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Project result report

(Written group exam/Project exam – Final delivery)



Høyskolen Kristiania

Semester V24

This answer has been completed as part of the education at Kristiania University College. The university is not responsible for the thesis' methods, results, conclusions or recommendations.

## Table Of Content

<b>Introduction .....</b>	<b>3</b>
<i>Overview of the result .....</i>	<i>3</i>
<i>System requirements .....</i>	<i>4</i>
<i>Demonstration of the solution.....</i>	<i>5</i>
<b>Technical decisions .....</b>	<b>14</b>
<b>User testing.....</b>	<b>15</b>
<i>Testing objectives.....</i>	<i>15</i>
<i>Test analysis.....</i>	<i>20</i>
<b>Design decisions .....</b>	<b>22</b>
<i>Color scheme, iconography and typography.....</i>	<i>22</i>
<i>Accessibility considerations.....</i>	<i>23</i>
<i>Design theory and descriptions of prototypes .....</i>	<i>24</i>
<i>Wireframes.....</i>	<i>24</i>
<i>Prototype 1.....</i>	<i>24</i>
<i>Introduction to First Prototype.....</i>	<i>24</i>
<i>Prototype 2.....</i>	<i>29</i>
<i>User testing feedback.....</i>	<i>35</i>
<i>Prototype 3.....</i>	<i>36</i>
<i>Prototype 4.....</i>	<i>39</i>
<b>Delivery testing (Test objectives, Test execution, Test outcomes).....</b>	<b>42</b>
<i>Introduction .....</i>	<i>42</i>
<i>Prototype 1.....</i>	<i>43</i>
<i>Prototype 2.....</i>	<i>43</i>
<i>Prototype 3.....</i>	<i>44</i>
<i>Prototype 4.....</i>	<i>45</i>
<i>Conclusion.....</i>	<i>46</i>
<b>Future enhancements .....</b>	<b>47</b>
<i>Further development of the solution.....</i>	<i>47</i>
<i>Technical decisions if we had decided to code .....</i>	<i>47</i>
<b>References.....</b>	<b>51</b>

# Introduction

## Overview of the result

Our solution is a prototype designed in Figma. It addresses a specific problem presented by our client, KPMG. Our goal is to deliver a more user-friendly and intuitive version of KPMG's anti-corruption web application. Key objectives include:

- Conducting user interviews and tests
- Implementing Universal Design principles
- Developing personas and user flows
- Creating wireframes to guide redesign efforts.

From the design sprint, these were our top three sprint questions:

1. Can we improve the user journey and reduce the time it takes for users to reach their desired goal?
2. Can we create a simple and informative website where users can easily navigate independently?
3. Can we present the information in an appealing, simple, and informative way?

These three sprint questions all shows that we have the users in the process.

### *Requirements*

Before beginning the to solve the tasks, we must have a clear understanding of the current solution, and how it is used. Additionally, gaining insights into the target audience is crucial for informed decision-making. Proficiency in Figma is necessary for the project, with four out of seven team members having prior experience with the tool.

### *Project Tasks*

This project tasks includes the following:

#### **Creating Wireframes**

Design wireframes showing the structure and layout of redesigned interfaces.

#### **User Interviews**

Conduct interviews to understand user needs and challenges.

#### **Develop Personas**

Create detailed personas representing different user types.

#### **Design User Flows/User Stories**

Develop user flows illustrating typical scenarios and tasks.

## **Graphical Proposals in Figma**

Create detailed graphical designs in Figma based on wireframes and feedback.

## **Feedback from Product Owner**

Collaborating with product owner to gather feedback and iterate on designs.

### *Expected Outcome*

- A redesigned application that is significantly more user-friendly and intuitive.
- Retention of all existing functionality.
- Documentation of user interviews, personas, user flows, wireframes, and graphical proposals.

### *Conclusion*

This project allows for creative solutions to improve KPMG's application, guided by feedback from the product owner. The goal is to exceed user expectations in usability and intuitiveness while continuing to support KPMG's mission to combat corruption effectively.

## **System Requirements**

### *Design Requirements:*

#### **Figma Proficiency:**

- The design team should have a strong understanding and experience in using Figma for creating wireframes, mockups, and prototypes.
- Access to the existing design templates and components used by KPMG.

#### **Design Consistency:**

- Ensure that the new design is consistent with KPMG's branding guidelines, including color schemes, typography, and logos.
- Maintain a coherent visual style across all screens and components.

#### **Desktop Focus:**

- The design will prioritize desktop usability, ensuring optimal layout and functionality for larger screens.
- Ensure that interactive elements are appropriately sized for desktop use, with a focus on ease of navigation using a mouse and keyboard.

#### **User Interface (UI) Elements:**

- Design intuitive and accessible UI elements such as buttons, forms, menus, and dialogs.
- Ensure that UI elements are easy to interact with and provide clear feedback to the user.

#### **Accessibility:**

- Incorporate accessibility best practices to ensure the design is usable by people with disabilities.
- Use appropriate contrast ratios, keyboard navigability, and screen reader compatibility.

#### **Prototyping And Testing:**

- Create interactive prototypes in Figma to simulate user flows and gather feedback.
- Conduct usability testing with stakeholders to identify and resolve any design issues.

### *Documentation Requirements*

#### **Design Specifications:**

- Provide detailed design specifications within Figma, including measurements, spacing, and interaction details.
- Document any design rationale and decisions made during the process.

#### **Component Library:**

- Develop and maintain a component library in Figma for reusable UI elements.
- Ensure that components are easily accessible and modifiable for future updates.

#### **Feedback Integration:**

- Implement a system for incorporating feedback from the product owner and other stakeholders.
- Iterate on designs based on feedback and ensure alignment with project goals.

By focusing on these design-specific requirements, we ensure that the Figma-based work meets the client's needs and sets a solid foundation for the development phase further.

## **Demonstration of the solution**

Figma link to prototype:

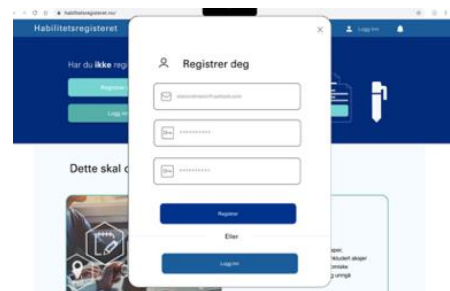
<https://www.figma.com/proto/qV9PIIdCkHUI1vpzV4mxhYv/Exam?page-id=0%3A1&node-id=765-7589&viewport=597%2C391%2C0.06&t=yfmcMuQA8bAmOFNr-1&scaling=scale-down&content-scaling=fixed&starting-point-node-id=765%3A7589>

*Figure 0 - Landing Page*



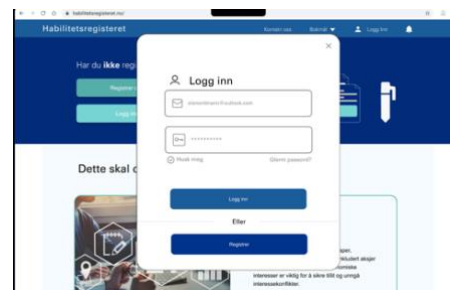
*Figure 1 - Register*

If the user chooses to click on “register”, this window will pop up. It is important to emphasize that the customer has not asked for any log in or register information, this is something that we chose to implement so the user flow will be more consistent. On a page like this, for security reasons, it could be an idea to implement Two-factor authentication (2FA).



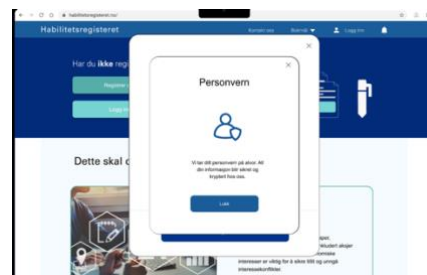
**Figure 2 - Log In Window**

If the user chooses to click on “register”, this window will pop up. It is important to emphasize that the customer has not asked for any log in or register information, this is something that we chose to implement so the user flow will be more consistent. On a page like this, for security reasons, it could be an idea to implement Two-factor authentication (2FA).



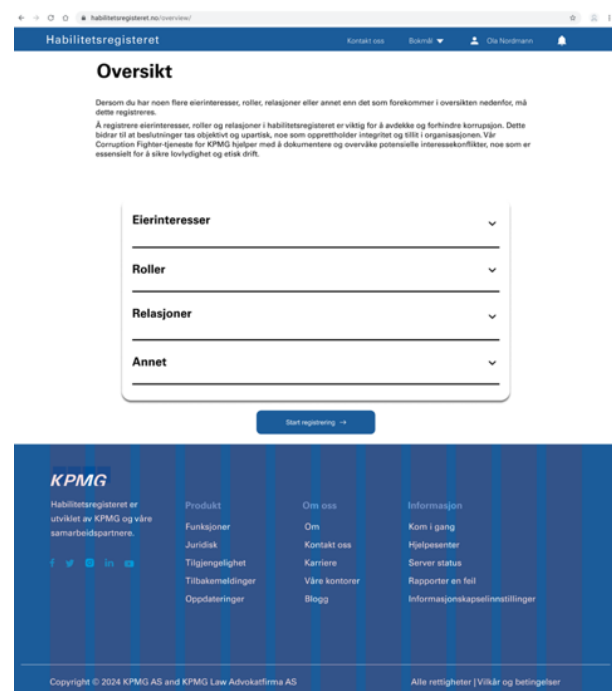
**Figure 3 - Privacy Window**

When the user clicks on “log in” or “register” this window will appear on the screen. We have implemented a privacy pop-up window designed to reassure users, as they may need to provide sensitive information on the website. This feature ensures that users feel secure and confident that their data is being handled with the utmost care and confidentiality.



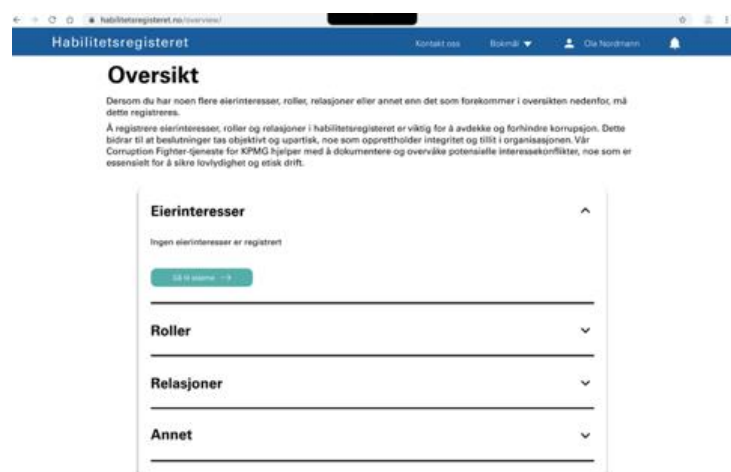
**Figure 4 - Overview Page**

This is the page the user will come to after “register” and “log in”. If the user just registered for the first time, the dropdown menu will be empty. If the user has been logged in before and registered the different schemas, the drop-down menu will have already have information in it. Check the two different examples on the next page.



**Figure 5 - Overview**

*Example of how overview page will look when a new profile is registered.*



**Figure 7- Overview**

*Example of how overview page will look like when the user has registered something earlier, and has logged in.*



**Figure 10 - Eierinteresser**

This page will appear when the user is clicking on “start registering” on the overview page. Here, the user has multiple options to choose from. We have done this to make it easier for the user. The user can cancel, skip the step, go back to the previous step, read more about what must be registered, add a new entry, or proceed to the next step once the form is completed. We have also included question marks, information icons to read more about what needs to be registered and help text to make it easier for the user to understand. The progress bar also shows how much step you have left.

The screenshot shows the 'Eierinteresser' registration form. At the top, there's a progress bar with four steps. Below it, a message says 'Her kan du opplyse om eksisterende eller tidligere eierinteresse'. There are buttons for 'Avbryt', 'Trykk her for å lese mer om eierinteresser', and 'Nå registrering & registrering'. The form itself has several fields: 'Land\*' (dropdown), 'Organisasjonsnavn\*' (text), 'Organisasjonsnummer\*' (text), 'Er selskapet benyttet?\*' (radio buttons for 'Ja' and 'Nei'), 'Aksjeklasse\*' (dropdown), 'Antall aksjer\*' (text), 'Status drift i selskapet?\*' (radio buttons for 'Aktiv' and 'Ikke Aktiv'), 'Eienskap fra' (text), 'Eienskap til' (text), 'Er forholdet relevant for din habilitet?\*' (radio buttons for 'Ja' and 'Nei'), and 'Eventuell kommentar:' (text). There are buttons for 'Jeg vil legge til ny' and 'Neste'. The footer shows the KPMG logo and contact information.



**Figure 11 - Information Pop Up – Owner interests**



**Figure 12 - Register Schema 2 - Roles**

These information pop-up windows will appear when the user click on “Trykk her for å lese mer om” so that the user know exactly what to fill in the fields.

**Figure 13 - Information Pop Up - Roles**

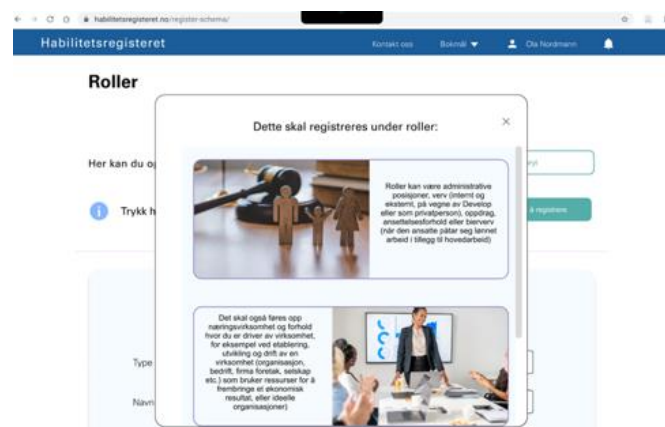


Figure 14 - Register Schema - Relations

Habilitetsregisteret

Kontakt oss | Bli med | Om Habilitetsregisteret

### Relasjoner

Her kan du opplyse om eksisterende eller tidligere relasjoner. Vennligst registrer din relasjons eierinteresser og roller, eventuelt annen relevant informasjon.

[Trykk her for å lese mer om relasjoner](#) [Trykk her for å registrere relasjoner](#)

Formann(medlem)en\*

Ettmann\*

Fødselsdato\*

Bor i utlandet?\*

Adresse\*

Type relasjon\*

Type relasjon\*

Eventuell kommentar:

**Eierinteresser**

**Rolle**

**Annet**

☐ Ja ☐ Nei

[Tilbake](#) [Neste](#)

Figure 15 - Information Popup - Relations

Habilitetsregisteret

Kontakt oss | Bli med | Om Habilitetsregisteret

### Relasjoner

Her kan du opplyse om eksisterende eller tidligere relasjoner. Vennligst registrer din relasjons eierinteresser og roller, eventuelt annen relevant informasjon.

[Trykk her for å lese mer om relasjoner](#) [Trykk her for å registrere relasjoner](#)

Formann(medlem)en\*

Ettmann\*

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Bor i utlandet?\*

Adresse\*

Type relasjon\*

Type relasjon\*

Eventuell kommentar:

**Eierinteresser**

**Rolle**

**Annet**

☐ Ja ☐ Nei

[Tilbake](#) [Neste](#)

Dette skal registreres under relasjoner:

Vennligst registrer dine nærtstående relasjoner for eksempel ektefelle/kamkamerat, barn og foreldre. Du skal kun oppgi informasjonen dersom relasjonen kan representere en mulig inhabilitet og skape usikkerhet rundt din og Dinveitg sin habilitet.

Det er også relevant å oppgi andre relasjoner som investorer, leietakere eller annen konsulent, og rådgivningsbemyndet, samt hos leverandører eller entreprenører innen bygg- eller anleggsvirksomhet.

Figure 17 - Information Popup - Other

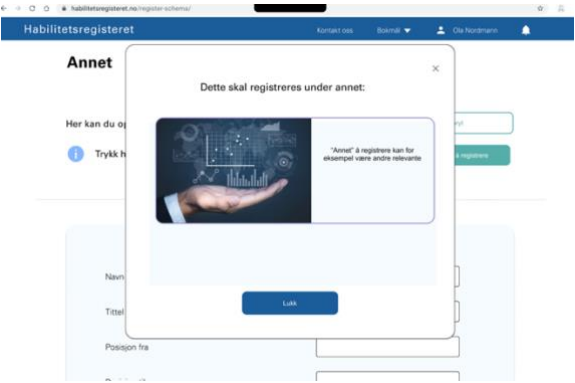


Figure 16 - Register Schema - Other

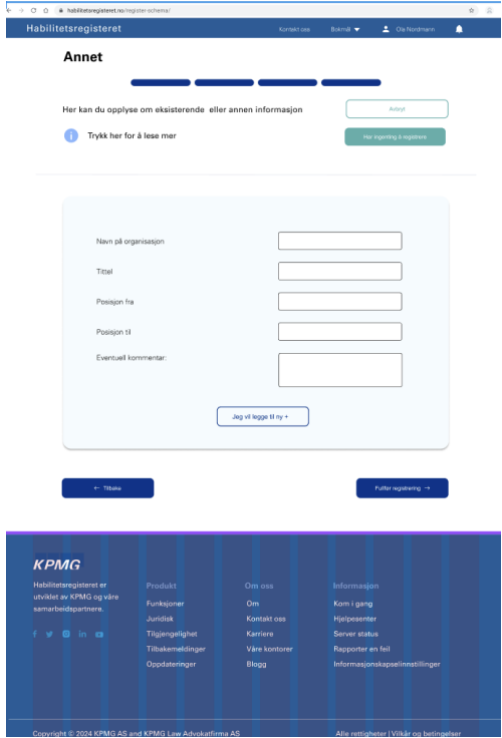
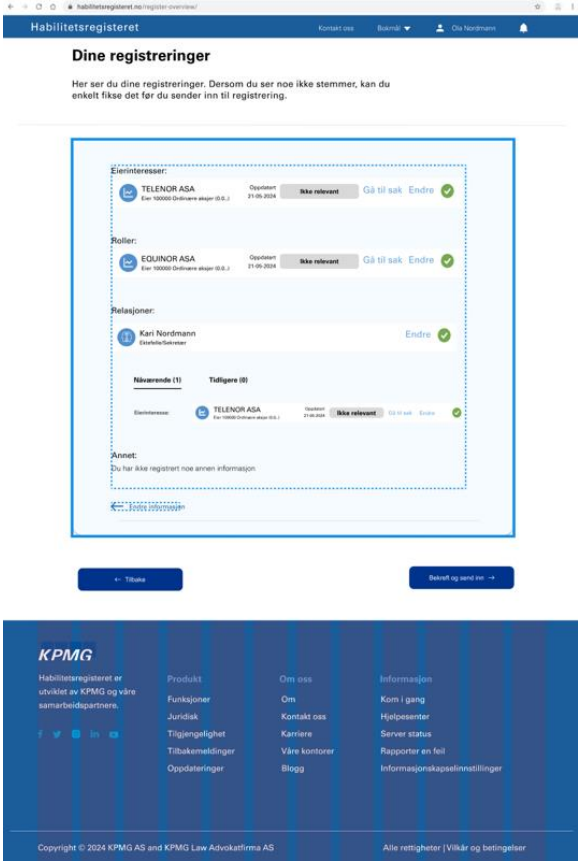


Figure 18 - Overview Registration



If the user is clicking on “Fullfør registrering”, we added an overview of what the user had currently registered. The user can easily go back and make any changes. Under the Figure 19, we added an animation so that the user can get a clear verification that the register is updated. From here, the user can easily navigate from there. We implemented a “Gi oss en tilbakemelding” button, so that the application can always meet the users need.

Figure 19 - Animation Page

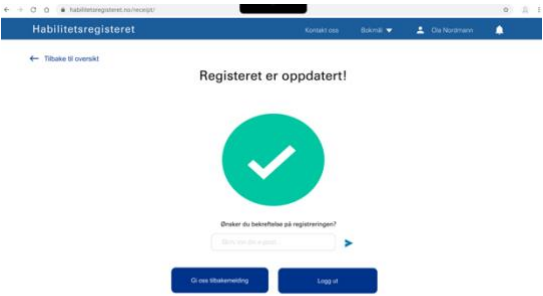
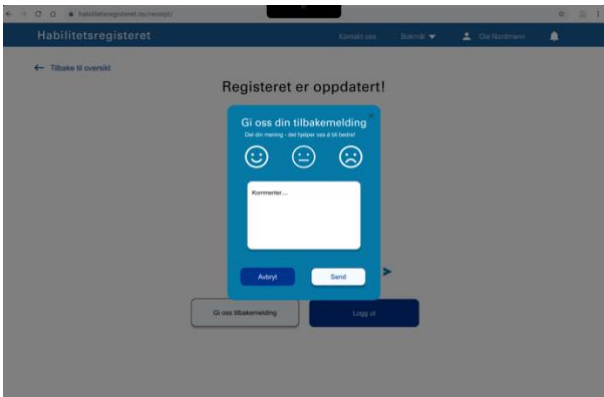


Figure 20 - Feedback Popup



If the user clicks on “Ole Nordmann” when the user is logged in, they will navigate to the profile page. They can also log out or go back. If the user clicks on the logo in the header, they will get back to “Oversikt”

Figure 21 - Profile Page

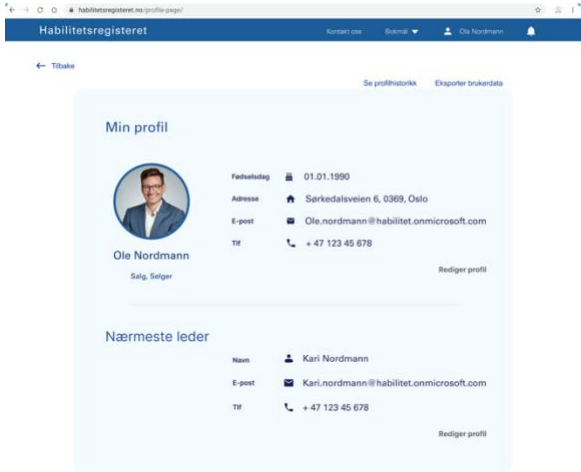
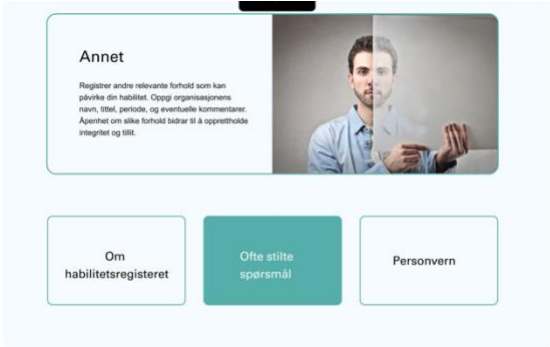


Figure 22 – Landingpage Navigate To FAQ



**Figure 23 - FAQ Page**

The user will get to the FAQ Page when the user clicks on “Kontakt Oss” in the header or from the landingpage



**Figure 24 - Privacy Page**

This page will appear if the user clicks on “Personvern” on the landing page



**Figure 3 - About Page**

This page will appear if the user clicks on “Om habilitetsregisteret” on the landing page.



## Technical Decisions

The product owner was clear about their preference for the product to be delivered in Figma. Consequently, there was no discussion about using any other program. However, we did consider early in the process whether we should create a prototype in Figma in addition to coding the product in React. Our final decision on how to deliver the product and what tools to use was carefully deliberated.

We ultimately decided to deliver the product only as a Figma file. This decision was based on two main factors. Firstly, we evaluated our team’s competencies. Our team had two members from the front-end who were comfortable with coding, while the rest were less proficient.

However, we had two team members who were skilled with Figma, two who were comfortable with it, and the rest were willing to learn. Therefore, we believed we could provide the best value to the customer by creating a high-quality prototype in Figma rather than a potentially subpar coded product.

Secondly, we consulted directly with the product owner. Initially, we sought advice from our lecturer on whether we should deliver the product primarily as a code project or solely using Figma. The lecturer recommended coding the product to demonstrate more IT competence and add value for the customer. While we understood these arguments, we felt this advice contradicted the customer's requirements for the product. After clarifying expectations with the product owner, it was confirmed that the product should be delivered in Figma, not code. Although they mentioned we could code it if we wanted, we decided to stick with Figma.

Our main focus then became creating a user-friendly and intuitive design for the client. We conducted several user tests to ensure we met this requirement.

Using Figma as our primary tool proved beneficial in many ways. Firstly, it enabled us to collaborate in real-time, helping us work efficiently and providing a clear overview of the product at any given time. Figma also facilitated design consistency, allowing us to reuse components and share styles, ensuring a consistent design across the entire application. Additionally, Figma is excellent for creating interactive prototypes that simulate user interactions and transitions, providing a realistic preview of the final product. This capability was invaluable for obtaining feedback during user testing, as interactive prototypes are easy to share with users for testing.

In summary, our decision to use Figma was based on our team's strengths and the product owner's requirements. This approach allowed us to deliver a high-quality prototype that met the client's expectations while leveraging the collaborative and interactive features of Figma to ensure an efficient and consistent design process.

## User Testing

### Testing Objectives

### **The goal of the user testing**

The goal of the user testing was to obtain honest and constructive feedback from potential users regarding the prototype's design, user flow, and user experience. This will help us optimize and simplify the user journey, making it as intuitive and efficient as possible. Through user feedback, we will be able to identify areas for adjustments and improvements needed to better tailor the website to the needs and preferences of potential users.

### **What should be tested?**

A prototype of the website “Habilitetsregisteret”, created in Figma.

### **Conducting the user test:**

We introduced the test participants to what the website is about, ensuring they understand its purpose.

#### **2 rounds of user testing:**

We conducted the user testing in a total of two rounds. Each round was performed after we had improved the prototype based on feedback from the test participants. We carried out multiple rounds to ensure that the changes effectively addressed the identified issues and to uncover new challenges.

#### **Our test users:**

The group includes individuals of different ages and genders. It comprises people with and without experience with a habilitation registry, as well as those with and without experience in UX.

#### **5 test participants per round:**

We chose to test the prototype with 5 people in each round. According to usability expert Jakob Nielsen, this number is usually enough to uncover most usability issues. Because the same problems often come up again after testing with just a few people.

<https://www.nngroup.com/articles/why-you-only-need-to-test-with-5-users/>

#### **Location of the user test:**



The tests were conducted online via Zoom. The camera and microphone were on for both the test leader and the test participant, while those who took notes and observed had their cameras and microphones off. This made it more accessible for test participants, as not everyone could meet in person.

### **Equipment:**

The setup required a PC and a power source.

### **The test team included:**

- Test leader: Hannah
- Observers: Jenny, Mari, Tobias, Izel, Michelle
- Project leader: Elizabeth
- Client: KPMG

### **Pilot testing:**

The tasks included checking if the Figma file was functioning correctly and ensuring that Zoom was working properly.

### **Schedule**

#### **First round user test: 23.05.2024 - 24.05.2024**

<b>Time</b>	<b>user</b>	<b>Previous experience with Habilitets registeret</b>	<b>Previous experience with Ux</b>	<b>Age</b>	<b>gender</b>	<b>Occupation</b>
<b>16:00 – 16:45</b>	<b>User 1</b>	<b>no</b>	<b>no</b>	<b>51</b>	<b>male</b>	<b>Reception manager at a refugee reception center</b>
<b>17:00 – 17:45</b>	<b>User 2</b>	<b>no</b>	<b>no</b>	<b>27</b>	<b>female</b>	<b>Master student in business</b>
<b>18:00 – 18:45</b>	<b>User 3</b>	<b>yes</b>	<b>no</b>	<b>23</b>	<b>female</b>	<b>Economist</b>
<b>Next day</b>	<b>Pause</b>					

<b>17:15 – 18:00</b>	<b>User 4</b>	<b>yes</b>	<b>no</b>	<b>53</b>	<b>female</b>	<b>Author</b>
<b>18:15-19:00</b>	<b>User 5</b>	<b>no</b>	<b>yes</b>	<b>55</b>	<b>male</b>	<b>CEO of an IT company</b>

### **Second round user test: 31.05.2024 - 01.06.2024**

<b>Time</b>	<b>Name</b>	<b>Previous experience with Habilitets registeret</b>	<b>Previous experience with Ux</b>	<b>age</b>	<b>Gender</b>	<b>Occupation</b>
<b>12:00-12:45</b>	<b>User 1</b>	<b>no</b>	<b>yes</b>	<b>30</b>	<b>female</b>	<b>Ux designer</b>
<b>13:00 – 13:45</b>	<b>User 2</b>	<b>no</b>	<b>yes</b>	<b>25</b>	<b>male</b>	<b>Web developer</b>
<b>14:00-14:45</b>	<b>User 3</b>	<b>no</b>	<b>yes</b>	<b>35</b>	<b>female</b>	<b>it</b>
<b>Next day</b>	<b>Pause</b>					
<b>13:15-14:00</b>	<b>User 4</b>	<b>yes</b>	<b>no</b>	<b>23</b>	<b>female</b>	<b>Economist</b>
<b>14:15 – 15:00</b>	<b>User 5</b>	<b>no</b>	<b>no</b>	<b>24</b>	<b>female</b>	<b>Social work student</b>

### **Questions**

We asked users open-ended questions, allowing them to discover how to navigate the website and find information independently. This approach simulates real-life scenarios, where future users won't have guidance. We also encouraged test users to think aloud, enabling us to understand their thought processes.

#### **Questions to ask before the test:**

- What is your name?
- How old are you?
- What do you do for work?
- Do you have any previous experience with the "competence register"?

#### **Questions during the test:**

**Log-in page / Page after log-in:**

- How would you log in?
- What do you see on the page?
- What do you think you can do here?
- What type of information do you see here?
- If you were to register, where would you click?

**Main Page:**

- What do you see here?
- What do you think you can do on this site?
- Where would you navigate if you wanted more information?
- How would you register “eierinteressert”?

**Navigation:**

- How would you register “eierinteressert”?

**Profile Page:**

- What do you think of this page?
- What kind of information do you get from this page?

**Schema Page:**

- What do you see here?
- Where would you navigate if you wanted more information?
- How did you experience the page?
- How would you navigate further?

**Receipt Page:**

- Would you like the feedback to be a pop-up on the page, or would you prefer a separate page?
- What are your thoughts on being able to provide feedback?
- Would you prefer receiving a confirmation via email?
- Do you receive a clear confirmation that you have registered?

**Questions Asked After the Test:**

- How did you perceive the service overall?
- Was there anything you didn't like?
- Was it self-explanatory? Was it easy to understand?
- How do you think other users will perceive the site? Do you think they will find it easy to navigate?

## Test Analysis

### First user test

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- **Clarity and information:** Several users express the need for clearer information throughout the process. This includes more extensive introductory texts, specification of what needs to be registered, and better explanation of terms such as "owner interest" and "applications."
- **Navigation and usability:** Users point out the need for easier navigation through various pages and steps. This includes the desire to move forward and backward more seamlessly, clear back buttons, and a better indication of where they are in the process.
- **Design and presentation:** Opinions on the design are divided, but several users want a more modern and cohesive visual experience throughout the website. There are also requests for greater contrast and more readable text.

- **Feedback and suggestions:** The feedback system is considered important, but there is a need for clearer indication of what is required and why.
- **System understanding and user support:** Several users have questions about the system's purpose, who has access to the information, and how it should be used. There is a need for better understanding and guidance throughout the process.

## Second user test



## Log inn page and landing page:

- Preference for cleanliness and simplicity.
- Desire for clear information before registration.
- Irritation over jumping animation on the landing page.
- Start registration button should be at the bottom.
- Avoid unnecessary confirmations at the end of registration.

## Overview page:

- Desire for clearer defined buttons and functionality.
- Uncertainty about what the check button means.
- Confusion about whether registration starts on the overview page.

## Forms:

- Desire for clearer headers and guidance texts.
- Well-received use of question marks to provide more information.

### Feedback Page:

- Need for less space-consuming feedback boxes.
- Preference for either a separate receipt page or a pop-up, not both.

### Profile Page:

- Desire for clearer visual consistency, especially regarding color choice and font.
- More visible "Edit profile" button.

### General Comments:

- Benefits of a clean and tidy layout.
- Desire for clearer information and navigation before registration.
- Some want more details about registration purpose and process.
- Suggestions to improve usability by reducing jumping and animations.

## Design decisions

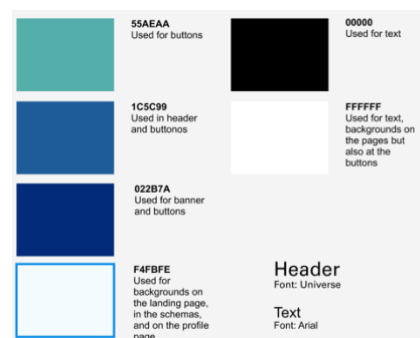
### Color scheme, iconography and typography

In developing our prototypes, we carefully selected a color palette that not only adheres to the design guidelines provided by KPMG but also enhances user experience and interface aesthetics. The primary colors used throughout our prototypes, particularly in the final iteration, include a range of blues and complementary shades. This palette was chosen for its professional and trustworthy feel, aligning with the established branding of KPMG.

55AEAA (Teal): Used predominantly for buttons, this color provides a noticeable but not overwhelming call-to-action.

1C5C99 (Medium Blue): Applied in headers and buttons, this color helps to maintain visual hierarchy and consistency across the interface.

022B7A (Dark Blue): Utilized for banners and buttons, it adds depth and emphasis to key elements on the page.



F4FBFE (Light Blue): This shade is used for backgrounds on the landing page, schemas, and profile pages, offering a clean and cohesive backdrop that supports readability and visual comfort.

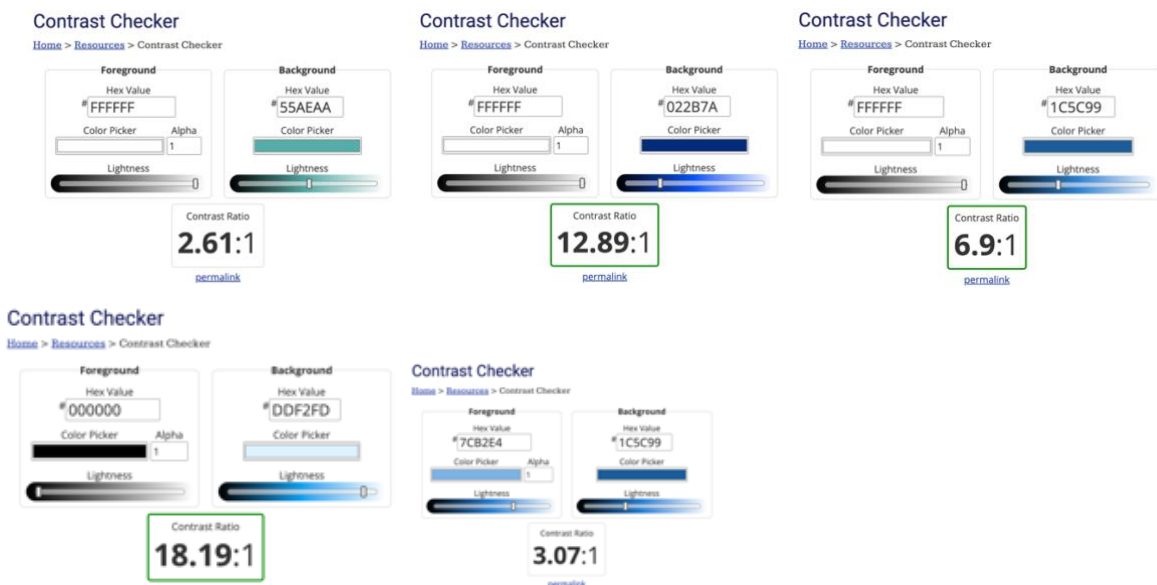
FFFFFF (White) and 000000 (Black): Employed for text and various backgrounds, these classic colors ensure clarity and contrast, making information easily readable.

For typography, we chose Universe for headers to provide a distinct and professional appearance, while Arial was selected for body text due to its readability and simplicity.

This thoughtful selection of colors and fonts not only reflects KPMG's branding but also ensures a user-friendly and visually appealing interface, supporting our design objectives and enhancing overall user interaction.

## Accessibility considerations

To ensure accessibility, we used the WebAIM Contrast Checker to verify that our color combinations meet the WCAG 2.0 guidelines. All combinations have a contrast ratio of at least 3:1, ensuring readability for users with visual impairments. This ensures that our design is both visually appealing and accessible to a wider audience.



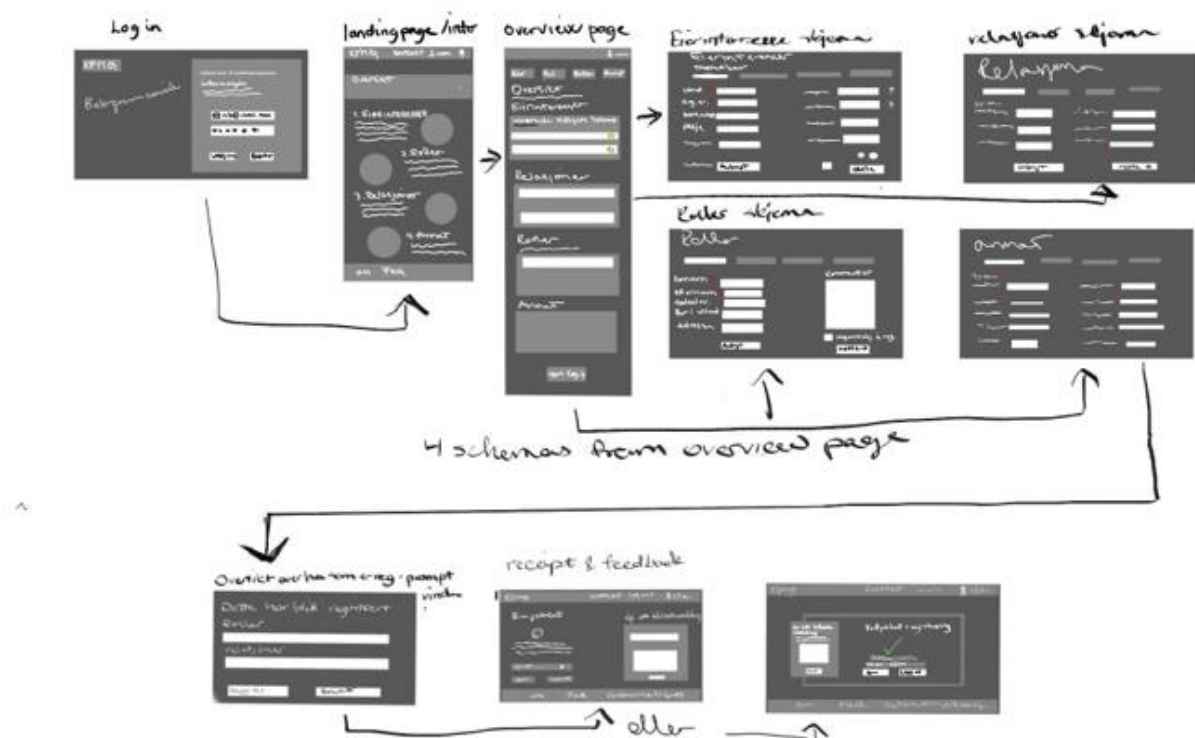
WebAIM. n.d. "WebAIM: Web Accessibility In Mind." Accessed June 13, 2024. <https://webaim.org/>.

## Design theory and descriptions of prototypes

### Wireframes

It is important to emphasize that the wireframes underneath was made early on. We based our work on wireframes in the first sprint and later developed them into more advanced prototypes with adjustments after each user test iterations.

# Wireframes



## Prototype 1

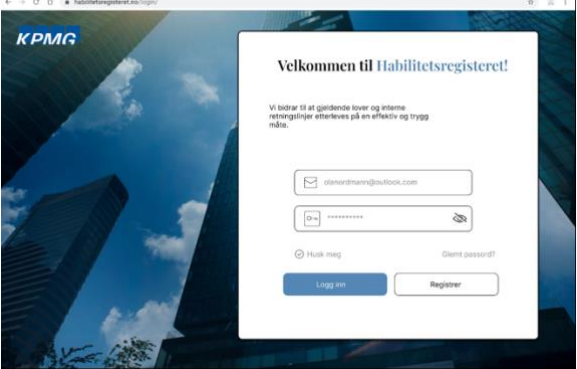
### Introduction to First Prototype

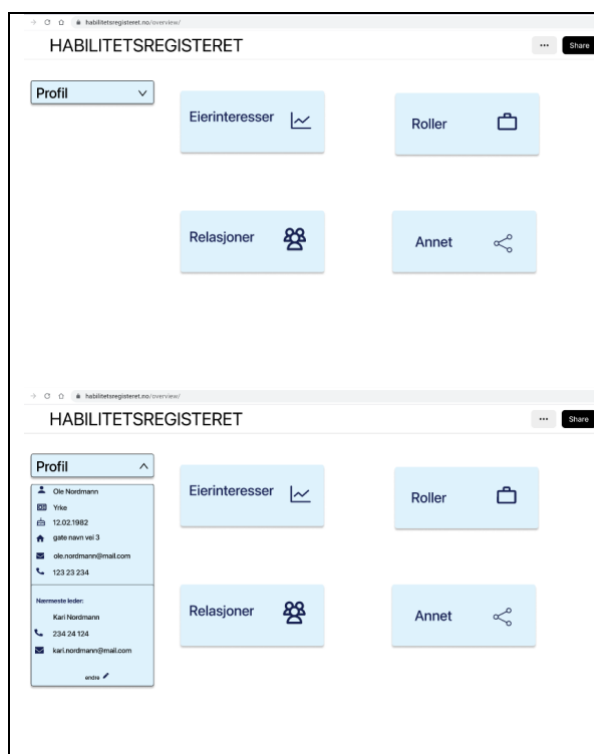
Our first prototype is the culmination of an intensive design process that involved design sprints, team brainstorming, and careful evaluation of original screenshots from KPMG. Through these processes, we explored various concepts, identified key challenges, and developed innovative solutions to meet the needs of our users and fulfill the goals set by KPMG.



Drawing from our observations and discussions during the design sprint, we quickly formulated thoughts on enhancing the user experience and functionality of the existing platform. This prototype served as a rapid means to test and gather feedback on what resonated with our users. Analyzing original materials from KPMG, we pinpointed areas for improvement and devised a plan to integrate these changes into our first prototype.

As a result, the prototype offers a foundational glimpse into our vision of a user-friendly and efficient platform for conflict of interest registration. Through continual testing, feedback collection, and iteration, we aim to refine and evolve this prototype into a comprehensive solution that meets and exceeds user expectations.

	<h3>Login/Landing Page</h3> <p>For our login/landing page, we prioritized creating a trustworthy atmosphere inspired by professional websites. Our color scheme of blue, white, and black aligns with established design conventions, aiming to instill a sense of security in users. Clear icons for email, password, and the "Remember Me" checkbox were strategically incorporated to intuitively guide users through the login process.</p> <p>In terms of accessibility, we ensured all non-text content had text alternatives and maintained a high color contrast between the background and login fields. This adherence to accessibility standards enhances readability and usability for all users. Additionally, our choice of simple and readable fonts ensures effective communication of information.</p> <p>Following Fitt's Law, we optimized the visibility and interaction of essential elements on the page, improving navigation efficiency. This approach supports a positive user experience by making key actions easy to locate and engage with, thereby promoting usability and accessibility across the platform.</p>
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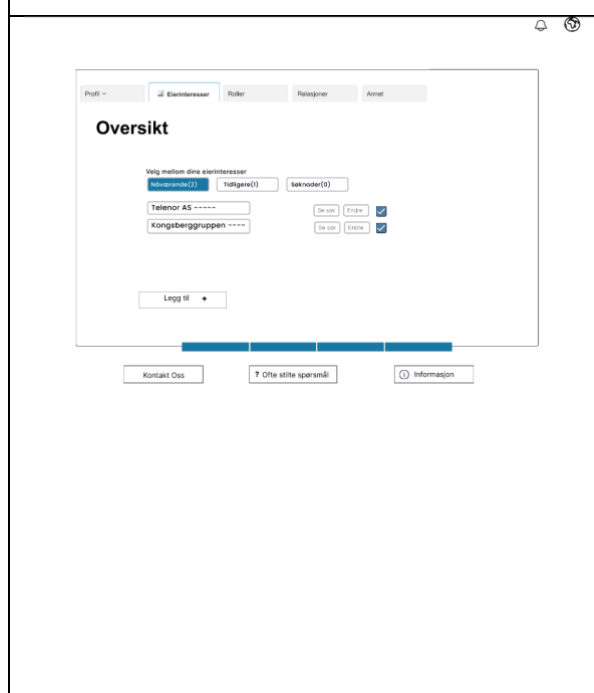
## Navigation Page

To maintain consistency and clarity, we opted to continue using the blue and white color scheme throughout the platform. This choice aligns with design theory principles of visual hierarchy and brand identity, ensuring a cohesive user experience.

Iconography was strategically employed, particularly within the dropdown profile menu, to organize and structure information effectively. By incorporating icons, we enhanced the interface's intuitiveness and visual appeal, promoting ease of navigation for all users.

In terms of accessibility, progress bars were introduced to offer visual indicators of user progress through form fields. This implementation supports users by providing clear feedback and encouraging task completion. Leveraging the Zeigarnik Effect, these progress bars signal incomplete tasks, motivating users to finish their actions.

Overall, these design elements enhance usability and accessibility by guiding users intuitively, maintaining engagement, and facilitating efficient task completion across the platform.



## Overview

Our commitment to a cohesive design is demonstrated through the consistent utilization of our color palette, which enhances brand identity and visual coherence across the platform. The minimalist design approach, characterized by a clean layout and uncluttered interface, directs users' attention to the task at hand, promoting usability and clarity in navigation.

Progress bars were implemented to provide visual feedback on user progress through form fields, reinforcing task completion and guiding users intuitively. This design choice aligns with principles of user-centered

Patient Information	
First Name	
Last Name	
Address	
City	
State	
Zip	
Phone	
Insurance	
Physician Information	
Physician Name	
Physician Address	
Physician City	
Physician State	
Physician Zip	
Physician Phone	
Physician Insurance	
Referral Information	
Referral Number	
Referral Date	
Referral Type	
Referral Source	
Referral Reason	
Referral Status	
Referral Notes	
Referral History	
Referral Date	
Referral Type	
Referral Source	
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Referral Date	
Referral Type	
Referral Source	
Referral Reason	
Referral Status	
Referral Notes	

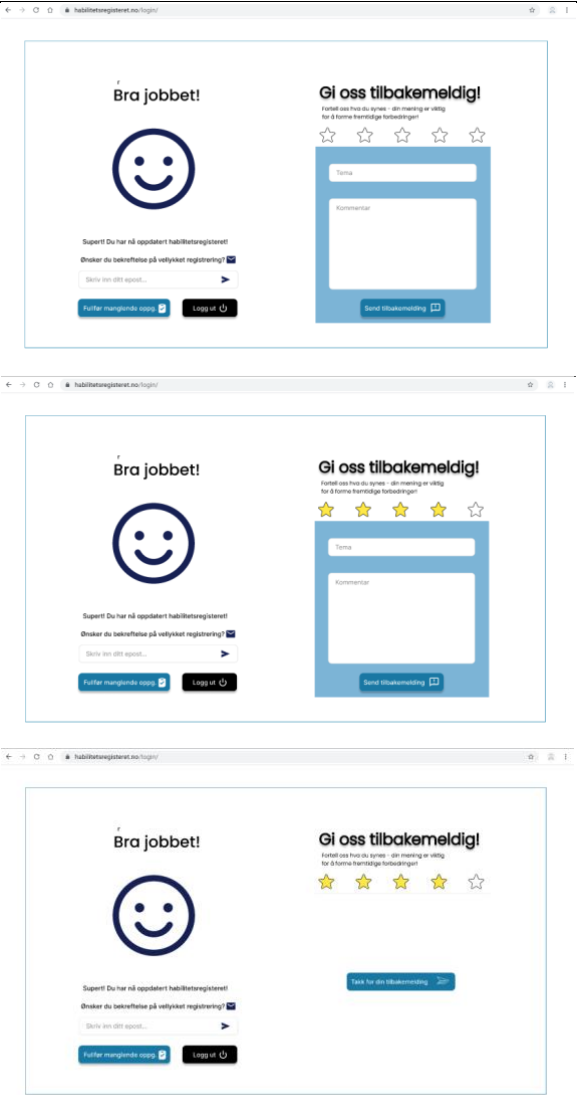
By integrating these design elements, we strive to create a user-friendly environment that promotes engagement, clarity, and accessibility for all users, regardless of their capabilities or limitations.

[illegible]

Adopting a minimalist design approach, we employed a clean layout and uncluttered interface to help users maintain focus on their tasks.

In theory, our minimalist design fosters user focus and clarity, enhancing usability by minimizing distractions.

7 av 51

	<p>can efficiently complete forms without barriers.</p> <p>By integrating these design principles and accessibility features, we aim to provide a user-friendly experience that promotes efficiency and inclusivity across our platform.</p>
	<p><b>Receipt &amp; feedback page</b></p> <p>For the feedback page, we continued using the blue color scheme to maintain visual consistency. A prominent blue frame was used to highlight the information, ensuring it stands out to users. We included a smiley as a response for the completed registration. rating system to allow users to easily provide feedback on their experience, promoting engagement and encouraging them to share their thoughts. An accessible feedback button was also provided, inviting users to report any issues or suggest improvements. Following Hick's Law, we focused on simple and clear communication to reduce decision time and complexity, making it easy for users to interact with the feedback elements. This design choice helps gather valuable user insights while keeping the interface straightforward and user-friendly.</p> <p>For accessibility, we ensured the feedback mechanism was straightforward and easy to use for all users, including those with disabilities.</p>

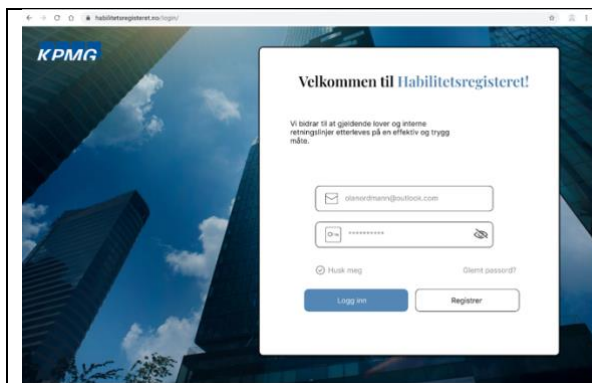
<p><b>Feedback from first user test</b></p>
<p>Usability</p> <ul style="list-style-type: none"><li>- Navigation was confusing; clearer steps and back buttons needed.</li><li>- The "Complete missing information" button and profile section lacked clarity.</li></ul> <p>Information and Clarity</p>

- Key areas had insufficient and unclear information.
- Introductory info and definitions need to be more comprehensive.
- Text size was too small; privacy concerns noted.

#### Aesthetics and Design

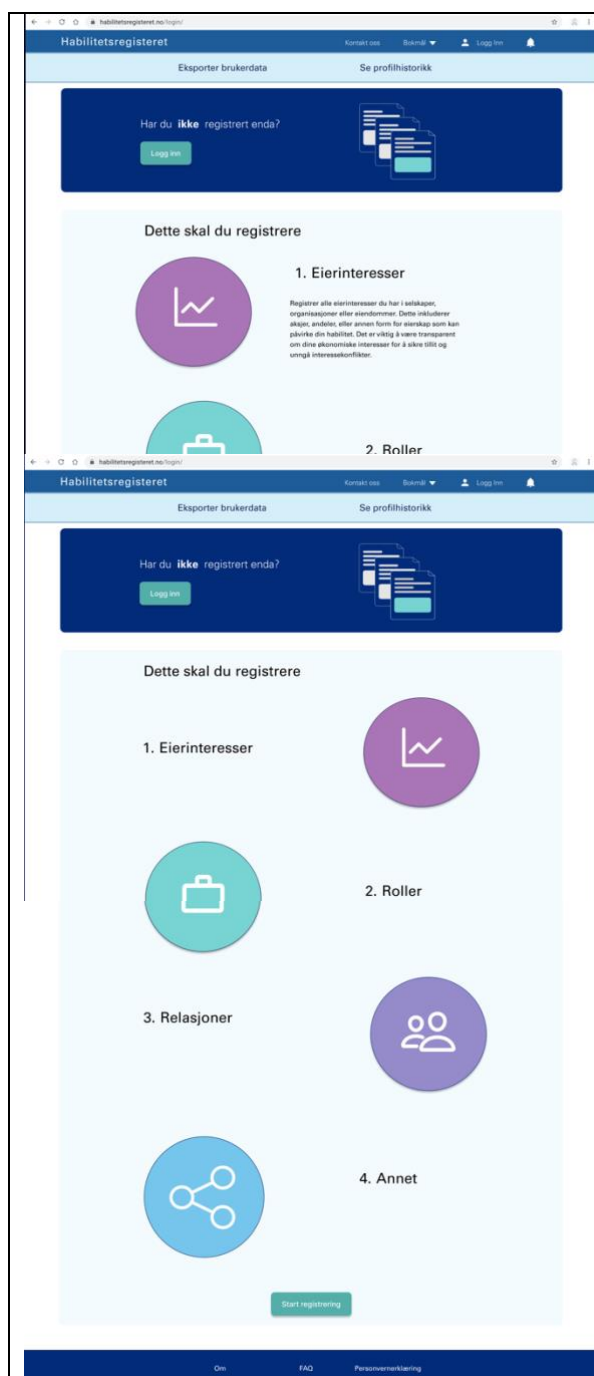
- Colour palette and design were unappealing and inconsistent.
- Suggested improvements included a more professional, modern design with real images and a light blue color scheme.
- The smiley face on the last page was considered unprofessional.

## Prototype 2



#### Log In

We retained the same frame from the previous prototype because users seemed to like this page.



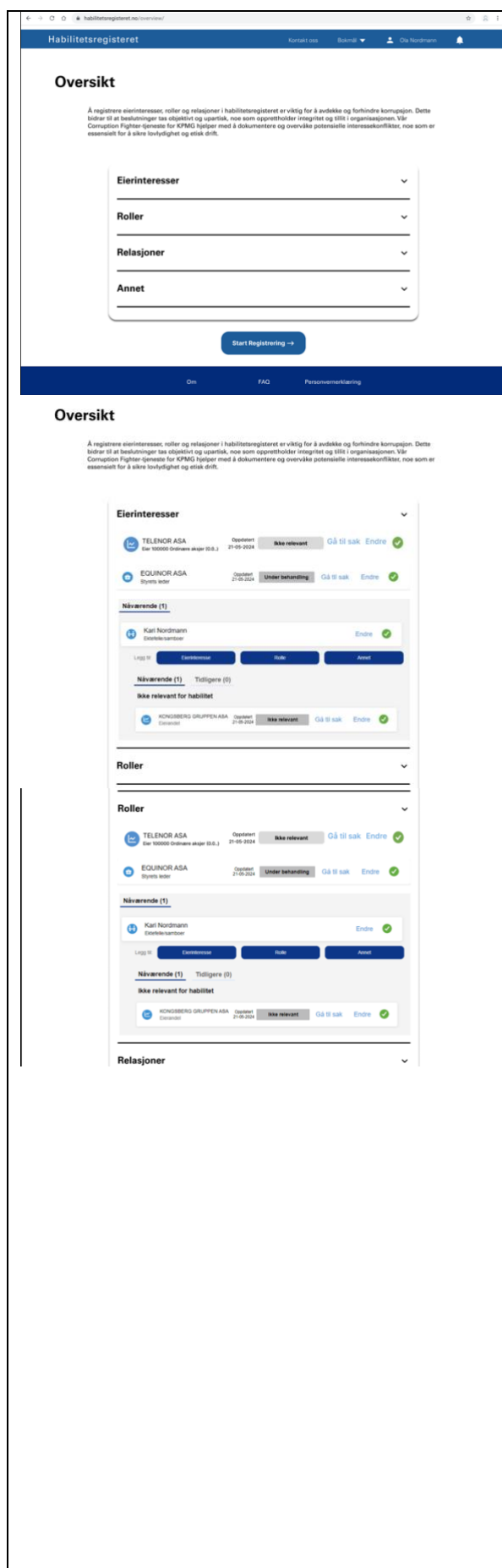
## Landing page

We looked at other websites for inspiration, particularly focusing on Nordes' website for ideas on designing the banner menu and header. We applied Jakob's Law, which emphasizes the importance of making interfaces familiar to users by adhering to common design patterns.

To streamline access, we made logging in quick and straightforward, adhering to Fitts's Law by minimizing the distance to frequently used actions.

One consistent piece of feedback from our testers was that they were unsure about what to register for or why. We addressed this by creating an additional page dedicated to providing clear information about the registration process. This page adheres to Miller's Law, which recommends breaking information into manageable chunks to avoid overwhelming the user.

To display subcategories, we used icons and headers that represented the topics. Our design goal was to avoid overwhelming users at first sight. Therefore, we used a hover effect to reveal more information. When the user hovers over a header, an animation plays, revealing additional details. This approach aligns with the Law of Proximity, as it shows related information only when needed, reducing cognitive load and improving the overall user experience.



## Overview page

We wanted to provide users with an overview of all previous registrations before they started a new one.

Due to some technical problems right before user testing, the information in the dropdown menus was incorrect. Instead of containing relevant information for each subcategory, all information was included in each dropdown menu.

The user tests revealed that it was difficult to understand what needed to be registered and the information presented was confusing.

We had to rethink our presentation approach. We were unsure if we had understood the registration flow correctly, so we contacted KPMG to clarify these uncertainties. After discussing with KPMG, we gained more insight into how their registration system truly works. Initially, we thought users could register for individual sections like "Eierinteresser" without completing other sections. However, it turned out that users must go through all the registration steps. Therefore, it made more sense to include a button to start the registration process, guiding users through the entire registration, rather than registering one topic at a time.

We concluded that having the subcategories in a dropdown menu would be beneficial. This design choice aligns with the Law of Proximity, as it groups related information together, making it easier for users to get a quick overview of the page. By using dropdown menus, we also adhered to Hick's Law by simplifying choices and reducing cognitive load.

	<p>Additionally, we included more information about the purpose of the page. At the bottom, we added a button that takes users to the registration process. This ensures that users understand it is a single registration process with different schemas, each representing a subcategory.</p> <p>Using dropdown menus also allows users to easily access the information they need without being overwhelmed, following Miller's Law by breaking information into manageable chunks.</p>
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Eierinteresser

Her kan du opplyse om eksisterende eller tidligere eierinteresse

Land\*

Status drift i selskapet\*

Aktiv

Ikke aktiv

Organisasjonsnavn\*

Feks. Orkla AS

Eierskap fra

Organisasjonsnummer\*

Feks. Orkla AS

Eierskap til

Er selskapet børsnotert\*

Ja

Nei

Er forholdet relevant for din habilitet? 

Ja

Nei

Aksjeklasse\*

Eventuell kommentar

Antall aksjer\*

\*Påkrevet felt

Jeg har ingen nye eller tidligere eierinteresser å registrere

Avbryt

Neste

Relasjoner

Her kan du opplyse om eksisterende eller tidligere relasjoner

Fornavn/mellomnavn\*

Type relasjon\*

Efternavn\*

Bor i utlandet?\*

Ja

Nei

Fødselsdato\*

Eventuell kommentar

Adresse\*

Postnummer\*

\*Påkrevet felt

Jeg har ingen nye eller tidligere relasjoner å registrere

Tilbake

Neste

Annet

Jeg har ingenting å registrere

Tilbake

Fullfør

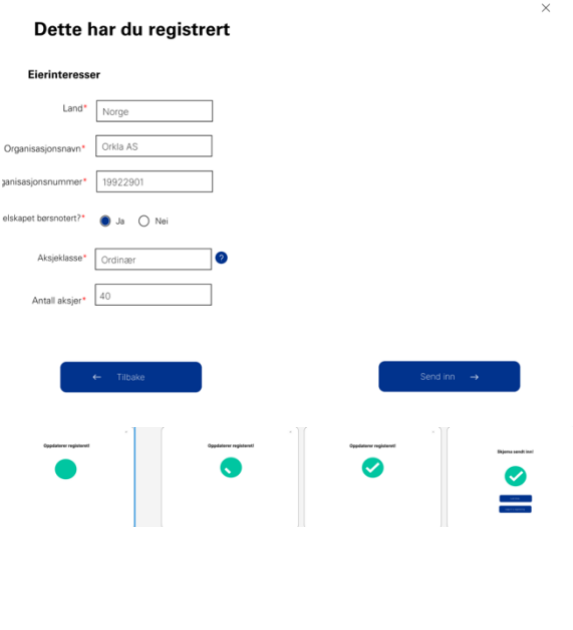
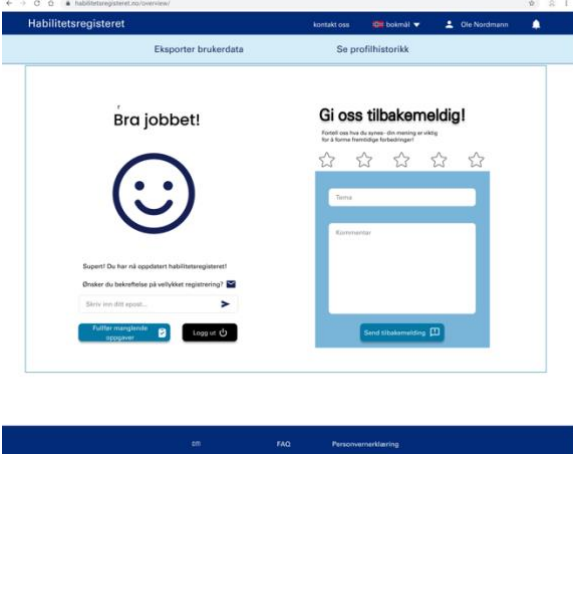
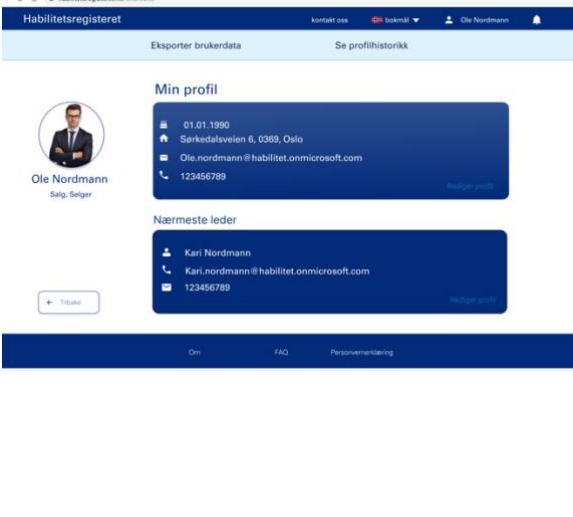
## The Schemas

Based on the feedback, users liked the progress bar, but some suggested it might feel more natural if placed at the top. We took this into consideration and made the adjustment to enhance the user experience, aligning with Fitts's Law by positioning frequently viewed elements in easy-to-reach areas.

We also received feedback that the text was hard to read, especially from older testers. To address this, we increased the font size to improve readability, adhering to the Aesthetic-Usability Effect, which states that designs perceived as more attractive are also perceived as easier to use.

The schemas were presented as a pop-up window in front of the “overview” page. This design choice was intended to give users the impression that they had not "left" the "overview" page, maintaining context and reducing cognitive load as per the Law of Prägnanz, which emphasizes simplicity and clarity.

Given the feedback that it was confusing to understand what needed to be filled out or registered, we included an information icon. Users can click this icon to gain more information without being overwhelmed by too much information at once. This approach follows Hick’s Law, simplifying the decision-making process by presenting information progressively, ensuring that users can access detailed information only when needed.

	<h3>Overview of information before it is sent into registration</h3> <p>As a user, we anticipated the need to get an overview of what they are about to register before submission. This approach follows Jakob's Law, ensuring the interface meets user expectations by providing familiar functionality.</p> <p>After users confirm that the information is correct, they are taken to a confirmation page. Here, we utilized animation and a green color to indicate the confirmation, adhering to the Aesthetic-Usability Effect, which enhances the perception of usability through visually pleasing design elements.</p>
	<h3>Confirmation and feedback page</h3> <p>We wanted to give users the opportunity to receive their confirmation via email. This aligns with Fitts's Law, making it easy for users to access important information efficiently.</p> <p>Additionally, we aimed to provide users with a quick and easy way to give feedback, ensuring they can reach out effortlessly if they have any comments. This approach adheres to Hick's Law, simplifying the process and encouraging user engagement by minimizing the steps required to provide feedback</p>
	<h3>Profile</h3> <p>Based on the user test, we found that users didn't always understand the "profile" drop-down at the first page. We also wanted to make this information more easily accessible.</p> <p>We therefore rethought how to present and place this information. We decided to create a separate page that could be easily accessed from the header. This approach aligns with Jakob's Law, ensuring our design is similar to other familiar websites, which helps users navigate more intuitively.</p>

	Our goal was to keep the page clean and clear, adhering to the Law of Prägnanz, which emphasizes simplicity and clarity in design.
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## User testing feedback

### Login

Users found the login process straightforward and easy to use. Some mentioned that they would like the option to log in with "Google" or "Apple" for better convenience.

### Information Page

There was a consistent desire for a more cohesive visual design and consistency across pages. The snake design was generally acceptable, but there was a strong preference for fewer hover effects and a more unified color scheme. The light blue menu banner at the top was seen as confusing and unappealing. Having two buttons, one at the top and one at the bottom for starting registration, was also found to be confusing.

### Overview Page

Some users found it confusing to have the registration button before reading the information. They wanted the option to read and gather more information before starting the registration process. Otherwise, the overview page was considered clear, with a useful dropdown menu, but the text was seen as too thin and difficult to read against a white background.

### Registration Schemas

There was a recurring request for more information about what needed to be registered throughout the process. Users wanted better explanations and guidance during registration to ensure a clearer understanding. The text was hard to read for some, especially older users.

### Overview of Information Before Submission and Confirmation Animation

Users appreciated the ability to review their information and check for accuracy before submission. After submission, many appreciated the confirmation.

## Confirmation Page

While some users valued the opportunity to provide feedback, others found it less relevant or likely that they would use it. It was suggested that this option could be a new window or a button, taking up less space on the page. Users liked the option to receive the confirmation via email. Many felt that the pop-up confirmation from the previous frame could be combined with this confirmation page.

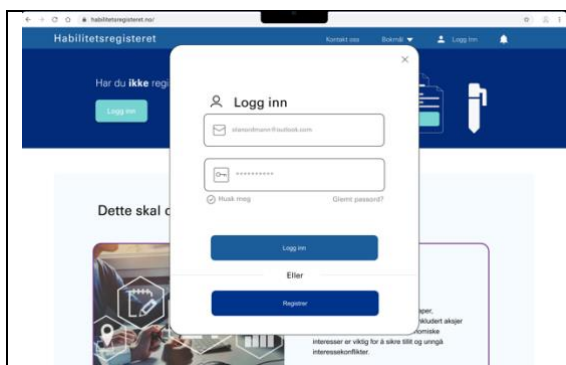
## Profile Page

Users liked having a dedicated "Your Page" where they could view and easily edit their information. However, there was some confusion about why "Your Relationships" was on the page and its relevance.

## General Feedback

There was consistent feedback that buttons were not uniform in size and color. Users desired a clearer, more consistent design throughout the service. There was also a request for more accessible information.

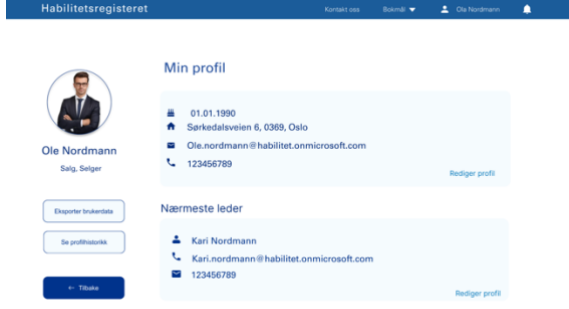
## Prototype 3



Based on user testing, we redesigned the user flow to prioritize user needs by introducing an information page before login. This enhances accessibility and aligns with user-centered design principles, providing clarity and aiding informed decision-making.

Additionally, we implemented a popup login process to maintain continuity and flexibility. This improvement reduces navigation steps, improves usability, and enhances accessibility by allowing seamless interaction between information viewing and login tasks on the same page. These changes collectively improve user experience, catering to various user preferences and needs more effectively.

<p>Dette skal du registrere</p> <div data-bbox="276 237 699 387">  <p><b>Eierinteresser</b></p> <p>Registrer alle eierinteresser i selskaper, organisasjoner eller eiendommer, inkludert aksjer og andeler. Åpenhet om dine økonomiske interesser er viktig for å sikre tillit og unngå interessekonflikter.</p> </div> <div data-bbox="276 425 699 546"> <p><b>Roller</b></p> <p>Registrer alle formelle og uformelle roller i organisasjoner, selskaper eller offentlige verv. Dette inkluderer styreverv, ledende posisjoner, og andre betalte og ubetalte roller. Åpenhet om dine roller bidrar til å opprettholde integritet og unngå habilitetskonflikter.</p>  </div>	<p>Based on user testing, participants criticized the information page for lacking professionalism and visual appeal, noting ineffective icons and excessive colors that gave a childish impression.</p> <p>In response, we redesigned the page to improve aesthetics and accessibility. Replacing icons with real images depicting ownership interests, roles, and relationships enhances visual appeal and ensures clarity and relevance for all users. This approach aligns with accessibility principles by enhancing understanding and inclusivity.</p> <p>These updates address user feedback, resulting in a more polished and user-friendly information page that meets professional standards and improves usability across a broader audience.</p>
	<p>Following user testing, one participant found the double header confusing, suggesting that maintaining only the top header as the main navigation across all pages would enhance clarity and usability.</p> <p>In response, we streamlined the design by removing one header, adhering to design theory principles of simplicity and visual hierarchy to reduce clutter and improve navigation clarity. Additionally, we relocated the "Export user data" and "View profile history" buttons to the profile page. This adjustment ensures a consistent header throughout the platform, enhancing accessibility by simplifying navigation and logically grouping related actions within the context of user profiles. These changes collectively improve usability, making interactions more intuitive and efficient for all users.</p>

	<p>Based on user testing, inconsistencies were found in the design of the "My profile" and "Nearest leader" boxes, with one having a gradient and the other lacking it. Both boxes appeared too bold compared to the rest of the page, impacting visual consistency and accessibility.</p> <p>To address this, we adjusted the design by changing both boxes to a light blue shade, ensuring better harmony with the overall page design and improving accessibility through enhanced color contrast. Standardizing the color across both boxes resolved visual discrepancies, aligning with design theory principles of coherence and consistency.</p>
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## Feedback from KPMG (Product Owner) meeting

After meeting with the product owner (KPMG), we received the following feedback on Prototype 3:

### Positive Feedback:

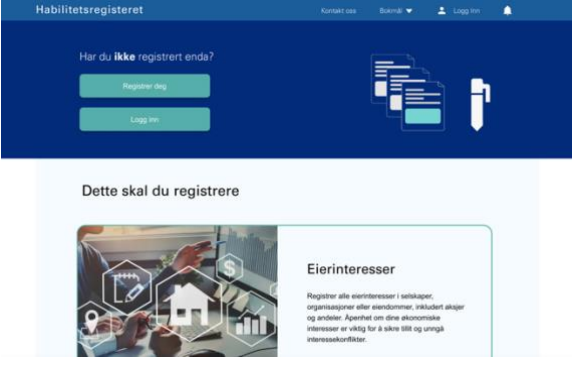
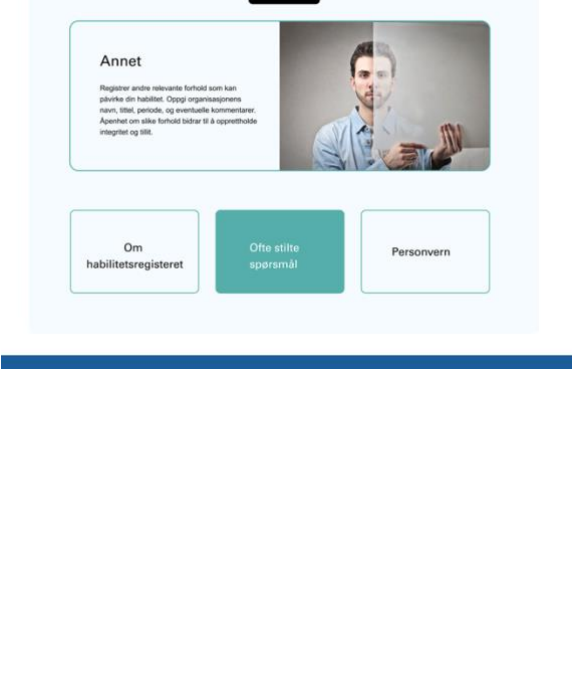
- **Navigation:** They were very pleased with the overall navigation, finding it intuitive and user-friendly.
- **Color Scheme:** The color choices were highly appreciated for their professional and appealing look.
- **Layout:** The layout was well-received, with positive comments on its clean and organized structure.
- **Forms and Progress Bars:** The forms, especially the use of progress bars, were praised for their user-friendliness and clear indication of progress.
- **Information Pages:** They found the information pages to be very informative and helpful for users.

### Suggested Improvements:

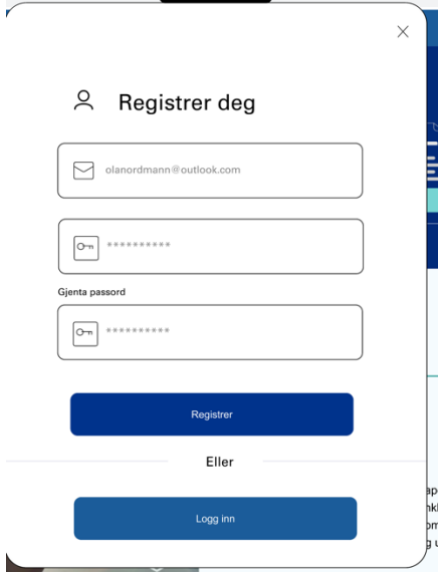
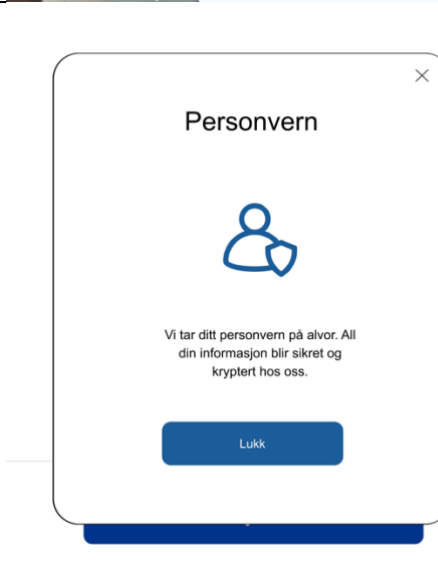
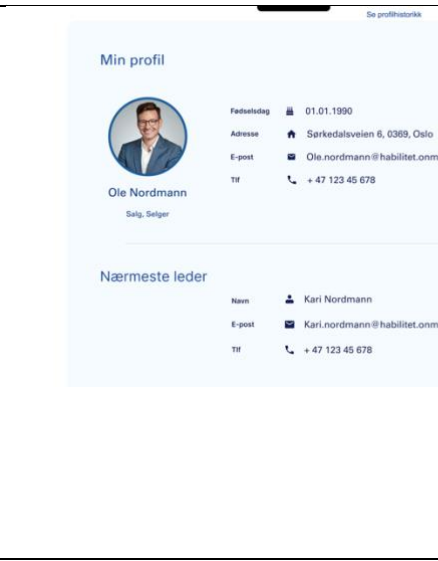
- **Direct Access to Forms:** They suggested adding buttons under the sections for "Ownership Interests," "Roles," "Relationships," etc., to allow users to navigate directly to the relevant forms without having to scroll down.
- 
- **Registration Button:** We added a registration button after the product owner expressed a desire to consolidate both login and registration options in one location, promoting intuitive navigation and user choice in accordance with design theory principles.

## Prototype 4

There are some changes from prototype 3 to the final prototype.


	<p>We added a registration button after the product owner expressed a desire to consolidate both login and registration options in one location, promoting intuitive navigation and user choice in accordance with design theory principles. This adjustment enhances accessibility by presenting clear action options in a unified manner, improving user understanding and navigation efficiency across the platform.</p>
	<p>We added a registration button to consolidate login and registration options, aligning with design theory principles of simplicity and user choice. This adjustment improves navigation by streamlining access to essential actions, thereby enhancing usability and accessibility.</p> <p>Additionally, we revamped the color scheme from purple to turquoise, which now matches the "Log in" and "Register" buttons. This cohesive visual approach not only improves aesthetic appeal but also reinforces design consistency and accessibility. Turquoise is now consistently applied across hover effects on bottom boxes and borders of larger boxes, ensuring a unified and intuitive user experience. e and improving user engagement.</p>



	<p>We created a popup registration similar to the login feature, which enhances accessibility by reducing navigation steps and adheres to design theory principles of seamless user interaction. This approach allows users to register more efficiently without being redirected to a new page, optimizing the user experience by minimizing interruptions and maintaining continuity in their interaction with the platform.</p>
	<p>We also added a new popup that informs users about privacy policies after they log in or register. This enhancement improves accessibility by ensuring essential information is easily accessible without disrupting user workflow. It aligns with design theory principles by promoting transparency and clarity, enhancing the overall user experience. This approach fosters trust and compliance with regulatory requirements, thereby contributing to a more user-friendly and trustworthy platform.</p>
	<p>We redesigned the profile page, integrating "My Profile" and "Direct Manager" into a unified section with a clear dividing line to improve clarity and adhere to design theory principles of visual hierarchy.</p> <p>To enhance accessibility, we strategically placed the "View Profile History" and "Export User Data" buttons above the blue box, minimizing their prominence while maintaining easy access. This adjustment aims to streamline navigation and optimize user experience by balancing visibility with functional accessibility, ensuring a more intuitive interface for all users.</p>



	<p>To enhance usability, we introduced a cancel button and a prominent "Nothing to register" option, aligning with design theory principles of user interface visibility and efficiency. This improvement enhances accessibility by reducing the need for unnecessary scrolling and ensuring clear navigation choices.</p> <p>The "Nothing to register" button's increased prominence makes it quickly noticeable, improving user experience by simplifying the registration process. These adjustments aim to streamline usability, making it more intuitive and user-friendly for all individuals interacting with the platform.</p>
	<p>We adjusted the footer by aligning elements more evenly and adding a margin to enhance visual hierarchy and balance. This improves visual coherence, making navigation clearer.</p> <p>Additionally, we refined the text under the logo for readability and aligned the logo with surrounding text, improving consistency. These changes enhance aesthetic appeal and accessibility for all users, including those with visual impairments, ensuring clearer navigation and information understanding.</p> <p>Overall, these enhancements create a more polished and user-friendly interface, promoting a positive user experience through clarity, consistency, and accessibility.</p>
	<p>We introduced a new "Go to Form" button to expedite user access, aligning with design theory principles of simplicity and efficiency. This addition improves accessibility by reducing navigation steps and ensuring quicker access to essential functions.</p> <p>The button aims to streamline user interaction by minimizing the effort required to reach the form, thereby enhancing overall usability and satisfaction. This approach supports a more efficient user experience, catering to diverse user needs while</p>

	promoting accessibility through intuitive design choices.
	In the final form, we replaced the "Next" button with a "Complete Registration" button to signify to users that it is the last step in the process. This change enhances usability and aligns with design theory principles of clarity and expectation management. It improves accessibility by providing clear guidance and reducing confusion, ensuring a smoother user experience for all individuals interacting with the form.

## Delivery testing (Test objectives, Test execution, Test outcomes)

### Introduction

In the development of our solution, we iterated through four prototypes, each with specific goals and improvements based on user feedback and internal reviews. The objective was to create a user-friendly, intuitive, and professional platform that meets the needs and preferences of our target audience and stakeholders.

- **Prototype 1** laid the foundation with basic functionalities before formal user testing.
- **Prototypes 2** underwent formal user testing to gather detailed feedback and identify areas for improvement.
- **Prototype 3** was further refined based on informal discussions with a knowledgeable acquaintance, focusing on professional aesthetics and usability enhancements.
- **Prototype 4** incorporated feedback from the product owner (KPMG), addressing their specific requirements and making general improvements to align the solution with their vision.

Each iteration brought significant changes, enhancing the overall design, functionality, and user experience. The following sections provide detailed descriptions of each prototype, including their objectives, execution, results, and the changes implemented.

## Prototype 1

**Description:** The first iteration of the prototype included the basic functionalities necessary to demonstrate the main concepts.

**Test Objectives:** The goal of the testing was to evaluate usability and understanding of the tasks to be performed on the website.

**Test Execution:** User testing was conducted with 5 participants via Zoom, focusing on navigation and usability. The test included interviews and observation to gather detailed feedback.

**Results:** The testing revealed several navigation issues, including a lack of help text and insufficient information about the services, overall clean but simple and boring design, Improved the text readability for older users.

### Changes:

- Improved the navigation structure to make it easier for users to find their way.
- Changed the landing page from having 4 main interactive boxes/paths to include more information about what needs to be registered and explanations of various terms.
- Created a more comprehensive overview page to provide users with better insight into available features.
- Improved the form layout by adding a status bar at the top for better visibility and organization.
- Implement a fresher official KMPG color palette.

**Additional Note:** Due to time constraints in Prototype 1, only a single form was implemented to gauge user feedback. In Prototype 2, all four intended forms were fully developed and included for comprehensive testing.

## Prototype 2

**Description:** The second iteration of the prototype included improvements based on feedback from the first prototype and introduced new features and a more complete implementation.

**Test Objectives:** The goal of the testing was to verify navigation improvements and evaluate the completeness of the forms and overall functionality.

**Test Execution:** User testing was conducted with 5 new participants via Zoom, focusing on navigation, the new landing page, and the comprehensive implementation of all forms. The test included interviews and observation to gather detailed feedback.

**Results:** The testing revealed ongoing navigation issues and a need for more information to help users understand what needs to be registered. Feedback also indicated that the initial landing page (login) was not optimal for new users.

#### **Changes:**

- Improved the navigation structure to further enhance usability.
- Changed the landing page from a login screen to a more informative welcome page, guiding users on what needs to be registered.
- Implemented the entire site with all four intended forms, providing a more complete and functional prototype.
- Created a more comprehensive overview page to offer users better insight into available features.
- Unified the design for a more consistent user experience.
- Improved the text readability for older users.

## Prototype 3

**Description:** The third iteration of the prototype aimed to achieve a more professional look and feel. Key changes included a refined color scheme, enhanced imagery, improved login functionality, and additional registration forms to create a more realistic user experience.

**Test Objectives:** The goal of the testing was to enhance the professional appearance of the site, improve overall usability, and ensure that users could easily navigate the site while receiving assistance when needed. The focus was on making the site more user-friendly and intuitive.

**Test Execution:** Feedback was gathered informally from a knowledgeable acquaintance who provided insights into design improvements and usability issues. Observations and detailed suggestions were used to refine the prototype.

**Results:** The feedback highlighted the need for a more cohesive color scheme, better visual aids, improved login and registration processes, and a more streamlined user interface. Specific issues with the landing page animations and navigation were also identified.

**Changes:** Adopted a professional color scheme using two main colors consistent with KPMG branding.

- Added images to better describe situations rather than relying solely on logos.
- Implemented an improved login/register page and an additional private policy prompt to make the experience more realistic and trustworthy.
- Added more information to the footer for better user guidance.
- Enhanced the menu header for easier navigation.
- Removed hover effects and animations on the landing page to improve clarity and accessibility, making it static for easier information access.
- Switched from popup windows to dedicated frames/pages for forms to provide more space and improve readability and usability, following UX design principles.
- Fixed the overview dropdown menu to function correctly, displaying only relevant information.
- Added informative pop-up pages for each form to guide users.
- Introduced three boxes at the bottom of the main page to organize footer content more effectively.
- Deleted the duplicate menu, consolidating content on the profile page.
- Merged the confirmation and feedback pages, transforming the static feedback section into an optional pop-up window that users can choose to engage with.

## Prototype 4

**Description:** The fourth iteration of the prototype focused on incorporating feedback from the product owner (KPMG) and implementing general improvements where potential was identified. The goal was to refine the solution according to the product owner's preferences and enhance overall usability and aesthetics.

**Test Objectives:** The objective was to address the specific changes requested by the product owner and make general enhancements to improve the site's functionality, consistency, and user experience.

**Test Execution:** Based on the feedback from the product owner and internal evaluations, several key changes were implemented to achieve a more polished and cohesive design.

**Results:** The updates led to a more realistic, user-friendly, and visually appealing prototype, aligning with the product owner's vision and addressing usability concerns.

**Changes:**

- Realistic Registration Experience: Added a registration pop-up to create a more realistic user experience.
- Enhanced Overview Page: Made tabs on the overview page functional, allowing users to click and navigate easily.
- Consistent Design: Standardized design elements across all pages, including fonts, font sizes, button sizes, and consistent use of blue and turquoise colors, integrating the turquoise color from the landing page into other sections.
- Improved Navigation: Moved the "I have nothing to register" checkbox to a button at the top of the form to make it more visible and improve navigation, allowing users to skip sections more quickly without scrolling down.
- Profile Page Redesign: Centralized the boxes on the profile page and ensured the design matched the other pages for a cohesive look.
- Back Button Adjustment: Replaced the back button at the bottom left with a small arrow and text under the compliance logo for better usability.
- Aesthetic Enhancements: Ensured proper spacing, margins, and padding between all elements to create a visually pleasing layout.
- Simplified Color Scheme: Switched to using only two primary colors, with turquoise incorporated into the boxes for a cleaner appearance.
- Privacy Prompt: Added a privacy prompt after the login and registration forms to enhance credibility and trustworthiness.

## Conclusion

The iterative process of developing and testing our prototypes allowed us to make continual improvements and align our solution with user needs and stakeholder expectations. Starting from basic functionalities in Prototype 1, we incorporated formal user feedback in Prototype 2, refined the design based on informal insights in Prototype 3, and finally integrated specific feedback from the product owner in Prototype 4. This progression ensured that our final product is user-friendly, intuitive, and professional. By addressing feedback and refining the design and functionality through each iteration, we created a robust platform that meets the high standards set by our team and product owner.

# Future enhancements

## Further development of the solution

If we had more sprints to continue with the project, we would ensure closer contact with the product owner. If the customer desired a complete solution and we were to implement it further, we would include the following:

### Technical programs:

*DB browser for SQLite* – Program for making the database with the tables and entities.

*Entity-Relationship Diagram* – Program for data modeling tool, at [lucidchart.com](https://lucidchart.com)

*Visual Studio Code* – Program for coding the web application. It offers a variety of plugins, that could be useful. For example, debugging and team collaboration.

*Visual Studio* – Program for using the programming languages intended (C#, .NET, JavaScript, TypeScript etc.)

*Git* – For version control and team collaboration

*Github* – Where we would push and pull between the developers on the team and publish the solution.

*Node.js* – For JavaScript runtime and package management

## Technical decisions if we had decided to code

### Backend Development:

#### ***Database***

We would use a database tool as DB browser to form a structured way to store information in an organized and efficient manner. First, we would make a diagram with all the tables and the relations between them with primary key and foreign key at [lucidchart.com](https://lucidchart.com). Then, we would create a new database with all the entities and columns in DB Browser.

#### ***.NET***

.NET is known for its powerful framework for building web applications. It also supports various development activities from front-end to back-end. It is known for developers who value productivity, performance, security, and reliability (Microsoft.com,

<https://dotnet.microsoft.com/en-us/platform/why-choose-dotnet#:~:text=With.NET%20you%20can%20target%20any%20application%20type%20running,developers%20can%20build%20apps%20faster%2C%20with%20less%20cost.>)

Since this is a web-application with sensitive personal information, the security is also an important aspect. .NET provides robust security features, such as build-in authentication, authorization, and data protection.

## **C#**

C# is the primary language for the .NET framework. C# is a statically typed language, which means that the type of every variable (such as integers, strings, classes, etc.) is known at compile-time. C# and .NET are used to build secure, high-performance, and scalable web applications. C# an ideal choice for developing a comprehensive and reliable web application that can effectively handle sensitive personal information and meet our project's needs. By using .NET and C# along with best practices such as ORM tools like Entity Framework, we can significantly reduce the risk of SQL injections. These approaches help ensure that user input is handled securely and efficiently in our application, protecting your database from potential security threats.

## ***API Development and Integration***

RESTful API (Representational State Transfer) is an architectural style for designing network applications. It relies on a stateless, client-server, cacheable communications protocol, usually involves HTTP. This also refers to CRUD (codeacademy,

<https://www.codecademy.com/article/what-is-crud>)

When it comes to HTTP Methods, we would include are the following:

## **GET**

Scenario: **The user wants to see their profile page**

- Endpoint here would be: GET api/user/{userId}
- This would retrieve information about a specific user based on their unique identifier. This would be used to get a specific id to show the profile page.
- This ending point will be used when the user is clicking on the “Ola Nordmann” in the header.

GET To Retrieve Overview Page:

- Endpoint GET api/users/{userId}/overview
- This endpoint will retrieve the overview for a specific user, identified by the id, which is unique.



## POST

Scenario: **The user wants to fill out a new schema**

- POST is used when creating new data. When users are filling in the schemas, they are creating new entries in the system. So, when the user submits the form, this must be stored in the database.
- Further, it needs to be sent to the server refers to the fact that once the user fills in the required information in the schema, such as "Role Type," "Title," and "Monthly Time Spent," this data needs to be transmitted from the client-side (where the user interacts with the form) to the server-side (where the application is hosted and data is processed).
- Taking a closer look at the "Rolle" schema, users are required to provide specific details such as the type of role they are adding, the title of the role, and the amount of time spent monthly in that role. These details, entered by the user in the form, need to be formatted into a JSON payload before being sent to the server.
- Formatting the data to a JSON payload involves organizing the user-provided information into a structured format that can be easily understood and processed by the server. In JavaScript, this often involves creating an object with key-value pairs corresponding to the form fields, and then converting this object to a JSON string using the `JSON.stringify()` method. This JSON string can then be included in the body of the HTTP request (POST request) sent to the server.
- Once received by the server, the JSON payload can be parsed and the data extracted for further processing, such as storing in a database or performing additional operations based on the user input. This ensures that the information provided by the user is captured accurately and can be utilized effectively within the application.

## PUT

Scenario: **The user wants to edit their personal information on their profile page.**

- Endpoint: `api/user/{userId}`
- In react, the component sends a PUT-request with updated data to the ASP.Net core backend, which would process the request and updates the database

accordingly. This approach ensures efficient handling of updates and adheres to RESTful API principles for updating resources.

Scenario: **The user wants to edit one or several of the filled-out forms before sending it in.**

- When the user confirms their changes, the frontend triggers a PUT request to the server endpoint (/api/schema/{schemaId}) using Axios or another HTTP client library.
- The PUT request includes the updated data (e.g., modified role type, corrected title) in the request body to update the server-side representation of the schema.
- As the user makes changes (e.g., corrects a typo, updates monthly time spent), the frontend application updates the corresponding data in the local state using useState.
- After successfully updating the schema data on the server, the frontend can handle the response to confirm the update and provide feedback to the user (the animation page).

It is also important to emphasize that we would use error handling as well in the code.

## Frontend Development:

### ***React***

We would use React as a framework because of several reasons. One of them is because its component based. It's very useful and simplifies a lot of the code. For example, the fill out forms. React uses a virtual DOM to efficiently update the UI. Instead of re-rendering the entire UI when there's a change, React updates only the necessary parts of the DOM. This leads to better performance and a smoother user experience, especially when handling form submissions and real-time updates. React can be easily integrated with various backend technologies and APIs, allowing you to fetch and update data asynchronously. This flexibility is essential when implementing features like form submissions, data retrieval, and CRUD operations (Create, Read, Update, Delete). It also uses different hooks that we would use, such as useState (used for managing state within functional components) and useReducer (used for handling side effects in functional components)

### ***JavaScript and TypeScript***

JavaScript allows for dynamic updates without page reloads, improving the user experience. TypeScript adds static typing and enhanced tooling capabilities.

### ***HTML***

We would use HTML for the structure and content of the web-application.

### ***CSS***

We would use CSS framework (as Bootstrap or Tailwind) in the React project, for make sure that the application is visually appealing and a consistent UI.

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