

Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of information Engineering



Bachelor thesis

UI specification for application

Dog Shelter Libeň

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

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Thesis title

UI Specification for application Dog Shelter Liben

Objectives of thesis

To design UI Specification for Dog Shelters Liben:

- to define suitable Use Cases and personas
- prepare UI Specification
- prepare Paper prototype
- test it at the CULS UI Lab
- to describe results and conclusions

Methodology

- Analyze current state of Dog Shelters support informations systems.
- Study suitable literature and electronic resources.
- From the result of study define current state of suitable IS and their ability to support Dog Shelters Use-Cases.
- Define typical Use Cases and prepare UI Specification.
- Prepare paper prototype according to the UI Specification and test it.
- Describe conclusions for gained results.

The proposed extent of the thesis

43

Keywords

Dog Shelter, UI Specification, IS, UseCase, Persona, Business Goal

Recommended information sources

Alan Cooper and Robert Reimann: About Face 2.0: The Essentials of Interaction Design (Mar 17, 2003), ISBN-13: 978-0764526411

Jakob Nielsen's Alertbox, April 14, 2003: Paper Prototyping



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Declaration

I declare that I have worked on my bachelor thesis titled “UI specification for application Dog Shelter Libeň” by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break copyrights.

In Prague on 2017 _____

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UI specification for application Dog Shelter Libeň

UI specifikace pro aplikaci Psí Útulek Libeň

Summary:

The purpose of this bachelor thesis is to create the UI specification for application Dog Shelter Liben. The application should support volunteers in frequent walking shelter dogs.

The first part contains a theory of creation of a user interface and a paper prototype. In this thesis are also described the principles of walking dogs in dog shelters.

The second part is the creation of the UI specification, which includes a motivation, goals and personas. Then there are discussed various proposals, which are always with a use case and a scenario. Finally, there is described the testing and evaluation of the solution.

The third part is the final evaluation of the entire thesis.

Keywords: Dog Shelter, UI specification, IS, Use Case, Persona, Business Goal

Souhrn:

Cílem této práce je vytvořit UI Specifikaci pro aplikaci Psí Útulek Libeň. Aplikace by měla podpořit dobrovolníky v pravidelném a častém venčení útlkových psů.

První část se zabývá teorií ohledně tvorby uživatelského rozhraní a papírového prototypu. Dále jsou zde popsány principy venčení psů v útulcích.

Druhá část již zahrnuje tvorbu samotné UI Specifikace, kde je nejprve rozepsána motivace, cíle a persony. Poté jsou popsány různé návrhy jednotlivých stránek, které jsou vždy s případem použití (Use Case), scénářem a logickým designem. V závěru je popsáno, jak probíhalo testování a jaké jsou jeho výsledky.

Třetí část je závěrečné hodnocení celého práce.

Klíčová slova: Psí útulek, UI specifikace, IS, Use Case, Persona, Obchodní cíl

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1 Introduction

Nowadays, everyone has a cell phone and it is often a smartphone. The smartphones are full of applications which help us in everyday life, are just for fun or for any other specific purposes. One category are motivation applications. This category includes diet applications, jogging applications, exercise applications or many other which encourage us to improve our lives. The idea of jogging application is a motivation for people to walk/run more. It is also possible to use it as a support for volunteers of dog shelter. People are motivated by their improvements and goals, so they can compare and improve their results. And that is what I am going to utilize in my application.

Applications should be simple and with clear instructions so they can be used by an advanced user as well as a beginner. Problems of current programs and applications are their complexity and unnecessary extra features those are often unused.

Thesis is divided into theoretical and practical part. The theoretical part is focused on basic concepts of applications, User Interface, the mobile operating system, user interface, paper prototypes and the issues of shelters and volunteering.

The practical part describes the procedure to create a UI specification for application Dog Shelter Libeň, whose functionality and usability are verified on a paper prototype.

2 Objectives and methodology

2.1 Objectives of thesis

To design UI specification for Dog Shelters Libeň:

- to define suitable Use Cases and personas
- prepare UI specification
- prepare Paper prototype
- test it at the CULS UI Lab
- to describe results and conclusions

2.2 Methodology

- Analyze current state of Dog Shelters support information systems.
- Study suitable literature and electronic resources.
- From the result of study define current state of suitable IS and their ability to support Dog Shelters Use Cases.
- Define typical Use Cases and prepare UI specification.
- Prepare paper prototype according to the UI specification and test it.
- Describe conclusions for gained results.

3 Theoretical Solution

3.1 UI specification

A User Interface specification is a written document that captures the details of the UI of a software product. The specification covers all the possible actions that may occur at the instigation of the usage by user, thus all visual, audio and other interaction elements. [1]

The UI specification is one of the cornerstones for the creation of software. Without the specification of the user interface it is not possible to create good software, the results without UI spec. are often confusing and user-unfriendly applications. The final document UI specification is therefore a set of test procedures that will be used in the development of software solutions. With creating an UI specification we can also use a technique called paper prototyping. This is a process of software design, in which a test paper models represent possible states of the software from the user's perspective. Technically this is called website wireframe. At this stage of development we don't consider the graphic design, but only to outline the basic features of the software and layout of controls. For verified models of the UI specification is possible to finish the graphical interface. [2]

3.2 Application

In software engineering the web application is provided by users of the Web site through a global computer network (the Internet), or its local equivalent an internal net (intranet). Web applications are popular due to the ubiquity of the Web browser as a client. It is then called a thin client because it by itself knows the application logic.

The ability to update and maintain web applications without the need to distribute and install software on potentially thousands of endpoints is the main reason for their popularity. Web applications are not only used to implement many corporate and other information systems, but also for emails, online stores, online auctions, forums and weblogs.

3.3 Mobile application

The mobile application is in Wikipedia defined as software that is run on platforms such as smart phones, tablets, PDAs and other mobile devices. It serves to interact between man and machine. The goals of making each application are clarity, functionality and simplicity to make it easy for the user to control it. The biggest problem are the current applications and the hardware requirements. Many applications need to use the internet, GPS, camera and many other phone functions at once. They take up a lot of RAM at runtime, are demanding a graphical interface and need to reserve more space in the internal or external memory of a phone. On some older devices some applications may not work or are working slowly. [3]

3.4 Operating systems in smartphones

A mobile operating system is a special operating system designed primarily for mobile devices such as smartphones, tablets, PDAs and handheld computers. The more sophisticated ones, like Android, for example, are also used in embedded devices, personal computers, etc. These operating systems are usually closely designed with their hardware devices. The system is usually stored on a special internal standard read-only memory. There are many types of operating systems, such as iOS for iPhones, Android for many types of smartphones, Windows Phone for Nokia and HTC smartphones, Symbian OS for Nokia phones, Tizen for Samsung [4]

3.5 iOS

iOS is a simpler version of the MacOS operating system, used in computers from Apple. It is therefore a Unix-like systems. Because it is designed for mobile devices, it does not have all the functionality of OS X, but on the other hand, is has added support for touch control. The system is divided into four primary layers, which provide basic functionality, APIs and frameworks needed for developers to develop applications.

The primary layers are:

- Layer Cocoa Touch

The technology available in this layer provides the infrastructure for implementing

graphical interface and user interaction, and also provides high-level system services (data protection, push notifications, local notification gesture recognition, peer to peer).

- Media layer

This layer allows the creation of sophisticated graphic and audio applications. These technologies enable smooth playback of animations, videos and sounds.

- Core Services layer

These technologies provide essential services to apps but have no direct bearing on the app's user interface. For example, it is possible to do payments for additional content inside the app or cancel ads, it is possible to track user's current location or work with SQL and XML documents.

- Core OS layer

It provides low-level functions to other technologies that are built on it. For example Security Framework, Accelerate Framework and External Accessory Framework. [5]

- The kernel layer

3.6 Android

Android is an operating system based on Linux kernel and it is adapted directly for specific requirements for the use of mobile devices primarily with ARM processors. ARM processors are used in mobile devices thanks to their low power consumption. Applications for Android do not communicate directly with the kernel, but through unified Android API where developers can have access to their applications and applications can have access to a phone features. Virtual machine Dalvik VM is responsible for running applications. The rest of the operating system is provided under the benevolent Apache 2.0 license, so anyone can download the source code, use it or modify it. [6]

Android philosophy of "open source" is one of many reasons for the rapid expansion between users and developers. The main goal of Android OS is to be opened up to developers, industries and users. Android is now referred to as the mobile operating system of the future. [7]

3.7 UI - User Interface

The user interface is the way the user communicates with a particular system. It is one of many components of human-computer interaction (HCI). In the past, the main way of communication was command line, today still dominated paradigm bitmap display and input devices, a Graphical User Interface (GUI). The user interface also incorporates communication and control system by voice, touch and other options that are collectively called as a natural user interfaces. [8]

The main objective of a well-designed user interface is to allow users to perform required tasks quickly and efficiently. This evaluation shows the user interface of the academic field of HCI, which has long been exclusively focused on the pragmatic and utilitarian requirements. Current research and practice emphasize hedonic, emotional, experiential, aesthetic aspects and the implementation of user goals. [9] [10]

3.8 Human - Computer Interaction

Human - computer interaction (HCI) is a discipline that extends to all possible areas (eg. psychology, design, and engineering). It investigates the interaction of man and machine. How end-users respond to different environments, how they can control it and if it is difficult for them to achieve their intentions. On that basis HCI is trying to bring an effective solution to the user interface design.

This field started to develop with the start of the era of computers and the need for better and more intuitive controls for common users. Software makers have begun to realize the importance of simplicity and appropriate access to the user. As a result the most popular software so intuitive and user-friendly that it can be controlled by almost anyone with basic knowledge. Among the most famous and advanced companies in the terms of design and accessibility to users is well-known company Apple Inc. [11]

3.9 Principles of Human Computer Interaction

HCI design is generally difficult, mainly because it involves thinking about more things at once, such as the user types, options and equipment costs, changing technology and so on. HCI is a relatively new discipline. Researchers and developers piled up and set basic principles. These principles are fundamental and commonsensical applicable to all types of construction HCI design. [11]

3.9.1 Know Thy User

The term "Know thy user" Wilfred J. Hansen created in 1971 in the publication "User Engineering Principles for Interactive Systems", although aiming for design and general users started later. He simply wanted to highlight the fact that the user interface must be adapted to the user who will use it. It depends on many factors, such as gender, age, education, culture, for example the fact that young people adjust to technical features better than the older generation. The goal of HC interaction is the "universal usability" for wide spectrum of users across age groups, skill levels, cultural backgrounds, and levels of disability. [11]

3.9.2 Understand the Task

Another indispensable principle is the understanding of the task that the user has to do with a given environment. This may explain, for example, a connectivity to Wi-Fi. While a person familiar with computers will need various other adjustments in the process of connecting, or he is interested in additional information such as signal strength, or encryption, but ordinary users just need to enter a password to an available network and be connected. Ideally, the model should come from users. Different users will have different models of tasks and it is reflected in the simplicity and implementation for all users. [11]

3.9.3 Reduce Memory Load

With this principle here is considered a short-term human memory. The user in order to complete a task can store a few details, but certainly cannot allocate and consume large

amounts of memory of device. This leads to the environment which is easy to work for users and minimal requirements on memory. For example, this may relate to the number of items in a particular menu. The "Magic number" is between 5-9, stating how much information the user is able to store in his short-term memory. [11] [12]

3.9.4 Strive for Consistency

It is a way to reduce demands on memory. If the users fail to observe the consistency of certain elements, they may be confused. For example, for a similar type of operation are chosen a different layout elements. Or in another part of the program the same thing is handled another way. [11]

3.9.5 Remind Users and Refresh Their Memory

It is important to give continuous reminders of important information to the users, because the user may not be able to remember everything at the first time. The ideal is to ask the user some important things again and again. [11]

3.9.6 Prevent Errors and Reversal of Action

It is practical for users to block or hide the functions that at a given time cannot be used. It is quite often used for example in the menu, where unavailable functions are visible, but gray and you cannot click on them. Another essential element is to allow the user to make mistakes and come back in time. In order not to worry about it, for example when user do typo, he can always go back and correct it. [11]

3.9.7 Naturalness

The last basic principle is naturalness. Operations are therefore put together as it is logical and natural. We will not use the down arrow to move down, or do the same while turning the mouse wheel. [11, 12]

3.10 Creation of UI specification

UI specification describes how the user interface looks like, how it should be used and how it will respond to the user.

3.10.1 Motivation

This section clarifies why the application is created and who will benefit from it.

3.10.2 Goal

The author discusses in detail the form of user interface. Thus, for example, what will be the application like, for whom the application is intended and what important features it will contain.

3.10.3 Personas

Personification is identifying target groups of users who will use the application.

3.10.4 Use case

Use case captures the expected user behavior. If the user does some action, for example, clicks on a button, it says what the user is expecting to happen. This is used by other sectors (such as programmers) which are needed for the creation of the application.

3.10.5 Scenario

While the Use Case is from the user's perspective, the scenario covers the same situation from the perspective of the application. How the application behaves, what it would do. Thus, the user performs some action and scenario shows how the system will handle and process the interaction.

3.10.6 Logical design

The logical design is the predecessor of the finished graphic design. It specifies deployment of elements, their size and shape. The logical design is the simplest and most accurate display of the solution. The logical design often proposes creation of UI specification, but graphic design is done by a graphic artist who utilizes the logical design.

3.10.7 Graphic design

It shows how the application will look like in color, and what the concrete figures are.

3.11 Paper prototype

Part of this thesis is to create a paper prototype. The paper prototype is one of the options, how we can test the usability of the application. Users can perform real tasks by interacting with the paper version of the interface. It allows to map user requirements. It is possible to be operated without computers. According to the presentation of Mr. Ing. Josef Pavlicek, PhD, the procedure for the preparation of a paper prototype is following:

1. List the requirements on adhesive paper.
2. Create a logical units (clusters) - describe the basic framework of the required behavior.
3. Find the basic functionality and deploy it on the expected interface (in iterations tune the screen).
4. Propose the screens that we compose as a paper prototype. [13]

Why use the paper prototype:

- saves time and money
- provides troubleshooting
- will help to better define the requirements
- contains feedback from users

- promotes creativity
- allows you to test mechanisms as a whole
- checks the balance
- has ongoing testing

3.12 Types of making paper prototype

3.12.1 On paper

Paper is one of the basic school supplies. The paper is almost always available when doing anything. Therefore, it is simple to make most basic form of paper prototype. The developer can draw screen after screen how the application behaves or use adhesive labels and make the paper prototype more interactive. The advantage is that there can be drawn anything what is needed in any size and appearance.

3.12.2 In application for paper prototyping

There are many applications where there is possible to model a paper prototype. This method requires computer and elementary understanding of the application. It may not be simple to find the required things for the first time. The disadvantage of this method is that a given application may not have all the necessary buttons and functions that are needed. The advantage of this method is interactivity of some functions, such as functional buttons, pop-up windows, scrolling lists or prearranged types of icons.

3.12.3 In a drawing program (Illustrator)

This method is somewhere between the above mentioned methods. The advantage of this method is that we can use already finished images, icons, and logos, and also that we can modify and do everything as in method on paper. The disadvantage of these programs is that the developer must be able to know how to use it and create a draft.

3.13 Adobe Illustrator

Adobe Illustrator is a commercial vector graphics editor from Adobe Systems. It was developed in 1986, the first version was released in January 1987 and was originally developed for the Macintosh. The current version is CC and it is used for creating vector graphics. [14]

Adobe Illustrator is among the world's most popular tool for working with vector graphics. It's an application used by professionals in the field of graphics throughout the world. It provides precision and power with sophisticated drawing tools, expressive natural brushes, a series of time-saving features and integration with other Adobe tools, for example Adobe Photoshop.

Adobe Illustrator can work with vectors, fonts, create objects and drawings, but also add text and photos. It can work in RGB color mode or CMYK and also handles Pantone colors.

3.14 Dog shelter

A dog shelter is a social facility for abandoned dogs. It serves as a temporary refuge shelter providing roof over their heads, food and treatment for all animals, who are in existential distress. Beyond this basic mission shelters fulfill other additional functions such as animal rescue, neutering programs, organization of exhibitions for the adoption of abandoned dogs or general popularization of proper animal care to reduce abandoning of animals to a minimum.

3.15 Types of dog shelter

There are two elementary types of dog shelters. One is a municipal shelter and second is a private shelter. The municipal shelter has contracts with one or more cities or villages and have obligation to catch all dogs found in a given area. Dogs in municipal shelter can go to adoptions, but before that during the first four months the previous owner can pick up his found pet. Private shelters can't catch abandoned dogs, they have dogs directly from a

previous owner or families. For example if owner die or has a complicated life situation and therefore cannot keep his dog or if the dog is mistreated, for these reasons the dogs can go to a private shelter.

3.16 Why dog shelters need active volunteers?

Taking care of dogs is very time consuming. Some dogs need lots of daily activities in order to feel satisfied and employees of the shelter often may not have time resources for them. Therefore, many shelters accept volunteers. The main type of dog shelter volunteering is "walking a dog." Every day dogs need at least one long walk and that is exactly what the volunteers can find the time for. Some dog shelters accept any incoming unfamiliar people who want to walk a dog. Some shelters need only registered volunteers, which is for example a problem of dog shelter Libeň. Because it is in a Prague, there are so many people who want to walk a dog and among these people it could happen that somebody may want to steal a dog or have some other ulterior motives. So because of this, the Dog Shelter Libeň have registration for volunteering and only registered volunteers can walk sheltered dogs.

Other types of volunteers cannot go out with the dogs, but they can provide health care, services for grooming, training, assisting with the promotion of sheltered dogs, financially or materially contribute, or assist in promotion events.

3.17 The main problem of volunteers those walk with dogs for Dog Shelter Libeň

At first everyone wants to be helpful and at the moment when they are fully motivated to do something, but unfortunately the interest later fades away. Dog Shelter needs reliable and long-term volunteers for walking. Majority of volunteers do just a few months or even a few weeks. The first month they are motivated to help to the dogs and feel useful. Many of them finish because they find something better or more exciting to do, some sport for example.

3.18 Attempts to resolve the situation

A few years ago dog shelter Libeň gave vouchers for some leisure activities to the best volunteers, it was motivating for the best 5 volunteers but it didn't motivate other people, who did not have enough time to get among the top five.

Dog shelter Dogpoint suggested for volunteers to walk their dogs while catching Pokemons with Pokemon Go application. This resulted in a huge rise in number of volunteer walks with the dogs.

3.19 Proposed solution

In here I am proposing an idea that it could be combine the issue of jogging applications with walking the shelter dogs.

3.20 Principle of motivation hidden in jogging applications

Jogging applications for mobile phones measure the route and also the speed of a running person. Runner sees where he ran slowly and conversely where he ran fast. For this application a smart phone must have access to GPS for the whole time.

Each run is recorded into the user database. So the user can compare the individual runs and see where he improved or conversely where he was slower. Some jogging applications are connected with health bracelet and monitor also activity of the body, like heartbeat, consumption of calories and others.

The greatest benefit of these applications is the motivation hidden within each of them. People like to see that they are improving and that they managed little more than before. They can compare their runs, but they can also compare with each other. Their results then can be shared with others on Facebook or Twitter, and they can find new friends with common interest thanks to this application.

3.21 Conclusion of the theoretical part

For the elaboration of quality User Interface is necessary to determine the motivation and objective, what does this application does and for whom it is intended. Then to make paper prototype and build on it use cases and scenarios. The conclusion will be elaborated logical design for the application Dog Shelter Libeň.

3.21.1 Research results

- The mobile phone provides us with a great number of services through mobile applications.
- Mobile application allows the user to control the device via the interface.
- When designing the user interface we ask two basic questions:
How to achieve efficiency and how to prevent errors?
- User interface of Android OS and iOS is touch-optimized.
- Part of this project is to create a paper prototype, which is testing the usability of application.
- The paper prototype is used because it:
 - saves time and money
 - provides troubleshooting
 - will help to better define the requirements
 - contains feedback from users
 - promotes creativity
 - allows us to test mechanisms of the proposed application
 - checks the balance
 - has ongoing testing.
- Paper prototype is created on paper in an application for paper prototyping or in a drawing program.
- There are two types of shelters - city and private.
- Dog shelters need volunteers for walking shelter dogs.

- The main problem of continuous volunteering is low motivation.
- The main purpose of jogging applications is motivation

4 UI specification

4.1 Motivation

Dog Shelter Libeň is functioning only thanks to the help of the public. This shelter usually has about 10-20 dogs. And because every dog needs to go for walks, dog shelter needs volunteers for a dog walking. The shelter is looking for volunteers and there are a lot of people who want company for walks, partner for running or just feel the need to do something useful.

The problem is to keep these volunteers in a long term. Most of them are going to a shelter for a few months or half a year and then get bored and go away. My goal is to design an application that will support and keep these people interested in walks with shelter dogs for long term.

4.2 Goals

The main goal is a mobile/tablet application that helps the volunteers to keep on walking shelter dogs. When a volunteer comes to the shelter, he takes the dog and starts this application. A user logs and click on "start walking". Applications will need a photo of the dog and they can start a walk. The application will scan the path of walks and their speed. During the time when the application is operating during the walk, the user can take photos, which can be recorded in a user database or in a database of the dog. The user can also insert to the route other activities such as dog swimming, relaxation, meeting with another dog, or break at a dog playground, etc...

- System for log-in to the app

This system will allow volunteers to login into the application. If they don't have username and password, they can do it by "New registration".

- Main menu

There the user can click on "Start walking" or look at his own profile, look at the offer of dogs, help-page, history of his walks, settings and goal completions.

- The offer of dogs for walking

This application will show shelter's dogs which need walks and allow opening more information about these dogs.

- Profile

There will be information about the user and the user can change them.

- Walking

By clicking on "Start walking" on the main page, the application will ask the user which dog he will take and start a mobile camera, then the user should make a photo. If the picture fails, the user can click on the "again" button and try it again. After the photos are uploaded, this application will monitor the walk. The user will see a page with a small map and options that may be added during the walk.

- History of my walks

Every walk will be recorded and stored. The user can view history of his walks.

- Goal completions

The shelter manager will enter various quests and in this menu, the user can see how many percent has been fulfilled from quests.

- Help page

There will be some information which may help in emergency situation.

4.3 Personas

This application is for all people who are interested in the topic of dogs and dog rescue. The people who want to help dogs and be outside in the fresh air.

4.3.1 Jesica Johansson

-Information: woman, student, 23 years

-Hobbies: tourism, photography

Background:

Jesica is a student in Czech Agricultural University, she studies economics in third year. She wants to spend a lot of time outside but she doesn't want to walk alone. She loves running and running with a dog is the best for her. Jesica has a dream that she will go to a canicross race (the canicross is a sport, where a human has waistbelt which is attached to a two meters bungee leash to a padded dog harness, so they are off-road running across the country). So Jesica is training running whenever she can, but she needs dogs to improve her skills in running with dogs. She found dog shelter and now she can do trips and run with dogs.

Jesica's father has two cars and he lends one of them to his daughter. So Jesica can have the big car Nissan X-Trail for her trips with shelter dogs.

Jesica also has SLR camera Nikon D7000 and she takes photographs of dogs for presentation for an adoption.

A typical day:

She starts her day by making a breakfast or reading a book and then she goes to school. There she studies economics. When she has a lunch, she talks about her hobbies with her friends. After the end of school, she arrives at home and if she has a time, she is walking

dogs or making photos. On weekends, she always visits dog shelter and goes to the trips by her father's car. On every summer holidays Jesica goes with one shelter dog to Tatry mountain for two weeks.

Other information:

-Activities in shelter: Walking dogs and photo-documentation

-Devices: Samsung Galaxy J3

-Language: Czech, English

4.3.2 John Mill

-Information: man, writer, 51 years

-Hobbies: writing, reading, running

Background:

John is retired widower. He had been an electrician for 30 years. He doesn't want to be alone, so he walks shelter dogs and that gives him a feeling that he is helpful. Every Monday John goes to the chess club and from time to time he also goes to chess tournaments. The idea of a best day is for him a long walk through the countryside with a small picnic and a game of chess with his friend.

A typical day:

John wakes up at 8 o'clock. He usually spends all day in a park but if it's raining, he stays at home and watches television. Sometimes he makes a one day trip to the mountains where he goes by his small car Smart. When John goes on a trip, he takes his friend Jacob with him. Jacob is John's friend from the chess club. On the weekends, John often spends his free time with friends in the pub or on the trip in the mountains.

Other information:

-Activities in shelter: wants to fill his free time with something useful

-Devices: iPhone

-Language: Czech

4.3.3 Julia Hepworth

-Information: woman, mother on maternity leave, 35 years

-Hobbies: walking, training dogs

Background:

Julie is one of the main shelter leaders. She is on maternity leave with her second child. Previously she was a hair stylist. She has been married with her husband Jacob for 8 years. She lives in a small house with big garden. She spends a lot of time in shelter taking care of dogs, managing a list of volunteers or dealing with people interested in adoption of a dog. Julie also organizes occasional part time volunteers for cleaning the dog shelter, fence painting, bathing dogs, etc. Twice a year, Julie goes to the well-deserved vacation with all her family. Meanwhile, the dog shelter is led by the other managers.

A typical day:

She starts her day at 6 am. After a short breakfast, she walks with her first child to school. After that, she goes to the children club with her second child for an hour. There she meets a lot of mothers and their children of the same age as her daughter. After that she usually needs to go shopping and because she lives in a small village, she needs to go to Prague by her car. When she makes a big purchase, then she goes straight home but if she has some free time after shopping, she goes to the dog shelter. At 5 pm, she returns home and cooks a meal. Then she starts to deal with emails from people interested in a dog or anything associated with the shelter. During weekends, Julie is always in the shelter and deals with people who take care of the dogs and many more...

Other information:

-Activities in shelter: Take care of dogs

-Devices: tablet

-Languages: English, Czech

5 Implementation of solution

5.1 Log in page

5.1.1 Use Case

The user starts the application and demands two text boxes where he can write his username and password. After that he wants to use “Log in” button and continue into the application. If the user hasn’t registered yet, he expects a “New registration” functionality, where he must fill in all fields like name, birthday, telephone number and email.

5.1.2 Scenario

If the user opens this application for the first time or it is opened after some actualization, the system needs the “log in” from the user. System shows two empty text boxes for username and password and waits for them to be filled in and for confirmation by a button “Log in”. System also offers “New registration”, where it waits for fill in of all fields and after that for a click on “Sign up”.

The system automatically remembers signing in and next time directly show main page.

5.2 Main page

5.2.1 Use case

The user starts the application and (if he is already logged in) expects the main menu opened with following information:

- The logo of the Dog Shelter
- Main selection of functions of this application.
- The most commonly used buttons at the top in largest size
- A simple way to start a new walk

- A simple way to look at offer of dogs for walking, goals, history of walks, help page, profile and settings

5.2.2 Scenario

The logo is displayed at the top of the main page. The Main Menu appears in the form of buttons, which are controlled by tapping on the touch screen display. There are 7 buttons. Some of the more frequently used buttons are larger than others. The system waits until the user selects one of the options on menu.

The system offers:

- Start walking
- History of walks
- Dogs for walking
- Goal completions
- Help page
- My profile
- Settings

5.2.3 Logical design



Figure 1 - logical design of Main Page

5.2.4 Graphic design proposals

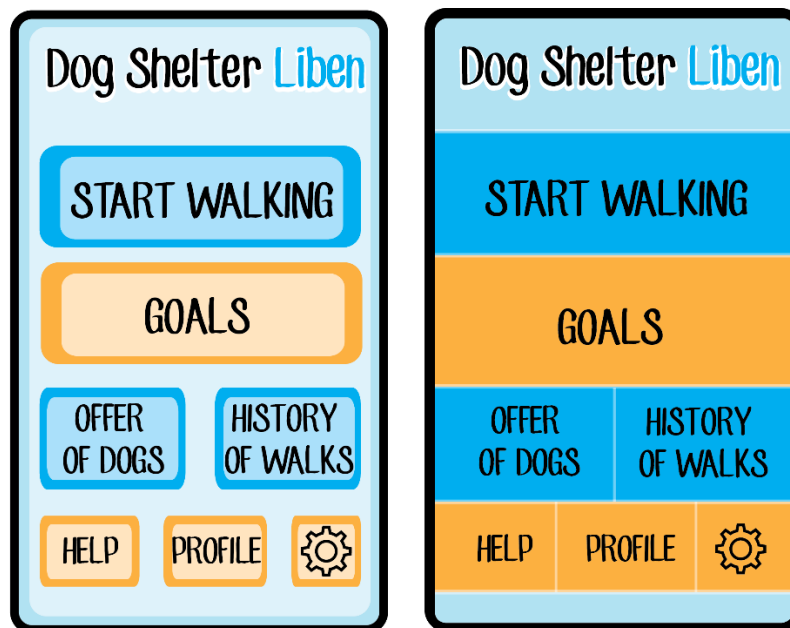


Figure 2 - graphic design of Main Page

5.3 Start walking page

5.3.1 Use Case

After pressing "Start walking" user expects:

- View the selection of shelter dogs that can go for a walk.
- The dogs are displayed on photos and beside them is a small label (name, age, temperament).
- Button to return to the main menu.
- Concise description of what is displayed on this page.

5.3.2 Scenario

After pressing "Start walking" in the main menu system executes the page with dogs for walking. The system waits until the user:

- Select one or more dogs that will go out with him
- Click on the start button

5.3.3 Logical design

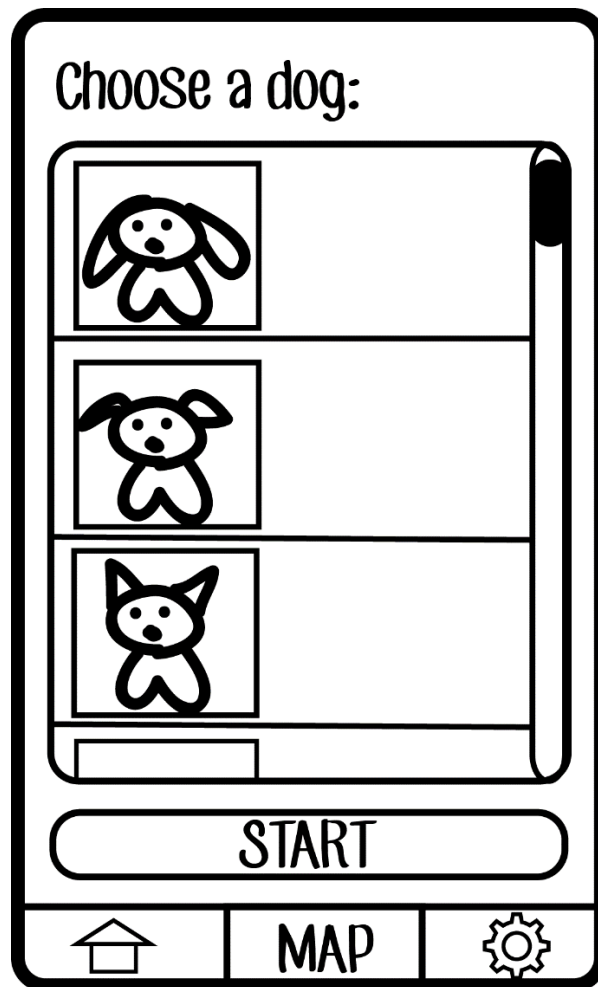


Figure 3 - logical design of Start Page

5.4 Walk page

5.4.1 Use case

After pressing "Start" on the previous page user expects:

- Activation of a camera that displays in the traditional form as we would expect from his smartphones
- If the user is not satisfied with the photo, he can retake it
- After uploading a photo of a dog/dogs, user expect a map with his current position and surroundings
- Special places (like dog playgrounds, rivers or training places) are displayed with small icons on the map
- Small bar for quick switch into main menu or settings
- Button to start the camera
- Button to show goals page
- Button for adding special activities such as swimming, playing, training, etc. which can add points to the current quests

5.4.2 Scenario

After pressing "Start" on the previous page, the system launches a camera. The system is waiting for:

- focus on the subject that will be on the picture
- options such as turning the flash on or off
- button to be pressed to take a picture

The final photo is showed on the screen and system wait for validation as "save" or "retake" from the user. If the user clicks on "retake", the photo will be deleted and camera starts again. For the "save" button, the system saves the photo into a database and into a smartphones album.

After uploading a photo the system starts a map and starts using location data. System

displays on the map the user's current location and its surroundings. If the user moves, the system records the position and moves the map to current position so it will be in the middle of the display.

The system is ready to start the camera when the user clicks on the camera icon at the top of the screen. After taking picture, the system shows the photo and offers to the user, if he wants to retake it or save it into the database and album on the smartphone.

When the user uses Goals icon, the system starts a page with goals.

If the user uses Bonus icon, the system shows offers with bonuses, like dog swimming, relaxation, meeting with another dog, break at a dog playground or training.

5.4.3 Logical Design



Figure 4 - logical design of Walk Page

5.5 Goals page

5.5.1 Use case

After pressing Goals from the main page or from the map, the user expects list of quests, where he can scroll down. Every quest has a small picture and name so the user can read some important information about it in 3 lines. In the right corner the user can see how many percent of the quest has been fulfilled already. The user also expects a small bar for quick switch into main page, back to the map or settings.

5.5.2 Scenario

The system shows scrolling list of goals and waits until user clicks some button on small bar.

5.5.3 Logical Design

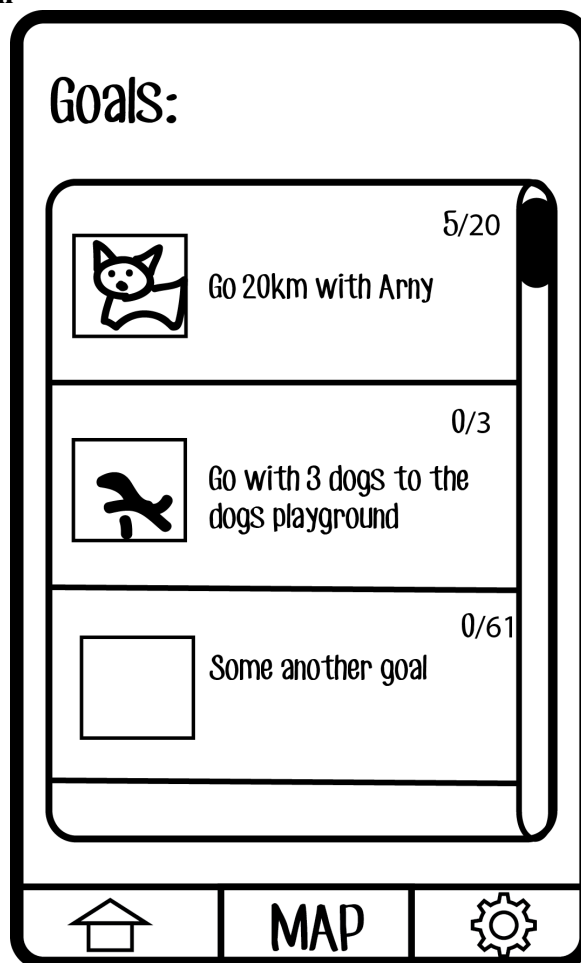


Figure 5 - logical design of Goal Page

5.6 The offer of dogs

5.6.1 Use case

After pressing Offer of dogs from the main page, the user expects list of dogs available in dog shelter for walking. The list can be scrolled down. Every dog has one small photo and some important information next to it, like name, age, temperament. The user expects to see more information about the dog, if he clicks on the line with photo and text.

5.6.2 Scenario

The system shows scrolling list of dogs and waits until the user clicks on any line with a dog or on some button on small bar. If the user clicks on a line with a dog, the system loads the page with detail information.

5.6.3 Logical Design

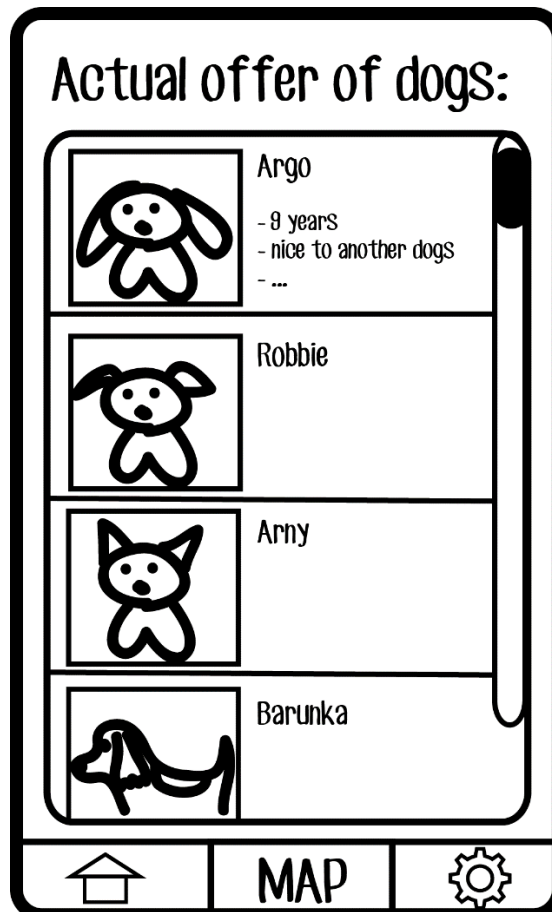


Figure 6 - logical design of Offer of dogs

5.7 History of walks

5.7.1 Use case

After pressing History of walks from the main menu, the user expect list of all previous walks. He also can open every walk for more information.

5.7.2 Scenario

The system shows scrolling list of walks, every walk has a photo of dog or dogs with which the user was outside, the date and some additional information like duration or distance of previous walks. The system waits until the user clicks on some walk, after it opens a page with detail information about selected walk. System again has a small bar with options to return to the main page, map (if is active) or settings.

5.7.3 Logical Design

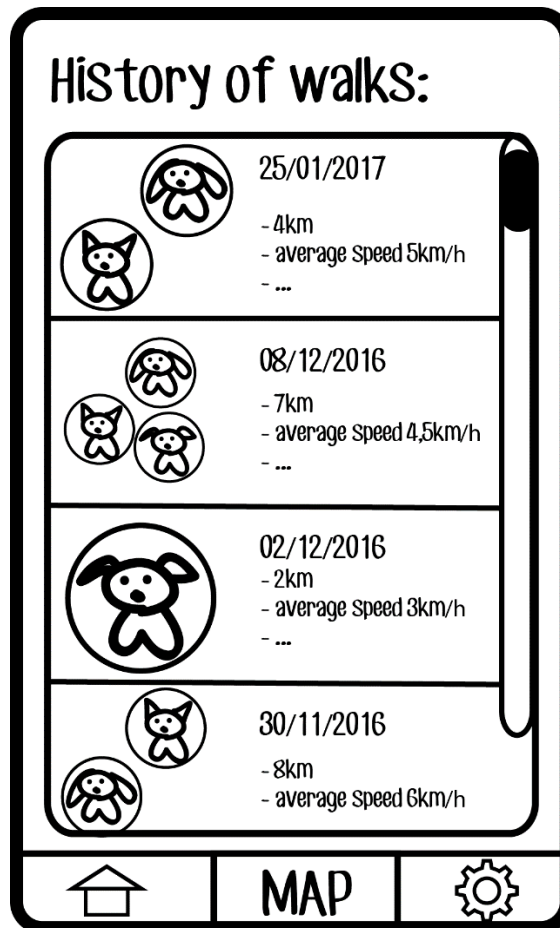


Figure 7 - logical design of History of walks

5.8 Help page

5.8.1 Use case

After clicking on the Help button the user expects to view the page with information about emergency situations. He will use this if the dog runs away, bites someone, fights with another dog or gets hurt.

5.8.2 Scenario

The system shows a page with big buttons, which are connected to the phone and can immediately call an ambulance, canine ambulance or dog shelter manager. System is waiting until the user clicks on some button, after that it will ask, if user really wants to call and if yes, the system will switch to a normal telephone and call the chosen number.

5.8.3 Logical Design



Figure 8 - logical design of Help Page

5.9 Profile

5.9.1 Use case

The user clicks on Profile on the main page and expects a page with information about him and possibility to change:

- password
- email
- phone number

or log off from this account.

Scenario

The system shows the page with name, surname, username, that user filled during the registration. Some data are enabled to be changed. These are: telephone number, email address and password. The system is expecting that the user will click on these data which he wants to change. Below this is situated simple button for Logging off from the account, which switches the system into the “Log in page “.

5.9.2 Logical Design

The logical design of the Profile page is shown within a rounded rectangular frame. At the top left, the text "My profile:" is displayed. Below this, there are seven rows of labels followed by input fields: "Username:" with a greyed-out field, "Name:" with a greyed-out field, "Surname:" with a greyed-out field, "Birthday:" with a greyed-out field, "Phone:" with a white field, "Email:" with a white field, and "Password:" with a white field. At the bottom right of the main content area is a button labeled "Log off". Below the main content area is a navigation bar with three items: a house icon, the text "MAP", and a gear icon.

Figure 9 - logical design of Profile

5.10 Settings

5.10.1 Use case

After clicking on the button Settings the user is expected to view the general map settings, such as switching between standard, satellite or hybrid or switching between kilometers and miles and default map scale. There are also notifications setting.

5.10.2 Scenario

System shows the setting page with options to change map conditions. It contains:

- Switching between different types of maps
- Switching between kilometers and miles
- Modification of default map scales

And notifications setting which offers ON or OFF options for notifications.

5.10.3 Logical Design

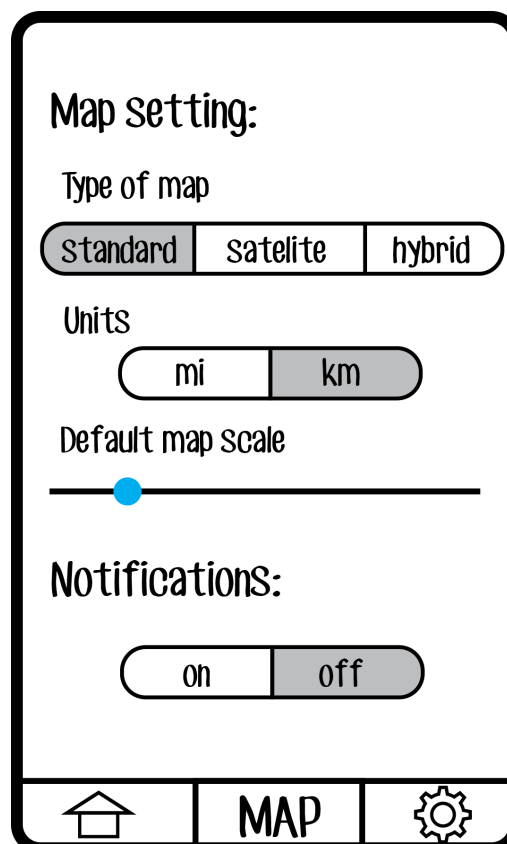


Figure 10 - logical design of Settings

6 Reporting

Per Jacob Nielsen, identification of design's the most important usability problems, testing five users is typically enough. Rather than run a big, expensive study, it's better use of resources to run many small tests and revise the design between each one so you can fix the usability flaws as you identify them. [15]

Paper prototype was tested on six respondents by qualitative testing in CULS UI lab. Users got a list of tasks what they should do with the paper prototype (in online application Marvelapp). And three questions they should answer. Results of the test confirmed that the users don't have problems with application. They successfully started a new walk, explored the goals and history of walks and did changes in the settings.

The list of tasks for testers:

- Start a new walk.
- Explore the goals and history of your walks.
- Do some changes in settings.

Follow-up questions to evaluate testing of paper prototype:

- Is the application user-friendly and easy to handle?
- Would you like some changes in the application?
- Have you installed this application on your device?

The users reported that they worked easily and intuitively with the paper prototype. They graded the user interface as friendly.

The responders suggested the following changes:

- Adding a function to share walks on social networks.
- Adding a function to crop or edit photos.

Many users who are interested in supporting dogs in shelters will download and install the application, when it is created.

7 Conclusion

The main goal of this thesis was to create a UI specification of the application for Dog Shelter Libeň. The UI specification includes the motivation, the goal, the personas, the use cases, the scenarios, the logical designs and the proposal graphical design. Part of this work was to create a paper prototype. The usability of the paper prototype was tested on six respondents. The users tried to work with the prototype and answered three simple questions.

In the first part of this work are described shelter's issues and basic concepts of the application, the UI specifications, the principles of human - computer interaction, the mobile software, the paper prototype and the issue of shelters and volunteering.

Based on the research part is the practical part, which includes a creation of the paper prototype and then creation of the UI specification with logic designs. Paper prototype was tested on six respondents. The user interface was rated as friendly.

The respondents mentioned the following advantages:

- A simple menu with large buttons for the most important functions.
- A small bar which can quickly switch to the main menu, map or settings.
- Intuitive control which is easy even for unexperienced users.

The respondents suggested the following changes:

- Ad a function to share walks on social networks.
- Ad a function to crop or edit photos.

The results of testing show that the goals were achieved. The application might be interesting for broad public.

8 Bibliography

- [1] GRAHAM Nicholas and PALANQUE Philippe, Interactive systems design, specification, and verification: 15th international workshop, 1st ed. New York: Springer ed., Kingston, Canada: DSV-IS 2008, July 16-18, 2008.
- [2] COOPER Alan, Robert REIMANN, Dave CRONIN, About face 3: the essentials of interaction design, 3rd edition ed., Wiley Pub: Completely rev. Indianapolis, 2007.
- [3] MOBILE APP, "Wikipedia: the free encyclopedia," Wikipedia Foundation, 08 03 2017. [Online]. Available: https://en.wikipedia.org/wiki/Mobile_app.
- [4] MOBILE OPERATING SYSTEM, "Wikipedia: the free encyclopedia," Wikimedia Foundation, 02 03 2017. [Online]. Available: https://en.wikipedia.org/wiki/Mobile_operating_system.
- [5] iOS (APPLE) , "Wikipedia: the free encyclopedia," Wikimedia Foundation, 07 03 2017. [Online]. Available: [https://cs.wikipedia.org/wiki/IOS_\(Apple\)](https://cs.wikipedia.org/wiki/IOS_(Apple)).
- [6] MARVAN Filip, "Mobilní operační systém Android," 05 03 2017. [Online]. Available: <http://diit.cz/clanek/mobilni-operacni-system-android>.
- [7] Android?, Co je to ten Android?, "Androidaplikace," 05 03 2017. [Online]. Available: <http://androidaplikace.cz/index.php/co-je-operacni-system-android/>.
- [8] HASSENZAHN, Marc a Noam TRACTINSKY., "User experience: a research agenda," 06 12 2015. [Online]. Available: <http://www.tandfonline.com/doi/abs/10.1080/01449290500330331>.
- [9] VERMEEREN, Arnold P. O. S., Effie LaiChong LAW, Virpi ROTO, Marianna OBRIST, Jettie HOONHOUT a Kaisa VÄÄNÄNENVAINIOMATTILA, "User experience evaluation methods," 2010. [Online]. Available: <http://dl.acm.org/citation.cfm?doid=1868914.1868973>.
- [10] LAW, Effie LaiChong et al., "Understanding, scoping and defining user experience," 2009. [Online]. Available: <http://dl.acm.org/citation.cfm?doid=1518701.1518813>.
- [11] KIM, Gerard Jounghyun, Human-computer interaction: fundamentals and practice, 1st edition ed., Boca Raton: CRC Press, 2015.
- [12] MILLER, George A., "The magical number seven, plus or minus two: Some limits on our capacity for processing information.," Psychological Review, 1956.
- [13] PAVLÍČEK Josef , "HumanComputer Interaction Lecture 3," Prague, 2016-11-03.
- [14] ADOBE ILLUSTRATOR, "Wikipedia: the free encyclopedia," Wikimedia Foundation, 06 03 2017. [Online]. Available: https://en.wikipedia.org/wiki/Adobe_Illustrator.
- [15] NIELSEN Jakob, "Usability 101: Introduction to Usability," 4 1 2012. [Online]. Available: <https://www.nngroup.com/articles/usability-101-introduction-to-usability/>.

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