

THE DEVELOPMENT OF MOBILE APPLICATIONS FOR PET SITTING

Antonela Požarina, Nikolina Stanić Loknar , Filip Cvitić , Tajana Koren Ivančević 
University of Zagreb, Faculty of Graphic Arts, Zagreb, Croatia

Abstract: Nowadays, the presence of pets in family households is increasing. There are more and more studies carried out on the effects of pets on human health, physical activity, stress levels, feelings of anxiety or happiness and similar parameters. At the present time, pets are not only animals, but also family members. Regardless of this fact, it is not always possible for owners to be with them due to various obligations and responsibilities. Owners want to ensure that their pets are always in safe hands. The innovative application discussed in this article is a solution for owners whose goal is to find quality care for their pets while they are away. The application offers all the necessary functions for easy and fast communication between the parties involved, finding and booking a guarding service. Owners can describe their pets in detail, including all their unique needs and behaviors, so that potential sitters can assess their compatibility and ability to provide quality care. On the other hand, sitters can create their own profile and highlight their experience so that owners can find the ideal candidate for pet care.

Key words: user experience, user interface, pets, mobile application

1. INTRODUCTION

Users are the main actors in the interaction with the application and, taking this into account, the application design plays a key role in creating a good and positive user experience. To increase user confidence in the service offered by the application, it is necessary to create an intuitive and attractive user experience that is easy to use and navigate. User interface design and user experience play a very important role in today's technology and design world. User interface design consists of guidelines, workflows, colour palettes, design process, and design thinking, while user experience includes the processes of using the application itself and its simplicity or complexity (Sharma & Ankit, 2021). It is important to emphasize that the interface design can simultaneously deter or attract potential users of a particular application. In order to develop and create the best possible user interfaces, there are many guidelines and principles that designers follow when designing a product (Thornsby, 2016). The user interface is the graphical appearance of the application. It consists of buttons that the user can click on, text that the user can read, images, sliders, text input fields and all other elements with which the user can interact. This includes the layout of the graphical elements on the screen, transitions, interface animations and every single microinteraction. Each visual element, the user's interaction with the application or animations must be designed individually. Some user interface designers are also graphic designers. They are responsible for creating an attractive user interface that visually fulfils the purpose of the application. They must also ensure that each individual element functions consistently (Medium, 2019). There are many different principles, so Adobe has defined the four most important principles for user interface design, namely:

- put the user in control of the user interface,
- create a product that enables pleasant interaction,
- reduce the mental load and
- maintain consistency of the user interface (Babich 2019).

A good user interface gives the user a feeling of control. For each action of the user, the system should show a clear reaction, i.e. feedback linked to the action point. It is necessary to consider the type of interaction. For example, when the user clicks on a button, it is necessary to provide an indication that this action has been performed and that the user is waiting for feedback from the system (usually something simple, such as changing the colour tone of the button or micro-animations) (Stevens, 2021). As user experience becomes key to customer loyalty, the UX designer becomes an important member of the organization. Anyone who creates a digital product, be it an application or software, can successfully meet the needs of users with the help of a UX designer (Browne, 2023). User experience is all about the overall experience of using a product, not just its appearance. Defining user experience can be challenging as it encompasses different areas such as design, research, usability, functionality and the like. The general

definition of user experience refers to the process of developing physical or digital products that are useful, easy to use and provide a great experience throughout the interaction. In short, user experience encompasses the following questions - why, what and how the user uses the product. It starts with the question of why the user has the desire or need to use the product. The "what" question explains what the users do with the functions and features that the product offers, and finally, the "how" question refers to how the users access the product's functions through the user interface (Canziba, 2018).

2. THE PROCESS OF CREATING MOBILE APPLICATIONS

Like most other disciplines, UI and UX design has its own process. They follow a user-centred design process that is divided into several phases:

- discovery and planning,
- strategy,
- researching the user experience,
- analysis,
- design and
- production.

In order to create a high-quality product in the end, it is very important to strictly follow all these phases. Before the designers start the actual product design, they need to define the problem that the product is supposed to solve. Defining the problem is the most important, but also the most difficult phase of the process. It is necessary to consolidate all the research and objectives and integrate them into several general problem areas that can be solved by a single product. This involves a process that identifies the key user needs and aligns them with the objectives (Chew, 2021). It is always a good idea to write a problem statement as early as possible in the research phase, as this can be very helpful in setting goals (Rosala, 2021).

The problem description should include the actual background of the problem, questions such as why the problem has arisen, how users are currently solving the problem and what it is essentially about. You also need to create an empathy map, developed by Dave Gray, co-founder of strategy consultancy Xplane. This is a powerful visualization tool designed to help teams use emotional intelligence to gain insight into their target audience. The tool provides a common thread to identify the thoughts, feelings, motivations, desires and needs of the target group. For example, developers could use an empathy map to consider how users react to a new device or a particular pain point (Mind Tools, 2024).

Empathy maps give an insight into the user as a person as a whole and are not chronological or sequential. The "utterances" section contains what the user says during the interview, ideally with verbatim and direct quotes from the research. The "Thoughts" section records what the user is thinking about. It is important to ask what is on the user's mind, what is important to them, and to pay attention to what the user is thinking and what they are not willing to express and share. The "does" section includes all actions that the user performs. Research has shown that it is important to find out what the user does and how they do it. The "feelings" section reflects the user's emotional state. What worries the user, what pleases him, how does he feel when he uses the product? Humans are complex beings, so it is quite normal for there to be contrasts between the sections. This is why designers often come across inconsistencies - positive actions but negative quotes. The designer's job is to investigate the cause of the conflict and resolve it (Gibbons, 2018). Figure 1 shows an example of the use of the empathy map.

EMPATHY MAP Example (Buying a TV)

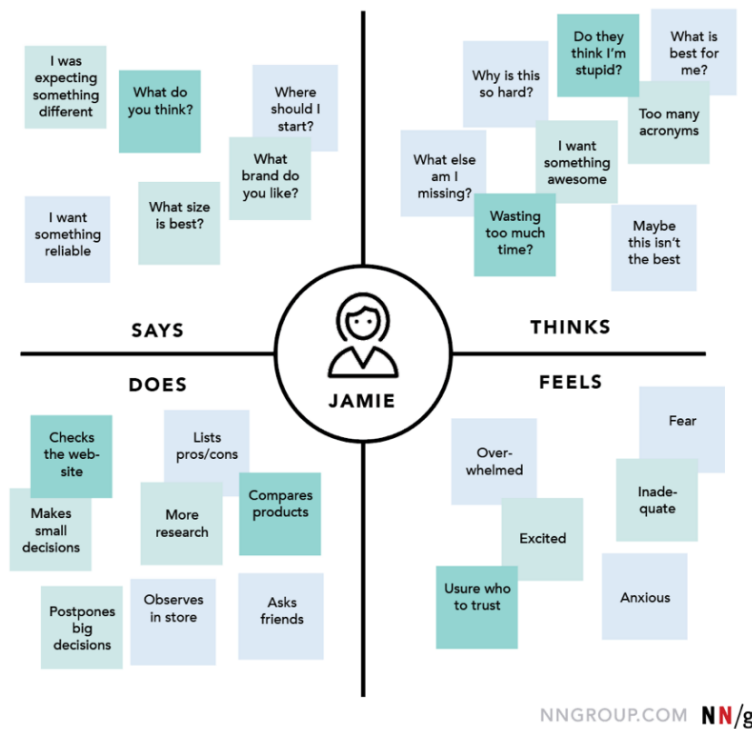


Figure 1: Example of the use of the empathy map

Personas are fictitious potential users of an application that designers create on the basis of research. Creating personas helps to understand users' needs, experiences, behaviour and goals. To create something useful and usable, you generally need to focus on a clearly defined group of users, i.e. a group of people with common characteristics and needs. The more similar the user population is, the greater the likelihood that the product will be tailored precisely to their goals and needs. Personas are therefore detailed descriptions of fictitious people that are created on the basis of thorough, very specific information about real people. They are used to describe the goals, expectations, motivation and behaviour of actual users (Marsh, 2016). Why do people visit a website? What are their expectations and what are they looking for? What excites them? As designers, we create personas iteratively. We divide users into manageable groups and represent each of them with a typical persona. For example, for an application that helps students calculate expenses, "Amy" represents an eighteen-year-old female adjusting to student life. Using Amy as an example, you can see how this application helps students in their daily life and activities. It was assumed that Amy is new to online banking, lives in a dorm and works on weekends. Her goal is to save money (Interaction Design Foundation, 2016).

Once all personas have been described in detail, the next step is to create a user journey or user scenario. The user journey represents the way in which a user accesses a website or application to complete a task. When successfully executed, the user journey identifies ways to fulfil the user's needs and eliminate any points of frustration (Kaplan, 2024). A user scenario is a very useful technique for a deeper understanding of user motivations, needs and concerns.

2.1 Wireframe and UI design

The user interface is the most important element of a computer system or product. If the interface is poorly designed, users' ability to utilize the computing power of applications can be severely limited. User interface design begins with identifying the user, the tasks they want to perform, and the environmental requirements. Once all tasks are identified, user scenarios are created and analyzed to define a set of

interface objects and actions. In many cases, the user interface shapes the user's perception of system quality (Sridevi, 2014).

Since the design of user interfaces is a very complex field, UI designers have many tasks in their role. Not only do they have to ensure that the user interface is particularly attractive and easy to navigate, but they also have to consider the psychological aspect of the design. To successfully design a user interface, they need to understand the user and be aware of how each design element affects the user experience. It is also their job to ensure consistency throughout the digital product by developing a specialized library of user interface patterns and style guidelines. Ultimately, UI designers focus on designing an attractive user interface that aligns with organizational goals (Jaye, 2023). The role of the UI designer is crucial in creating an intuitive and user-friendly interface. Every aspect of the design must be carefully considered and it is important to recognize how it affects the end user.

Before the designer starts developing the UI design, it is necessary to start with the wireframe. Wireframing is a method of designing digital products on a structural level. It is usually used to set up content and functions on a page, taking into account user needs and the user experience.

2.2 Testing mobile applications

Mobile application testing is the process by which applications developed for mobile devices are tested. The main goal is to test the functionality, usability and stability of the application. Testing is the most important step before an application is launched and is crucial for its survival in today's market. To ensure the best possible quality for end users, the app is also tested from other aspects, such as performance, security and user interface. Apps need to be tested on different mobile devices and operating systems to check their compatibility, usability and consistency. When testing mobile applications, testers should have a variety of skills and master multiple testing techniques to find as many bugs as possible in different environments and scenarios (Testsigma, n.d.). There are more than 9,000 different mobile devices, and in the real world, end users can install and use apps on any device. The application must be optimized for each device to work smoothly. The increasing use of mobile devices will also encourage the development of advanced mobile applications designed to facilitate access to various services. Companies need to ensure that their mobile applications are optimized and ready for future, more advanced smartphones. This can only be achieved by testing and optimizing applications on the latest mobile devices. Mobile application testing helps to achieve good esthetics - i.e. UI design, performance and functionality of applications on different devices (BrowseStack, n.d.).

3. EXPERIMENTAL PART

3.1 Definition of the problem

The aim of this work is to develop an application that meets the specific needs of pet owners and caretakers. Based on the hypothesis that there is a significant need for a tool that simplifies the process of communicating, booking and finding reliable caregivers, the research focused on developing a user-oriented, secure and highly functional application. By integrating advanced features such as detailed profiles, reviews, GPS tracking of the pet's location and a secure communication platform, it is expected to significantly improve the user experience and increase user confidence in pet sitting services.

The pet sitting mobile application is a solution that enables easy communication, searching and booking of appointments with sitters. Owners have the ability to describe their pet in detail, including specific needs and behaviours, so that potential pet sitters can assess their compatibility. Pet sitters can create profiles highlighting their experiences, making it easier for owners to find the ideal pet sitter. With a rating system that enables the sharing of experiences and recommendations, the app contributes to the transparency and reliability of the service and provides a comprehensive tool to solve the challenge of finding a reliable pet care provider.

The problems faced by users are as follows:

- finding reliable pet sitters,
- clear communication between both parties,
- safety of the pet and trust in the caretakers,
- simple and intuitive reservation system,

- tracking the location of the pet,
- ensuring service quality,
- attracting qualified pet sitters and
- building trust.

The objectives of the research are as follows:

- Understanding user needs and pain points - insight into the specific needs and challenges pet owners face when looking for a pet sitter, as well as the concerns and requirements of sitters themselves.
- Trust and reliability factors - exploring the factors that contribute to building trust and reliability between pet owners and sitters, including communication methods, vetting processes and user reviews.
- Examining user behaviour - analyzing how pet owners and sitters currently search for and use pet sitting services, including their preferences for online platforms and frequency of use of the service itself.
- Identifying opportunities for improvement - identifying areas where the current pet sitting experience can be improved or simplified, such as streamlining the booking process, improving communication features or implementing additional safety measures
- Gathering feedback on existing solutions - feedback from pet owners and sitters who have used similar apps or services.
- Market trend research and competitive analysis - researching market trends, new technologies and competitive offerings in the pet care industry to identify potential gaps, opportunities and areas of differentiation.
- User satisfaction measurement - measuring the effectiveness and impact of a pet care app.

3.2. Target group and in-depth survey

The target group comprises several different profiles of people. On the one hand, these are professionals with demanding jobs and long working days who occasionally need a pet sitter - while they are at work, when they have to go on a business trip or when they just want to relax. They need reliable pet sitters who will take proper care of their pets when they are away. They prefer a simple booking process and clear communication. Another group are people who travel frequently and need a pet sitter on a regular basis. They need flexible and reliable sitters who can adapt to their schedule. In addition, there are pet owners with special needs, such as pets suffering from various illnesses or pets with behavioural problems - they therefore require special care. Such pets need experienced and professional caregivers who are willing to cater to their special needs and provide them with special care when required. Older pet owners who are restricted in their mobility or have health problems that make it difficult for them to look after their pets independently are also part of the target group. They are looking for help from caring and reliable pet sitters who can help and support them with basic pet care tasks such as feeding, grooming and walking. They are looking for patient and empathetic people. Finally, there are the pet sitters themselves, people who offer pet sitting services as a part-time or full-time job, often out of love for the animals and a desire to help pet owners in their community. With all this information about the target group, it is possible to define several personas. An empathy map was created for each person.

For research purposes, an in-depth interview was conducted with four people belonging to different categories of people from the target group in order to gather as much information as possible about potential users. User interviews provide a deep insight into who our users are, their lives, their experiences and their challenges. When designers and developers know certain information about potential users, it is much easier to find and design an appropriate solution to their problems.

Before you start creating the wireframe, you need to create a user scenario. The scenario looks like this: Sara works at a marketing agency known for its extremely fast and stressful work pace and is looking for a sitter for her Labrador, Max. Suddenly she finds out that she has to stay at work until late at night. The most important thing for her is that the future housekeeper is reliable and that there is the possibility of easy booking and communication via messages.

3.3. Creation of a wireframe

After thorough research and questioning, the next step is to create a wireframe for the app before the actual UI design is created. By creating a wireframe, a basic layout of the elements on the screen can be established, taking into account the needs of the users and the intuitiveness of the application. Creating wireframes allows designers to correct structural errors and improve usability before committing to design details. Wireframe testing has become very popular to effectively identify problems with the intuitiveness of an application. To avoid spending hundreds of hours designing an application only to find that it's unusable in the end, it's very important to conduct testing at the wireframe stage. Jakob Nielsen popularized the idea of performing simple tests on early product models such as wireframes with only five users and identified the most important usability errors that can lead to the failure of an application (Angeles, 2024).

In order to test the intuitiveness of the application, three tasks were designed in which the respondents go through the most important functions of the application. The aim is to determine the degree of intuitiveness and user-friendliness of the application and to eliminate any shortcomings. Respondents were presented with a scenario in which they had to put themselves in order to solve a problem using the application. The first task was: "You need to go to a business meeting in another city. You can not take your dog with you because you will not have time to look after him properly. You research all the options available to you to find a person who can look after a dog and suddenly come across the WagWatch app." The interviewees had to create their profile in the application. The next step and task was to define and post a request for pet care, through which a person can reach the ideal candidate who will take care of the dog. In addition to the next task of define and posting a request, respondents also had the task of describing the home screen and the options they see on it, and describing their experience in setting up a request.

After completing the basics and posting the request, respondents move on to the final task where they must respond to the notification from the trustee who responded to the posted request. Respondents must look at the profile of the person who wants to take care of a pet and describe what they see there.

Respondents completed all tasks with ease and without difficulty, indicating the exceptional intuitiveness and simplicity of the WagWatch application.

3.4. Interface design and prototyping

After creating the wireframe, the next step is to create the design of the user interface. When developing a design, it is important to keep some of the following guidelines in mind:

- Colour selection - the colour palette must match the theme of the application, encourage users to interact with the design elements and ensure a good composition between all elements (hierarchy).
- Font - it is important to choose simple and legible fonts. It is recommended to use fonts that are suitable for smaller screens (an example of fonts that should be excluded from the selection are various display fonts that attract attention and are mostly used on billboards).
- Size of elements - the elements on the user interface should be large enough to be visible and accessible to users on their cell phones, and care should be taken to arrange the elements correctly so that the user experience is intuitive.
- Navigation bar - contains all the main menus and should be clearly visible so that users can easily navigate through the different areas of the application. The most important components of the navigation bar are the icons, which should be clear and simple.
- Creating and testing flows - trying out different ways to solve an important task in the application itself and testing with users to determine the intuitiveness of the flow.

The application was created with Figma, while the icons were drawn with Adobe Illustrator. First, the components are created, elements that are repeated several times throughout the design. Creating components makes the designers' work easier, as they act like building blocks from which the entire application is constructed. Editing one component affects all other elements of the design, i.e. the designer only has to make a change to one component, which is then applied to all elements of the application (variables - child element created from the main component - parent element).

The icons have been drawn in Adobe Illustrator in a modern geometric and minimalist style so that the application is not cluttered and all screens appear clean and transparent (Figure 2).

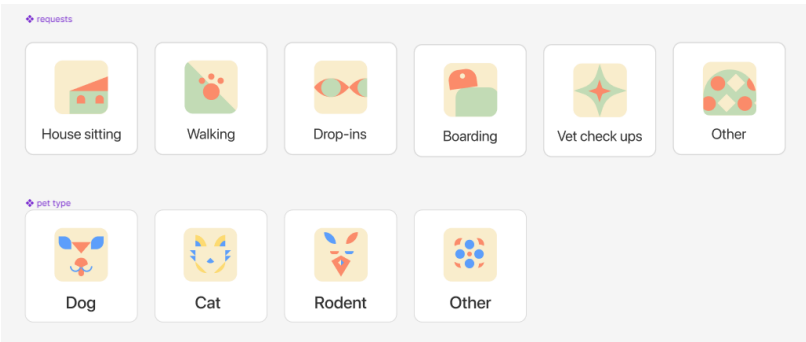


Figure 2: Display of icons

The colour palette consists of four colours: Blue (#54A0FF), Beige (#FAEDCA), Orange (#FF8966) and Green (#C1DBB3). Beige, orange and green are soft shades. Soft shades have a calming effect and in the context of an application whose main function is to give pet owners a sense of security and reduce stress, the use of soft shades is a good choice. The blue colour is mainly used to highlight the buttons. Figure number 26 shows the icon.

Figure 3 shows the onboarding of the application.

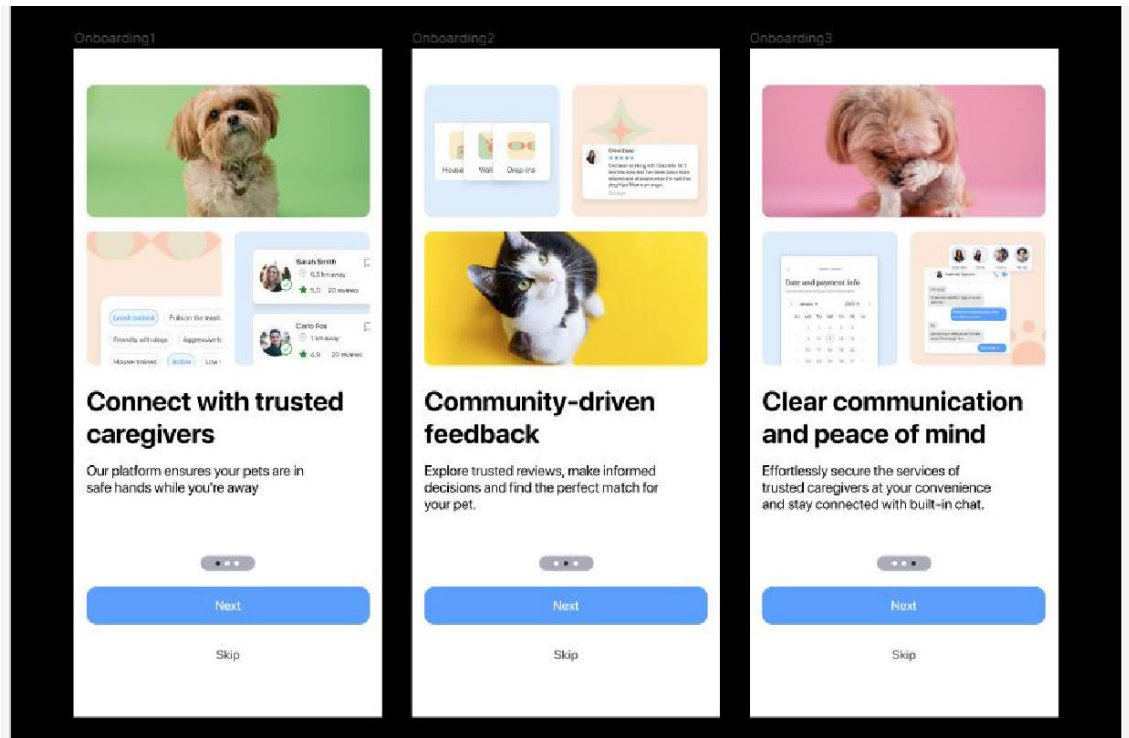


Figure 3: Presentation of the onboarding

The next step is to create a prototype of the application. With Figma, you can create a high-fidelity interactive prototype that closely resembles the final product. The purpose of the prototype is to show as accurately as possible how the final product would work. Figure 4 shows the layout of the pet owner profile.

Profile - pet owner

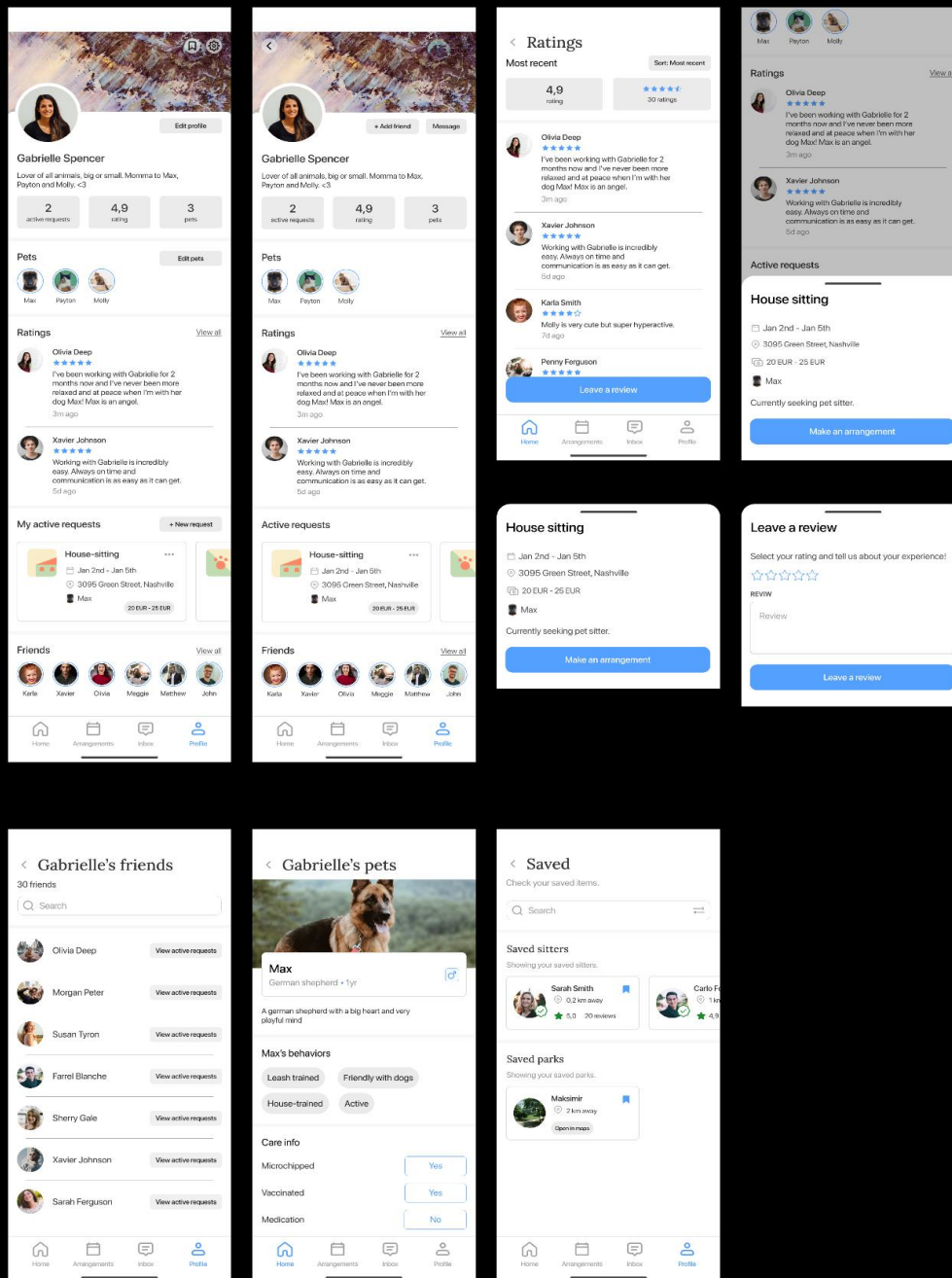


Figure 4: Presentation of the pet owner profiles

This prototype was also used to examine the functionality and intuitiveness of the application. Usually, the entire application is not prototyped, but only the processes that are of central importance. In this example, these would be questions that are defined in advance for testing - such as the key functionality, i.e. the process of creating requests within the application. Figure 5 shows a screenshot of the prototype in Figma.

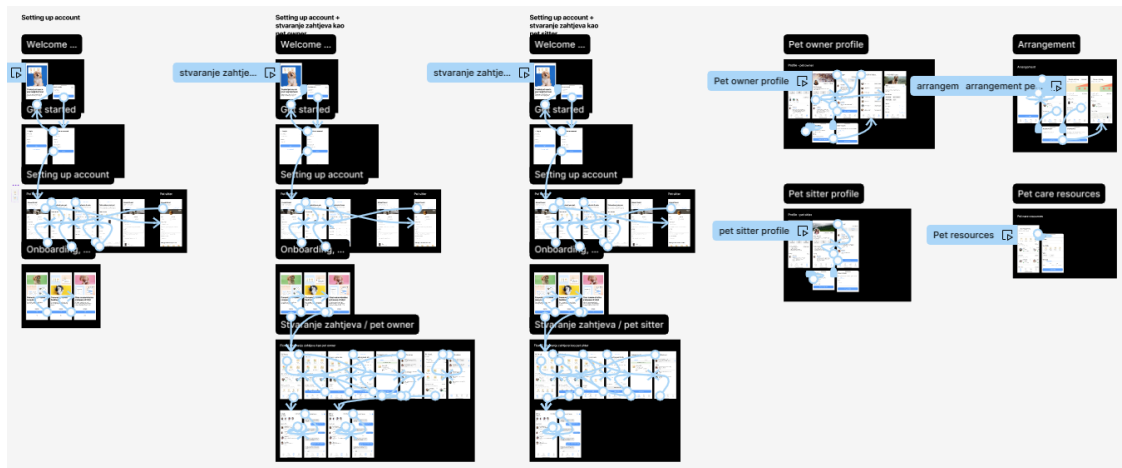


Figure 5: View of the prototype in Figma

3.5. Testing the application

Throughout the process of creating mobile or web applications, from the initial conceptual sketches to the final design refinements, testing with users should be a constant process. In this way, it is possible to discover usability issues, confirm design decisions and ultimately create the best possible user experience.

The final stage of the development of the WagWatch application is testing with potential users. The application was tested with a total of 30 users. The first part of the testing consisted of an introduction in which I introduced myself as the designer and author of the application and briefly described the application to be tested. The first part of the test was about convincing the potential users that their opinion is very important and that they should express all their emotions and opinions out loud, whether they are positive or negative. It is also important to emphasize that they are not being tested, but the application, and that expressing an honest opinion does not hurt anyone. After the first part of the test, users move on to solving tasks. Users were given a link to the Figma prototype and the tasks. The tests were conducted live to observe the way users use the application. It is important not to reveal too much information and details about the application so that the users can find a solution themselves.

In the first task, the users were asked to create their user account. They particularly liked the onboarding graphics and the pet icons. When asked whether more questions should be asked about the pet during registration to make the description more detailed, users replied that registration would then be too long and tedious and that the current level of detail was perfectly adequate.

In the second task, users were asked to successfully create a query. All users solved this task without difficulty. Some commented that they liked the way the application guided them to the next step - everything is intuitive and when there is a more complicated part, the application offers an explanation in smaller font under each heading, and the buttons are large enough and convey their purpose. In this task, users were asked to find a way to send a message to someone and get to the notifications. All of them solved these subtasks successfully. The only criticism from users was that the Quick Chat area could be a little larger.

In the third task, the users had to find out where the ratings of the individual profiles were located. It is clear that the ratings are located on the people's profiles, and everyone successfully completed this task. The users liked the design and appearance of the profile. What is particularly good is that each individual profile contains an overview of the user's active requests and these requests can be booked directly from the profile.

The fourth and final task was to share the location with the animal owner. This task was also successfully solved, but one of the suggestions is that there is an element like a "floating bubble" that is present in all parts of the application so that users know that their request is currently active and that they can access it from any screen application or mark an active request in the reminder section.

5. CONCLUSIONS

The development of applications requires a deep understanding of the needs and wishes of many users. Successful user interface and user experience design for applications requires a user-centred approach that involves very detailed research and testing to ensure that functionality and design meet all user expectations.

This process began with defining the goals, a thorough market and competitor analysis, followed by user research to determine their wants and needs. All the information gathered was used to define the functionality and design conceptual sketches that could be continuously tested and adjusted to make the design intuitive and user-friendly. The result was an innovative application, WagWatch, aimed at pet owners and pet sitters. The application offers all the key functions for easy communication, searching and booking of babysitters.

Design is an ongoing process that never ends, so the development of an application will never really be complete. There will always be new features that can be introduced to solve different problems and new ways to improve the usability of the design. In addition to functionality, the design of the user interface is also crucial to the success of an application. A consistent and carefully designed colour palette, iconography, typography and graphics can go a long way in creating an attractive user experience that adds value to the application itself and encourages users to use it more often.

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