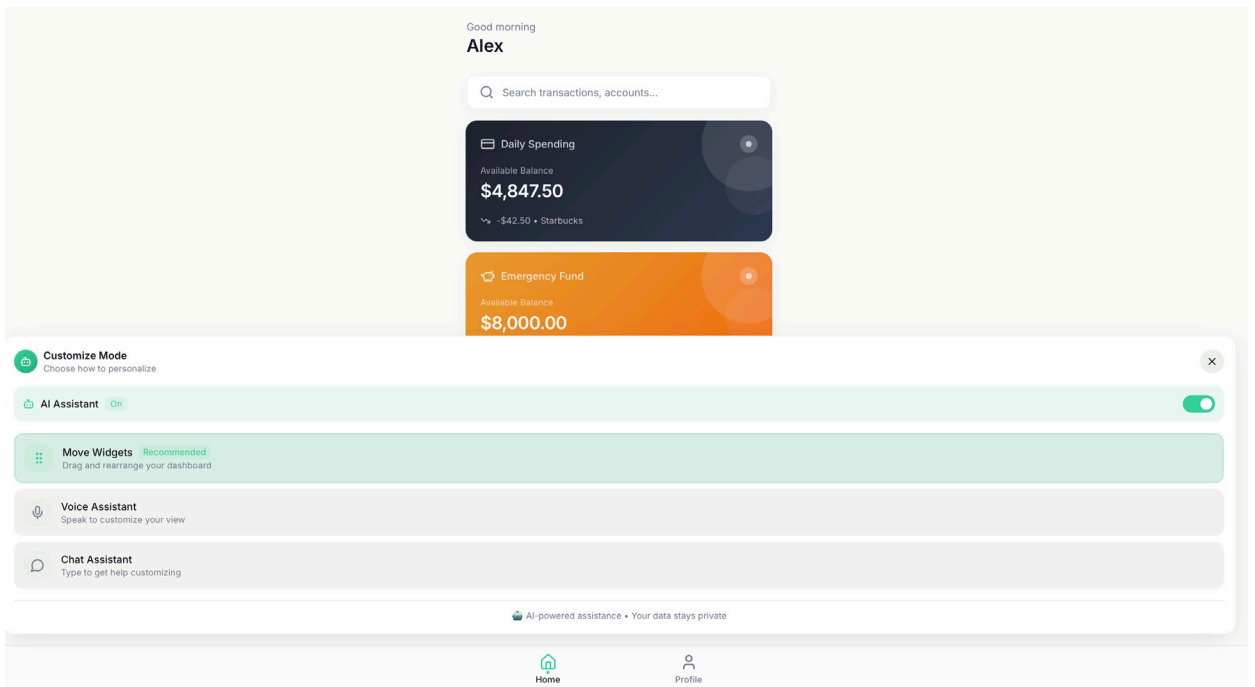
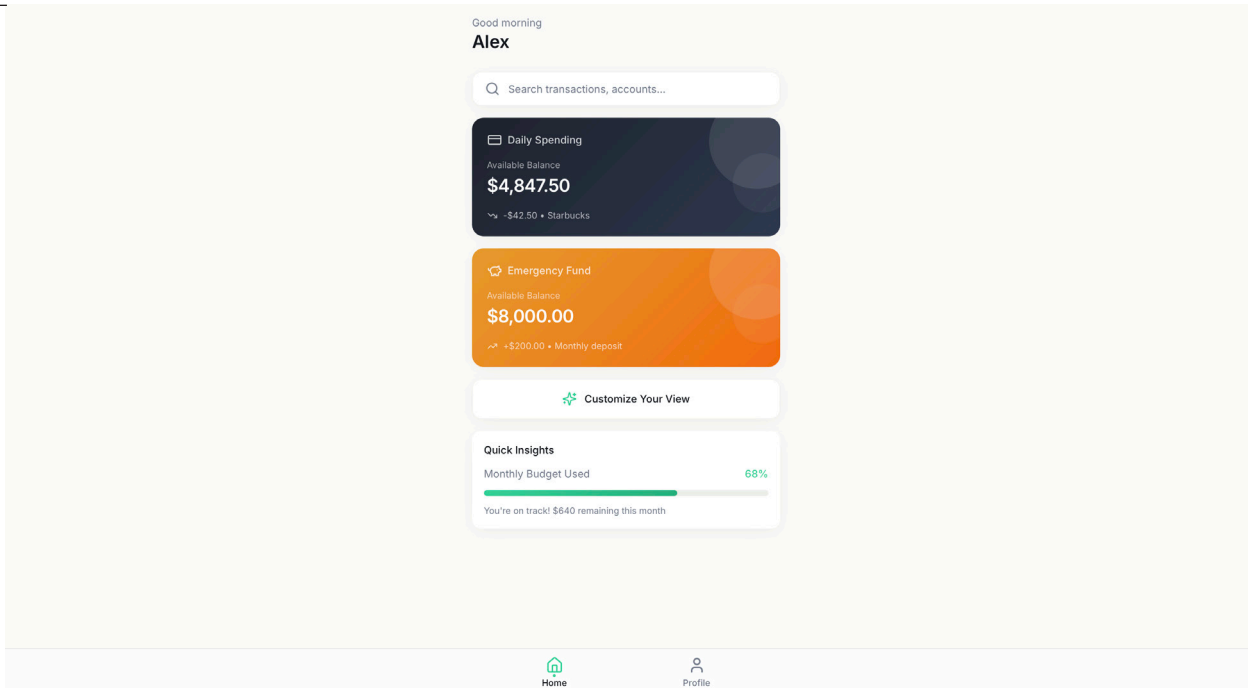
- Users want transparency and manual control — not only AI-driven changes
- Provide yes/no buttons for AI suggestions
- Users prefer moving UI elements over speaking or drawing
- Customization controls should be easy to find and highly visible
- Avoid overlap between “ask me” actions and navigation elements
- Budgeting with percentages is preferred
- Provide cashflow insights that are simple and snackable
- Let users link all financial apps (including stocks)
- Provide help with categorizing expenses, but categories should not be too large
- Offer an easy calculator in the app
- Give insights into large expenses or deposits
- Voice > writing when necessary
- Users need clarity about what can be customized and what the AI can do

#### Design principles to follow

- Balance user customization with AI/Data-driven personalization
- Support Gen Z financial wellbeing
- Ensure clear navigation and avoid cognitive overload
- Enable easy & conversational interaction
- Use a calm, minimal, modern visual style

#### Task for Lovable

Using these requirements, create a fully interactive mobile banking app experience — including screens, navigation flows, widget behavior, customization interactions, and conversational AI moments — all aligned with the principles and user insights above.



# B - General Research Discussion Guide

Researcher: Joppe Roorda

Interviewee: x

Goal: *Explore how user customization and malleable software can be integrated in digital products.*

## **Introduction (2–3 min)**

- Could you tell me a bit about your role within D&DP and types of projects you usually work on?
- How long have you been working at Song?
- Introduction of thesis

## **Future of User Customization (6–7 min)**

- How do you see user customization evolving in the next 1-5 years?
- What kinds of customization do you think users will find most valuable in the future (layout, automation, content control, data management or something else)?
- How do you think emerging technologies like AI or adaptive systems will influence customization and user agency?

## **Promising Use Cases (6–7 min)**

- Which product areas do you think hold the most potential for deeper user customization? (e.g., mobile banking, productivity tools, retail, social platforms)
- Could you share an example of a product or situation where giving users more control could meaningfully improve their experience or engagement?

## **User Needs & Behaviors (5–6 min)**

- From your experience, what motivates users to customize; is it efficiency, self-expression, accessibility or something else?
- Do you think most users actually use customization options when they're available or do they stick with defaults? An why?

## **Barriers & Design Constraints (5–6 min)**

- What are the biggest challenges in making digital products more malleable (technically, organizationally or from a design perspective)?
- How can designers balance user flexibility with maintaining a coherent, brand-consistent experience?

## **Wrap-Up (2–3 min)**

- If you imagine an ideal future app, how much control would users have over how it looks and behaves?
- Are there any other projects or people I should look into who are exploring similar ideas?

# C - Results Exploratory Interviews

## C.1 Notes Exploratory Interviews

**Role**

- Creative Technology Manager

**Experience in D&D**

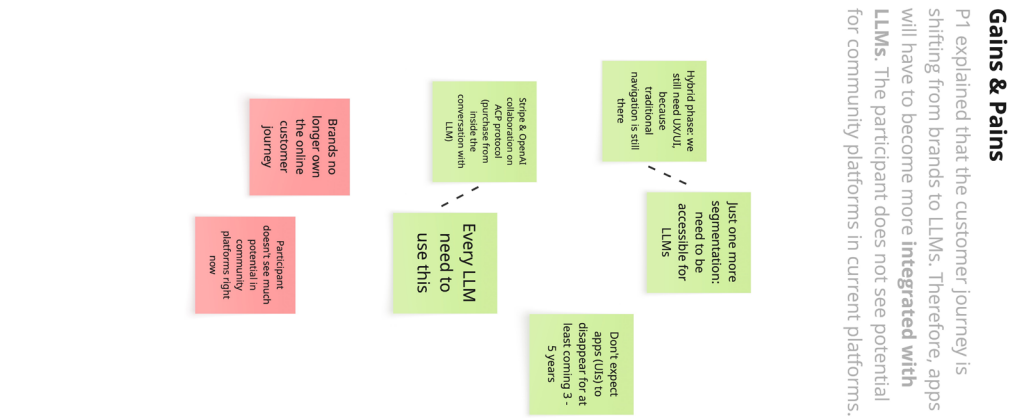
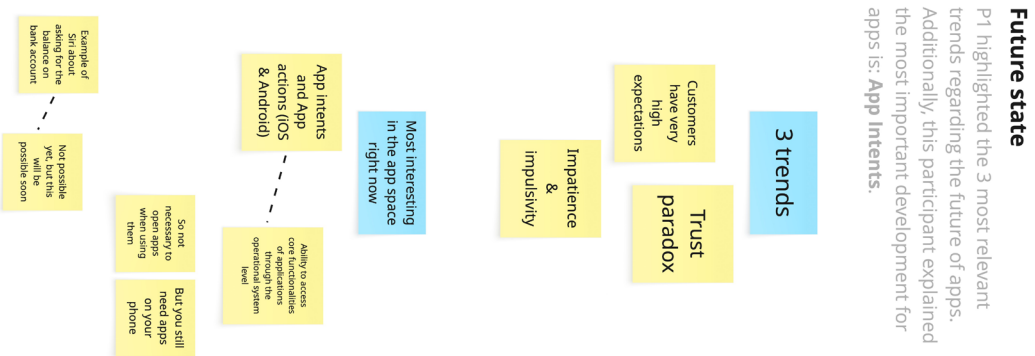
- 8 years

**Interview Details**

- Online 30 minutes session

**Topic**

- The future of apps



**Thesis topics**  
 This interview was mainly used to explore which of the **two potential thesis topics** would be most relevant in a service designer's daily work.

**Role**  
 • Service designer

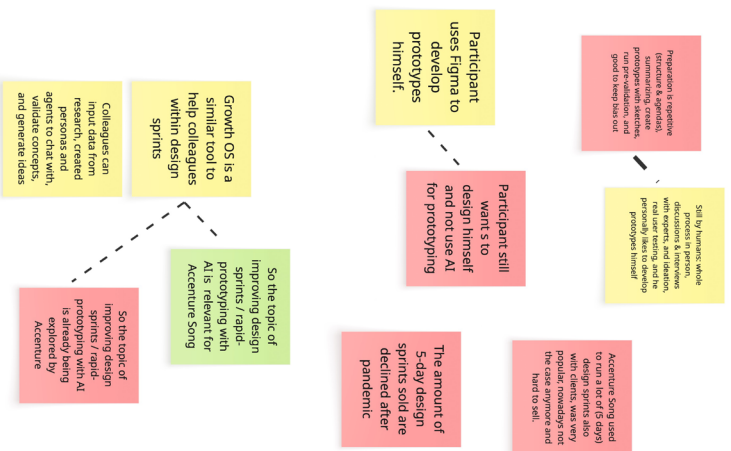
**Experience in D&DP**  
 • 8 years (3 months)

**Interview Details**  
 • Online 30 minutes session

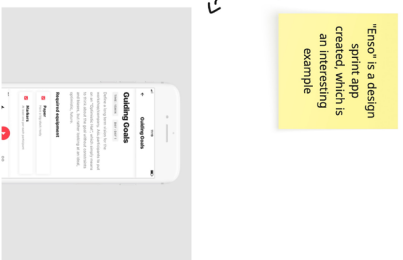
**Topic**  
 • Hyper-personalization & rapid-prototyping



**Gains & Pains**  
 There are quite some pain points related to design sprints and a new AI-toolkit can help in this process, but participant still wants to **design himself** and there are **assisting tools** already being used.



**Notes**  
 Participant describes tools already being used that assist in the process of design sprints and rapid prototyping. So, the topic of **malleable software** can be **more innovative** for Accenture Song.



**Future state**  
Participant is already **looking further** than personalization in UIs. He suggests that the future will be more about **LLMs** and the **integration of brands** with these LLMs.

**Gains & Pains**  
There are a lot of gains by looking a few steps **further into the future**. Hyper-personalization will grow, but also behind UIs and with the **integration of LLMs**.

**Notes**  
Participant gives some **technical background** aspects to look into.

**Role**

- Digital integration senior manager

**Experience in D&DP**

- 12 years (7 months)

**Interview Details**

- Online 30 minutes session

**Topic**

- Hyper-personalization in User Interfaces

Vision on hyper-personalization

We're currently way further already than creating personalized UIs, there is way more individual personalization.

The future won't be about personalized UIs

The future will be more about system to system integration (AI to AI)

Currently Agentic AI uses human triggers, but AI will become proactive instead of reactive

One step further will be a scenario in which people have their own AI companion

Example: nowadays you have a travel agent wherever, but this will be a travel agent in the future via ChatGPT or a similar platform -> UI won't be necessary anymore.

For companies it will become very important to focus on services (APIs, integrations) instead of UIs and AI platforms

He thinks this stage is not long term but it is already a short term vision

We have to look way further than companies that want to offer personalized websites

For companies it will become very important to focus on services (APIs, integrations) instead of UIs and AI platforms

Expect UIs not to be very necessary anymore in the future

System-to-system integration is not good enough yet for a lot of brands

Suggestion: look at trends with chat prompts

Check REST API (Restful APIs)

Look into: "Gibberlink"

<https://en.wikipedia.org/wiki/Gibberlink>

"Gibberlink" is a communication protocol (from the other autonomously) this is a so called dynamic protocol -> along the way communication

AI will be acting like your parents did when you were a child

Suggestion: Think 6 steps further than you're doing right now

(2x)

### Role

- Lead D&DP Customer Tech

### Experience in D&DP

- 7 years (3 months)

### Interview Details

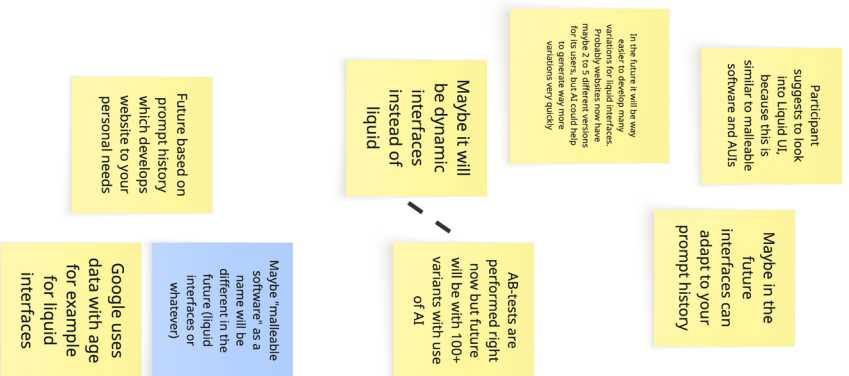
- Online 30 minutes session
- Physical 30 minutes session

### Topic

- Adaptive User Interfaces (Liquid User Interfaces)

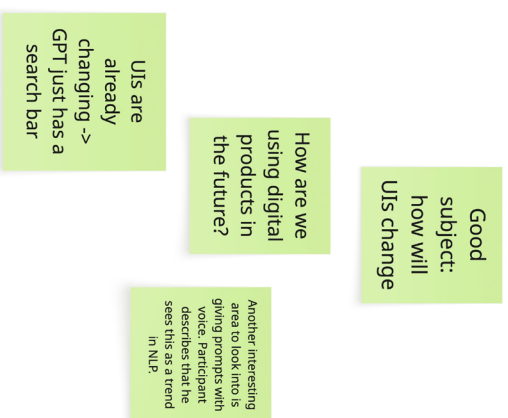
### Future state

There are **multiple descriptions** for malleable software principles, like Liquid UI for example. **Prompts by voice** appear to be relevant for the future.



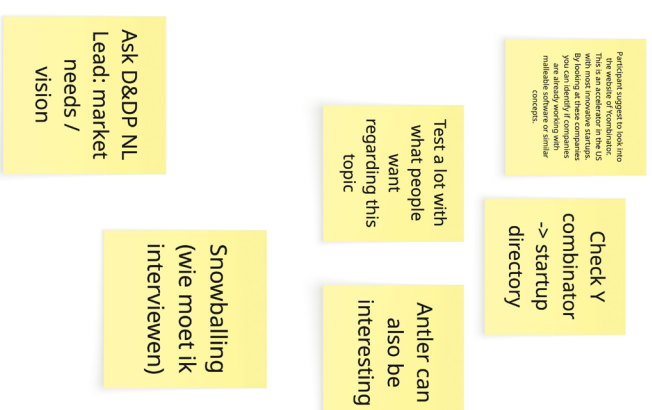
### Gains & Pains

Currently, the way people interact with UIs are **already changing**.

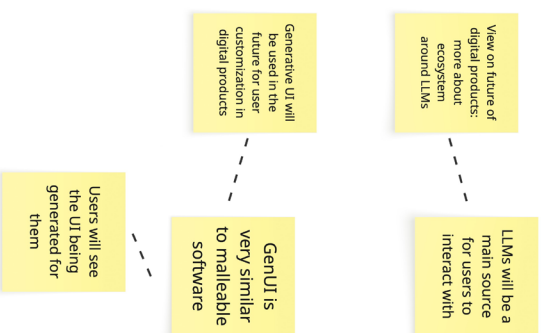


### Notes

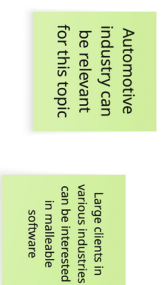
Participant gives a lot of suggestions to look into and suggests colleagues to speak to about the **technical background**.



**Future state**  
 Participant's vision on the future is that the **ecosystem** around **digital products and LLMs** will be very important. **GenUI** is relevant to explore within my thesis.



**Gains & Pains**  
**Automotive** industry, **large clients** of Accenture Song can all be **potential users** of malleable software in digital products.



**Notes**  
 Currently colleagues are working on a POV related to the **future of apps**, which is in line with my thesis topic. There is also a relevant example of a **previous project** with Audi similar to user customization.



- Role**
  - Lead D&DP NL
- Experience in D&DP**
  - 18 years (2 months)
- Interview Details**
  - Physical 30 minutes session
- Topic**
  - Malleable software in digital products

**Future state**  
 We already see developments of the **integration of apps with OpenAI.** GenUI will empower users to customize their digital products, but the technology is not there yet.

**Role**

- Full Stack LLM Development Associate Manager

**Experience in D&DP**

- 14 years (8 months)

**Interview Details**

- Online 30 minutes session

**Topic**

- Technical feasibility of malleable software

I think we are probably moving towards what we're probably in 10 years, we want to see some of the things that we're working on now, but we're not there yet. I think we're probably in 10 years, we want to see some of the things that we're working on now, but we're not there yet.

Apps will be in the ChatGPT environment (already in US)

Questions: "And do you think there are specific product areas where this particular form of digital product is most potential in kind of doing product?"

Perhaps like apps or products that require some sort of personalization. So you can just build out a product, but then there is just build it for you, or generate automatically.

**Gains & Pains**

**Security** is the biggest constraint for malleable software. Additionally, **AI systems are not good enough yet** to provide this, but they **probably** will be.

There's always the topic of hyper-personalization, but what you're trying to do with malleable software is different.

Usually in these cases, you have very controlled software where the user can only change a few features within the software that can be changed.

We never got absolute freedom to the user to do what they want to do. I think, I think that's a bit dangerous, giving, giving the freedom, is dangerous.

Easier to add changes than building a whole widget

But you need to have a lot of guardrails and things like that.

**Biggest constraint in security**

Users can do malicious stuff when they have the freedom to change software

There are also still bugs when you ask an AI system to generate UI

But the AI will become good enough to get rid of these bugs and build better UIs

For Accenture Song it is difficult to initiate malleable software to clients, because there is risks involved

But if clients will ask for malleable software in digital products, Accenture Song can definitely help

Personalization in Revolut is also still constrained

**Notes**

**Revolut** is a good example in which users can customize their dashboard, but still **constrained**.

Mentions Revolut as a good example for user customization in digital products

Mainly based on look & feel

OpenAI Atlas

MCP protocol will help with the integration of apps and LLMs

Apps integrated in ChatGPT since last week

## OpenAI developments

OpenAI seems to be the very **active** in introducing new features for **Apps to integrate** with their **LLM** and it becomes more easy to use ChatGPT for different purposes and make less use of separate apps. Additionally, they work together with Stripe to create an **ACP protocol**, which makes it possible for agents to perform purchases.

Apps integrated in the last week

OpenAI Atlas

Apps will be in the ChatGPT app (likely in US)

US are changing - getting a new UI

More apps are being added to the LLM

## App Intents

**App Intents** is an Apple framework (introduced with iOS 16) that lets developers expose their app's functionality to the system so users can interact with it via **Siri, Spotlight, Shortcuts, and widgets** — without manually opening the app.

App Intents are available on iOS and Android

Intents are used to expose app functionality to Siri, Spotlight, Shortcuts, and widgets

## Small adjustments

One of the participants elaborated on the fact it is **easier** for users to add **small changes** to their **UI** than building complete widgets, which is in line with literature.

Learn to add changes that change the whole widget

## Automotive/banking/retail industry

There can be **more relevant industries** for this concept. The automotive, banking and retail industry are mentioned as examples. But **focus on Accenture Song's clients** is most relevant.

Automotive industry can be relevant for this topic

Banking industry can be relevant for this topic

Retail industry can be relevant for this topic

## GenUI

GenUI is mentioned by a lot of colleagues as a **promising concept**, but the technology is not there yet. This term is very **similar** to what I try to accomplish with **malleable software** in digital products.

GenUI is a concept that allows users to customize the user interface of an application

GenUI is very similar to malleable software

## Bugs

Currently, **bugs** will still arise when customizing or designing with AI, but in the **future, AI systems** will become **good enough** to prevent this.

This is a risk that you will see an AI-generated UI

There is a risk that you will see an AI-generated UI

## Liquid interfaces

Another term related to this research is **liquid UI**. This is very **similar** to **malleable software** and **GenUI**.

Liquid UI is a concept that allows users to customize the user interface of an application

Liquid UI is very similar to malleable software

## Revolut

Revolut is mentioned as a good **current example of user customization in digital products**. This is useful to challenge **current mobile banking** at traditional banks.

Revolut is based on look & feel

Revolut is based on look & feel

## Security

**Security** appears to be the **biggest constraint** when integrating malleable software into digital products. There is a possibility that users will do malicious things, so **designers must include guardrails**.

Biggest constraint in security

Biggest constraint in security

Biggest constraint in security

## LLM integration

This is the **most mentioned** theme within all exploratory interviews. The **ecosystem behind UIs**, that needs to be integrated with LLMs to reach customers, will become very **important** for brands. The **customer journey** will move away from brands towards LLMs.

View on future of digital products

LLMs will be a primary source of information

The future will be a system of systems

Just one more step towards a more accessible LLM

Some digital products are already using LLMs

Brands to integrate LLMs into customer journey

There is a risk that you will see an AI-generated UI

## Voice prompts

There are signs that **voice prompts** will be used **more** in the **future**. This fits with **natural language prompting**.

There are signs that voice prompts will be used more in the future

## MCP protocol

There is a protocol that makes the **integration of apps with LLMs** possible.

MCP protocol makes the integration of apps with LLMs possible

# C.2 - Coding Exploratory Interviews



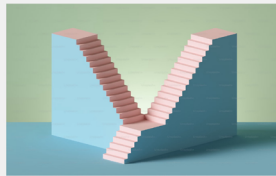
# E - Interaction Principle Cards

## Balanced Adaptivity



*Balance user-driven customization with system-driven adaptivity to maintain usability and consistency.*

## Design for Incremental Adaptation



*Introduce adaptability through small, low-effort adjustments before offering full customization.*

## Trustworthy Generative Systems



*Make system provenance visible and help users verify generated content.*

## Collective Personalization



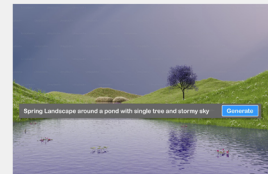
*Encourage community-driven engagement and pluralistic customization.*

## Design for Digital Self-Expression



*Enable users to express and shape their financial identity through transparent, customizable, and socially resonant digital experiences.*

## Design for Ambient & Contextual Intelligence



*Enable systems to sense context, anticipate intent, and dynamically render interface elements at opportune moments.*

## Design for Navigable Ambiguity



*Help users explore open-ended possibilities by exposing system boundaries, offering contextual guidance, and maintaining a sense of discovery.*

## Design for Embedded Financial Learning



*Integrate learning and literacy seamlessly into daily financial interactions.*

## Design for Aspirational Growth



*Encourage future-oriented financial behaviors through goal-based design and visible progress tracking.*

**Design for Proactive Companionship**



*Create emotionally intelligent digital companions that anticipate needs, guide with empathy, and adapt through dialogue.*

**Design for Fluid Stability**



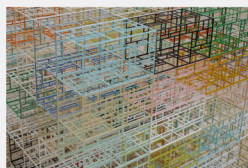
*Adapt financial experiences to users' fluctuating income streams and evolving life patterns.*

**Design for Hybrid Interaction**



*Balance traditional interface elements with natural language interactions to maintain usability and control.*

**Design for Seamless Framework Integration**



*Architect products to integrate fluidly across AI protocols and intent-based ecosystems.*

**Sustainable Foundations**



*Design adaptive systems that are locally grounded (data local-first) and economically feasible over time.*

**Design for Emotional Financial Resilience**



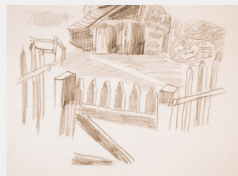
*Support both the emotional and rational dimensions of financial behavior through trustful guidance and reflective feedback.*

**Empowered Ease**



*Empower users by minimizing cognitive load and enabling effortless customization.*

**Expressive Interaction**



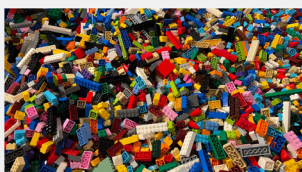
*Design for expressive and intuitive interaction through natural language and direct manipulation.*

**Design for Conversational Agency**



*Use voice and natural-language interaction to lower barriers and humanize complex financial actions.*

**Design for Modular Autonomy**



*Empower users to assemble, tailor, and interconnect modular financial tools into coherent, adaptive ecosystems.*

**Design for App-Agnostic Customizability**



*Enable customization beyond individual applications by making features and data portable across ecosystems.*

**Guardrails for Responsible Malleability**



*Establish visible, ethical, and technical boundaries that protect users from unintended outcomes.*

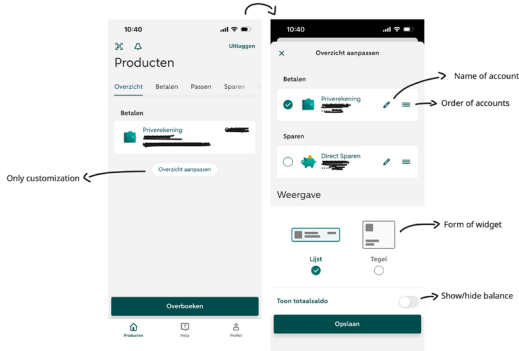
# F - Exploring & Ideating

## F.1 Market Analysis

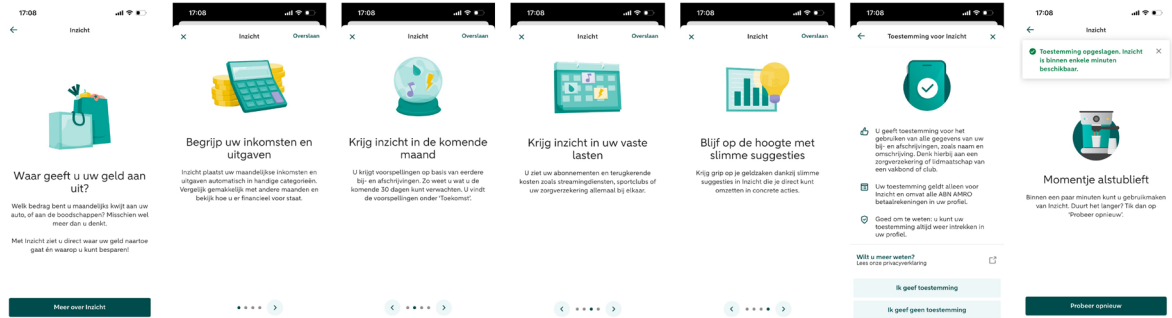


Offers just 4 simple options for customizability

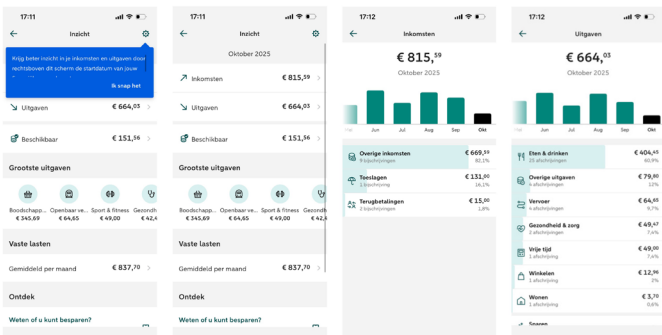
How to start customizing



Process of accepting personalized insights



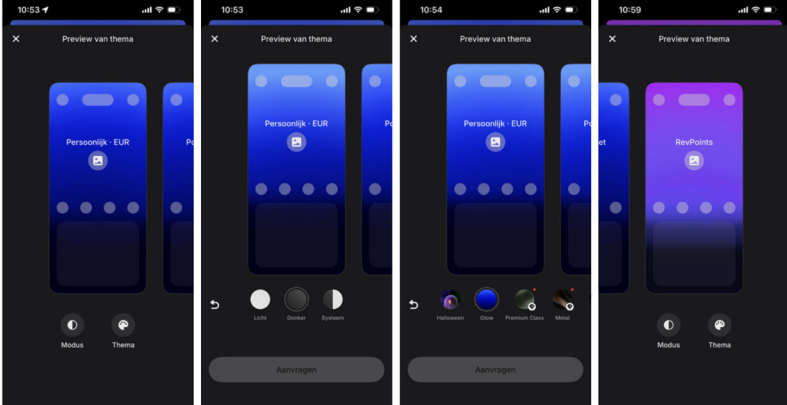
Insights



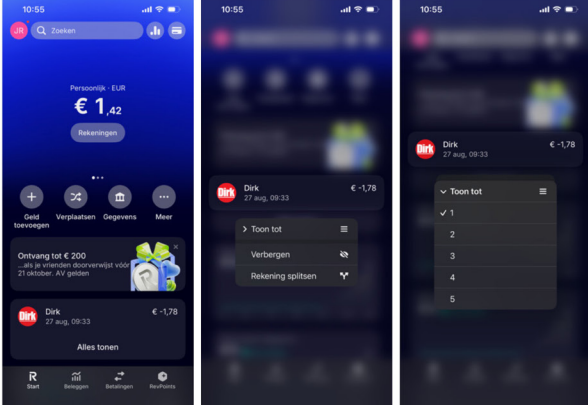
# Revolut

Multiple options from pre made widgets

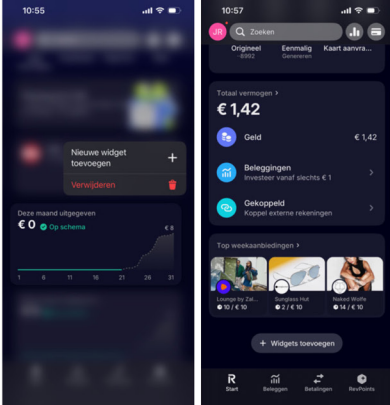
Theme customization



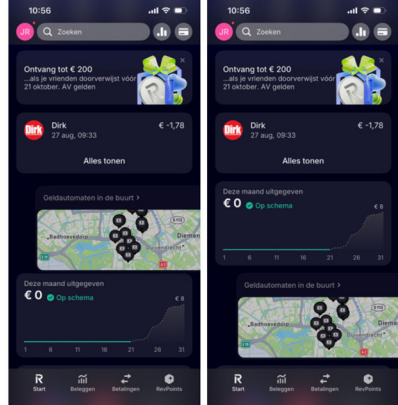
Customize how many transactions are shown



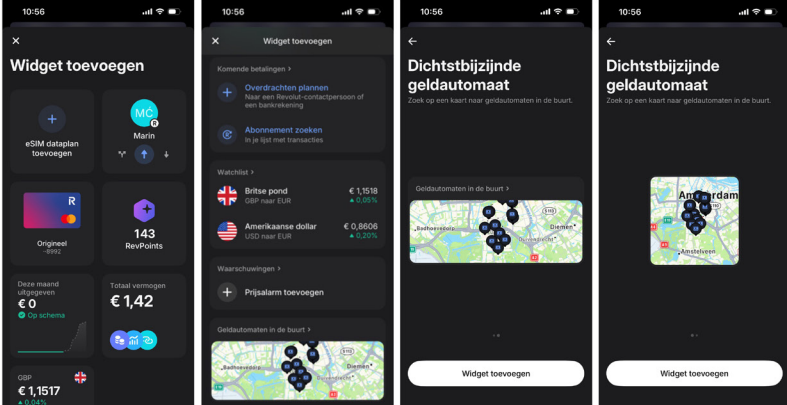
How to add widget



Placement of a widget



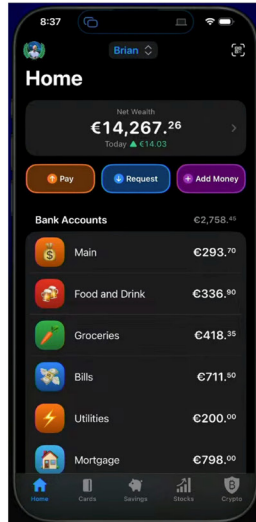
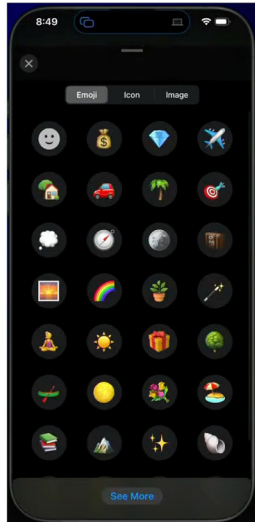
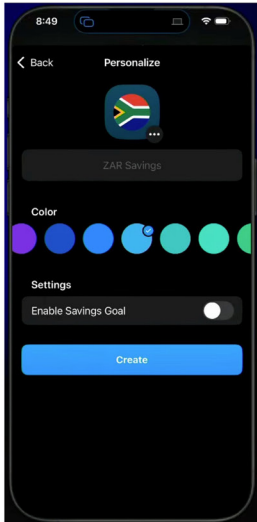
Choosing from premade widgets



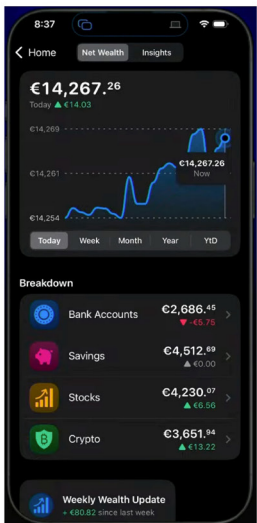
# bunq

Easily create various personalized accounts, receive personalized notifications and customize your budgeting

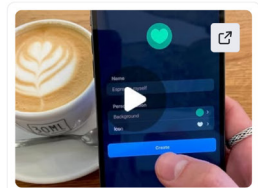
Create personalized accounts



Combine savings, stocks & crypto

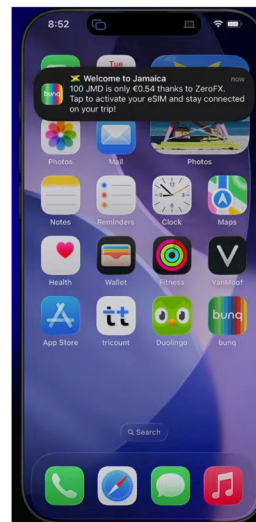
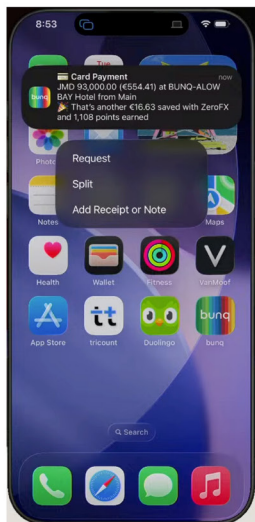


Custom budgeting/ categories

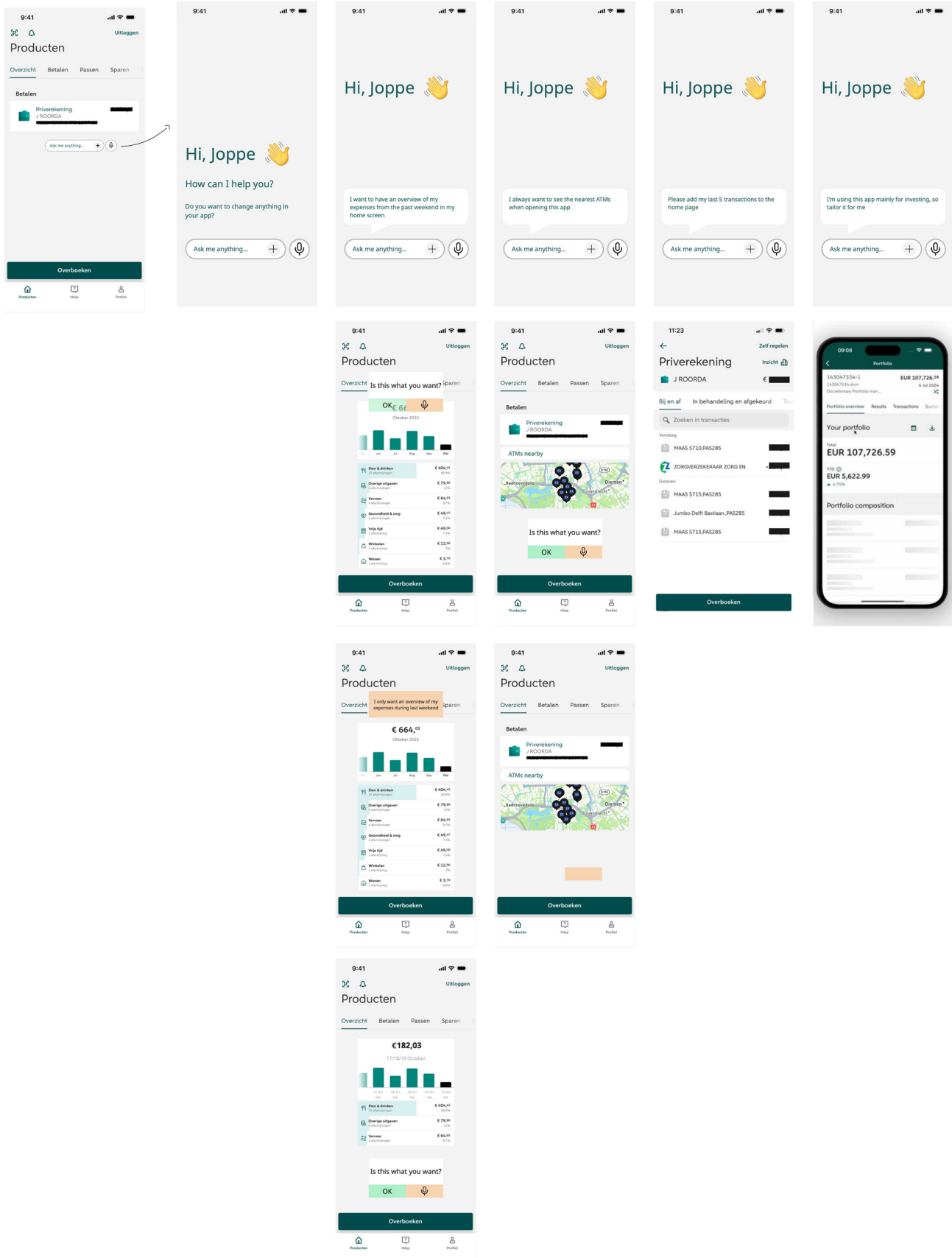


Instagram  
**bank of The Free on Instagram: "Eas...**  
 bunq on April 14, 2023: "Easily add Custom Categories 📱".

Personalized messaging



# F.2 Storyboard



# G - Synthetic User Interviews

## G.1 Interview Guide

### Intro (3 min)

1. Dit is een interview die gaat over het regelen van jouw financiën
2. Hoe zou jij jouw relatie met geld omschrijven? (Impulsief? Ben je er mee bezig? Geen zin om naar om te kijken?)
3. Wat betekent 'financiën' voor jou? Waar denk jij vooral aan bij financiën?

### Dagelijks gedrag & routines (5 min)

1. Hoe regel jij je geldzaken op een gewone weekdag?
  - a. Welke apps gebruik je? Hoe vaak check je ze?
  - b. Wat doe je er precies mee?
2. Wanneer denk je actief na over geld?
  - a. Wat zijn triggers of momenten dat je over geld nadenkt?
3. Zijn er momenten dat je het juist negeert?
  - a. Waarom? Te druk? Stress? Geen zin?

### Sociale context (3 min)

1. Waar praat je met vrienden over als het om geld gaat?
2. Met wie praat je er vooral over en waarom?

### Uitgaven (3 min)

1. Waar geef je vooral geld aan uit? (En jouw vrienden?)
2. En ben je veel bezig met sparen, investeren of het plannen van financiën?

### Zorgen & uitdagingen (4 min)

1. Wat vind je lastig aan geldzaken op dit moment?
  - a. Sparen? Overzicht? Discipline? Plannen? Onverwachte kosten?
2. Zijn er dingen waar je je zorgen over maakt voor de toekomst?
  - a. Wonen, studieschuld, inkomen, sparen, inflatie
3. Zijn er dingen die regelmatig misgaan met je geld?
  - a. (Impulsieve aankopen, te laat betalen, geen overzicht, etc.)
4. Wat zou je het liefst willen veranderen aan hoe je nu met geld omgaat?

### Ervaring met financiële apps/tools (4 min)

1. Welke apps gebruik je voor je geld? En waarom juist deze?
2. Zijn er bepaalde aspecten die je onhandig of irritant vindt aan deze apps?
3. Welke features mis je echt?
4. Hoe zou jouw ideale financiële app eruitzien?
  - a. Visueel? coachend? gepersonaliseerd? alleen essentials?

### Afronding (1 min)

1. Is er iets wat je nog kwijt wilt over geld, apps of stress die je ermee ervaart?

# G.2 Results Synthetic User Interviews

## Noa (20) - Chronisch geldtekort & Geldstress

<b>Intro</b>	Indirect & subversive geld tekort	Afrijd geld	Dagelijks gelding & routines	2,39 per dag Rabo-app	Sociale context	Spitten via Tiktok	Uitgeven	Spullen uitgeven	Uitgeven & overdracht	Discipline	Rabo & Tiktok	Bank app is saai en support in	Zit geen support in	Heel app: controle over kosten	Uitgevoerde app: meer grip	Einde van de maand halen	Dagelijkse gedachten schrijven	Hoort: gedachten schrijven	Indirect & subversive geld tekort
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## Jasper (24) - Beleggen & Automatisering

<b>Intro</b>	Gevoelend te vroeg	Beleggen	Dagelijks gelding & routines	Beleggen & Copy	Sociale context	Uitgeven & reizen	Tech	Waren	Inflatie	Storing	Beleggen	Bank app 1x per week	2,3x beleggen	Trigger is salaris storting	Eén super app	Storing	Beleggen	Bank app 1x per week	2,3x beleggen	Trigger is salaris storting
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## Yara (23) - Heel bewust & Veel apps

<b>Intro</b>	Bewust & georganiseerd	Extrem bezig met geld	Dagelijks gelding & routines	Beleggen & Copy	Sociale context	Uitgeven	Waren	Inflatie	Storing	Beleggen	Bank app 1x per week	2,3x beleggen	Trigger is salaris storting	Eén super app	Storing	Beleggen	Bank app 1x per week	2,3x beleggen	Trigger is salaris storting
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## Zion (19) - Weinig gedoe & alleen checken als nodig

<b>Intro</b>	Niet impulsief	Wenig zin om naar te kijken	Dagelijks gelding & routines	Sociale context	Uitgeven	Gaming food	Uitgeven	Spullen via Tiktok	Uitgeven & overdracht	Discipline	Rabo & Tiktok	Bank app is saai en support in	Zit geen support in	Heel app: controle over kosten	Uitgevoerde app: meer grip	Einde van de maand halen	Dagelijkse gedachten schrijven	Hoort: gedachten schrijven	Indirect & subversive geld tekort
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## Maya (22) - Creator lifestyle & onregelmatig inkomen

<b>Intro</b>	Overzicht maar desgevraagd	Bank app inbouw en app	Dagelijks gelding & routines	Sociale context	Uitgeven	Zaai app	Waren	Inflatie	Storing	Beleggen	Bank app 1x per week	2,3x beleggen	Trigger is salaris storting	Eén super app	Storing	Beleggen	Bank app 1x per week	2,3x beleggen	Trigger is salaris storting
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## Finn (21) - Gamified spender & microtransacties

<b>Intro</b>	Impulsief en heel weinig grip	Microtransacties	Dagelijks gelding & routines	Sociale context	Uitgeven	Fast-food	Waren	Inflatie	Storing	Beleggen	Bank app 1x per week	2,3x beleggen	Trigger is salaris storting	Eén super app	Storing	Beleggen	Bank app 1x per week	2,3x beleggen	Trigger is salaris storting
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## Shane (16) - Digital-native & nieuwkomer

<b>Intro</b>	Impulsief	Salaries & zakgeld	Dagelijks gelding & routines	Sociale context	Uitgeven	Gaming	Waren	Inflatie	Storing	Beleggen	Bank app 1x per week	2,3x beleggen	Trigger is salaris storting	Eén super app	Storing	Beleggen	Bank app 1x per week	2,3x beleggen	Trigger is salaris storting
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# H - Diary Study

## H.1 Description

Ik wil graag begrijpen hoe jij omgaat met jouw financiën. Kun jij 5 dagen een dagboek bijhouden die inzicht geeft in jouw dagelijkse routine met betrekking tot financiële interacties? Dit houdt in het openen van jouw mobiel bankieren app of andere apps die te maken hebben met financiën zoals investeringsplatformen of spaaraccounts etc.

De opdracht is als volgt:

- Noteer elke keer wanneer je een financiële app opent en omschrijf je emotie die je op dat moment voelt met de reden.
- Beschrijf momenten waarop je financiële apps opent en waarom je op dat moment de app opent en waarvoor je het gebruikt.
- Schrijf het op als je iets zou willen aanpassen tijdens het gebruik van de financiële app.
- Maak screenshots van niet-financiële apps waarvan je de interface/layout geweldig vindt (mogen ook widgets zijn). Noteer wat je hiervan zou willen meenemen naar financiële apps en waarom.

## H.2 Input Diaries

### Ties

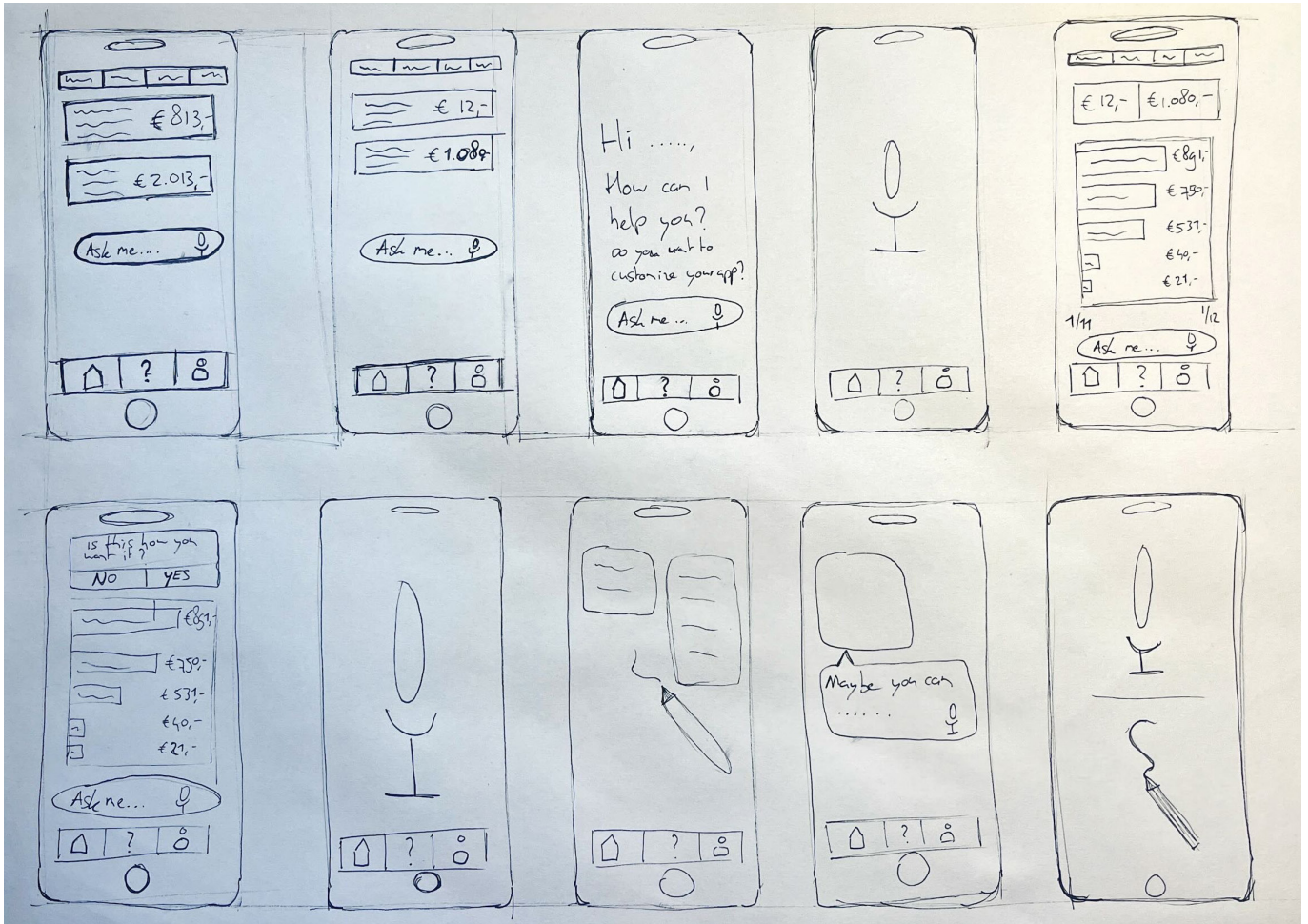
Wednesday	Thursday	Friday	Saturday	Sunday
<div style="background-color: #fff3cd; padding: 5px; margin-bottom: 10px; text-align: center;"> <b>ABN AMRO</b> </div> <div style="display: flex; justify-content: space-between;"> <div style="background-color: #fff3cd; padding: 5px; width: 45%;">                     Needed to find a statement to cancel something                 </div> <div style="background-color: #fff3cd; padding: 5px; width: 45%;">                     Used the search function to find the company and immediately found four transactions                 </div> </div> <div style="background-color: #fff3cd; padding: 5px; margin-bottom: 10px; text-align: center;"> <b>DEGIRO</b> </div> <div style="display: flex; justify-content: space-between;"> <div style="background-color: #fff3cd; padding: 5px; width: 45%;">                     Looked at my portfolio, now understand the app well, but I have to say that I found it less clear at first                 </div> <div style="background-color: #fff3cd; padding: 5px; width: 45%;">                     Lots of different options and busy pages                 </div> </div> <div style="background-color: #fff3cd; padding: 5px; margin-bottom: 10px; text-align: center;">                     This may also be due to the fact that I didn't understand the subject matter very well.                 </div> <div style="background-color: #fff3cd; padding: 5px; margin-bottom: 10px; text-align: center;"> <b>Tikkie</b> </div> <div style="display: flex; justify-content: space-between;"> <div style="background-color: #fff3cd; padding: 5px; width: 45%;">                     Created and sent a Tikkie                 </div> <div style="background-color: #fff3cd; padding: 5px; width: 45%;">                     Very quick and easy                 </div> </div> <div style="display: flex; justify-content: space-between;"> <div style="background-color: #fff3cd; padding: 5px; width: 45%;">                     The app's interface is also clear and easy to use                 </div> <div style="background-color: #fff3cd; padding: 5px; width: 45%;">                     Not too many buttons                 </div> </div>		<div style="background-color: #fff3cd; padding: 5px; margin-bottom: 10px; text-align: center;"> <b>ABN AMRO</b> </div> <div style="display: flex; justify-content: space-between;"> <div style="background-color: #fff3cd; padding: 5px; width: 45%;">                     Transferred money and paid in a store with my iPhone                 </div> <div style="background-color: #fff3cd; padding: 5px; width: 45%;">                     Very easy and fast                 </div> </div>	<div style="background-color: #fff3cd; padding: 5px; margin-bottom: 10px; text-align: center;"> <b>WieBetaaltWat</b> </div> <div style="display: flex; justify-content: space-between;"> <div style="background-color: #fff3cd; padding: 5px; width: 45%;">                     I use this with my housemates                 </div> <div style="background-color: #fff3cd; padding: 5px; width: 45%;">                     Very nice app                 </div> </div> <div style="background-color: #fff3cd; padding: 5px; margin-bottom: 10px; text-align: center;">                     I believe there is even a function for scanning receipts, but I think that takes longer                 </div> <div style="background-color: #fff3cd; padding: 5px; text-align: center;">                     I find it handy that it has a calculator so you can easily add and subtract items from a receipt                 </div>	

Uses search function in ABN app. Uses DEGIRO, but a bit unclear layout. Likes not too many buttons in Tikkie app.

Calculator = handy. Scanning receipts probably takes too long

# I - Low-Fidelity Prototype

## I.1 First Low-Fidelity Prototype



## I.2 Testing Plan

### Lo-fi interface prototyping Testing plan

#### Intro we tell the user

*"Thanks for participating in our device test.*

*What you do can't be wrong: we test the interface, not you.*

*Please think out loud."*

Imagine you:

*[have an impulsive and stressful relationship with money. It looks like your money disappears as fast as you receive it. You really like doing spontaneous activities, which also cost a lot of money. Some expenses are probably expensive, like subscriptions, tickets for parties, clothing and holidays. However, you don't really know what all your expenses are every month and why it continuously looks like you don't have any money left.*

*You use your mobile banking app daily. A problem with your banking app is that it is difficult to get a personalized overview of your expenses. This does not help with understanding why you don't have any money left every month. Also, you cannot customize this mobile banking app tailored to your needs currently.*

*The lo-fi interface cards represent a new mobile banking app. Try to use it and please think out loud when you are using the lo-fi interface cards. Pick the cards one-by-one and describe how you would use the app.]*

#### Data collection

What was clear, unclear?

...

What did the user do well, wrong, ...?

...

What did (s)he think and say?

...

What else?

..

#### Suggestions for improvement

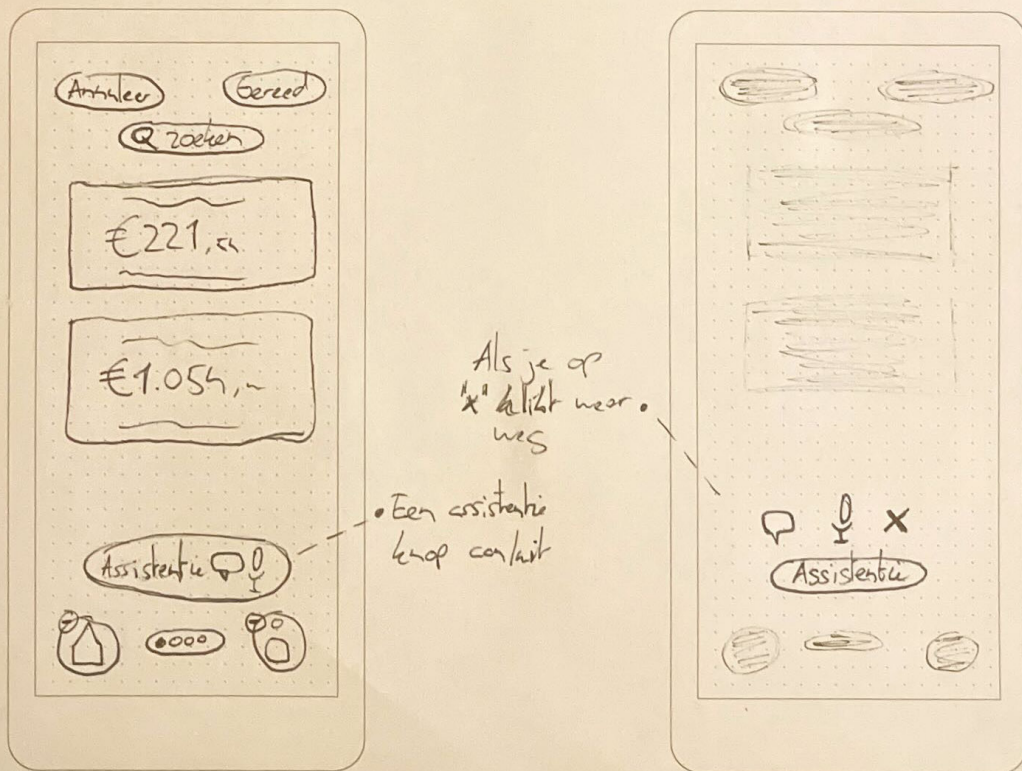
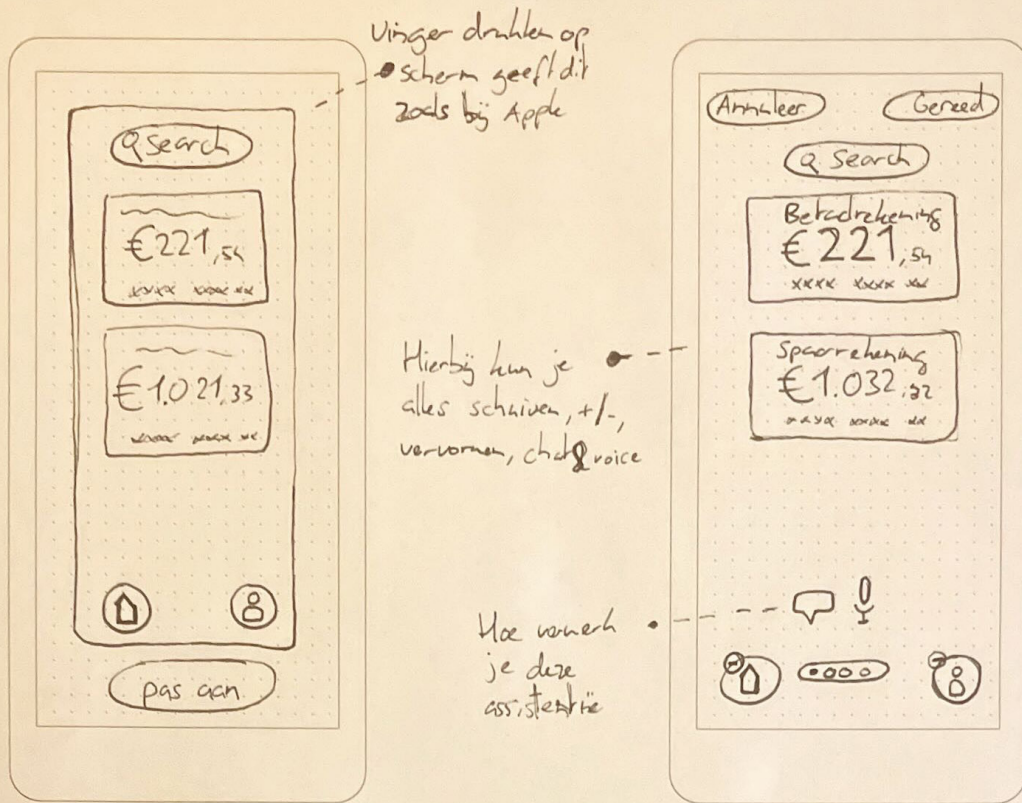
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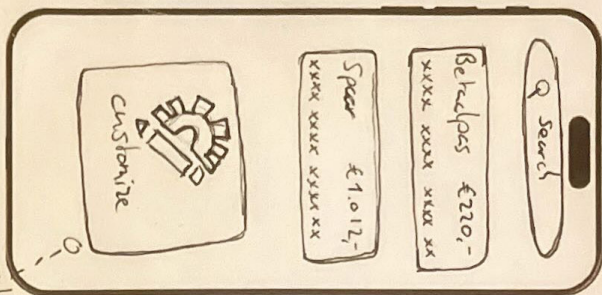
### I.3 Set-up First Testing Round



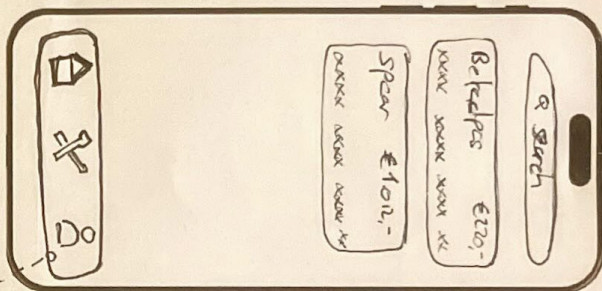
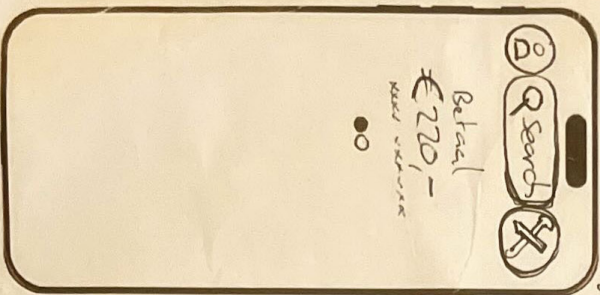
# I.4 Annotated Prototype



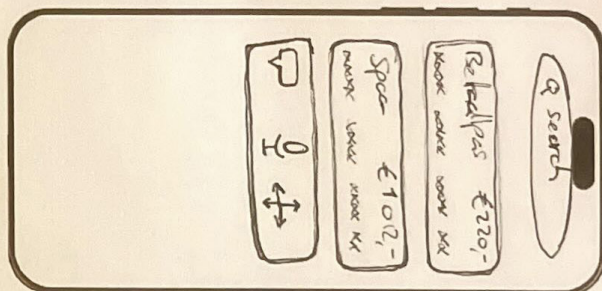
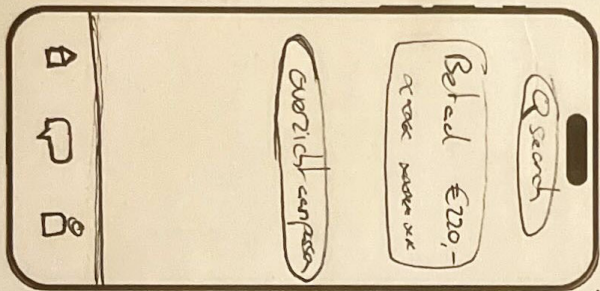
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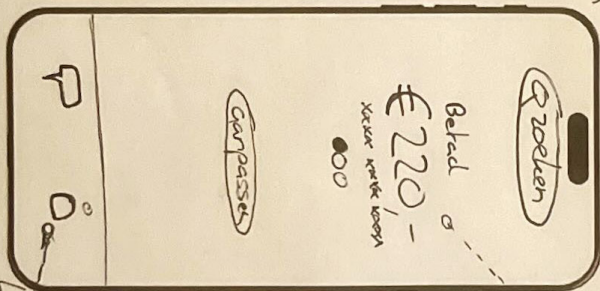
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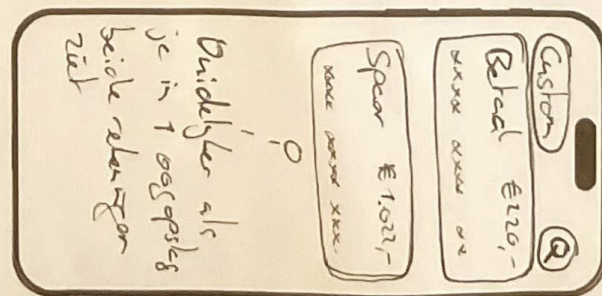
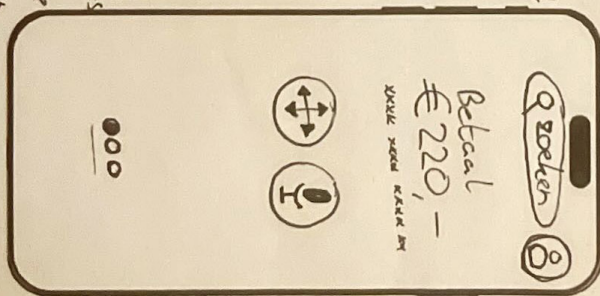
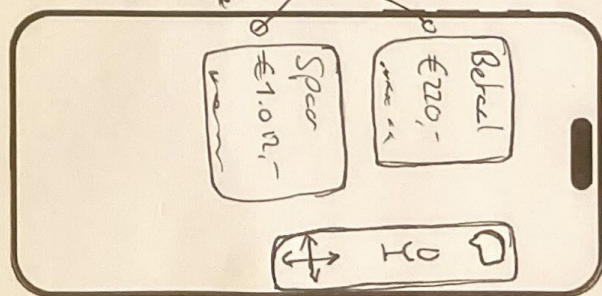


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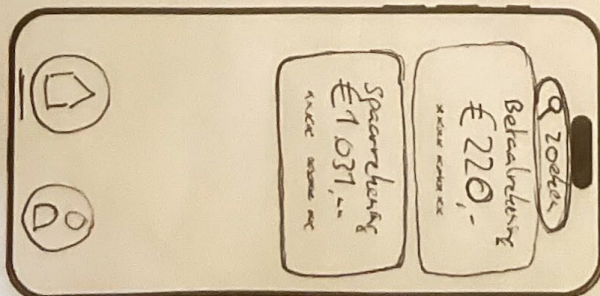


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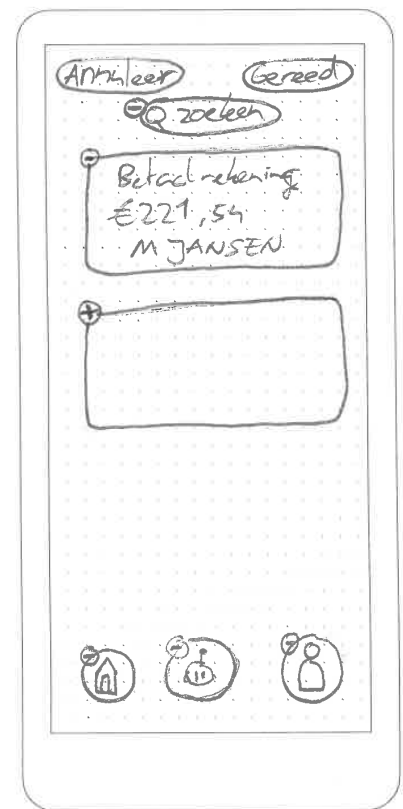
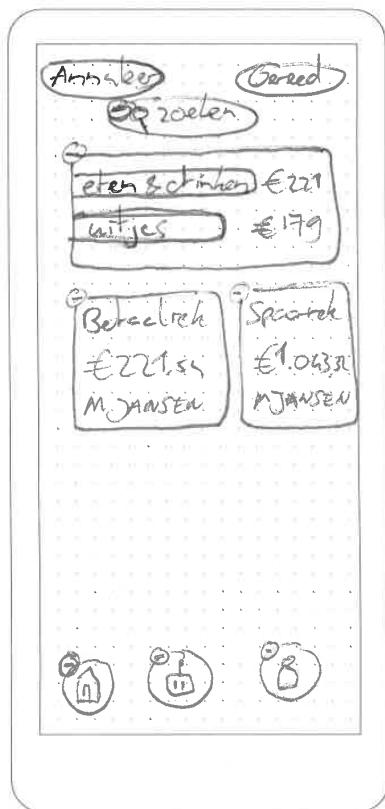
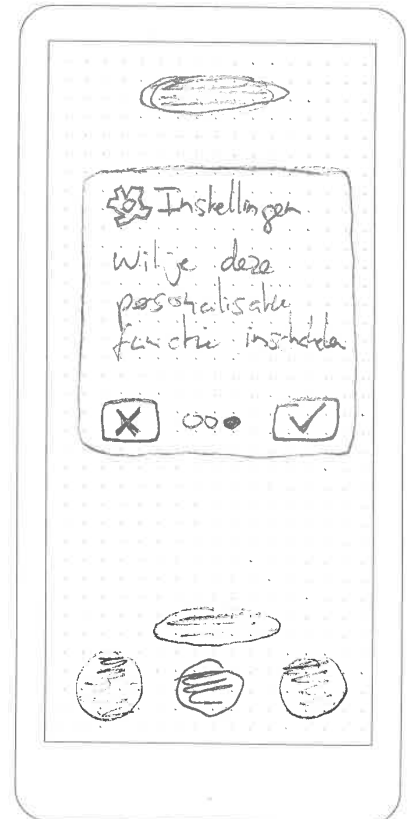
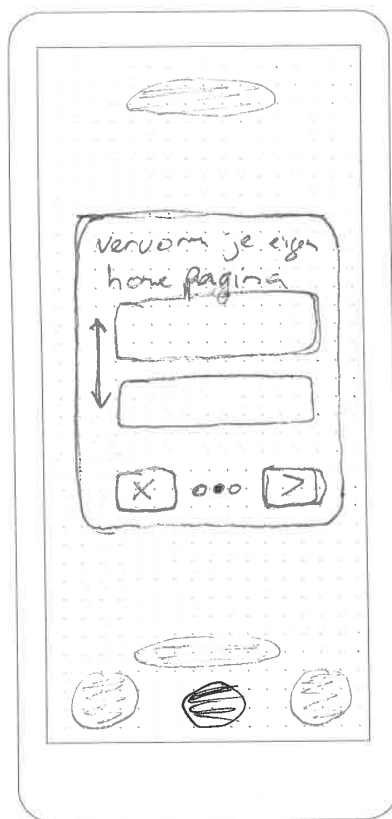
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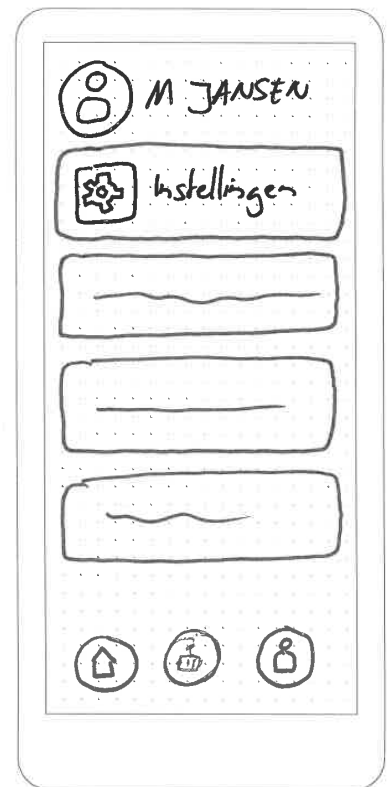
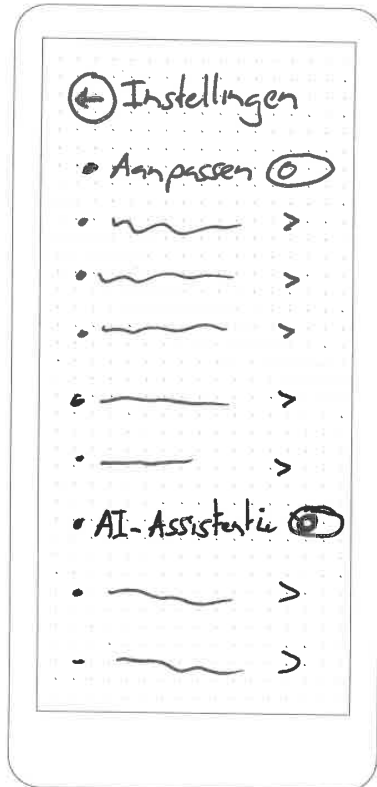
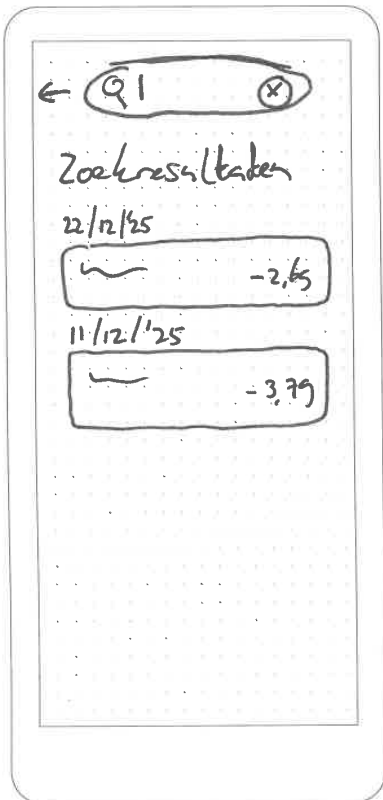
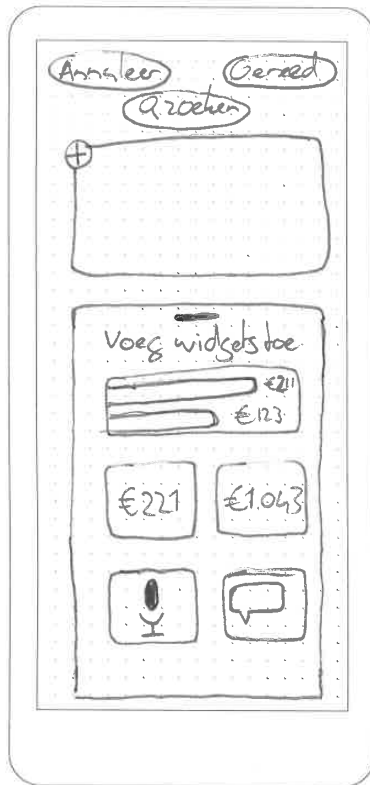


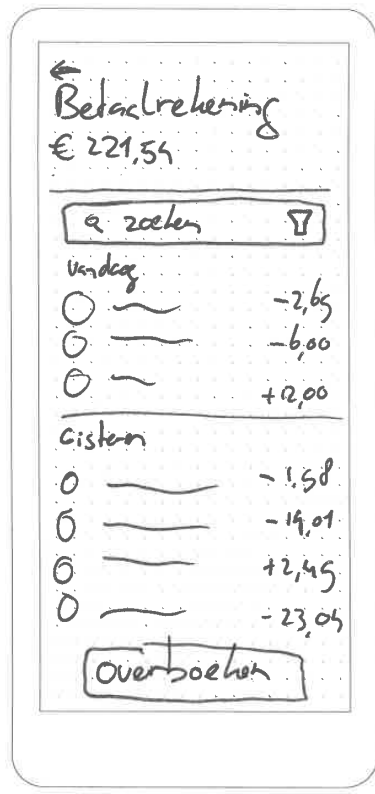
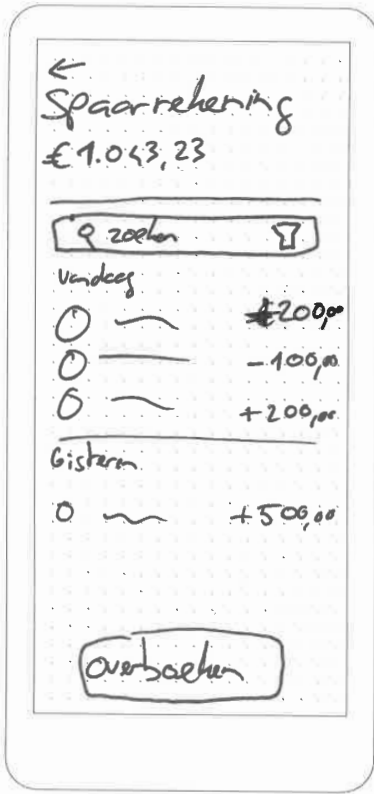
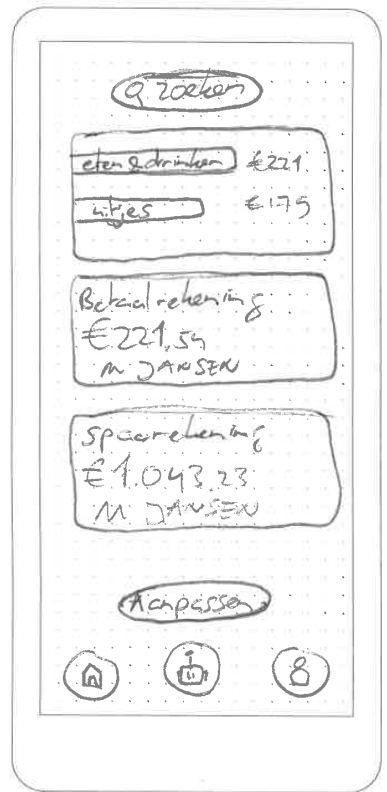
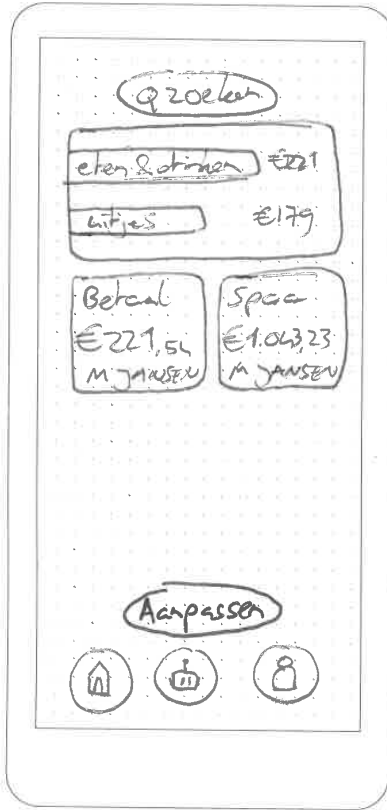
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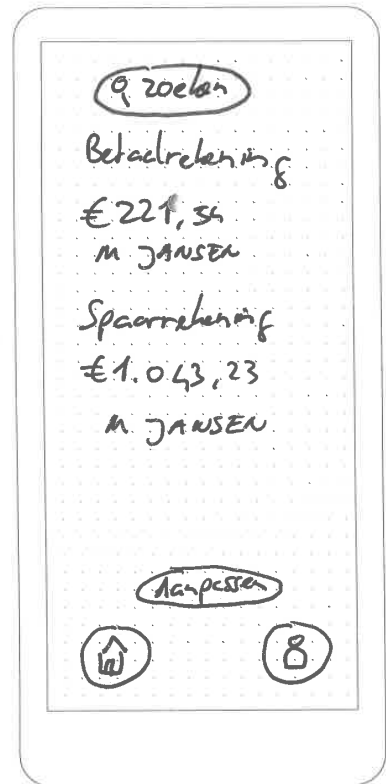
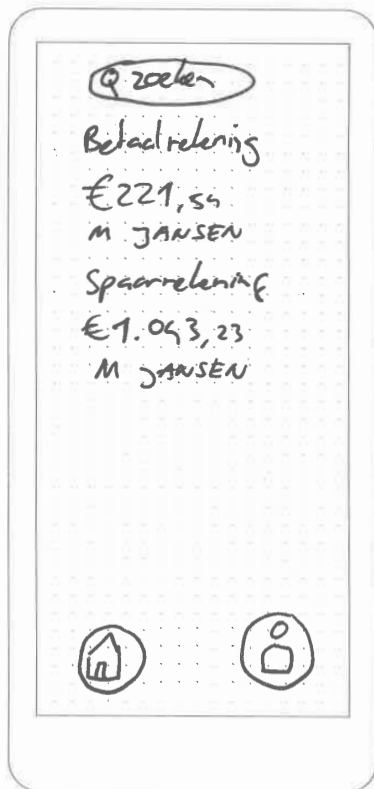
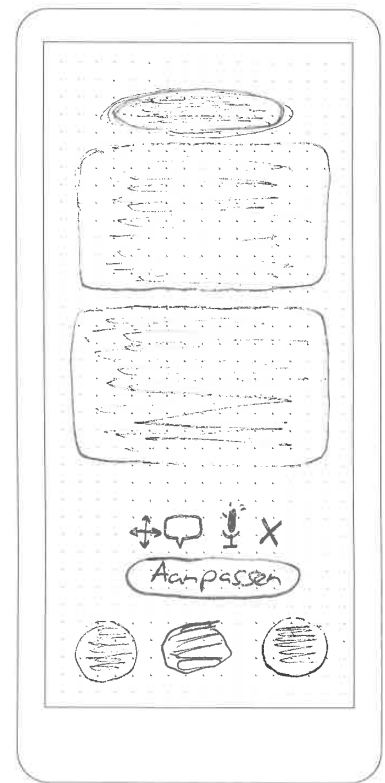
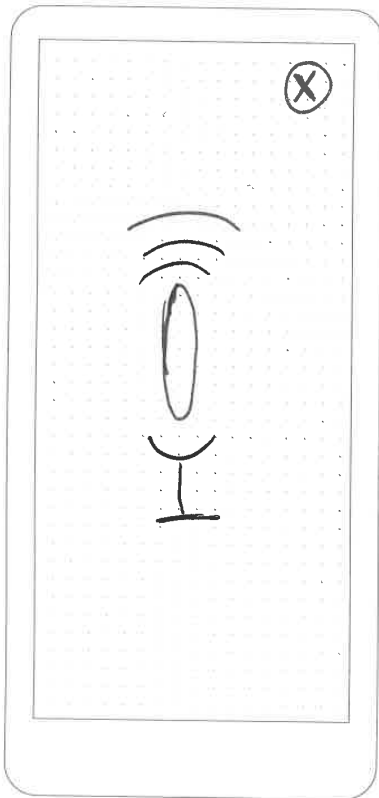


# I.5 Iteration Low-Fidelity Prototype





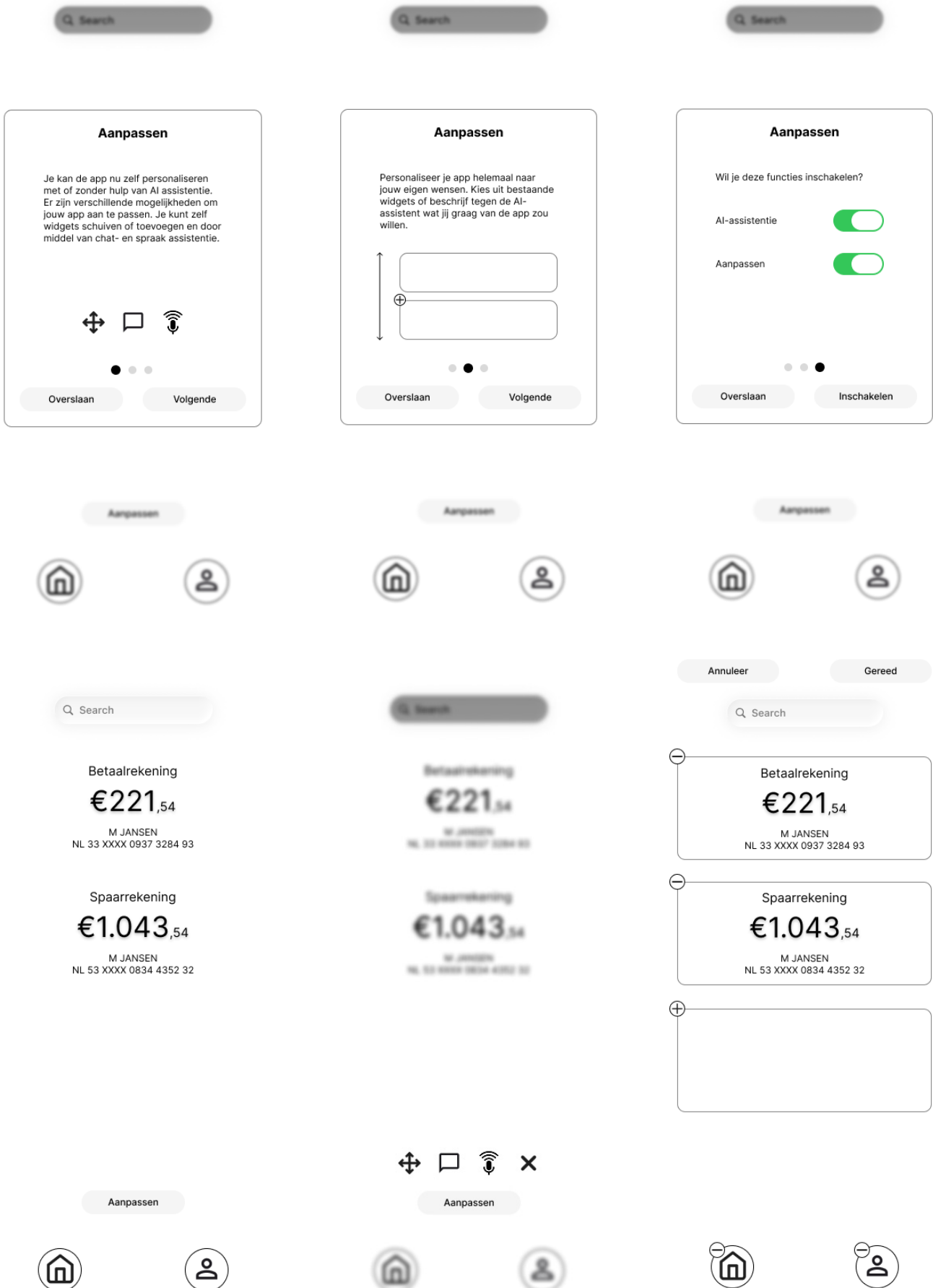


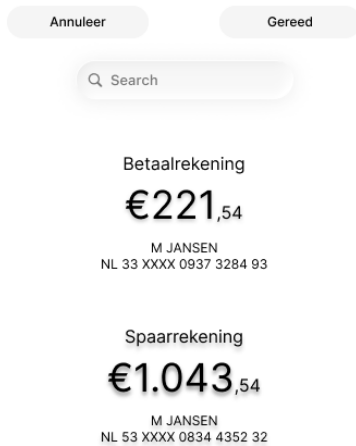
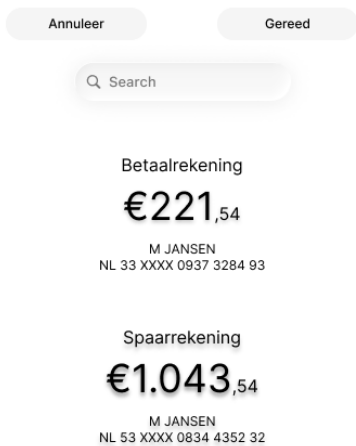
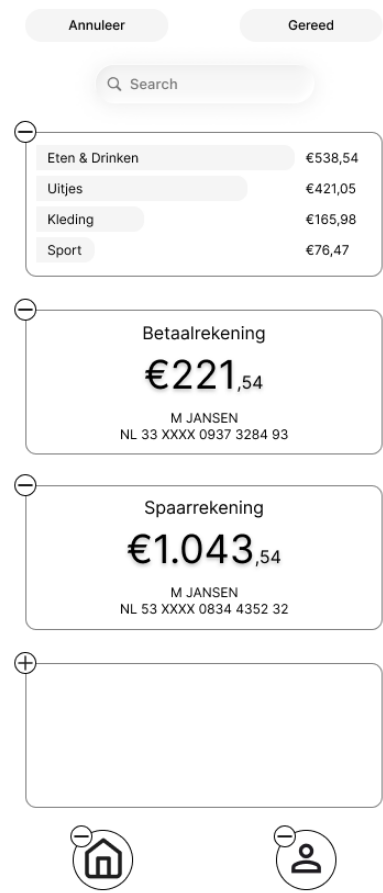
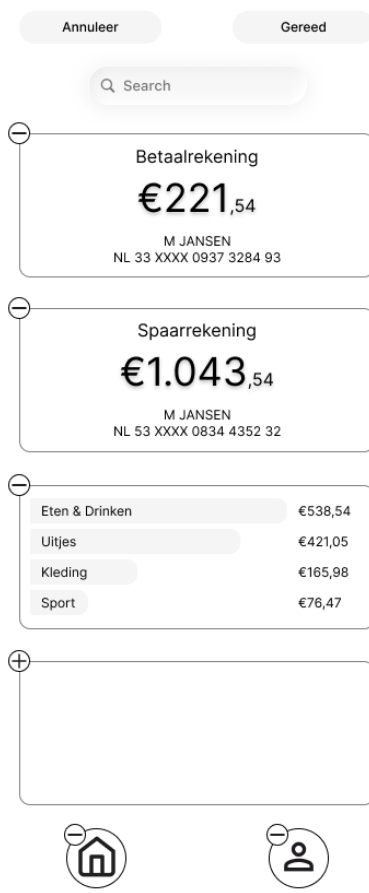
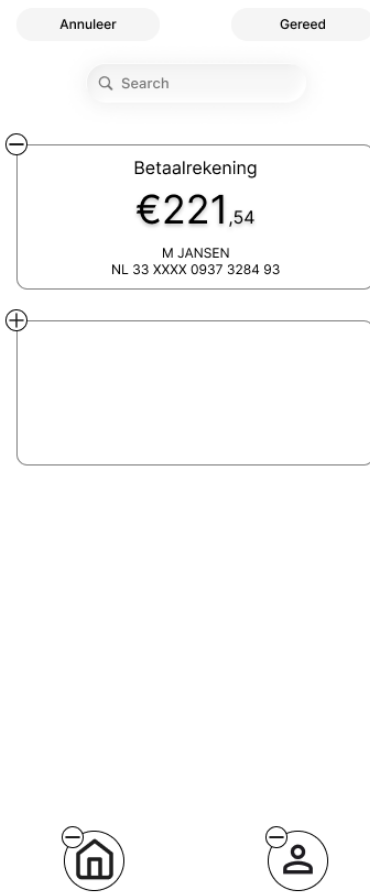


# I.6 Insights Low-Fidelity User Testing

Balance user customization	Easy & conversational interaction	Navigation in interface	Financial wellbeing Gen Z
<p>Transparency &amp; understanding</p> <p><i>What is AI-assistant? What does it do? Finance is sensitive topic, therefore transparency and understanding is important</i></p>	<p>Accept or decline suggestions</p> <p><i>Add 'no' and 'yes' button for users to accept or decline suggestions provided by AI-assistant</i></p>	<p>Question icon in tab bar and 'ask me' button overlap</p> <p><i>Keep the UI simple with not too many buttons</i></p>	<p>Budgeting with percentages</p> <p><i>Gen Zers want to gather quick insights via budgeting with percentages</i></p>
<p>Switch button for AI-assistant</p> <p><i>Some users don't want to see AI-assistant continuously in their UI</i></p>	<p>Moving UI elements instead of only speaking</p> <p><i>Most users choose to move widgets rather than speaking to the app</i></p>	<p>Customize by moving more prominent</p> <p><i>Users often choose customized by moving (like widgets on an iPhone). AI-assistant during customizing by moving can help them.</i></p>	<p>Insights into cash flows</p> <p><i>Insights into salary and expenses monthly</i></p>
<p>Assistance when customizing</p> <p><i>How to use AI-assistant when changing widgets</i></p>	<p>Explain who AI-assistant is</p> <p><i>Who is helping users? Is it an AI-assistant and what does it do or is it a person?</i></p>	<p>Explanation in settings</p> <p><i>Some users want to customize their app later whenever they have time for it. So, it should be easy to find how to customize your app later in settings.</i></p>	<p>Categorization</p> <p><i>Categories shouldn't be too large and users should be able to adjust them according to their wishes</i></p>
<p>Moving / adding widgets</p> <p><i>Most users choose to customize themselves and are open to AI-assistance</i></p>	<p>Easy search</p> <p><i>AI finishing your search request</i></p>	<p>Widgets as inspiration</p> <p><i>Widgets are a useful way to show potential of malleable software in app</i></p>	<p>Easy calculator in app</p> <p><i>Gen Zers like the calculator within WiebetaalWor app</i></p>
	<p>More guidance regarding opportunities</p> <p><i>It should be more clear when you users change (talking &amp; drawing without context is difficult), and the AI-assistant can give more examples.</i></p>	<p>Clear explanation in beginning</p> <p><i>When opening the app it was a bit unclear how to use customization. The popup can be improved to show full screen for examples.</i></p>	<p>Quick insights on homscreen</p> <p><i>See all accounts in homscreen</i></p>
	<p>Finish voice prompts</p> <p><i>Add button when speaking to finish your voice prompt</i></p>	<p>More shortcuts</p> <p><i>Add 'zelf regelen' button, like ING is offering. Or transfer button for example.</i></p>	<p>Option to hide savings account</p> <p><i>Is it possible to hide savings account</i></p>
	<p>Interactive chat function</p> <p><i>Asking for insights and overviews (text answers)</i></p>		<p>Personalized notifications</p> <p><i>Personaliseer meldingen wanneer je bijvoorbeeld uitgaans doet boven 20 euro</i></p>

# J - Mid-Fidelity Prototype





Suggestie: Ik wil een overzicht van mijn maandelijkse uitgaven verdeeld in categorieën...

Wat wil je aanpassen?



Wat wil je aanpassen?



## Welkom bij jouw Aanpasbare Bank

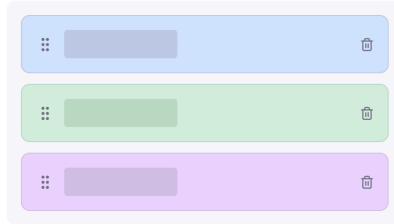
Jij bepaalt hoe je bankieren eruitziet. Sleep widgets, voeg functionaliteiten toe, en praat met onze AI om je app volledig naar jouw hand te zetten.

Volgende

Over slaan

## Volledig Aanpasbaar

Zie hieronder hoe je widgets kunt verslepen en herschikken. Jouw dashboard, jouw regels.



Laten we beginnen

Bank

Zoeken of vraag aan AI...

### Aanpas-modus

Sleep widgets om ze te herschikken

Klaar

AI Assistentie



Sleep om te verplaatsen



Betaalrekening

€827,11



Sleep om te verplaatsen



Spaarrekening

€4.231,42



Widget toevoegen



Home



Profiel

Bank

Zoeken of vraag aan AI...

### Aanpas-modus

Sleep widgets om ze te herschikken

Klaar

AI Assistentie



Sleep om te verplaatsen



Totaal Vermogen

DEGIRO

€2847.50

WieBetaaltWat

€85.00

Totaal

€2762.50

Sleep om te verplaatsen



Betaalrekening

€827,11



Sleep om te verplaatsen



Home



Profiel

Bank

Zoeken of vraag aan AI...

### Aanpassen

#### Abonnementen



Spotify Premium

5 jan 2025

€10.99



Netflix Standard

12 jan 2025

€13.99



Amazon Prime

18 jan 2025

€6.99

Totaal per maand

€31.97

Betaalrekening

€827,11



Spaarrekening

€4.231,42



Home



Profiel

# K - Co-Creation Session

## K.1 Miro Board Hackathon

**Welcome to this Hackathon!**

**Interaction Principles Themes**  
This board's focus will be on your interaction principles themes.

**Interaction Principles Themes**

- Form & Computational Interaction**
  - 1. Computational Interaction
  - 2. Computational Interaction
- Behavioral Data Consumption**
  - 1. Behavioral Data Consumption
  - 2. Behavioral Data Consumption
- Navigation & Structure**
  - 1. Navigation & Structure
  - 2. Navigation & Structure

**Team 1**

1. Introduction  
2. Context and Problem  
3. Design Requirements  
4. User Stories  
5. Define Project  
6. Deliverables

Set tutorial in the template on the right on how to transfer a project

Poste links of your project

**Team 2**

Set tutorial in the template on the right on how to transfer a project

Poste links of your project

**Team 3**

Set tutorial in the template on the right on how to transfer a project

Poste links of your project

**Team 4**

Set tutorial in the template on the right on how to transfer a project

Poste links of your project

## K.2 Persona Hackathon

### Persona

*Design your digital product for this persona*



#### Noa Jansen

<b>Age</b>	20
<b>Location</b>	Amsterdam
<b>Occupation</b>	Full time student + freelance side jobs
<b>Income</b>	Student loan + fluctuating freelance income

### Relationship with finances

Noa lives in a state of financial duality. On one hand, she is stressed about the future; on the other, she is impulsive in the present.

- **Feeling stressed:** She constantly feels like her balance is zero or near zero. The high cost of living in Amsterdam drains her accounts quickly.
- **Impulsive spending:** Despite the stress, she exhibits impulsive behavior, likely driven by social pressure or immediate needs.
- **High-risk focus:** Even with low income, she is active in investing and crypto. She is looking for a "quick fix" or high returns to bridge her income gap, rather than traditional saving.
- **Social finance:** She actively uses WieBetaaltWat (a splitser) frequently for shared costs with roommates and friends.

### Major worries

- Being able to buy a house in the future
- Student loan debt
- Liquidity

### Needs

- More grip & control on her finances
- Stress reduction
- Transparency
- Proactive companionship
- Financial learning

### Pain points

- Noa struggles to get a clear overview of her finances.
- She is using different financial platforms for different things. A banking app, an investment app and a splitser app.

## K.3 Pictures Hackathon



## K.4 Prototype Development Hackathon

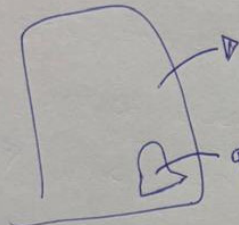
### Ideation - Team: Balance User Customization

①

questionaire

in huidige bank app

→ pop-up voor nieuw tracking functie



pop-up: nieuwe widget (inspelen op issues)

→ ②

klik op pop-up: vragenlijst over

lifestyle en potentiële interface voorbeeld

+ voorbeelden <sup>van</sup> over anderen

→ ③

interface staat: widget op scherm

per dag past hij zich aan (tijd, locatie, dag)

→ ④

Fysieke dingen widget → erg klikken

meer gegevens die je kan customizen

(meer uitgeven dan anderen / met elkaar vergelijken)

→ ⑤

voor online dingen: pop-up voordat je een betaling doet → moet je dit wel doen?

kan je aanpassen (spelletje → geld sturen naar verschillende doelen)

## **Prompt created for Lovable - Team: Balance User Customization**

Project overview

Project name: Trackie

Goal: Design a malleable banking app extension for Gen Z that helps users understand and gently shape their spending behavior, similar to an activity tracker, without judgment or heavy budgeting.

Context: This is a hackathon prototype, imagining full access to banking data. The product lives inside an existing banking app as a widget + contextual pop-ups.

Target user

Persona: Noa Jansen

- 20 years old
- Student + freelance income
- Lives in Amsterdam
- Feels stressed about money but also spends impulsively
- Uses multiple finance apps (banking, investing, split payments)

User needs:

- More grip & control
- Stress reduction
- Transparency
- Gentle guidance, not rules

Design principles (IMPORTANT)

Design according to Balance User Customization:

- The system adapts incrementally
- The user always has final say
- No sudden changes
- No hard limits or shame-based feedback

Think: calm coach, not strict accountant.

Tone & vibe

- Calm
- Friendly
- Non-judgmental
- Minimal
- Slightly playful (Gen Z friendly)
- Feels like a wellbeing tool, not a finance tool

Structure to build

Create the following screens/components:

1. Onboarding pop-up
2. Short questionnaire
3. Home widget (collapsed)
4. Widget expanded view
5. Contextual pop-ups
  - a. Before online payments
  - b. After physical payments
6. Deep-dive "patterns" screen
7. Customization screen ("Tune Trackie")

Core metaphor

Use an activity tracker metaphor:

- Rings
- Daily progress
- Patterns over time
- “Moments” instead of “mistakes”
- Avoid: Budgets Red warning colors
- Guilt language

Visual style

- Soft gradients (purple / blue)
- Rounded cards
- Clear white space
- Simple icons
- No dense charts

Rules

- No more than one suggestion at a time
- All nudges must be dismissible
- Language must never imply failure
- Adaptation happens slowly over time

### **BUILD STEP 1 — ONBOARDING & QUESTIONNAIRE**

Screen: Small modal pop-up

Copy: “Hey Want a lightweight way to keep track of your money habits — without spreadsheets?”

Buttons: “Let’s try it” “Maybe later”

Questionnaire (5 swipe questions)

Design as cards, one question per screen.

Questions:

- “What stresses you most about money right now?”
- “How hands-on do you want Trackie to be?” Chill / Medium / Active
- “What do you want to improve first?” Awareness / Control / Future
- “When should Trackie check in?” Before spending / After spending / Daily
- “Pick your vibe” Coach / Neutral / Playful Store answers as preferences, not rules.

### **BUILD STEP 2 — HOME WIDGET (DEFAULT STATE)**

Widget name: “Today’s Balance”

Layout: Circular activity rings

- Awareness ring
- Control ring
- Future ring

Short supportive text below

Example copy: “You’re on track today ”

Interactions:

- Tap expanded widget
- Long press customization

### **BUILD STEP 3 — EXPANDED WIDGET**

Section 1: “Today in motion” “€34 spent today” “2 spontaneous moments” “1 conscious choice”

Section 2: Gentle insight

Example: “Spending usually peaks for you in the afternoon Want Trackie to keep an eye on this?”

Buttons: “Yes, gently” “No thanks”

#### **BUILD STEP 4 — CONTEXTUAL POP-UPS**

A. Before online payment

Small, non-blocking pop-up.

Copy: "Quick check This fits your 'fun spending' today — all good?"

Buttons: Continue Adjust today Don't ask again today

B. After physical spending

Copy: "Was this planned or spontaneous?"

Buttons: Planned Spontaneous Use this to train the system, not to judge.

#### **BUILD STEP 5 — DEEP-DIVE: "Your Patterns"**

This is optional, not forced.

Sections:

- Spending rhythm (time-based)
- Impulse moments (visual clusters)
- What helps you most (based on past nudges)
- End with: "Want to tweak what Trackie focuses on?"

#### **BUILD STEP 6 — CUSTOMIZATION (KEY PRINCIPLE)**

Screen name: "Tune Trackie"

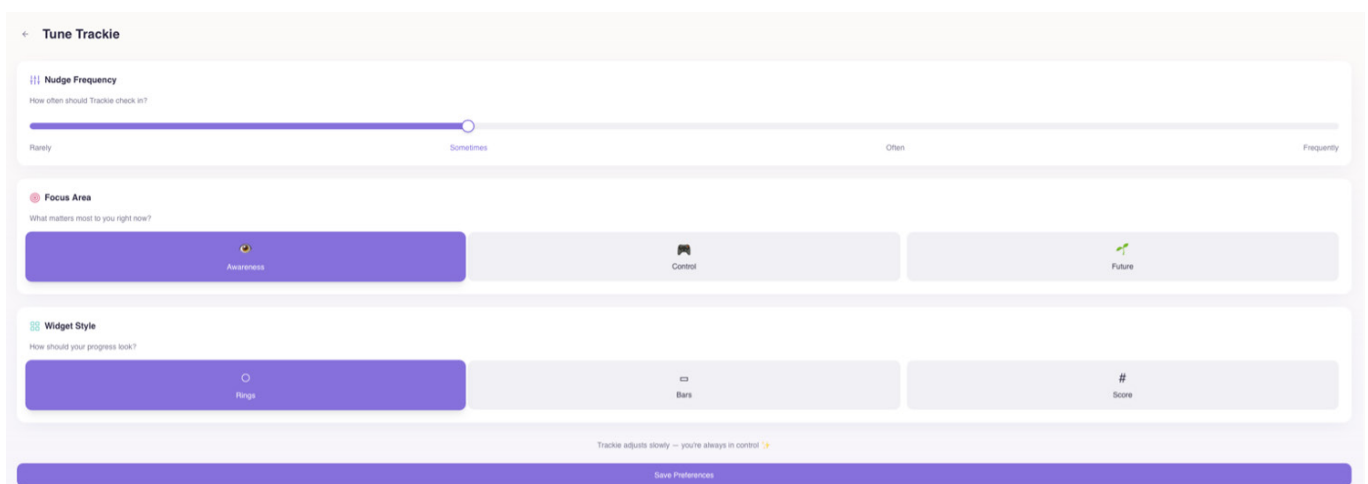
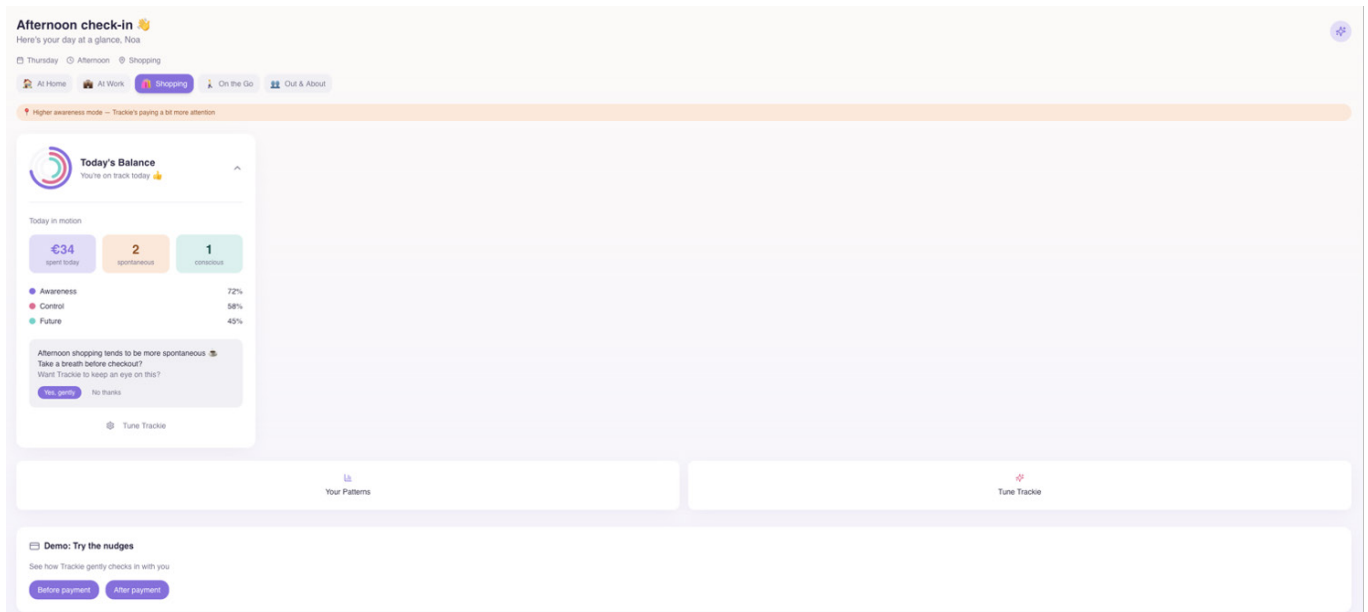
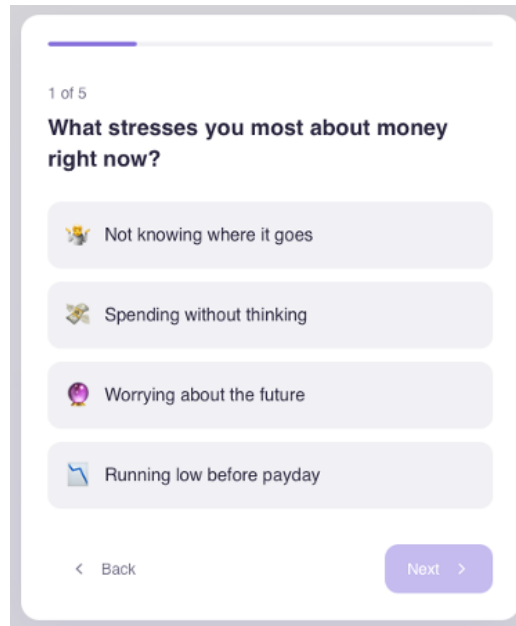
Use sliders, not toggles.

Controls:

- Nudge frequency
- Focus area
- Widget style
- Rings Bars

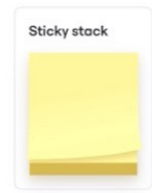
Single score Message: "Trackie adjusts slowly — you're always in control."

## Outcome - Team: Balance User Customization



# Ideation - Team: Navigation in Interface

## Whiteboard



Navigation in interface

Problems

Problem -> Noa is using a lot of financial apps

Noa needs a clear overview of the money she needs in the future, so she knows what she can safely spend now

How do we get her to provide the needed information?

Onboarding to get to know the user

Short conversation/survey to get to know the user

What financial applications do you currently use

financial recommendations

Functionalities

Modular design

Future goals

Help her out with 'averages'.  
The average 20 y/o has xxx money

Requirements

Combining the multiple financial tools she uses

Navigation in Interface

Navigating has to be very intuitive

Textbox; "What's your goal?"

Where can I find my recent payments?

Am I still on track to meet my savings goals in 2025?

## **Prompt created for Lovable - Team: Navigation in Interface**

Adaptive Gen Z Financial App with Preference-Based Onboarding

Create an adaptive digital financial product for Generation Z that improves financial wellbeing using malleable software principles.

The app is designed for Noa Jansen, a 20-year-old student in Amsterdam with student loans and fluctuating freelance income. She experiences financial stress, impulsive spending, and uses multiple financial apps.

The product should balance system-driven adaptation and user-driven customization, starting from onboarding, where Noa teaches the app how she wants to be supported.

### **Product Scope**

- Type: Mobile financial / mobile banking app
- Market: Netherlands
- Language: English
- Audience: Gen Z (18–25)
- Goal: Reduce stress, increase control, transparency, and learning

### **Core Concept: Malleable Interface**

The interface adapts with the user, not to the user.

- System adapts based on behavior and context
- User controls priorities, tone, and strictness
- All adaptations are visible, explainable, and reversible

### **Onboarding: Learning Noa's Preferences (Key Requirement)**

Design an onboarding flow that:

- Feels short, human, and non-intrusive
- Clearly explains why questions are being asked
- Lets Noa define how the app should behave

### **Onboarding should capture:**

- Financial goals (e.g. stability, saving, investing, stress reduction)
- Spending comfort level (hands-off supportive strict)
- Preferred tone (silent, calm coach, proactive companion)
- What causes stress (low balance, subscriptions, social spending)
- Willingness to receive nudges and learning tips
- What she wants visible on her home screen

### **Onboarding outcome:**

- Creates an initial adaptive dashboard setup
- Sets default nudge intensity
- Establishes trust through transparency
- Makes Noa feel in control from the start

### **Required Screens & Features**

#### 1. Adaptive Home Dashboard

- Large balance
- "Available today" and "Safe to spend"
- Quick actions: Pay, Request, iDEAL, Freeze
- Modular blocks that adapt and can be manually rearranged

#### 2. Spending Awareness

- Gentle, contextual nudges

- Future impact previews
  - User-adjustable strictness
3. Payments & iDEAL
    - Fast, low-friction flow
    - Spending impact preview before confirmation
    - Swipe/tap to confirm
  4. SCA / Security
    - Calm bottom-sheet confirmation
    - Biometric or PIN
  5. Insights & Learning
    - Monthly overview
    - Subscriptions
    - Social spending
    - Short, adaptive learning cards based on onboarding preferences
  6. Financial Companion Mode
    - Optional conversational interface
    - Explains trends and choices
    - Tone based on onboarding selection
  7. Cards & Controls
    - Virtual card
    - Freeze/unfreeze
    - Adjustable spending limits with overrides
  8. Profile & Transparency
    - IBAN
    - Fees
    - Student loan context
    - Deposit guarantee (€100,000)
    - Easy support and exit

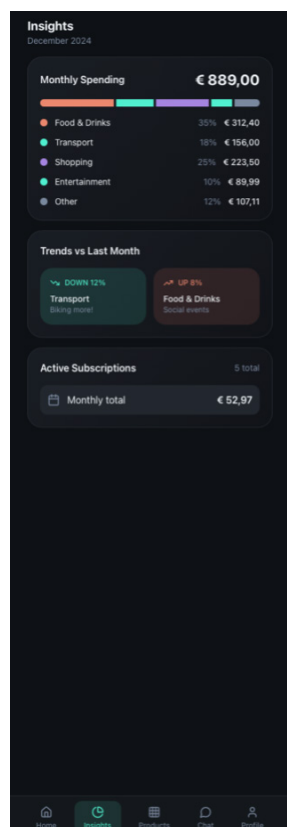
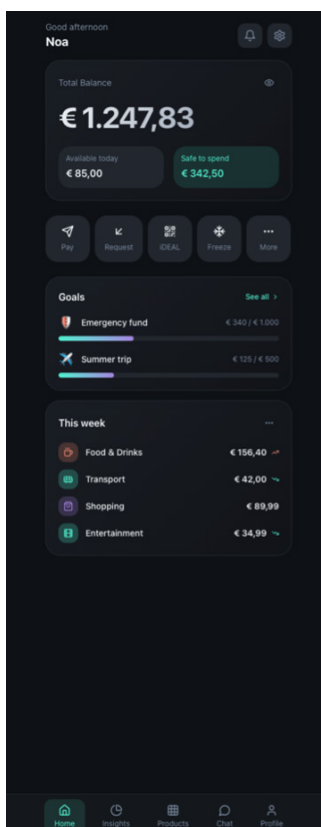
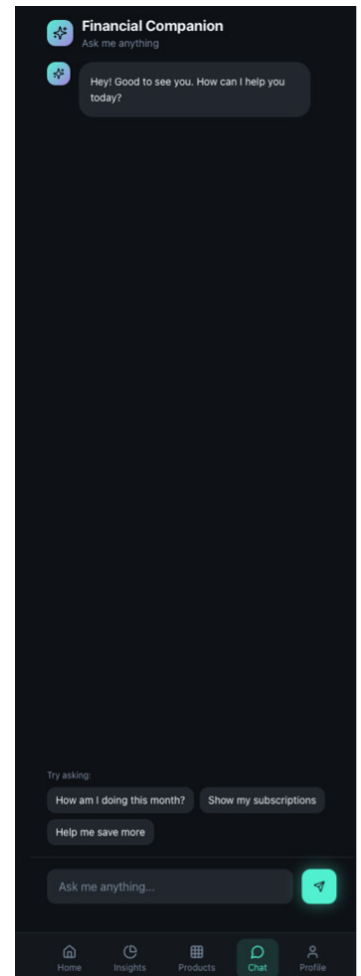
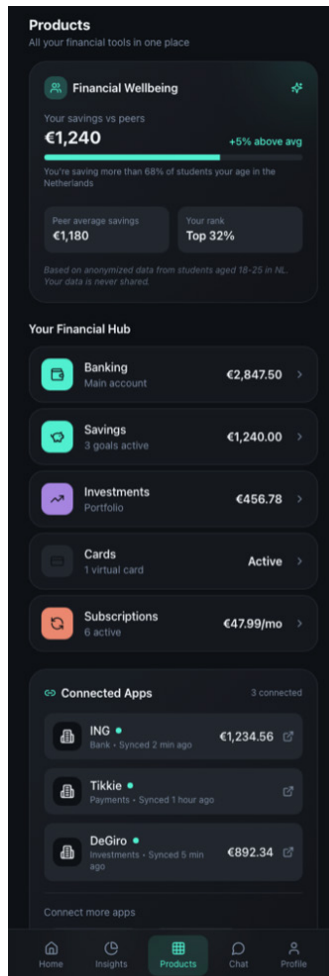
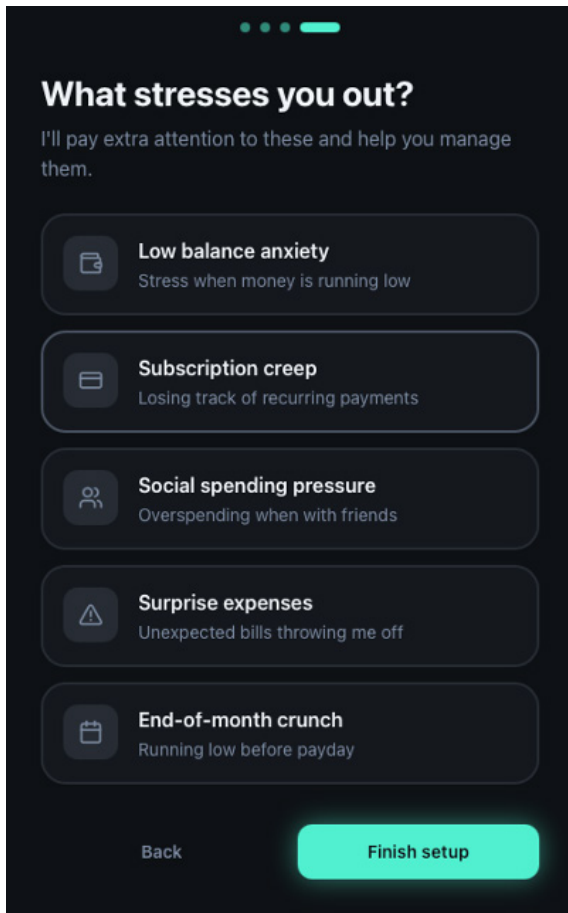
### **Visual & Interaction Style**

- Dark-mode first
- Calm, modern, Gen Z-friendly
- Soft neumorphism + glassmorphism
- Smooth transitions
- Conversational, supportive microcopy

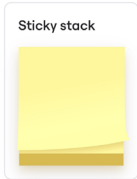
### **Overall Experience**

- The user is onboarded into control, not surveillance
- Adaptation feels earned, not imposed
- The app grows smarter because Noa teaches it how to help her

## Outcome - Team: Navigation in Interface



# Ideation - Team: Easy & Conversational Interaction



## Whiteboard

easy and conversational interaction

**Persona**  
Design your digital product for this persona

**Noa Jansen**

**Age** 20  
**Location** Amsterdam  
**Occupation** Full time student + freelance side jobs  
**Income** Student loan + fluctuating freelance income

**Relationship with finances**  
Noa lives in a state of financial duality. On one hand, she is stressed about the future; on the other, she is impulsive in the present.

- Feeling stressed:** She constantly feels like her balance is zero or near zero. The high cost of living in Amsterdam drains her accounts quickly.
- Impulsive spending:** Despite the stress, she exhibits impulsive behavior, likely driven by social pressure or immediate needs.
- High-risk focus:** Even with low income, she is active in investing and crypto. She is looking for a "quick fix" or high returns to bridge her income gap, rather than traditional saving.
- Social finance:** She actively uses WiebetaalWat (a splitter) frequently for shared costs with roommates and friends.

**Major worries**

- Being able to buy a house in the future
- Student loan debt
- Liquidity

**Needs**

- More grip & control on her finances
- Stress reduction
- Transparency
- Proactive companionship
- Financial learning

**Pain points**

- Noa struggles to get a clear overview of her finances.
- She is using different financial platforms for different things. A banking app, an investment app and a splitter app.

Easy and conversational interaction

Chat or speech function

painpoint: uit eten en op dat splitsen

potjes

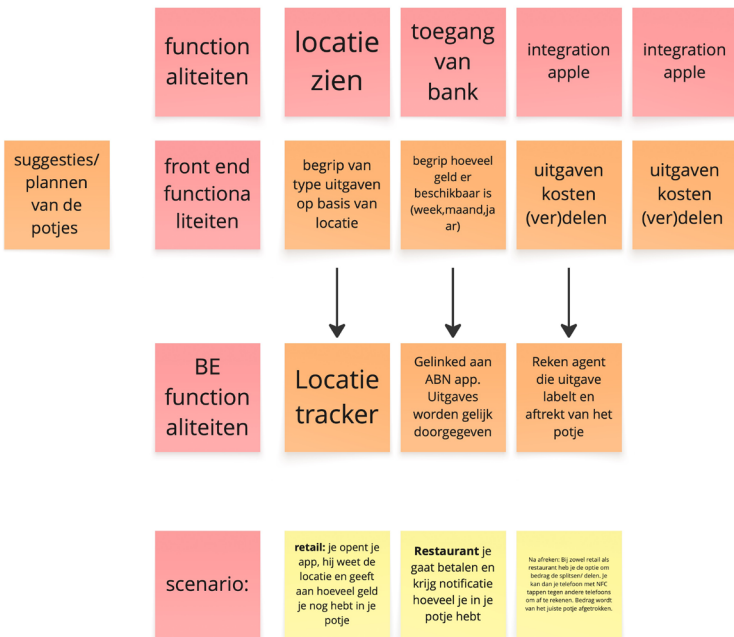
planner tool

wie betaald wat niet meer nodig

scope: op het moment dat ze wilt betalen

en als ze spent dan effect daarvan

Tap splitter functie naar vrienden



## Prompt created for Lovable - Team: Easy & Conversational Interaction

### Part 1: App Structure & Screens

Based on the sticky notes, here are the four core screens you need:

#### 1. The “Pulse” Home Screen (Dashboard)

Goal: Instant clarity on “How much can I spend right now?” (The “Noa struggles to get a clear overview” solver).

Key UI Elements:

- “Safe to Spend” Indicator: A large, friendly number (not total balance, but disposable daily/weekly allowance). <https://cdn.dribbble.com/userupload/45393567/file/244d56bd8b182d378f9fe4f9ba4ec4ba.jpg?resize=752x&...>
- Visual “Potjes” (Jars): Small cards for categories (Groceries, Social, Rent).
- Feed: A simple timeline of recent transactions and splits.

#### 2. The Context Mode (The “Retail/Restaurant” Scenario)

Goal: This triggers when the user enters a specific location (Store/Restaurant).

Key UI Elements:

- Location Card: “I see you are at De Pijp Bar.”
- Budget Advice: “You have €45 left in your ‘Social’ jar for this week.”
- Action Button: Big button for “I’m paying now.”

#### 3. The “Split It” Screen (Social Finance)

Goal: Painless bill splitting (The “painpoint: uit eten en op dat splitsen” solver).

Key UI Elements:

- Conversational Input: A chat interface where you can say “Split the bill at De Pijp with Sophie and Mark.”
- Tap to Share: Uses NFC or a QR code to instantly send split requests (Tikkie integration style).

#### 4. The Assistant/Chat Overlay

Goal: Easy interaction (Speech/Text).

Key UI Elements:

- A floating action button (FAB) that opens a voice/text interface to ask, “Can I afford these sneakers?” or “Move €20 from Savings to Groceries.”

### Part 2: The Vibe Coding Prompt

Copy and paste the text below into your AI coding tool.

System/Role: Expert Product Designer & Frontend Engineer (React Native/Expo or Next.js Mobile).

Context: We are building a mobile web app prototype called “Ole”. It is a financial companion for Gen Z students in Amsterdam. The vibe is “Financial duality”: it needs to be serious enough to trust

with money, but playful, impulsive, and social enough for a 20-year-old student.

Design Aesthetic (The Vibe):

Style: Neo-Brutalism meets Soft UI. Big bold typography, high contrast, but with rounded, friendly corners.

Palette: Background off-white/cream. Primary accents in “Gen Z Purple” and “Acid Green” (for money/positive actions). Warning states in soft coral.

Interaction: Highly conversational and card-based.

Font: Inter or Space Grotesk (clean but trendy).

Requirements - Please build a prototype with these 3 specific views:

### **1. The “Contextual Home” View:**

- At the top, display a “Safe to Spend” number for the day (e.g., “€18.50”).
- Below that, show a “Location Detected” card (simulate that the user is at a restaurant called “Mama Kelly”).
- Inside this card, show a notification: “You have €60 left in your ‘Eating Out’ Potje (Jar).”
- Include a prominent button: “Pay & Split.”

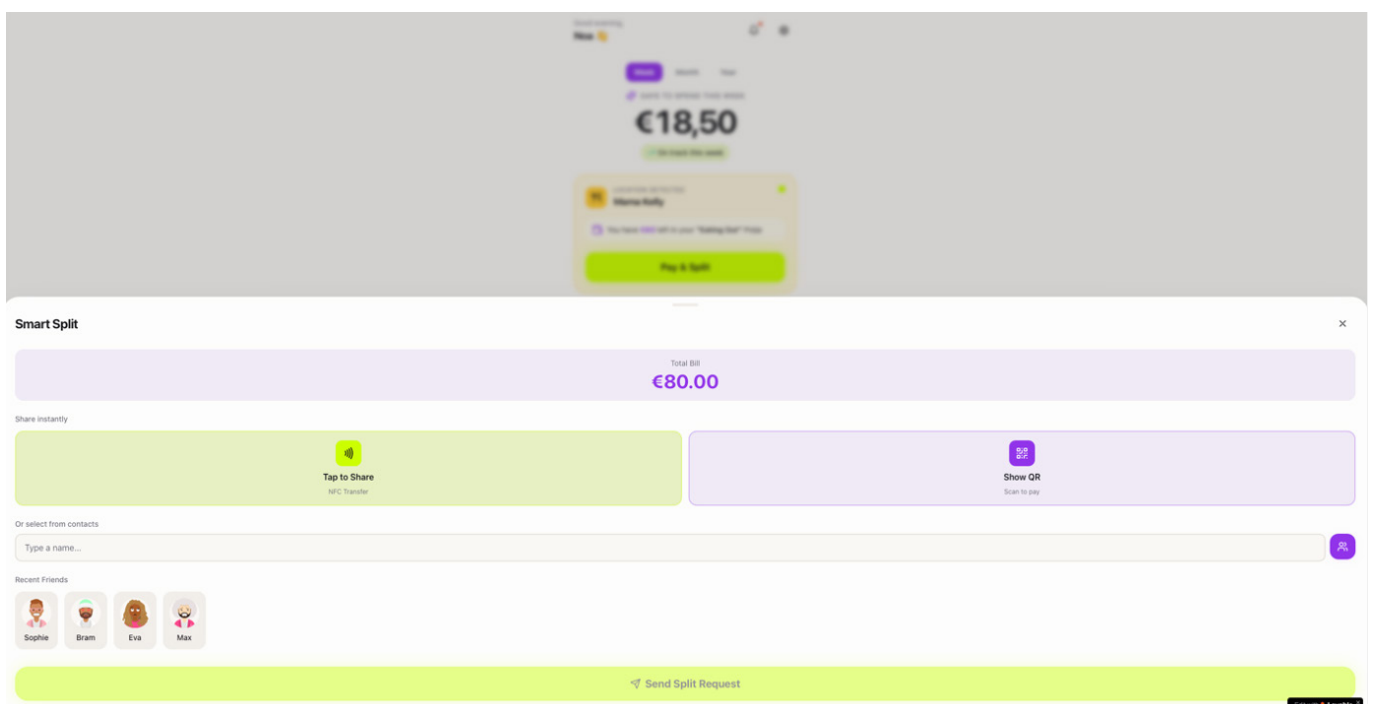
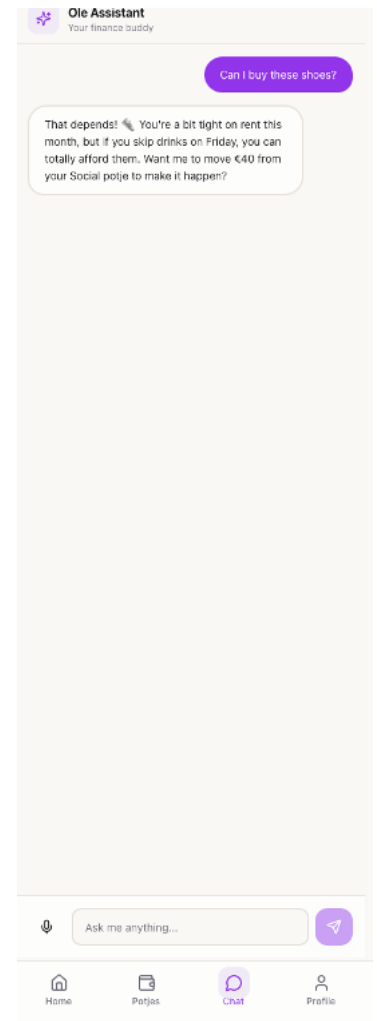
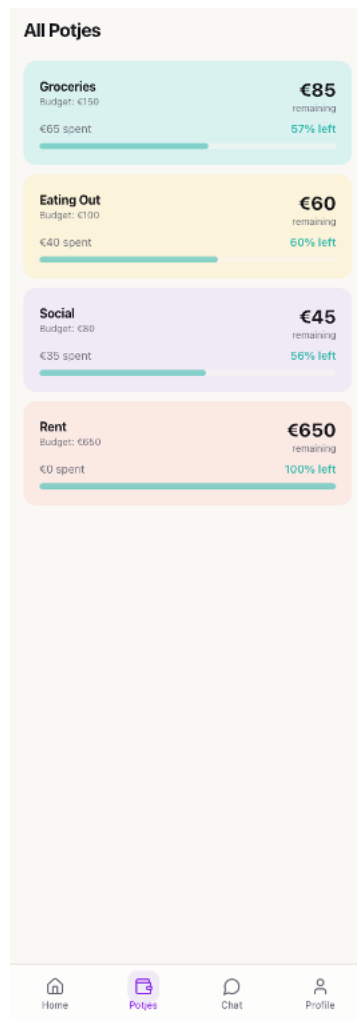
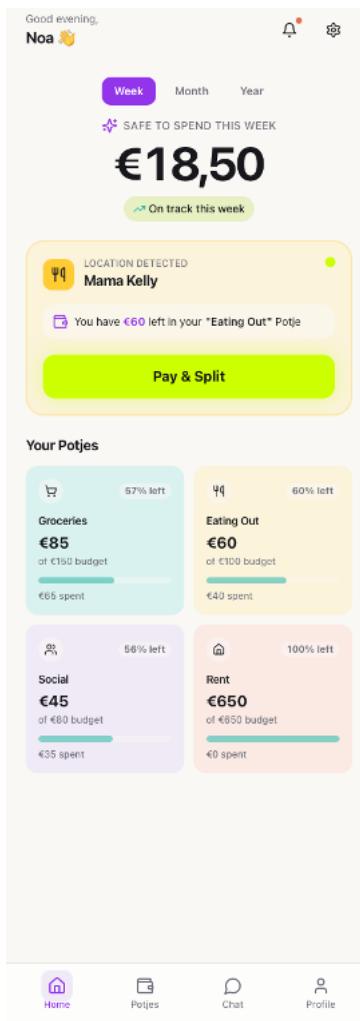
### **2. The “Smart Split” Modal:**

- When “Pay & Split” is clicked, open a sheet.
- Show the total estimated amount (e.g., €80).
- Show a conversational input field: “Who is eating with you?”
- Display a list of “Recent Friends” (Sophie, Bram, Eva) as tappable avatars to instantly split the bill.
- Show a final calculation: “You pay €20, requesting €20 from Sophie, Bram, and Eva.”

### **3. The “Conversational” Tab:**

- A chat interface where the user (Noa) is asking the AI finance assistant.
- User message: “Can I buy these shoes?”
- AI Response: “That depends. You’re tight on rent, but if you skip drinks on Friday, you can afford them.”

## Outcome - Team: Easy & Conversational Interaction

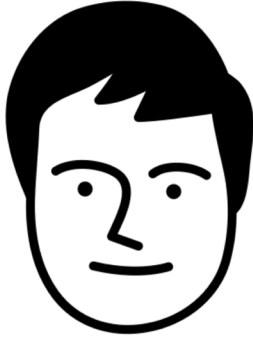


# L - Assessment List of Requirements

Requirements	Fynt	Trackie	Sptr
1) The product must provide an onboarding flow that explains: (a) Which UI elements can be customized, and (b) What the AI assistant can do	No	No	No
2) Users must be able to create, edit and delete shortcuts (e.g. direct payment)	No	No	No
3) Information about UI customization must be accessible via settings	No	No	No
4) Users must be able to enable or disable the AI assistant at any time	No	No	No
5) Users must be able to configure notification preferences	Yes	Yes	No
6) Users must be able to correct or override automated expense categorization	No	No	No
7) The system must adapt initial configuration based on responses to an onboarding questionnaire	Yes	Yes	No
8) The product must use basic contextual data (time and location) to influence system behavior	No	Yes	Yes
9) The AI assistant must support completing search queries	No	No	No
10) The product must support both text-based chat and voice input	No	No	Yes
11) Users must be able to explicitly accept or reject AI suggestions	No	No	Yes
12) Users must be able to manually stop or finish an active voice interaction	No	No	No
13) The product must display a consolidated financial overview	Yes	Yes	Yes
14) The product must integrate at least one external financial account or tool	Yes	No	yes
<b>Wishes</b>			
15) The UI must be simplified with not too many buttons	No	Yes	Yes
16) Visual examples must be provided of what users can change	No	No	No
17) There should be as little user administration necessary	Yes	Yes	Yes
18) Chat should provide financial insights if users ask	No	No	No
19) Provide categorization in savings pockets	Yes	Yes	Yes
20) Add intervention notifications (should you buy this?)	No	Yes	No
21) Option to make a financial planning	No	No	Yes
22) Product should help users with advanced budgeting	Yes	Yes	Yes
23) Add a calculator function	No	No	No
24) The UI should have adaptive contextual UI elements	No	Yes	Yes
25) Include gamification functionalities with positive feedback	No	Yes	No
26) Pro-actively coaching users	No	Yes	No
27) The product must support a pay-and-split functionality between at least two users	Yes	No	Yes

# M - Personas

## M.1 20-year-old student



### Ben de Wit

<b>Age</b>	20 years old
<b>Location</b>	Rotterdam, The Netherlands
<b>Occupation</b>	Student
<b>Income level</b>	Student loan

### Relationship with finances

Ben lives in a state of financial duality. On one hand, he is stressed about paying off his student loan in the future; on the other, he is impulsively spending currently.

- **Feeling stressed:** He constantly feels like her balance is zero or near zero. The high cost of living in Rotterdam as a student drains his accounts quickly.
- **Impulsive spending:** Despite the stress, he exhibits impulsive behavior, likely driven by social pressure or immediate needs.
- **High-risk focus:** Even with low income, he is actively investing in crypto. He is looking for a "quick fix" or high returns to bridge his income gap, rather than traditional saving.
- **Social finance:** He actively uses WieBetaaltWat (a splitser) frequently for shared costs with roommates and friends.

### Quote

*"I need to go out with friends even if I don't have money at the moment"*

*"I am always waiting for the 24th of the month to pay off some debts"*

### Goals

- Successfully bridge the monthly financial gap without asking parents for help or using 'buy now, pay later' services.
- Maintain his social life and status among friends without constantly having to decline invitations due to lack of funds.
- Hopes his crypto portfolio will result in enough money to pay off his student debt in one go.

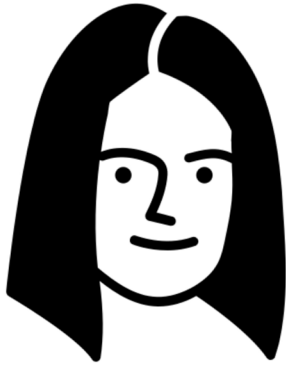
### Pain points

- He is terrified to open his banking app because he knows the balance is low; this avoidance leads to missed payments and further stress.
- he often pays upfront for rounds of drink to look good socially, but friend pay him back days later or forget to pay back, leaving him not having enough cash for daily spending.
- He loses track of small, impulsive transactions which destroy his budget before fixed costs are paid

### Needs

- Pro-active companionship. He needs a financial product that actively intervenes before a purchase is made, rather than just showing a history of mistakes.
- Safe to spend indication. Instead of a total account balance, he needs a specific number showing exactly what is truly free to spend today.
- Automated debt skimming. A system that automatically skims small amounts or takes a percentage of incoming money immediately to pay off debts, so he never "sees" that money available for spending.

## M.2 17-year-old pupil



### Mette Bergsma

<b>Age</b>	17 years old
<b>Location</b>	Sneek, The Netherlands
<b>Occupation</b>	Pupil
<b>Income level</b>	Pocket money + clothing allowance + side job

### Relationship with finances

For Mette, money isn't a serious responsibility. It's just the fuel she needs to keep up with the perfect lifestyle she sees on Instagram. She treats her bank account like a reloadable gift card for shopping and snacks.

- **Boring interaction.** She prefers to use other apps than financial apps, because the user interface looks boring. If the app isn't as engaging as Instagram or DuoLingo, she loses interest.
- **Separation clothing allowance.** She struggles to distinguish between her clothing allowance and pocket money. Often, funds meant for a sweater are spent on snacks.
- **Dependent of parents.** Her parents are her safety net. She wants to be independent, but currently, her financial strategy is "ask Mom for a reload" when the balance hits zero.
- **Saving as a game.** She is open to saving, but only if it feels rewarding. Traditional interest rates mean nothing to her; she responds better to visual progress bars, goals, or streaks.

### Quote

*"Why does my banking app look like an Excel sheet? It gives me zero dopamine to look at it."  
"I try to save, but then I see something on Vinted and... oops."*

### Goals

- Saving for a specific, high-value visual goal without dipping into her clothing allowance.
- To understand "adult" money concepts before she turns 18, but only if delivered in short, snackable content.
- To be able to see at a glance how much money she actually has left for "fun" versus "clothes."

### Pain points

- She finds categorizing transactions manually to be tedious and boring. If it's not automated, she won't do it.
- The pressure to join in on group gifts, dinners or trends often overrides her saving intentions, leading to guilt afterwards.
- She finds it annoying when her parents lecture her about spending, but she also feels anxiety about turning 18 and having to manage everything herself.

### Needs

- She needs a highly visual, customizable banking interface that feels like a lifestyle app.
- A feature where her parents can incentivize her saving rather than just monitoring her spending.
- Instead of a spreadsheet view, she needs friendly nudges or notification that sound like a friend.

## M.3 26-year-old freelancer



### Anna Klopper

<b>Age</b>	26 years old
<b>Location</b>	Tilburg, The Netherlands
<b>Occupation</b>	Freelancer
<b>Income level</b>	Fluctuating freelance income

### Relationship with finances

Anna lives in the "Freelance Trap": she has income, but she never truly knows how much of it is hers to spend. Her financial stress stems from volatility rather than a simple lack of funds.

- **Tax overview.** When a large invoice is paid, she feels momentarily wealthy and may upgrade her lifestyle, often forgetting that a significant chunk belongs to the Belastingdienst or is needed for next month's lean period.
- **Platform fatigue.** She feels fragmented. She uses a business bank for invoices, a private bank for spending, an investment app for her "future," and a splitting app for social life. She lacks a clear overview.
- **Buying a house.** She feels stresses about buying a house. House prices are very high and the costs of living in Amsterdam currently are also very expensive.
- **Admin anxiety.** She delays looking at her finances not because she is broke, but because the administrative burden of separating business from private expenses is mentally draining.

### Quote

*"I have a difficult time in organizing my income and making a financial planning for buying a house soon."*

*"I see €3,000 come in and think 'I'm rich!', but then I remember quarterly taxes are due next week and I panic."*

### Goals

- Her primarily long-term goal is to buy an apartment in or near Amsterdam, which currently feels impossible due to high housing prices.
- She wants to create a system where she pays herself a steady salary from her freelance earnings to top the emotional rollercoaster of variable income.
- To always know exactly how much money she needs to set aside for VAT and income tax so she never accidentally spends it

### Pain points

- Anna struggles to get a clear overview of her finances because her data is scattered across business and private accounts, making her net worth unclear.
- She is using different financial platforms for different things (banking, investing, splitting), which creates mental friction.
- The fluctuation in her income makes it hard to commit to recurring subscriptions or fixed savings plans.

### Needs

- A dashboard that aggregates her business and private data to show her True Spending Power.
- An app that acts as a business partner, notifying her: "You had a great month! Put 30% in this tax bucket now so you don't worry later".
- Specific guidance on how freelancers can build creditworthiness for a mortgage.
- Automated sorting of transactions so she doesn't have to manually tag every coffee as business or private.

# N - Example Iteration Process

## Iteratie 1

Maak een iteratieve website basierend op het bestaande design maar voeg in het ontwerp de volgende wijzigingen toe: **1. Maak de tabel met de laatste 10 berichten in de feed van de gebruiker te zien.**

Maak een iteratieve website basierend op het bestaande design maar voeg in het ontwerp de volgende wijzigingen toe: **2. Voeg een filter toe om berichten te sorteren op datum.**

1. **Maak de tabel met de laatste 10 berichten in de feed van de gebruiker te zien.**
  - De tabel moet de laatste 10 berichten van de gebruiker tonen.
  - De berichten moeten in de volgende volgorde worden weergegeven:
    1. Berichten van vrienden
    2. Berichten van familie
    3. Berichten van andere gebruikers
  - De berichten moeten de volgende informatie bevatten:
    - Naam van de gebruiker
    - Profiel afbeelding
    - Berichttekst
    - Datum van het bericht
    - Aantal reacties
  - De berichten moeten in een lijst worden weergegeven.
  - De berichten moeten in een lijst worden weergegeven.
2. **Voeg een filter toe om berichten te sorteren op datum.**
  - De filter moet de volgende opties hebben:
    1. Nieuwste
    2. Oudste
  - De filter moet de volgende informatie bevatten:
    - Filternaam
    - Filterwaarde
  - De filter moet de berichten sorteren op datum.
  - De filter moet de berichten sorteren op datum.

## Iteratie 2

Maak een iteratieve website basierend op het bestaande design maar voeg in het ontwerp de volgende wijzigingen toe: **3. Voeg een filter toe om berichten te sorteren op locatie.**

Maak een iteratieve website basierend op het bestaande design maar voeg in het ontwerp de volgende wijzigingen toe: **4. Voeg een filter toe om berichten te sorteren op categorie.**

3. **Voeg een filter toe om berichten te sorteren op locatie.**
  - De filter moet de volgende opties hebben:
    1. Alle locaties
    2. Amsterdam
    3. Rotterdam
    4. Utrecht
    5. Den Haag
  - De filter moet de volgende informatie bevatten:
    - Filternaam
    - Filterwaarde
  - De filter moet de berichten sorteren op locatie.
  - De filter moet de berichten sorteren op locatie.
4. **Voeg een filter toe om berichten te sorteren op categorie.**
  - De filter moet de volgende opties hebben:
    1. Alle categorieën
    2. Sport
    3. Reizen
    4. Eten en drinken
    5. Kunst
  - De filter moet de volgende informatie bevatten:
    - Filternaam
    - Filterwaarde
  - De filter moet de berichten sorteren op categorie.
  - De filter moet de berichten sorteren op categorie.

## Iteratie 3

Maak een iteratieve website basierend op het bestaande design maar voeg in het ontwerp de volgende wijzigingen toe: **5. Voeg een filter toe om berichten te sorteren op trefwoord.**

Maak een iteratieve website basierend op het bestaande design maar voeg in het ontwerp de volgende wijzigingen toe: **6. Voeg een filter toe om berichten te sorteren op trefwoord.**

5. **Voeg een filter toe om berichten te sorteren op trefwoord.**
  - De filter moet de volgende opties hebben:
    1. Alle trefwoorden
    2. Sport
    3. Reizen
    4. Eten en drinken
    5. Kunst
  - De filter moet de volgende informatie bevatten:
    - Filternaam
    - Filterwaarde
  - De filter moet de berichten sorteren op trefwoord.
  - De filter moet de berichten sorteren op trefwoord.
6. **Voeg een filter toe om berichten te sorteren op trefwoord.**
  - De filter moet de volgende opties hebben:
    1. Alle trefwoorden
    2. Sport
    3. Reizen
    4. Eten en drinken
    5. Kunst
  - De filter moet de volgende informatie bevatten:
    - Filternaam
    - Filterwaarde
  - De filter moet de berichten sorteren op trefwoord.
  - De filter moet de berichten sorteren op trefwoord.

7. **Voeg een filter toe om berichten te sorteren op trefwoord.**
  - De filter moet de volgende opties hebben:
    1. Alle trefwoorden
    2. Sport
    3. Reizen
    4. Eten en drinken
    5. Kunst
  - De filter moet de volgende informatie bevatten:
    - Filternaam
    - Filterwaarde
  - De filter moet de berichten sorteren op trefwoord.
  - De filter moet de berichten sorteren op trefwoord.
8. **Voeg een filter toe om berichten te sorteren op trefwoord.**
  - De filter moet de volgende opties hebben:
    1. Alle trefwoorden
    2. Sport
    3. Reizen
    4. Eten en drinken
    5. Kunst
  - De filter moet de volgende informatie bevatten:
    - Filternaam
    - Filterwaarde
  - De filter moet de berichten sorteren op trefwoord.
  - De filter moet de berichten sorteren op trefwoord.

9. **Voeg een filter toe om berichten te sorteren op trefwoord.**
  - De filter moet de volgende opties hebben:
    1. Alle trefwoorden
    2. Sport
    3. Reizen
    4. Eten en drinken
    5. Kunst
  - De filter moet de volgende informatie bevatten:
    - Filternaam
    - Filterwaarde
  - De filter moet de berichten sorteren op trefwoord.
  - De filter moet de berichten sorteren op trefwoord.
10. **Voeg een filter toe om berichten te sorteren op trefwoord.**
  - De filter moet de volgende opties hebben:
    1. Alle trefwoorden
    2. Sport
    3. Reizen
    4. Eten en drinken
    5. Kunst
  - De filter moet de volgende informatie bevatten:
    - Filternaam
    - Filterwaarde
  - De filter moet de berichten sorteren op trefwoord.
  - De filter moet de berichten sorteren op trefwoord.

11. **Voeg een filter toe om berichten te sorteren op trefwoord.**
  - De filter moet de volgende opties hebben:
    1. Alle trefwoorden
    2. Sport
    3. Reizen
    4. Eten en drinken
    5. Kunst
  - De filter moet de volgende informatie bevatten:
    - Filternaam
    - Filterwaarde
  - De filter moet de berichten sorteren op trefwoord.
  - De filter moet de berichten sorteren op trefwoord.
12. **Voeg een filter toe om berichten te sorteren op trefwoord.**
  - De filter moet de volgende opties hebben:
    1. Alle trefwoorden
    2. Sport
    3. Reizen
    4. Eten en drinken
    5. Kunst
  - De filter moet de volgende informatie bevatten:
    - Filternaam
    - Filterwaarde
  - De filter moet de berichten sorteren op trefwoord.
  - De filter moet de berichten sorteren op trefwoord.

# O - Project Brief



## Personal Project Brief – IDE Master Graduation Project

Name student Joppe Roorda

Student number 4869729

### PROJECT TITLE, INTRODUCTION, PROBLEM DEFINITION and ASSIGNMENT

Complete all fields, keep information clear, specific and concise

Designing Adaptive Interfaces in the Age of Malleable Software

#### Project title

*Please state the title of your graduation project (above). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.*

#### Introduction

*Describe the context of your project here; What is the domain in which your project takes place? Who are the main stakeholders and what interests are at stake? Describe the opportunities (and limitations) in this domain to better serve the stakeholder interests. (max 250 words)*

Accenture is a global professional services company that delivers consulting projects in strategy, technology, and operations. With around 800,000 employees, it helps organizations drive digital transformation and innovation. This graduation project takes place within Accenture Song, a tech-powered creative group, specifically in the Design & Digital Products (D&DP) team in the Netherlands.

The D&DP team designs and develops digital products for clients in industries such as finance, healthcare, and retail. A key trend in this domain is hyper-personalization, which uses AI and real-time data to deliver highly tailored customer experiences (Finio & Downie, 2025). Around 70% of consumers expect personalized experiences, and companies that successfully deliver personalized experiences generate up to 40% more revenue than slower-growing competitors (McKinsey, 2021).

A related concept is malleable software, which refers to digital products that allow users to adapt interfaces and functionalities to their specific needs. Unlike traditional system-driven personalization, malleable software gives users direct control over interfaces and features. For example, a customizable financial dashboard lets users rearrange tools to match their workflow.

For Accenture Song, these trends represent both an opportunity and a challenge to prepare and adapt to both client and customer expectations in the future. The company frequently develops a Point of View (PoV), which is a strategic report outlining market trends and Accenture's approach, to engage potential clients. By exploring how to design adaptive, user-centric digital products, this project aims to deliver actionable insights and frameworks that strengthen PoVs and enhance client offerings.

→ space available for images / figures on next page

## Personal Project Brief – IDE Master Graduation Project

### Problem Definition

*What problem do you want to solve in the context described in the introduction, and within the available time frame of 100 working days? (= Master Graduation Project of 30 EC). What opportunities do you see to create added value for the described stakeholders? Substantiate your choice.  
(max 200 words)*

The concept of malleable software is gaining attention in technology innovation circles but remains largely unfamiliar within Accenture Song. Interviews with the D&DP team revealed that its potential impact on design work, client expectations, and future workflows is unclear to many colleagues. While interest is growing, the concept is still abstract and lacks practical application in current design practices.

Accenture Song aims to lead in emerging technologies, making it essential for teams to understand how malleable software could shape future digital experiences. The challenge lies in translating this concept into tangible strategies that inform design and strengthen client-facing deliverables like PoVs.

This project presents two key opportunities: (1) raising internal awareness by clarifying what malleable software is and why it matters, and (2) exploring its broader impact on personalization, adaptability, and client engagement. By developing prototypes and a strategic framework, the project can help position Accenture Song as a thought leader and potentially unlock future client projects. This strategic framework will provide guidance on how Accenture Song can apply personalization across different industries.

### Assignment

*This is the most important part of the project brief because it will give a clear direction of what you are heading for. Formulate an assignment to yourself regarding what you expect to deliver as result at the end of your project. (1 sentence) As you graduate as an industrial design engineer, your assignment will start with a verb (Design/Investigate/Validate/Create), and you may use the green text format:*

Create guidelines for designing and building interface prototypes to demonstrate how malleable software principles can enable adaptive, user-centric digital products within the context of hyper-personalization

*Then explain your project approach to carrying out your graduation project and what research and design methods you plan to use to generate your design solution (max 150 words)*

This project follows a research-through-design approach, combining exploratory research with interface prototyping to explore the potential of malleable software. The focus lies on front-end interface design, investigating how user-facing components can support adaptability and personalization. The Double Diamond method will guide the process, supported by ideation workshops, rapid prototyping, and expert interviews.

Phase one involves contextual research, including literature research and expert interviews, to identify user needs, constraints, and define which aspect of hyper-personalization to address. Phase two synthesizes insights and develops hypotheses on how malleable software can improve personalization and adaptability. In phase three, interface prototypes will be created to test these hypotheses and demonstrate potential value.

The final phase delivers a design framework and strategic recommendations for integrating malleable software into Accenture Song's design practices and PoVs, helping target the right clients and implement more personalized digital products.

### Project planning and key moments

To make visible how you plan to spend your time, you must make a planning for the full project. You are advised to use a Gantt chart format to show the different phases of your project, deliverables you have in mind, meetings and in-between deadlines. Keep in mind that all activities should fit within the given run time of 100 working days. Your planning should include a **kick-off meeting, mid-term evaluation meeting, green light meeting and graduation ceremony**. Please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any (for instance because of holidays or parallel course activities).

Make sure to attach the full plan to this project brief.  
The four key moment dates must be filled in below

Kick off meeting	<u>22 September 2025</u>
Mid-term evaluation	<u>18 November 2025</u>
Green light meeting	<u>27 January 2026</u>
Graduation ceremony	<u>20 February 2026</u>

In exceptional cases (part of) the Graduation Project may need to be scheduled part-time. Indicate here if such applies to your project

Part of project scheduled part-time	<input type="checkbox"/>
For how many project weeks	
Number of project days per week	

Comments:

### Motivation and personal ambitions

Explain why you wish to start this project, what competencies you want to prove or develop (e.g. competencies acquired in your MSc programme, electives, extra-curricular activities or other).

Optionally, describe whether you have some personal learning ambitions which you explicitly want to address in this project, on top of the learning objectives of the Graduation Project itself. You might think of e.g. acquiring in depth knowledge on a specific subject, broadening your competencies or experimenting with a specific tool or methodology. Personal learning ambitions are limited to a maximum number of five.

(200 words max)

I am motivated to pursue this graduation project because it offers a unique opportunity to work within a large consulting firm at the intersection of business, strategy, and technology, an environment that closely aligns with my interests. This motivation stems from previous experiences, such as working at a student consultancy firm, doing an innovation-focused internship at Rabobank and contributing as a design engineer at Delft Hyperloop.

Through this project, I aim to learn from Accenture Song's expertise in digital product design and innovation. I became particularly enthusiastic about designing digital products during my bachelor's final project for Ahold Delhaize, in which I had to develop the shopping experience for 2035. For this project, I developed a user interface for an interactive shopping cart that enabled greater personalization and transparency.

My personal learning goals include:

1. Experimenting with advanced prototyping tools and methods to rapidly explore and communicate design concepts
2. Strengthening interview skills by engaging with experts from diverse disciplines to gather meaningful insights
3. Learning how to effectively apply design skills within a large corporate environment, collaborating across departments and areas of expertise

