UNIVERSITETET I BERGEN

GRUPPE

5733

PRØVE

INFO263 0 Interaksjonsdesign og prototyping

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Seksjon 1

Oppgave	Tittel	Oppgavetype
i	Introduction	Informasjon eller ressurser
i	Plagiarism and declaration	Informasjon eller ressurser
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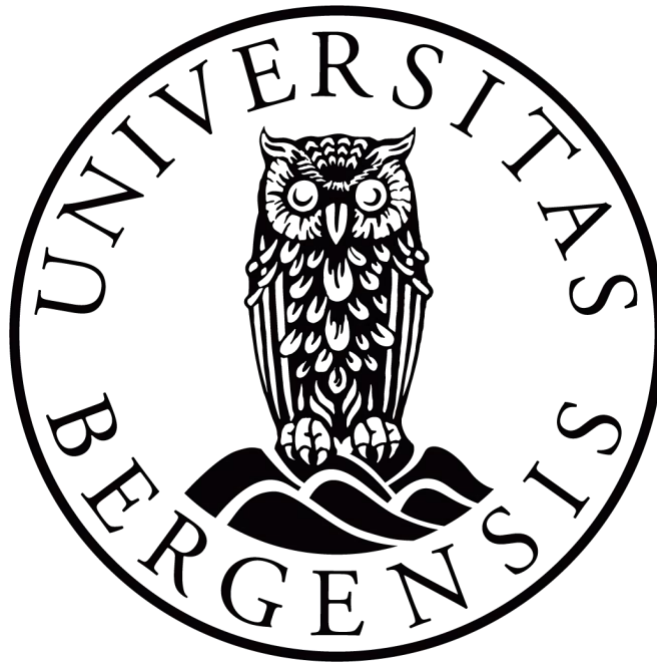| Filnavn:	Semester_assignment_INFO263.pdf
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Designing a Sustainable Exercise App

INFO263 – Interaction Design and Prototyping

Semester assignment

Spring 2023

Students: 140, 162, 163, 239, 249

Word count: 3395

Innholdsfortegnelse

1.0 Introduction

Environmental pollution caused by littering poses significant threats to natural habitats, wildlife, and human health. The litter often contains materials such as plastic, glass, and metal that decompose slowly and release harmful chemicals and pollutants into the environment. It may endanger animals who mistake litter for food or use it for shelter, resulting in injuries and deaths. Technological innovations present opportunities for addressing this issue. Our group has developed a design inspired by the global movement of *plogging*, originating from Sweden, which promotes environmental responsibility by encouraging people to clean up litter while being active outdoors. To incentivize participation, our design rewards users with points for registering and recycling litter found outdoors. Users earn the most points by verifying that they have recycled the litter, which can be redeemed for coupons and serves as player points in the gamified features of the application.

Our target audience comprises individuals aged 13 and above who value outdoor activities and prioritize environmental sustainability. These characteristics are elaborated upon in our personas section for a more comprehensive understanding.

2.0 Background and Inspiration

As we began this assignment, we shared a common concern and frustration regarding today's littering situation. We wanted to design something we were all passionate about, and discussed subjects like Pokémon Go, plogging and fitness apps. As we settled on *littering* as our main problem, we brainstormed how to create something that would motivate users to be a part of the green movement and reduce both local- and worldwide littering-issues.

We formed a general idea of what we wanted the application to look and feel like, then focused specifically on attributes to include and motivate users, such as gamification, a rewards-system, social features, and availability. Inspired by the concept of plogging, we wanted to incorporate high- and low intensity workouts as part of the concept. Overall, an application based on a combination of environmental protection, increase physical activity and taking advantage of the

increasing trend of gamification and rewards-systems. With an established foundation of our idea, we were ready to gather information about potential competitors.

2.1 Competitors

Although plogging is a relatively new concept, there already exists an established market for it. This indicates a wide range of similar looking ideas, which we wanted to differentiate ourselves from. To get a better overview of the available solutions, we conducted a brief competitive analysis, as shown in figure 1.

	Go Plogging	Rydde	Plogger	Plogalong	Marine Litter Reporter
Location tracker	✓	✓	✓	✓	✓
Gamified	✓	✗	✓	✓	✗
Document clean-up	✓	✓	✓	✓	✗
Reward system	✗	✗	✗	✓	✗
Report problem	✓	✓	✓	✓	✓
Events	✗	✓	✗	✗	✗
Hotspot Notification	✓	✗	✗	✗	✓
Sorting system	✗	✓	✓	✗	✗
Picture sharing	✗	✗	✗	✓	✗

Figure 1: Competitive analysis of similar applications and their attributes

This helped us identify direct and indirect competitors in the market, understand the landscape of the industry and identify potential threats and opportunities (Kaul & Vivek, 2015). We sought out applications which focused either on plogging as a concept, or the general idea of motivating users to collect litter in local areas. Thereby, we were able to gain insights on marked trends, how to differentiate our application and gain a competitive advantage.

2.2 Sustainability

With an established idea, an overview of our competitors, and potential threats and opportunities, we wanted to ensure that our application would contribute to making a difference. Our design and functionality choices were influenced by various United Nations Sustainability Development Goals (UN General Assembly, 2015). Below are a few illustrations of how our application aligns with these goals:

- SDG 11: Sustainable cities and communities
  - By reducing litter in the environment, it contributes to creating cleaner and more sustainable cities and communities.
- SDG 12: Responsible consumption and production
  - By encouraging recycling, it helps promote responsible consumption and production.
- SDG 13: Climate action
  - By reducing the amount of waste polluting the environment, the app helps mitigate climate change.
- SDG 14 and 15: Life below water and Life on land
  - Helps protect life both below water and on land. Ensures less plastic pollution in the oceans.
- SDG 17: Partnership of the goals
  - Promotes collaboration and community-building among users, creating a movement towards achieving the UN SDGs.

Figure 2: Incorporated United Nations Sustainability Goals

3.0 Design Process

Taking into consideration that this semester assignment is focused on the concept of mutual learning in design we wanted to have a high degree of user participation in our project design process. We wanted to explore the concept of co-creation and decided early that we wanted to give the users involved power and co-determination when making design decisions (Bratteteig, p. 19-23). After defining our conceptual idea, we organized the design process of our project in two main steps, involving our userbase in both.

3.1 Initial Preparations

At the initial stages of our project, we made a low-fidelity sketch (Bratteteig, p. 267) of our concept to describe the general look and functionality of our app. We also made concept designs and illustrations showing the look and feel of our app-idea with colors, pictures, different fonts, etc. To further materialize different functionalities of our idea we created two user personas with corresponding scenarios (Bratteteig, p. 259) that described how different people might appreciate the application and find it useful.

Based on these user stories we created an interview-guide (Appendix A) and picked out five people to do an informal, semi-structured interview (Bratteteig, p. 226) where the goal was to uncover initial user-based feedback for our concept. The interviews were conducted in a neutral setting where the subjects' answers were written down and documented. These initial interviews gave us some valuable insights to improve upon our idea, like additional features, choice of name and colors and an improved focus on recycling/littering rather than exercise and jogging.

3.2 Personas

To better understand and empathize with our target users, we created one primary- and one secondary persona. By creating a fictional representation of a user that embodies the characteristics and behaviors of the real target audience, we gained valuable insights regarding user needs, goals, and pain points, helping us create experiences that are more user-centered,

intuitive, and effective. As shown in appendix B and C we additionally created a user story and a scenario for each persona.
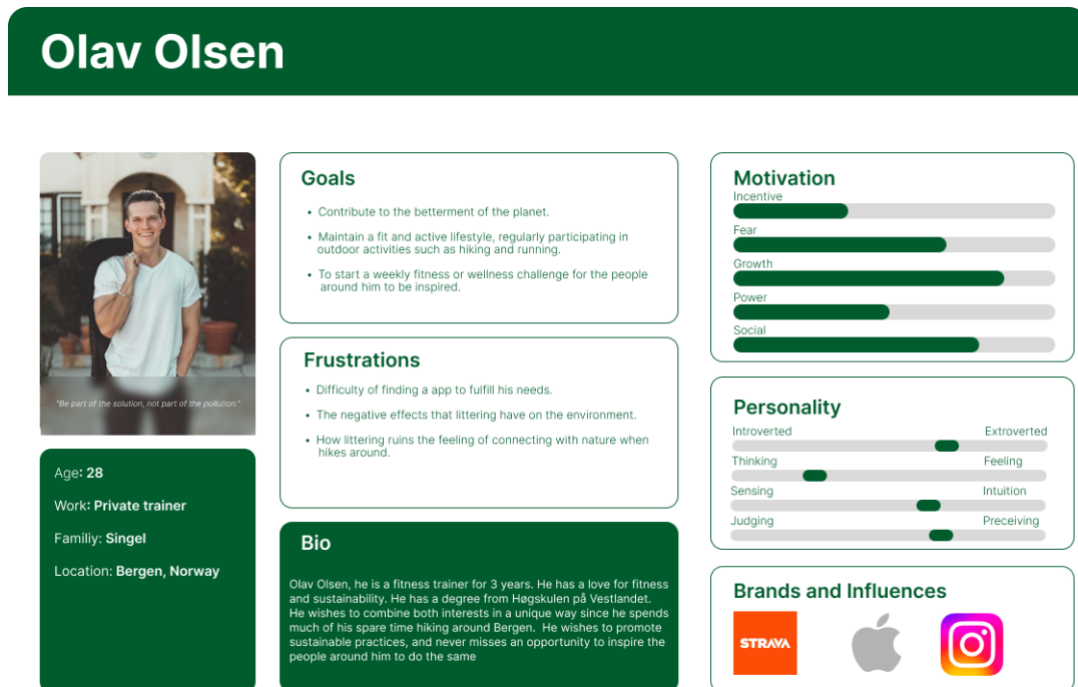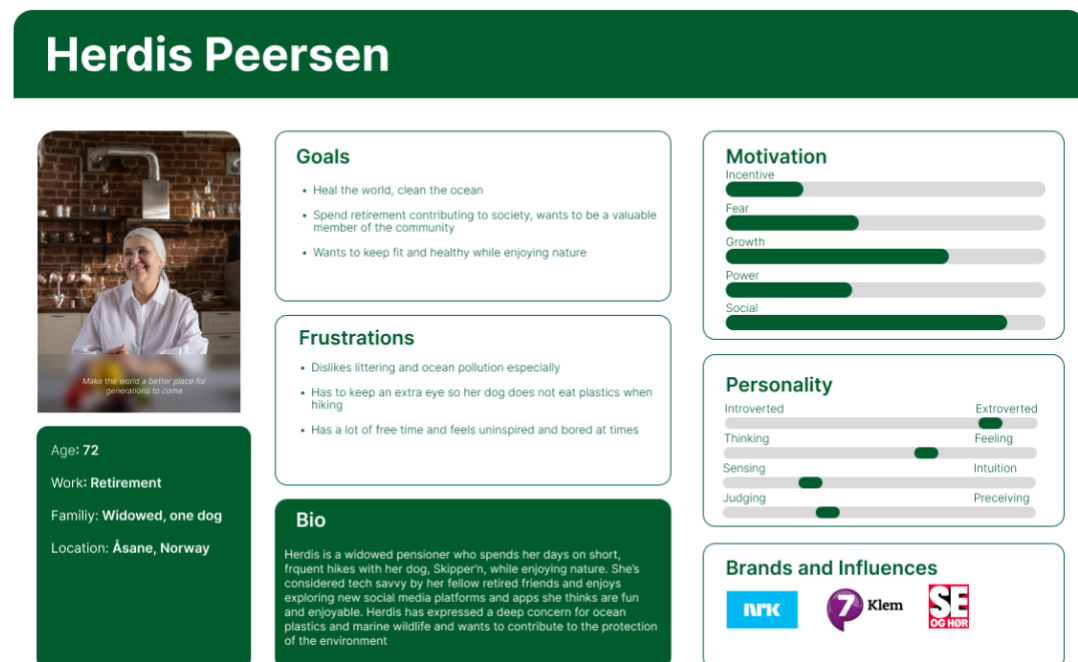

Figure 3: Primary persona

Figure 4: Secondary persona

3.3 Prototyping and Workshop

After developing low-fidelity prototypes, we used them to create a mid-fidelity prototype, as explained in section 4.0 of this assignment. This prototype was the foundation for the second phase of our design process, which involved a workshop where we engaged with users further.

The workshop was conducted in a controlled environment with four participants, and it lasted for an hour. We started by ensuring that all participants understood the objectives and agreed to comply with GDPR rules. We then presented our concept idea, including the prepared personas, initial design ideas, and the mid-fidelity prototype. The majority of the workshop was spent in an open-ended brainstorming session, where we solicited feedback on our concept. We guided the conversation through the same questions and challenges we had encountered during our initial interviews. This session generated a list of suggestions for improving our concept, which we later organized using the dot-voting method (Platz, 2021),. Participants placed stickers on the ideas and suggestions they liked the most, which allowed us to prioritize the feedback and make appropriate adjustments to our design.

Figure 5: The dot-voting session, translated in Miro

The workshop concluded with us expressing our gratitude to the participants for their time and effort and regretting our inability to offer prizes or gift cards as incentives. Our objective with the workshop was to obtain valuable feedback on our initial design ideas and development approaches, identify issues, and identify the best features of our project. Finally, we aimed to

derive a list of the most critical insights, both positive and negative, from our focus group. Our workshop's execution was based on the principles of designing for an enjoyable user experience through co-creation, co-determination, and mutual learning.

3.4 Post Workshop

One week after the workshop, we reconvened and created an affinity map using colored post-it notes assigned to each participant. The map helped us identify crucial challenges and issues that needed to be addressed in the future development of our project (McElroy, 2017, p.107). From the map, we extracted "key insights" - the most significant areas requiring our attention to advance the development of our app.
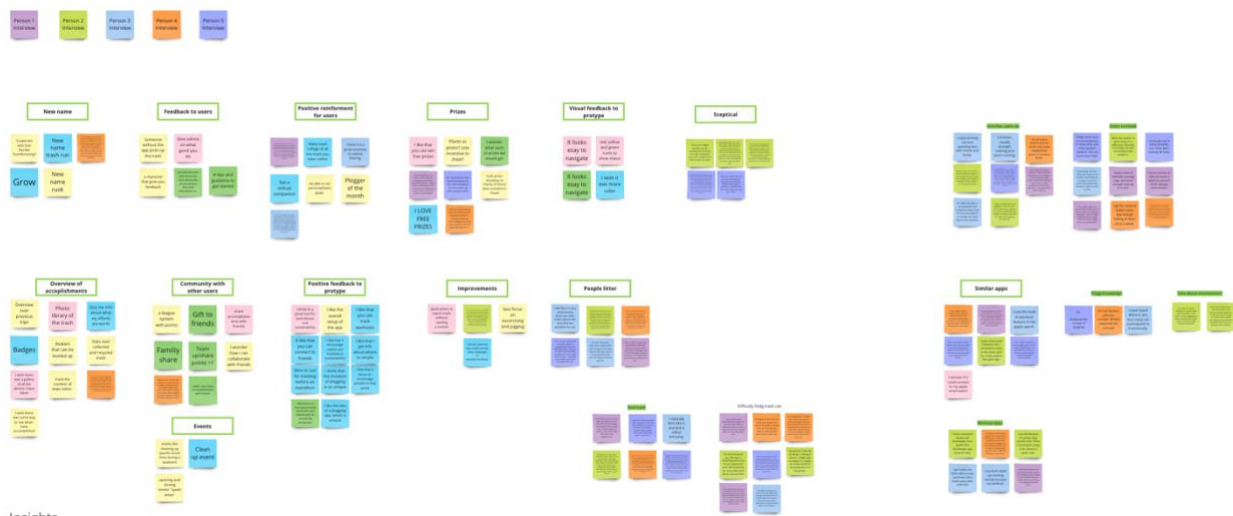
Figure 6: Affinity mapping

We comprised our key insights from the workshop like this:

- Users have a desire for incentives to stay motivated
- Users have a positive view of the app
- Users want a new name
- Users like to see what they have accomplished

9

- Users have a positive outlook on the prototype

- Users think the concept should shift towards hiking rather than jogging

- Users would like the app to focus on charity and volunteer work
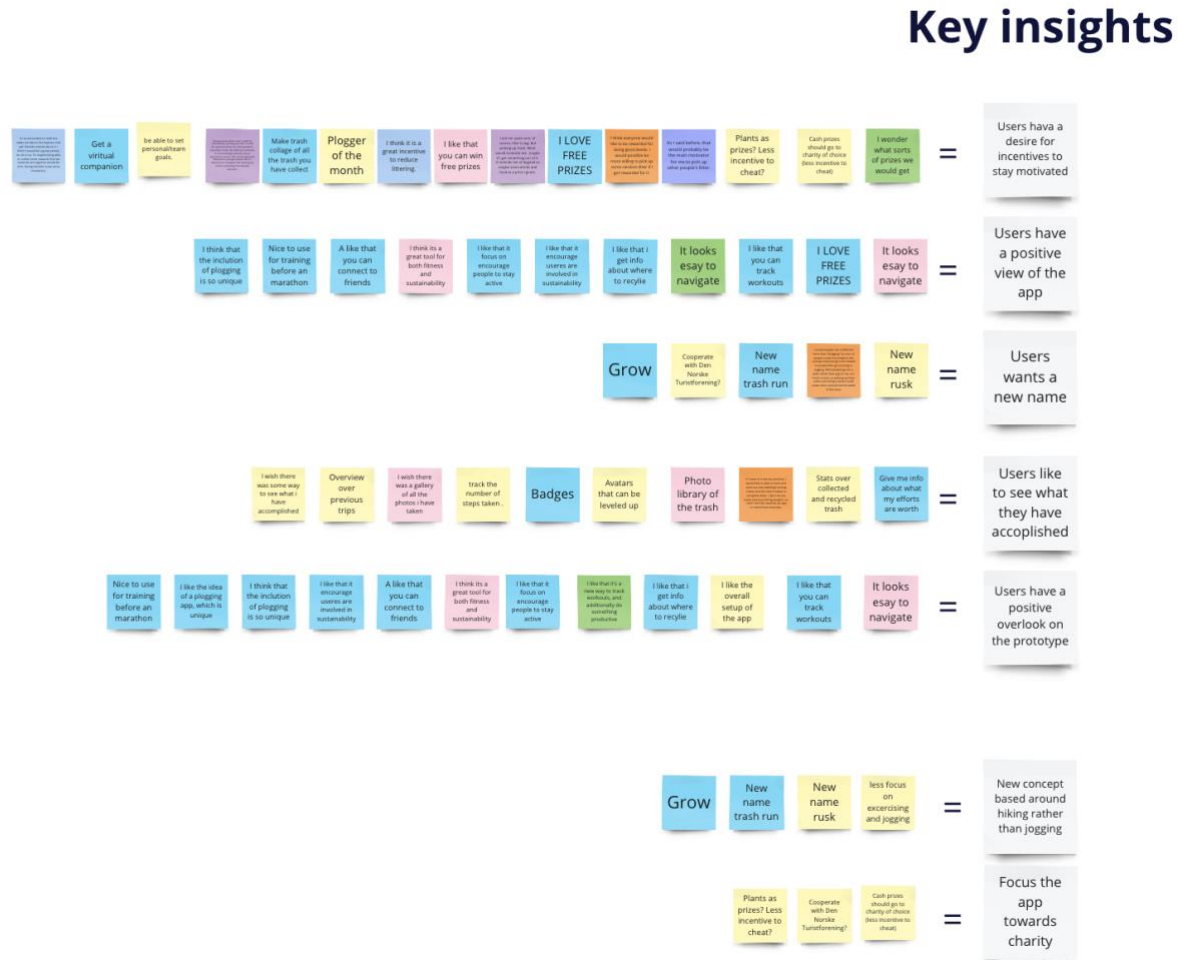
Figure 7: Key insights

To summarize, our workshop proved to be a success in terms of providing valuable insights for the future development of our project. We have gained new perspectives that we may not have otherwise considered, which has prompted us to make some changes to our initial concept. Some of these changes included altering the working title to RUSK, as well as exploring potential partnerships with Den Norske Turistforening.

4.0 Prototype and The Rationale for Design Choices

In designing the app, our group aimed to adhere to fundamental design principles and best practices while upholding the concept of mutual learning that we previously discussed. In addition, we wanted our prototypes to fully explore the diverse roles that the app is expected to fulfill, as outlined by Stephanie Houde and Charles Hill (1997) in terms of function, implementation, and form (Bratteteig, p. 268).

By considering these essential elements, we sought to develop an app that is both highly functional and user-friendly, while also being aesthetically pleasing. Our goal was to create an app that would effectively serve the needs of our target audience, while also being technically sound and practical in its implementation.

4.1 Design Systems and Tools

To begin the prototyping phase, our team sketched initial designs on paper before transferring them to an online platform, Miro, for further development and reference. As we progressed to mid- and high-fidelity prototypes, we utilized Figma to refine the design.

4.2 Information Architecture

To ensure a well-structured and organized design process, our team created an information architecture that served as a foundation for our low-fidelity wireframes. This involved mapping out the hierarchy of information and functions we intended to include in the app based on our initial ideas and objectives.
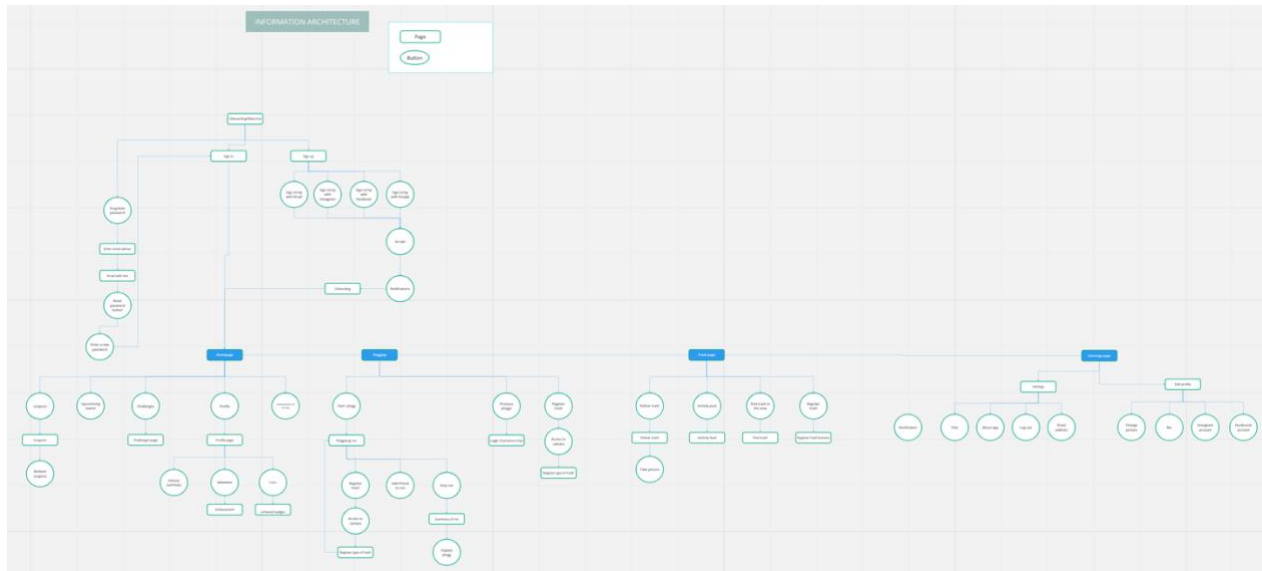
Figure 8: First edition of information architecture, https://miro.com/app/board/uXjVPuiVESg=/?share_link_id=651530134870

As the project progressed and the high-fidelity prototype was developed, the information architecture was refined to reflect the changes made. The final version of the information architecture, incorporating these modifications, is presented in Figure 7.
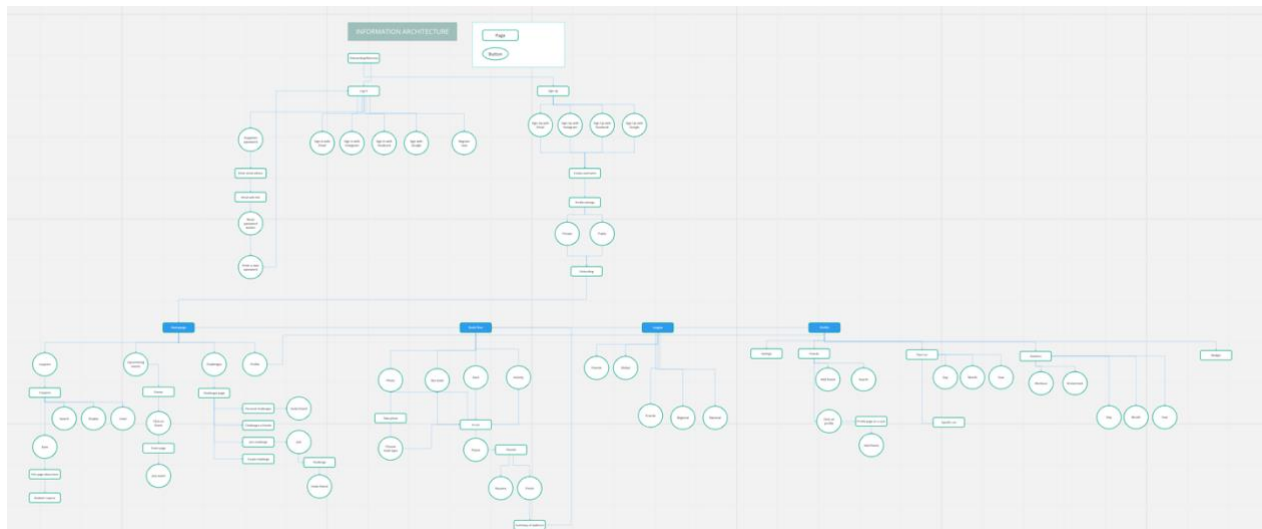

Figure 9: Finalized information architecture https://miro.com/app/board/uXjVPuiVESg=/?share_link_id=651530134870

4.3 Low-Fidelity

To map out the interface of the different screens, we employed low-fidelity wireframes. The purpose of creating low-fidelity wireframes was to visualize and iterate the design of the screens in a quick and low-cost manner. Initially, the team sketched out the low-fidelity wireframes on paper, which allowed us to quickly brainstorm and iterate different designs.
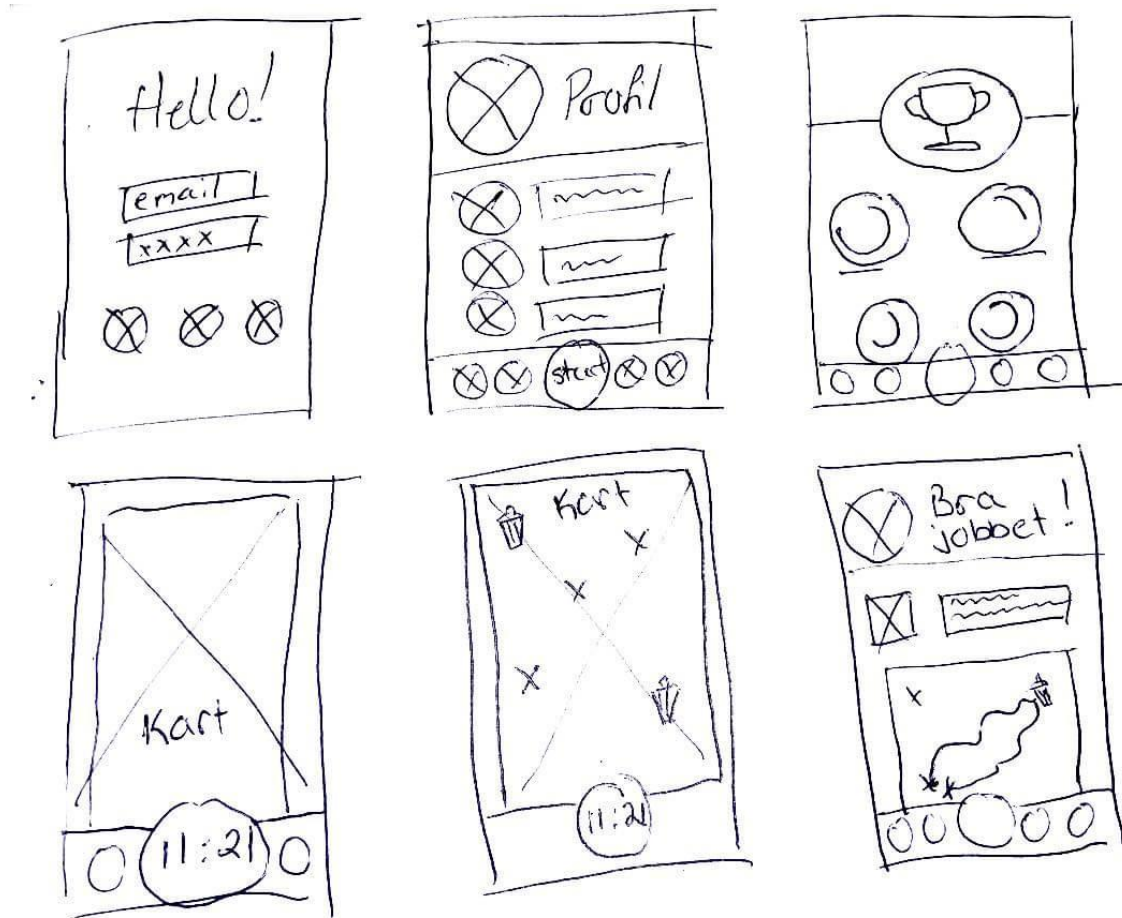
Figure 10: Low fidelity sketch

After creating the initial low-fidelity wireframes, the team collaborated to refine and finalize one specific design using Miro. This allowed us to discuss and make changes to the design collaboratively, providing valuable feedback to each other to improve the overall design.
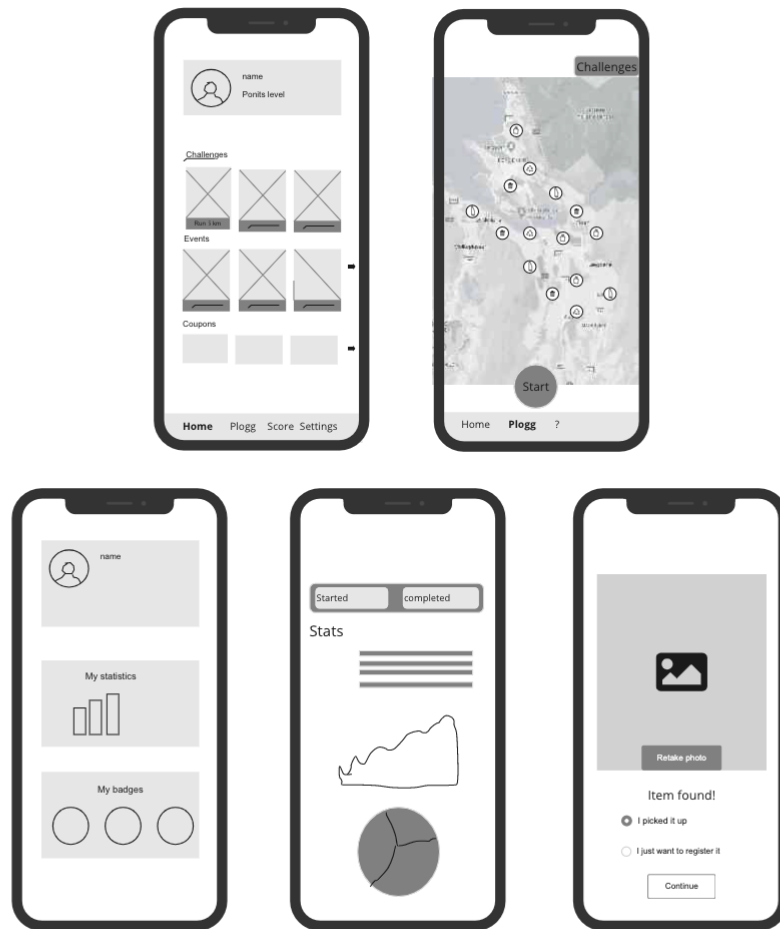
Figure 11: Finalized low-fidelity prototype, created in Miro

Home nav

Plogg nav

Figure 12: Low-fidelity prototype and its architecture

4.4 Mid-Fidelity

After completing the low-fidelity wireframes, the group proceeded to develop mid-fidelity wireframes in Figma. The primary aim of this step was to incorporate feedback obtained from users and workshops conducted during the design process. By doing so, the group was able to create a more user-friendly and intuitive interface for the app, which was critical to achieving the project's overall goal.

During this phase, the group worked collaboratively to ensure that the design was aligned with the project's objectives. The mid-fidelity wireframes served as a bridge between the low-fidelity sketches and the high-fidelity prototypes, allowing the team to better visualize the final product and address any issues that arose before moving to the next phase of the design process.
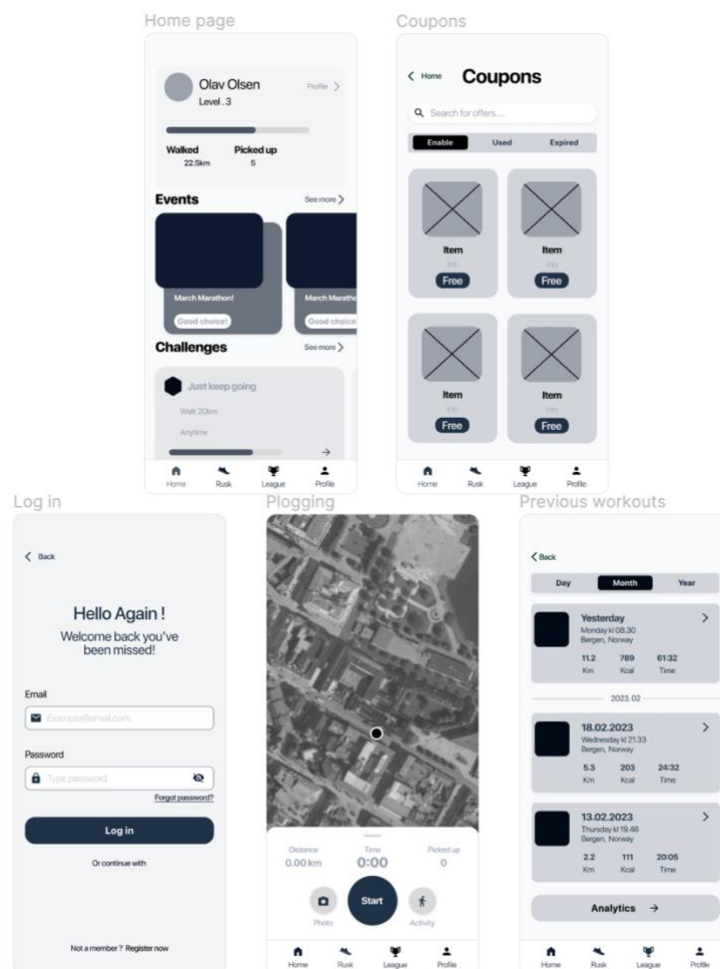
Figure 13: Mid-fidelity prototype, created in Figma

4.5 High Fidelity

The high-fidelity prototype marks the final stage of the design process before the actual implementation of the app. The high-fidelity prototype is a detailed and interactive representation of the final product, giving a more accurate depiction of what the end user will experience. The creation of the high-fidelity prototype involves refining the design elements and user interface, ensuring that all functionalities are working as intended. The high-fidelity prototype is available through the following link:

https://www.figma.com/file/jnvTNYBCBhEfCBONLUz6Gf/Rusk?type=design&node-id=20%3A144&t=8s9JItbP50Sv1VtP-1

4.5.1 Usability Heuristics

In the process of designing the high-fidelity prototype, our team made a deliberate effort to consider the 10 Usability Heuristics formulated by Jakob Nilsen. These heuristics provide a set of guidelines that are widely recognized in the field of user interface design, with the aim of improving the overall user experience. We closely examined each heuristic and sought to incorporate them into our design in a manner that would best serve the needs of our users.

19:02

Skip

Connect with your environment

Connect with people who likes to make the world a better place. With one action at the time.

Continue →
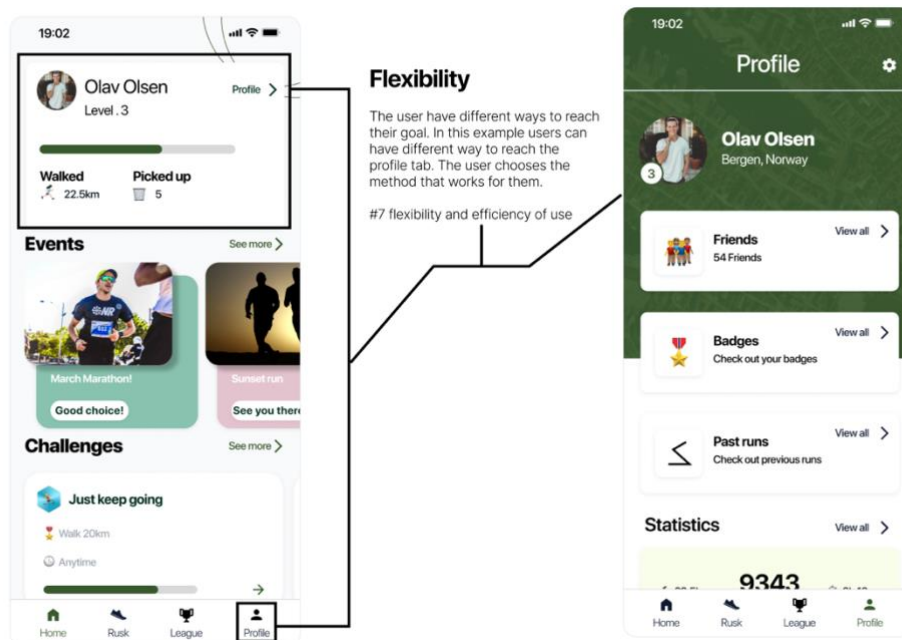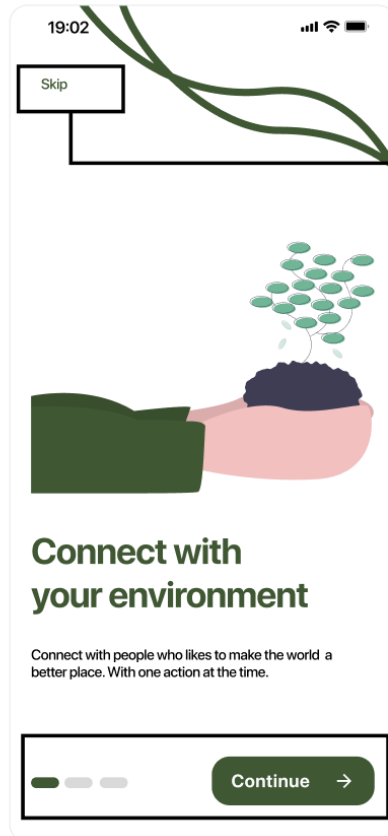
Page controll

The user can see where they are on the "onboarding process" or the user can skip the process.

1 Visibility of system status
3 User control and freedom

No clutter

The user is not overwhelmed by unnecessary elements to distract the user to reach their goal.

#8 Aesthetic and minimalistic design

Distance
0.00 km

Time
0:00

Picked up
0

Photo

Start

Activity

Home   Rusk   League   Profile
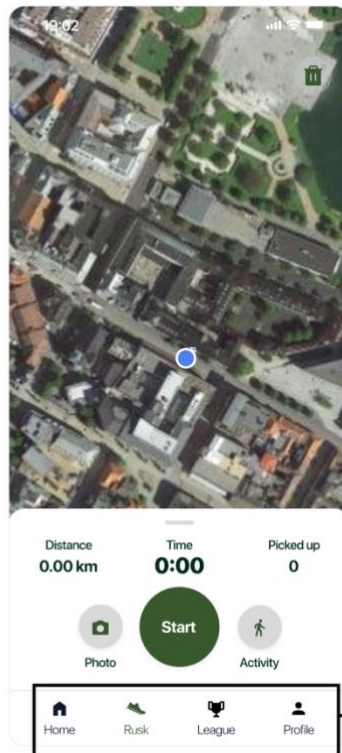
Match between system and the real world

The icons follows the real world conventions, making the information appear more natural and in logical order.

#2 Match between system and the real world

Menu

The menu uses icons, which most users are familiar with. This therefore lessens the cognitive load for the user.

The system also work based on the users' previous experience with similar systems.

6 Recognition rather then recall

Error prevention

In order to prevent any errors, there has been placed additional help text to give the user instructions. This helps lessening memory burden, which help prevent errors.

#5 Error prevention

19:02

< Back

Create new
password

Your password must be diffrent from
your previous used passwords.

Enter password

🔒 Fill in password

Must be at least 6 characters. Must contain a number
or symbol

Renter password

🔒 ●●●●●●

Password must match*

Reset password

Error message

The error message is expressed with red text and error symbol. The text represented to the user is telling the user how to recover from their error.

#9 Help users recognize, diagnose, and recover from errors.

19:02

< Back

Create account

Email

✉ Olav.

Write your email

Enter password

🔒 ●●●

Reenter password

🔒 ●●●

By creating an account, you agree to Rusk's **terms and
conditions of use**

Or continue with

G f 📷

Crate account

Help and documentation

When the form is activated by the user, they will be presented with relevant information about what they are required to do, at that particular moment.

10 Help and documentation

19:02

< Profile

Settings

Preferences

Units of measurement	Metric system →
Standard map type	Satellite →
Map download	WiFi or mobile network →
Calorie counter information	→

Account

Application, Services, and Devices	→
Facebook	→
Contacts	→
App health	Not connected →
Push notifications	→
Email settings	Terminated subscription →
Language	English →
Privacy settings	→
Delete account	→

Legal

Consistency and standards

The settings page follows the usual standards of a settings page. By following established industry conventions, the user can more easily navigate the page.
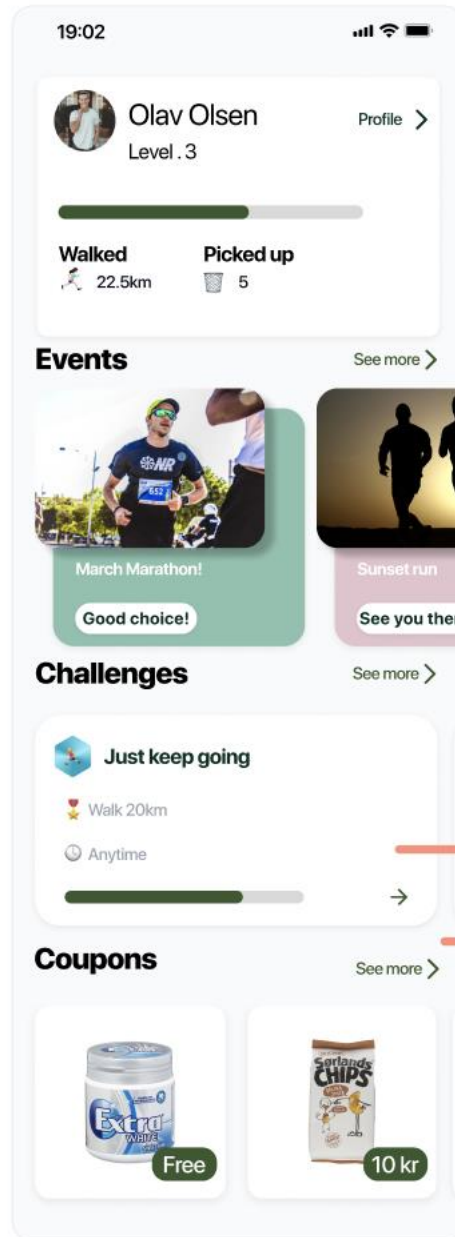
4 Consistency and standards

4.5.2. Gestalt Principals

According to Johnson (2020, p.39), gestalt principles offer an advantageous foundation for graphic design and user interface. With this in mind, the group integrated these principles into the design of the prototype. The following illustrations demonstrate the implementation of the gestalt principles.
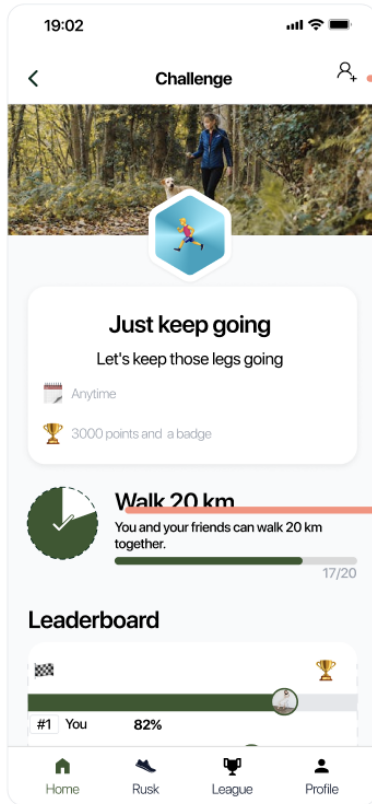
Closure

The principle of Closer explains that the human brain perceive elements and fills in the gaps that are incomplete.
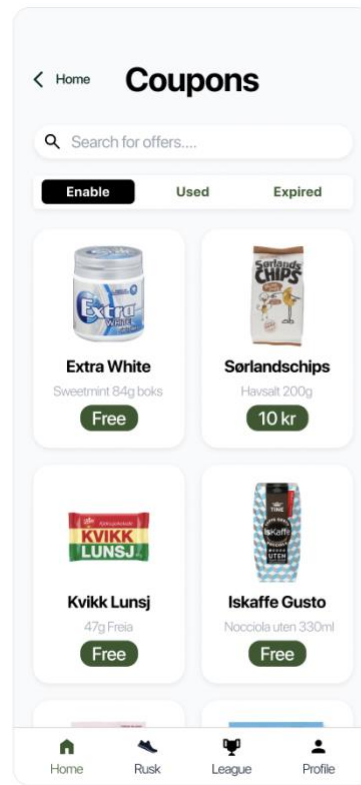
Symmetry and order

Symmetry and order, also known as prägnanz, is the principle that the human brain prefer symmetrical, balanced elements.

Continuity

The law of continuity indicates that the human eye will follow the smoothest path when viewing lines, regardless of how the lines were actually drawn.
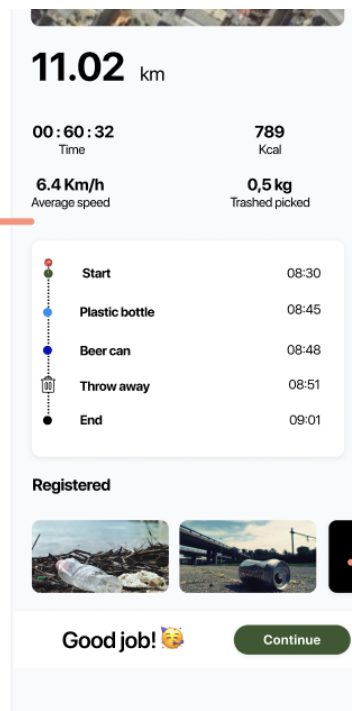
Proximity

Proximity refers to how elements that are close to each other are perceived as a group.

4.5.3 Human Interface Guidelines (Apple)

As we designed an app using the iPhone 14 plus template, we considered some of Apple's Human Interface Guidelines. These guidelines are set for best practices for designing user interfaces, described in the figure 11.
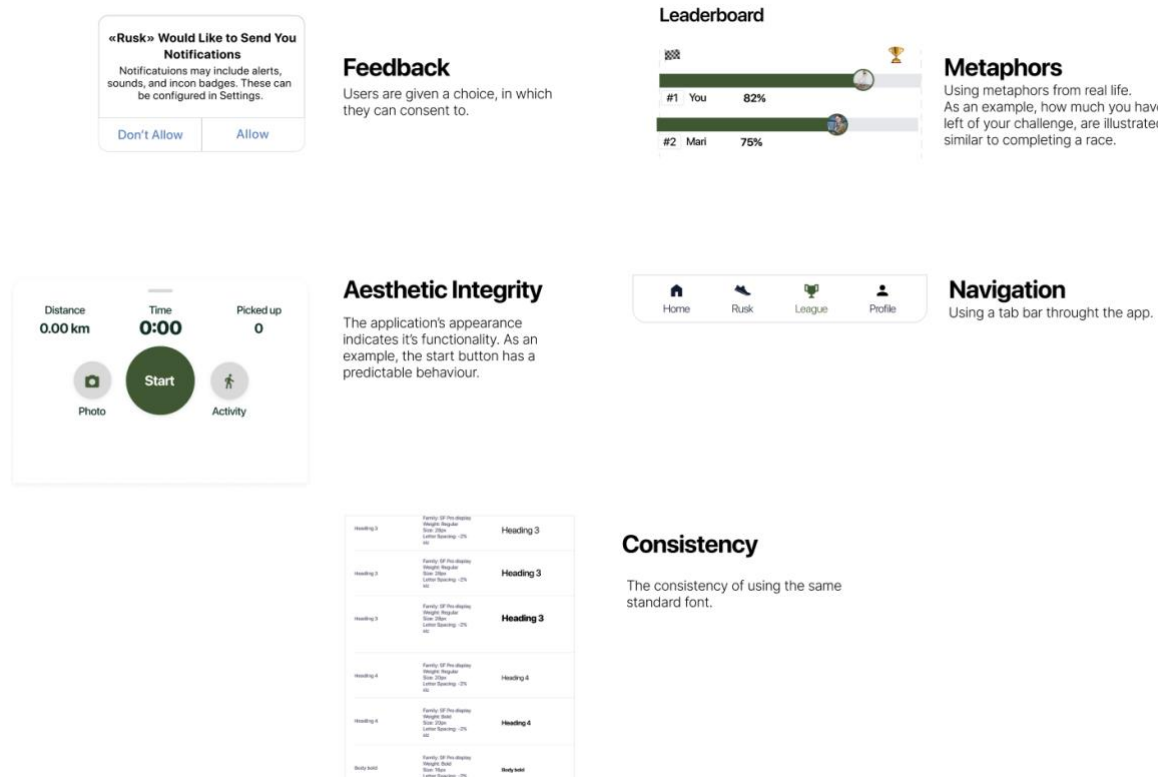
Figure 14: Apple's Human Interface Guidelines

4.5.4 Accessibility

The app also takes accessibility into consideration. In the design of the app, we considered color contrast. As shown in Appendix D, we tested our colors and text in the contrast checker to make sure they were WCAG2 AAA approved. (WebAIM, 2023)

Additionally, to improve accessibility we have considered font size and typography. In terms of minimum font size used within the app, no smaller than 16 has been used. This is to ensure that it

is eligible for most users. Regarding typography, the choice has been made to use Apple's SF pro font, as it's considered an accessibility friendly font and it is commercially free to use for apps (Appendix E).

Another initiative to make the app more accessible is to use icons and images to provide non-text-based indicators in the application.
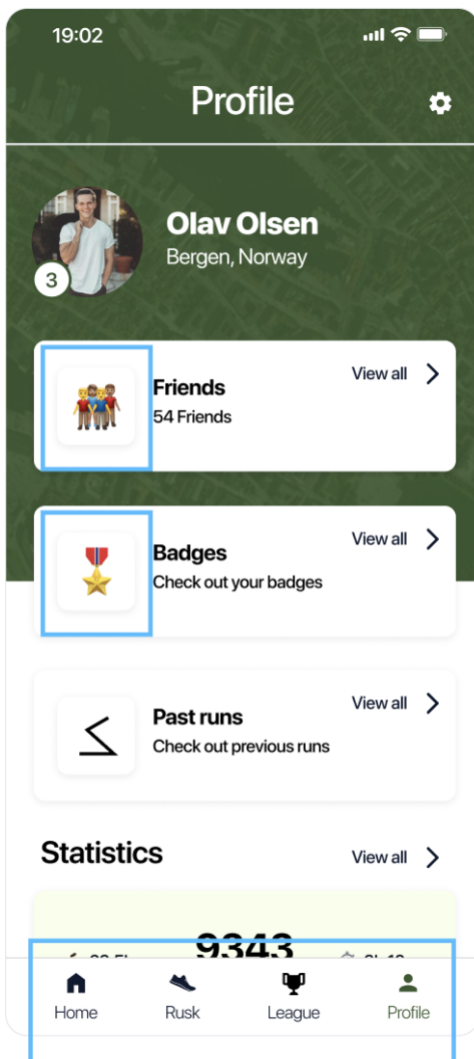
Text alternatives

In the app we have provided non text-based indicators such as images and icons to help users with lower vision.

5.0 Discussion

This section will provide a reflection on the design and solution created for the plogging app. It will explore the distinctive features of our solution compared to other similar products in the market. Additionally, it will address the limitations of our app and suggest potential improvements for the design. The role of user involvement in shaping our design decisions will also be discussed. Furthermore, ethical considerations related to research and design will be considered.

5.1 Difference to Similar Products

As part of our product development process, we conducted a competitive analysis to identify similar products in the market. Our objective was to differentiate our plogging app from the existing ones and offer a unique value proposition that fulfilled a gap in the market. By analyzing the artifacts of our competitors, we were able to identify their strengths and weaknesses and leverage them to create a product that offered a distinctive user experience.

Our analysis revealed that several elements, such as gamification, rewards, coupons, social connectivity, and events, were crucial in capturing a larger share of the market. We integrated these features into our product to promote sustainability through exercise, gamification, and collaboration. Additionally, social connectivity through features like connecting with friends and participating in events helped create a sense of community, promoting teamwork and a shared sense of responsibility towards the environment.

5.2 Limitations

One of the most significant limitations is that it is only a prototype, meaning that it lacks some of the features and capabilities that we plan to include in the final product. Another limitation is the challenge of ensuring that users are using the app correctly and honestly, particularly with respect to disposal methods. We have discussed several solutions to this challenge, such as requiring users to walk a certain distance or time to be credited for their cleanup efforts. However, this approach has limitations that may discourage users from picking up trash on shorter trips. Ideally, we would like to have disposal sites with built-in scales that can calculate a QR code scannable in

the app to credit points to the user's account, but this requires significant resources and government support to be feasible.

Since the success of Rusk depends heavily on a rewards program, the app relies on sponsors and partnerships. While the app is functional without rewards, users may lose motivation to continue participating actively. Therefore, it is essential to establish partnerships and secure sponsors to maintain the reward system and encourage users to participate actively.

5.3 Improvements

Accessibility is a key area that we intend to focus on to ensure our app is inclusive and user-friendly. A specific improvement we aim to make is to allow navigation using the tab key, making the app more accessible to people with sight or reading difficulties who use screen readers.

In addition to accessibility, we aim to improve our reward system and explore ways to make it more engaging and motivating for users. This could include expanding the selection of prizes and offering users the opportunity to contribute to a charity of their choice or have a tree planted in their name.

Lastly, we are working on enhancing the app's capabilities to better track users' environmental impact and provide them with feedback on their contributions to the environment. This would help users visualize the impact they are making and appreciate the importance of their work, no matter how small.

5.4 User Involvement

By conducting a workshop and interviews with potential users, we were able to gather feedback on our initial ideas and designs. This feedback helped shape the final product, ensuring that user needs, and preferences were incorporated into our design choices. For example, users expressed the desire for more incentives to continue using the app, which led us to introduce badges,

scoreboards, and rewards to keep them engaged. Moving forward, we understand the importance of ongoing user involvement to achieve the best possible result. By engaging with our user base, we can identify potential issues that we may not have discovered ourselves, ultimately resulting in a more useful and engaging product for our target audience.

5.5 Ethical Reflections

Throughout the development process of our plogging app, we prioritized research ethics and other ethical considerations that could impact our users and society. Specifically, we paid attention to user privacy and security concerns related to sharing personal information and data. In our workshop and interviews with potential users, we were careful to protect their identities and informed them of how their feedback would be used. In the final product, we plan to clearly communicate to users what data we are collecting and how it will be used, following guidelines from "Interaction Design: Beyond Human-Computer Interactions" to only collect necessary data for user protection (Sharp et al., 2019, p. 376-377). Additionally, we considered the potential environmental impact of our app and assessed any possible unintended negative effects.

6.0 Conclusion

Upon reflection of our research and development of the plogging app, we recognize the importance of user involvement and feedback. We held a workshop and conducted interviews with potential users in the early stages of development to gather valuable insights and opinions on our initial ideas and designs. The feedback we received was crucial in shaping the final prototype, as we made sure to incorporate user needs and preferences into our design choices.

As a result of this user involvement, we made significant design choices that improved the app's overall functionality and user experience. For example, we decided to increase the focus on recycling rather than exercising and added an option for users to donate their points earned in the app to a charity. These changes were a direct result of user feedback, highlighting the importance of user involvement in the development process.

While we acknowledge that there are practical issues that need to be addressed, such as registering recycled items and handling different rewards, we are confident that there are several potential solutions that could be implemented to address these challenges.

Looking ahead, we believe that our idea is a promising one, and our project documentation serves as a solid foundation to develop a widely used and popular app. As we continue to develop the product, we will continue to seek out user feedback and take it into consideration when designing and improving new aspects of the app. By engaging with our user base, we can identify potential issues that we, as designers, may not have discovered ourselves.

In summary, user involvement and feedback were crucial to the success of our project, and we are confident that our commitment to research ethics and other ethical issues will result in a valuable and beneficial app for both our users and society in general.

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Miro Rusk app (2023)

https://miro.com/app/board/uXjVPuiVESg=/?share_link_id=651530134870

Figma Rusk app (2023)

https://www.figma.com/file/jnvTNYBCBhEfCBONLUz6Gf/Rusk?type=design&node-id=20%3A144&t=8s9JItbP50Sv1VtP-1

Appendices

Appendix A

Interview answers are availble through the following link:
https://miro.com/app/board/uXjVPuiVESg=/?share_link_id=651530134870

User stories

As [a user], I want to have an option, so that I can [benefit]

Primary persona
As a fitness enthusiast that sees a lot of littering during my jogs I would like to combine exercise with cleaning my local area.

Secondary persona
As a retired widower, I want to create a better world for the generations to come, so that I can feel like a contributor to society.

Appendix C

Scenario

Primary persona
Olav is a private trainer
Olav is a fitness trainer who exercises regularly and especially enjoys jogging in the mornings along the beach where he lives.

Olav enjoys running in the forest as a morning routine before breakfast and considered this as a general warm up for his day as a PT. Olav sees a lot of litter and garbage on his runs and since he has a lot of spare energy he tries to pick up what he can and throw it away in a trash can. For the last 6 weeks Olav has been bringing a backpack on his runs so that he can gather even more trash.

Secondary persona
While walking her dog, Herdis often finds garbage lying around the path. She considered this a hazard, both for her dog, and for the environment. She is often annoyed by youths walking past the litter (not even recognizing it), and wishes for an incentive to clean the local area. She is fit and motivated, and on a daily walk she usually picks up several pieces of litter, in addition to forcing some out of Skippern's mouth.

Appendix D

Appendix E

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