

KARELIA UNIVERSITY OF APPLIED SCIENCES
Degree Programme in Design

Kristina Soloveva

CONCEPT DEVELOPMENT: A NATURE TOUR GUIDE FOR THE
CITY OF JOENSUU

Thesis
May 2016



THESIS
April 2016
Degree Programme in Design
Sirkkalantie 12A
80100 JOENSUU
FINLAND
tel. +358 (0)13 260 600

Author
Kristina Soloveva

Title
Concept development: A Nature Tour Guide for the City of Joensuu

Abstract

Nowadays, in the era of modern technology and social network communication, developed countries are facing a huge problem – people tend to spend most of personal free time in front of computer or gadget screens, preferring to stay at home instead of going outdoors. This way of behaviour may lead to problems with health.

A previously developed mobile application concept used as a basis for the current research. The main aim of this thesis is to define the usefulness of created idea and its ability to work in reality in the future. Service design philosophy is employed for this purpose. Qualitative and quantitative research methods are both applied.

This research covers the idea development phase of the design process, which is crucially important for the flow and outcome of the design course as well as responsible for further design decisions. The research findings are presented in the form of infographics illustrating final results.

Language

English

Pages 44

Appendices 3

Keywords

service design, product design, idea development, user research methods, mobile application

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1 INTRODUCTION

Today is the era of technology and social network communication. The amount of digital data created and processed worldwide has grown exponentially over recent years. According to a European Statistical System report (2013) societal institutions, companies and individual residents constantly generate large volumes of digital footprints. People tend to spend a lot of time using devices, preferring to relax in front of a computer or television instead of going outside.

Such habits lead to sad outcomes: more and more people are becoming inclined towards a static and lazy way of life. That problem most critically applies to the young generation. Present habits may even turn out to lead to sedentary lifestyle disease development.

The current thesis offers a possible solution for this problem in form of mobile applications for the City of Joensuu, Finland. This paper covers merely the starting phase of the design process – concept development. The study aims to test the idea for its relevance, workability and durability for chosen conditions. An additional aim is to improve the concept in a way that it would better fit user interests, needs and expectations. Testing and development are implemented through the service design perspective with applications of qualitative research methods as well as quantitative techniques. The chosen methods are co-design workshop, early user interviews and a survey.

The outcome of the thesis is an analysis of all the testing sessions' results and representations of them in the form of data infographics. This research process examines the idea's chances for future success, determines the necessary area of knowledge and provides clear directions for further development. In addition, the analysis of results will assist gaining a better understanding of potential users and to comprehend customer's real expectations more precisely. Thus, the thesis outcome helps to optimise the concept's design.

2 INITIAL CONCEPT

This thesis had a base to start working within the form of a mobile application idea. This idea appeared in Salzburg, Austria during exchange studies. The following sub-chapters will explain why and how it had been initially developed.

2.1 Idea description

The original concept of bringing humans back to nature with the assistance of modern technology is in creation of mobile application. This artefact moves along following pattern.

A user becomes a part of tour guide navigation around beautiful places of nature such as waterfalls, unusual trees, rocks with mysterious background stories, etc. There is a possibility of creating one's own route through desired places or to choose a ready one from what is offered. A user can follow the navigation on the mobile screen map and easily find his /her own location with GPS (Global Positioning System) technology. Initially there are already some places installed, but they are non-active and their pictures are depicted as black-and-white. After a user has visited a certain place the picture of it becomes colourful on the mobile screen and all the existing information about it is being revealed. There is the possibility of posting pictures of beautiful places and seeing the newest pictures of the place taken by other users. As a reward for a visit a user receives a digital mark – water drop, tree or stone – depending on the type of visited nature place: some water source (river, lake, etc.), a forest

(fields, etc.) and rocks (caves, stones with background story, etc.). All the visited places are saved in the application's memory.



Picture 1. Pilot concept of mobile application.

This application not only has an opportunity to demonstrate the incredible, uncommon wonders of natural surroundings, but also aims towards a positive influence on the emotions of people and the creation of healthy lifestyle habits. In addition, certain features of the application, such as, for example, sharing pictures and showing nearby application users, would allow people to fulfil their social needs.

2.2 Motivation and personal goal

The big idea behind this application is the creation of a meaningful value. Rather than simply foisting people with a healthy and fun lifestyle, the main emphasis of this digital artefact would be to indicate that this enriched way of life is the natural inner state of a human. Its main goal is to engage people to go outside and enjoy the beauty of nature.

Likewise, there have been many motivational reasons for this work. To begin with, design traditionally is associated with the creation of the aesthetics of an object. In fact, the profession of a designer is much more multifaceted and complex – it goes far beyond visual appearance projecting. Design is about problem solving; nowadays, it concentrates on the interaction between people and technology and providing experiences (Buchanan 2001, cited in Stickdorn & Schneider 2013, 56). That is why, as a designer, I had to tackle the existing challenge of sedentary lifestyle and device obsession, and generate a concept which would provide adequate solutions while serving real customer needs.

Moreover, a user is a fundamental basis of design. Everything which is made in this field is created for someone to serve a need. Each user is an individual with unique behaviour and perceptions. That is why there was a curiosity in customer research methods to be examined in detail to find out best ways for user-designer interaction and discussion as well as to figure out possible challenges.

What is more, mobile devices have become an inseparable part of everyday human life. Nowadays, the majority of people in developed countries have a personal mobile phone and use it constantly for work and individual needs. Due to continuous progress it seems that modern technology becomes popular over nature. Therefore there was personal need in creation of solution, where modern technology will act as a tool for the reunification of humans with nature.

Another point of motivation was the important role of sustainability in the present age. In times when the product market is saturated and even has a problem of overproduction, every new product or service being created needs to be thoroughly considered from the ecological, economic and social points of view in order to possibly avoid the creation of new problems. At the moment of idea creation my main concentration lay in the sphere of ecological perspective. Therefore, the produced solution needed to be primarily immaterial and intangible lest to generate novel negative impacts on the environment.

When discussing intangibility, service and service design are the first associations which appear in the mind. This field of design has always been a sphere of

my interest. It is a multidisciplinary field which provides a lot of possibilities and ways for development. Moreover, it possesses the necessary tools for problem solving and provides clear guidance for designing something useful. I have been studying it for several years in university and wanted to apply the gained skills into practice as well as generate new abilities via a real life problem solving process.

All the mentioned desires were taken into account and analysed. As a result, after several brainstorming sessions, there appeared to be a combination of the intangible, useful, up-to-date and serving of real customers' need – the concept of a mobile application – a service idea incorporated in the shape of a product.

2.3 Aim of the thesis

On the basis of the described idea I have developed a project for this thesis work. It is a small personal project developed mainly for research purposes. It does not have any direct customer, but in case of promising research results it can grow further.

The described idea appeared in Salzburg, Austria during my exchange studies, but was intended to be applied in the area of the City of Joensuu, Finland. Cultural and territorial differences could definitely influence the idea. That is why the concept needed to be tested and developed locally at the place of future application.

The main goal of the thesis work is to figure out if the idea has the potential to be applied and developed in the chosen circumstances of Joensuu. Additionally, there was a need to know if the citizens of the city really need this kind of service and in case the result is positive, how to develop the idea better so that it would answer real customer needs.

3 THESIS FRAMEWORK

The goal of my thesis work was to define the usefulness of the created idea and its ability to work in reality in the future. Initially it has evolved as a service concept. That is why such aspects as product and service design had to be overviewed, user research methodology explained, and the possible challenges of human behaviour illustrated. As the basis of the initial research, idea mobile application technology is examined in details as well.

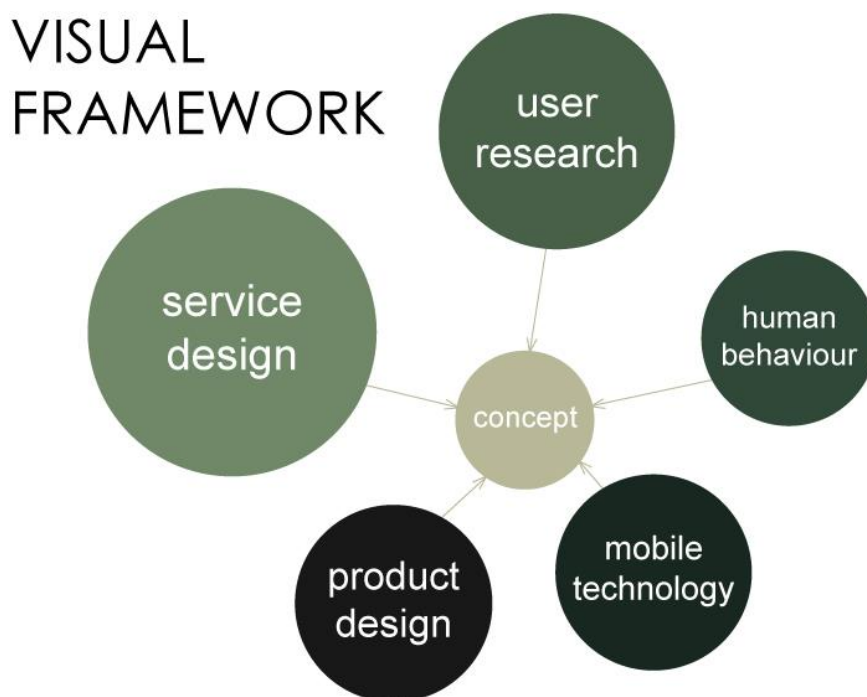


Figure 1. Thesis framework.

This thesis is a study about idea development. Therefore, merely the starting point of the design process is discussed. One of the key interests of the research was the investigation of user needs. Overall, the study provides answers to the questions 'Do people in Joensuu really need the offered idea?', 'What do

potential users think about it?', 'How could the idea be improved to fulfil customer needs in the best way?'

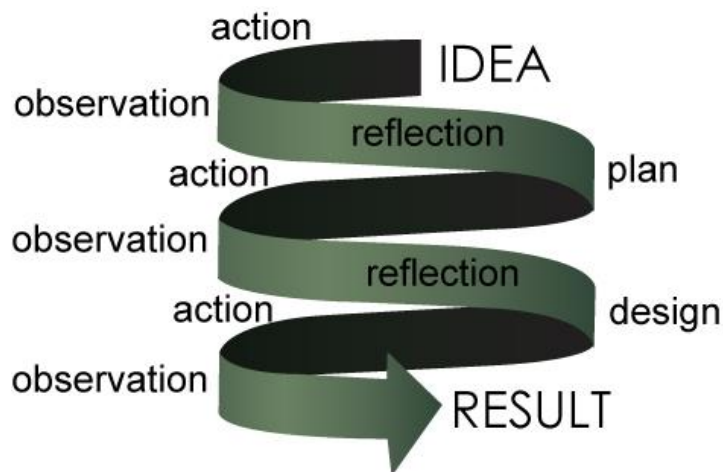


Figure 2. Practice-based research framework.

This paper follows the spiral framework of practice-based research introduced by Walker (1985, 28). In the present case it represents two rounds of actions and evaluation.

The outcome of this is the result of quantitative research conducted in the form of interviews. These results are presented in the form of infographics in Chapter 10. Additionally, this provides the results of a co-designing workshop – which opinions, suggestions, improvement participants of the workshop had and how these findings can be applied for further idea development. In order to start the design process and gain a stable theoretical base, a relevant literature review has been conducted.

4 MOBILE APPLICATION

The mobile market has changed dramatically over recent years. Imperceptibly, smartphones have become a more affordable integral part of our lives. It led to the bloom of mobile application industry. Various types of apps have appeared and became ubiquitous and easily accessible.

4.1 What is a mobile application?

Cambridge Advanced Learner's Dictionary defines the word "application" as "a computer program that is designed for particular purpose". According to Banga & Weinhold (2014, 3) "an application (app) is a piece of computer software designed to help a user to solve a problem". Mobile applications are software programmes, easy to download and access using a phone or another mobile device (Human Service Solutions 2016). Thus, it is possible to conclude that in the mobile application paradigm there are two obligatory elements – a mobile device and the application itself. The main target of the application is to assist the user to fulfil the need or cure the difficulty.

These definitions are distinct and support each other. However, the disposition of a mobile application has to be revealed clearly. Which category do these artefacts belong to: products or services? To find out the answer to this question, both definitions need to be analysed.

Most generally a product is explained as a material tangible item, which can be interacted with (Rodgers & Milton 2011, 6; Hestad 2013, 4). A file-based sequence of actions is also considered as a digital form of a product (National Archives 2016).

On the contrary, service represents something completely opposite. Grönroos (2007, 52) depicts service as a process consisting of a series of activities and interactions taking place between a customer and a service provider over time. Stickdorn & Schneider (2013, 35) agree with this definition. A more complicated mention of service can be found in Meroni & Sangiori's publication *Design for Services* (2011, 1), where service is given the description of a complex, hybrid artefact which consist of numerous details such as the "places and systems of communication and interaction" as well as "human beings and their organisations" (Meroni & Sangiori 2011, 1).

Another specialty which confirms ephemeral nature of the service, is the fact that services can be exchanged, but cannot be experienced in a tangible way. Services are being produced and consumed concurrently and do not exist before the moment of use (Grönroos 2007, 53). "Services are created through the interaction between a service provider and customer" (Stickdorn & Schneider 2013, 35).

The details mentioned above give us a clear understanding that services are intangible and cannot be ranked among regular goods. However, the situation is not as simple as it seems from the first sight. There is a third dimension combining both perspectives.

National Archives 2016 states that service can be "a significant element of a tangible product, which through some form of exchange satisfies an identified need". From time to time services are hard to detect as they are closely accompanying a certain good. Stickdorn & Schneider (2013, 62) are referring to this phenomenon as a "product-service hybrid". Such a perspective considers industrially manufactured products as a component of a service scheme. Koivisto (2007, 16) confirms that hybrid products are products designed in a way that service cannot be separated from the product. Moritz (2005, 26) likewise agrees

with that definition and states that services are a part of intricate hybrid products. Products often act as basis for services. Services add value to a product and assist to reinforce its competitiveness on the market. (Moritz 2005, 26.)

Taking into consideration the points mentioned above, it is possible to conclude that a mobile application is a product which extends into a service. It cannot exist in isolation out of physical media (e.g. smartphone); however, it can be interacted with and carry out desired functions.

4.2 Types of mobile applications

Mobile applications can be subdivided into three categories: native, web and hybrid (Morrison 2011; Lionbridge 2012; Mobdevapp 2013; Wilken 2015). Native mobile apps have to be downloaded from a web-store and installed on a device. They can work offline and integrate into a gadget's hardware and software (camera, e-mail, contacts, etc.). The greatest disadvantage about native mobile applications is their complex and costly production process as well as the inability to work on multiple devices. (Morrison 2011; Lionbridge 2012; Mobdevapp 2013; Wilken 2015.)

A mobile web application is a web application adapted for tablets and smartphones. It can be used via a mobile device's web browser. The main advantage is that it can be used on different devices and platforms. Besides, it is faster and easier to produce than a native app. A mobile web application also has a major drawback – there always has to be an Internet connection; otherwise application will not be able to work. This fact can be irritating for users who do not have constant access to a free wireless network (wi-fi) and would have to pay for the operator's network. (Morrison 2011; Lionbridge 2012; Mobdevapp 2013; Wilken 2015.)

A hybrid mobile application is a third possibility. It represents a combination of a native app and a web app. It can fully use a device's functionality and provide all the user benefits while being easier in creation from the time and money points of view. It has all the opportunities of a native app. Besides, due to its web nature it can work on multiple devices. (Morrison 2011; Lionbridge 2012; Mobdevapp 2013; Wilken 2015.)

Certainly, the most fitting type of application to be selected depends on particular cases and circumstances. If the goal is to easily adapt for the quickly evolving mobile market and reach the most extensive audience possible, then the choice should be concentrated on Hybrid and Mobile Web applications. These solutions are most cost efficient in terms of buildability and long term maintenance. (Morrison 2011.) If the purpose is to concentrate on a concrete operating system and create a smooth experience, then a Native Mobile application is the best decision. In case of uncertainty, the experienced developer, speaker and blogger Jim Morrison advises readers to focus on Hybrid or Mobile web application approaches.

4.3 Software licences

Software is an integral part of mobile application. It is a logical continuation of a device's technical characteristics. Based on distribution methods, software for mobile applications can be divided into proprietary or open-source (Zandbergen 2016; GNU 2016).

Proprietary or closed-source software is software which is licenced by the author or copyright-holder under precise conditions. A user can utilize it for his /

her own purposes, but cannot adjust or allocate it. The original code written by programmers is not public. Software can be free and proprietary at the same time. (Zandbergen 2016; The Linux Information Project 2005.)

Open-source software is software with accessible source code. The program's code is usually available for everyone to view, study and modify. A user can clearly see how software was made, take part in its development and create new programmes on the base of open source code. This kind of software can be modified and distributed by user. It can be developed in collaboration with other users, where each one contributes to development. (Laurent 2004, 9; Zandbergen 2016.)

Software itself is usually free to operate. However, the license explicitly declares that a user does not have the right to put restrictions on the use or distribution of the open-source software. Therefore, content created on the basis of open-source software cannot be sold afterwards. (Zandbergen 2016.)

Taking into account that the idea for this thesis is a self-financed project without a large budget behind, open source software can be considered as the finest option. Moreover, open-source software licence enables community creation, which likewise supports the project's concept.

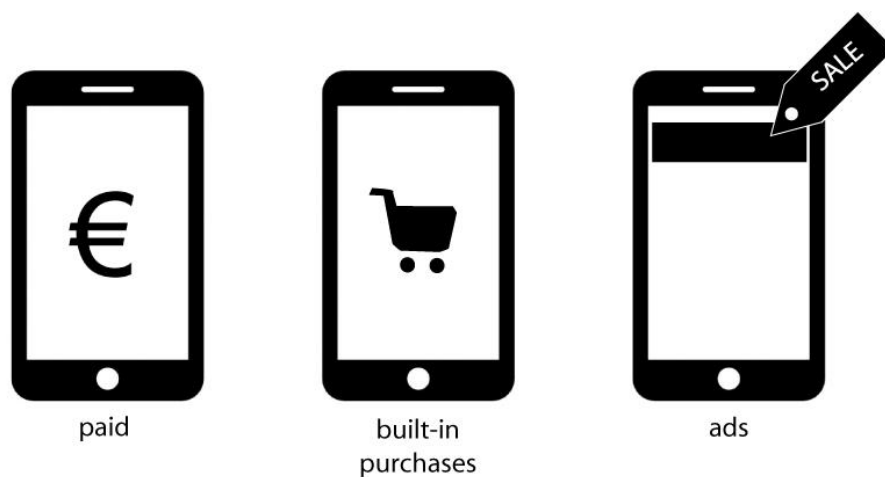
4.4 Monetization possibilities

Numerous amounts of mobile applications are being created for us. However, many of them have difficulty in being launched due to the lack of resources and cannot survive on the market for a long time. That brings up an important ques-

tion: how can developers earn money on mobile application productions? Monetization is the answer.

Monetization is a way to gain profit as well as a way to assess the effectiveness of a mobile application (Vitman 2014). Let us have a look at business strategies currently used in mobile application market. There are three main approaches to gain the profit:

- 1. Application is paid-for initially – it requires user to pay for the download.*
- 2. Application is free to download, however, controls the user with built-in purchases.*
- 3. Application is free to download, however, contains advertisements (subscriptions, sponsorship, push-notifications, icons, pop-up windows, dialogue boxes, video advertisements, offers).*



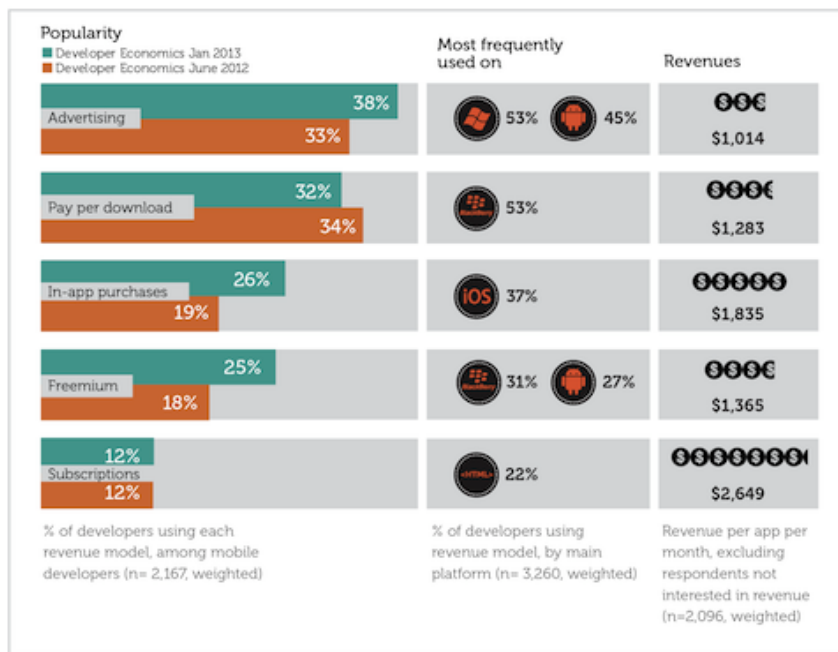
Picture 2. Ways of mobile application monetization.

Each of these business models has own advantages and drawbacks. Paid-for applications honestly ask for a set price and user can decide straight away, wither this sum is good to pay or not. However, frequently, a price tag shown

near the application creates a barrier between the user and application and even can alienate the user.

Free applications with built-in purchases can attract more users in comparison with priced ones. In-app purchasing strategy is considered greatly working in applications, where the process is very entertaining and fetching, for example, in games. However, these purchases may have an ethical issue as usually they leave no choice for the user; if the game was stopped at the most exciting point the user stays intrigued and has to do the in-app purchase to satisfy own interest.

Inside advertisements is a reliable, working method. Spaces of interface are loaned for the ads. Profit is gained from the quantity of views and taps on the ads. However, advertisements can be very irritating for the user, and the application itself has to be used often or constantly in order to get the advertisements as many views possible. Nevertheless, the most popular strategy nowadays is free to download applications with advertisements inside (Figure 3).



Source: Developer Economics 2013 | www.DeveloperEconomics.com | January 2013
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Figure 3. Popular ways of application monetization.
 Source: Developer Economics 2013.

Some users find paid-for applications most useful as they need to be paid for only once, have the full spectrum of functions and do not distract the user with built-in purchases and advertisements. Nevertheless, free applications still remain the most popular segment of the market. Figure 2 clearly shows a significant increase in the number of free mobile application downloads over the recent years as well as forecasts continuation of the growth. Figure 3, likewise, displays a noticeable reduction in revenue share of paid-for applications on the market.

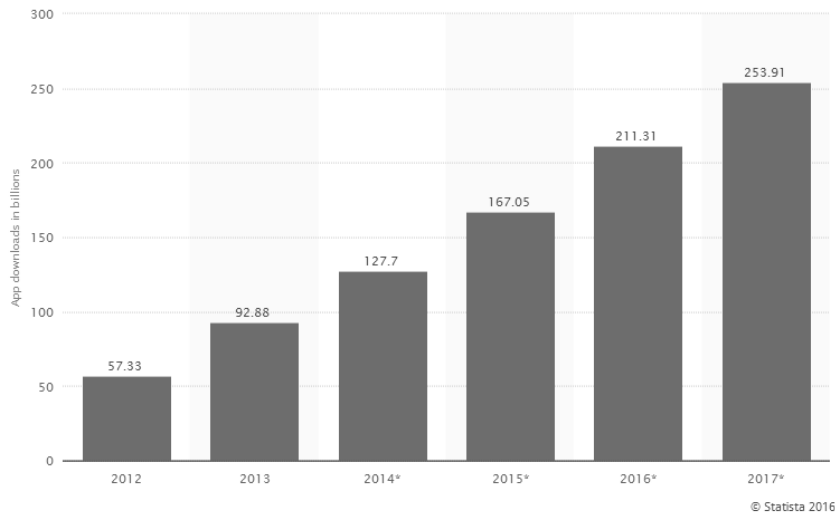


Figure 4. Number of free mobile app downloads worldwide from 2012 to 2017 (in billions).
Source: Statista 2016.

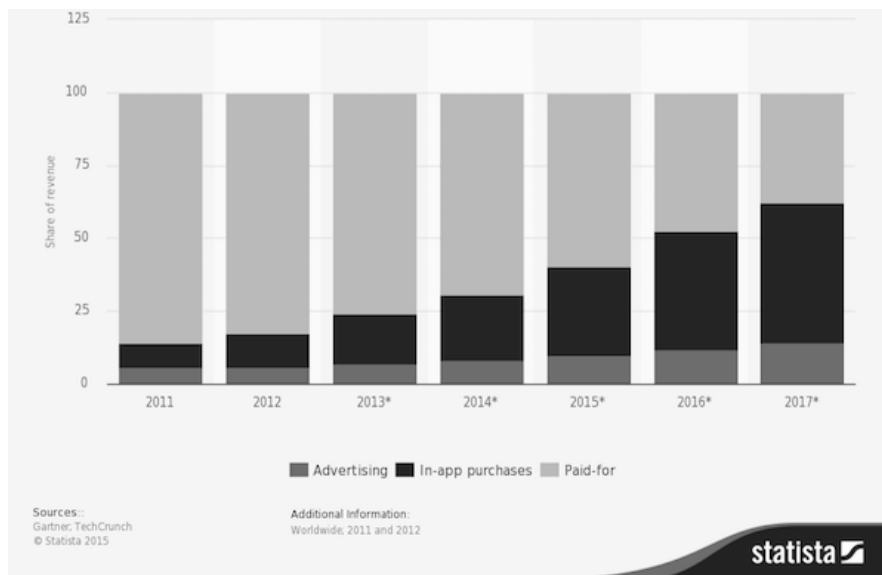


Figure 5. Share of world mobile app revenues from 2011 to 2017.
Source: Statista 2015.

The presented data demonstrates that free mobile applications attract the most customers and create the greatest share of the mobile application market. Developers actively use special strategies which offer users the chance to get acquainted with the application and afterwards be redirected to pay. There are two main ways to do it. One option is that developers create two versions of a mobile application. The first version is a free limited version allowing users to try

out the functions and decide on buying a full version. The second version is a similar mobile application, however one containing all the announced functions and, thus, paid-for. Another option is that developers make only one version of an application, where merely limited functions are free to use and a user has to make built-in purchases in order to obtain the entire application's functionality.

5 PRODUCT DESIGN

This research is built around the concept development of mobile application. Mobile application is a product. Therefore, mobile application development requires an insight into sphere of product design.

Caldecote (1989, 57) has defined product design as the process of changing an idea into information from which it can be used for the creation of a new product. In other words, product design is a transformation of an ephemeral concept into a physical shape, where function plays the main part in the designed artefact. A newer description by the Industrial Designers Society of America (IDSA) (2010) explains product design as the service of generating products and systems, which enhance appearance, value and function in order to provide mutual advantage for customer and manufacturer.

The role of the industrial design has changed over recent years. From the craftsmanship of objects it has developed into a multidimensional field focused on creating experiences, processes and systems (Moritz 2005, 3; Stickdorn & Schneider 2013, 56). Product designers often consult and co-create with specialists from areas such as marketing, engineering, manufacturing and management, to name a few (IDSA 2010).

Industrial design has become human-centred. Besides creating the appearance of an object, designers have to initially work as researchers. They have to study users in order to obtain the knowledge which is indispensable for new artefact creation. (Stickdorn & Schneider 2013, 57.) Gained information acts as inspiration and ensures the necessity and usefulness of a generated concept. Therefore, the chances of making good design and meeting customer needs grow significantly.

Product design has become an interactive sphere. It includes expert knowledge from related fields as well as involving customers in the design process. It employs specific methods and tools. (Moritz 2005, 3.) Thus, it is possible to conclude that product design is a component of service design.

6 SERVICE DESIGN

As already mentioned in a previous chapter, the object of research for the current study (mobile application) is a product. However, the value it delivers is a service. Over a long period of time the design of the service has not been seriously considered. Companies have been making rapid decisions about the development of new services without conducting proper initial research (Moritz 2005, 85-86). Such imprudence has often led to poor-quality and unnecessary solutions. The current research aspired to overcome mistakes of the past. Therefore, in order to distinguish the possible challenges in the way of service design and understand the object of a design more precisely, information about the service design field had been essential to gather and analyse.

6.1 Definition and mechanism of work

Service design does not have one common definition. It is a developing, living field which changes over time and constantly acquires new elements. However, there are only with small deviations, various researchers (Moritz 2005, 5; UK Design council 2010; Mager 2009 in Miettinen & Koivisto 2009, 34) agree upon that service design assists in creating or improving services and makes them more useful, usable and desirable for customers, as well as effective and efficient for suppliers.

Service consists of a series of touch points between the customer and the service provider over time. Service design ensures that all touch points work perfectly together to create high customer value with a positive experience (Transformator Design Group 2010). Service providers typically shape the service together with users, who, in their turn, participate in the production process (Morelli 2002, 4).

Service design is a complex and iterative process by nature. It is possible to map out the structure of the following steps, but it might be that during the process it would be needed to return to certain point or even start everything all over again. The most important part in this process is to learn from previous mistakes. (Stickdorn & Schneider 2013, 124-126.)

6.2 Key principles

Service design thinking does not have any strict set of rules. However, there are fundamental factors to rely on in order to direct the service design process. Ac-

According to Stickdorn & Schneider (2013, 34) the main principles of service design thinking are as follows:

1. User-centered.

User-centricity means that the service is built around the user. A designer should consider the service from position of the customer.

2. Co-creative.

Co-creation is fundamental in service design philosophy (Stickdorn & Schneider 2013, 198). The needs and expectations of people are different. A designer cannot read the mind of the customer. Therefore, involving all the stakeholders in the design process into a process of creation is an optimal solution to generate a result which satisfies everyone. Additionally, co-design activities engage communication between people, which, for instance, allows the designer to gain a clearer insight of the user's problem. Moreover, co-creation stimulates creativity and innovation to grow.

3. Sequencing.

The sequencing of a service is a vital factor to consider. Services are dynamic processes happening over time. Well-organized service timeline sequence assists to regulate the rhythm of a service for a customer to feel satisfied.

4. Evidencing.

Services are intangible. That is why it is often hard for users to be aware of them. Service evidence provided in a tangible form can prolong the service experience a customer received or activate positive memories concerning a gained experience.

5. Holistic.

Services are complex processes happening in the physical environment with the usage of material artefacts. Thus, it is often difficult to take all service influential factors into attention. Nevertheless, service design always has to consider the service in the wide context of the environment.

Service design structure contains various components. Different authors share one common attitude about the service design process. Mainly, it consists of the four following phases: exploration, creation, reflection and implementation (Stickdorn & Schneider 2013, 127; Mager 2009 in Miettinen & Koivisto 2009, 35; Best 2006, 24). Service design is iterative. The more iterations made between the mentioned stages, the better the created solution in the end.

One of the most essential principles of service design is its being user-centred. Understanding the current and the potential user is vital for successful solution creation and the overall design process. (Stickdorn & Schneider 2013, 34-129.) Cooper et al. (2014, 59) consent that user research is an essential basis for designs to be built upon. Good customer research ensures that the designer will be solving the right problem. Therefore, the user is a key figure of the design process.

7 USER RESEARCH TECHNIQUES

There are numerous methods to find information about the user. For many years these techniques have been applied in various spheres: in design, marketing and social sciences. They have proven their usefulness over the time of successful work; however, each of them has its own benefits and drawbacks.

7.1 Quantitative

Quantitative research is a way to get statistical information about respondents. It generates solid numbers about potential customers – the quantity of users, their age, gender, education, lifestyle and other variables. Gathered data can be

interpreted to distinguish market segments for users and most receptive types of consumers. Quantitative research can provide clear and reliable answers to the questions of 'what', 'how much', and 'how many' of the research equation. (Cooper et al. 2014, 32-34.)

Quantitative techniques are good for the collection of general information. For example, Garrett (2011, 46) states that market research methods, such as surveys and focus groups, are best for gathering the basic information about the general perceptions and attitudes of users. Cooper et al. (2014, 34) agrees with this notion and describes that quantitative marketing methods effectively help to determine the behavioural knowledge of customers – their resources, motivation to buy and self-orientation. This information can definitely help designers to define products for consumers. Another positive outcome of quantitative research is real numbers, which can be processed and used for creating statistics for future predictions and analysis.

However, statistical data may raise more questions than it answers. Quantitative research methods cannot help with identifying the reasons of consumer behaviour or investigating latent user needs. Human behaviour is very complicated and includes many variables. Quantitative data simply cannot analyse all of them. (Cooper et al. 2014, 34-35.)

7.2 Qualitative

Qualitative research definition is multifaceted. It has a variety of forms, names and means. (Mann & Stewart 2004, 2.) Crabtree & Miller (1992, 4) refer to the substance of qualitative research as holistic, configurational, multi-layered, ambiguous and even mysterious. Despite such complexity, certain core attributes of the research process remain relevant for the current discussion.

Qualitative research is applied to collect meaningful context information about humans with the intention to understand the experience and associations with a system or culture (Silverman 1999, 5). An analysis of received data may lead to the articulation of expounding hypotheses or the development of a compound theory (Brannen 1992, 8). Qualitative research is suitable for inquiry and the assessment of complex and constantly changing human behaviour. It can provide answers to such questions as what, how and why. (Cooper et al. 2014, 32.)

Scientific investigation has a minimum of five goals: identification, description, explanation-generation, explanation-testing and control. Qualitative methods are typically used for exploratory research, which consists of identification, description and explanation-generation phases. (Crabtree & Miller 1992, 6.)

Stage of identification is one of the most important aspects for research, as it is essential to gain detailed and clear knowledge about the users, the limits of the difficulty to solve, and the goals of the business or organization which is developing the idea. This information is crucial for success of the concept, as at the end of the day success is measured in a solution's ability to serve the needs both of the user and idea initiator (Cooper et al. 2014, 31).

Nevertheless, the identification phase is often neglected. Due to this fact created concepts are often based merely on a researcher's own assumptions or studied literature. As a result, conducted research may end up in easing a difficulty or solving a problem which is not worth it. (Crabtree & Miller 1992, 6.) Therefore, it is vital to apply qualitative research methods to ensure that identification is done correctly.

Qualitative research methods are rich in advantages. To begin with, they assist understanding patterns of customer behaviour as well as the context and constraints of developing solutions in a variety of ways. Furthermore, such techniques support and direct the design process and help to define and create products for users. Moreover, qualitative inquiry is almost always the most effective tool for portraying latent user needs. In addition, qualitative studies can provide valuable business insights which cannot be revealed from traditional market research. (Cooper et al. 2014, 32-35.)

Qualitative research has a major drawback – it is an extremely subjective process. Many interactions between people happen during its progress; consequently, there are plenty of variables which can influence the course of research. Firstly, there are differences in the perceptions of a user and those of a designer, even if they have the same goals (Hsu et al. 200, 375). For example, everyone comprehends and interprets words and images in individual ways. Secondly, human attitudes can likewise play an important role. According to Zhou et al. (2014), in case of a research interview, the “responses and activities of subjects can be influenced by speech, behaviour, facial expressions and even expectations of the interviewer.” Finally, information can be biased from a researcher’s perspective as well. For instance, if a designer or researcher selects users himself, he may generate data which does not reveal the actual target group. User research methods have to be applied carefully in order to facilitate the researcher to comprehend information as it is in reality, and not as it seems according to one’s thoughts. (Tidwell 2006, 7.)

7.3 Technology-based

Human behaviour is extremely difficult to deduct and analyse with the aim of getting precise and objective results. It is, however, possible. Nowadays, there are ways to define human reactions and perceptions with scientific accuracy.

For example, MRI (Magnetic Resonance Imagery) could be applied. During recent years this method has already been successfully used in the field of neuro-marketing (Lindstrom 2010, 6). Users are being shown something (for example, a new product or service idea) and the apparatus depicts which areas of the brain are highlighted. Afterwards specialists interpret the obtained data.

Another example of technology-based research is the eye-tracking method. A person is shown images, and a special apparatus records the movement of the subject's eye. Fixations, saccades, and pursuits of the eye are filmed. For example, the moment of gazing at a certain point of the picture can be referred to as the person's interest in that part (Duchowski 2007, 137). What is more, the preferences, habits and traits of users can be disclosed with eye movement analysis (Jarodzka et al. 2010, 146-154; Berg & Kojo 2012, 155-169).

Examples of the research mentioned above provide incredibly accurate outcome data. Bias of information is minimized – it can happen merely at the stage of results interpretation. However, there is one drawback – such scientific research is dependent on the availability of technology.

8 HUMAN BEHAVIOUR

Even though traditional research methods have been working successfully over the years, they remain subjective due to humans themselves, especially due to the peculiarities of behaviour and brainwork.

8.1 Tricks of communication

The main difficulty in understanding customer needs is that people usually do not know what they want or have no introspective skill to explain it. People are complicated creatures with personal thoughts, desires and goals, and it is hard for them to communicate their own necessities or expectations. To begin with, customers usually cannot clearly articulate personal needs (Edvardsson et al. 2000, 26; Tidwell 2006, 7). Only in dialogue with the customer can a designer or researcher obtain a better understanding, and, therefore, a better basis for service or product development. Moreover, users may communicate their necessities, but in a misleading way. Sometimes things people order and talk about are not actually the things they want. In addition, there is always the option that people do not yet know they want something (Garrett 2011, 66). Our perceptions of the present are biased by our past experiences (Johnson 2014, 1; Weinschenk 2011, 73). Therefore, it is difficult to imagine and accept something new and never experienced before.

8.2 Imperfections of human brain

According to Johnson (2014, 169) and Weinschenk (2011, 202), human behaviour is rarely reasonable: recent research in cognitive science demonstrates that stability and rationality are not the qualities of human decision making. This happens due to the specific character of how our brains work, their structure, and habits which have formed over thousands of years of evolution.

The brain consists of three parts: old, middle (mid) and new. The old brain is represented by a brain stem, a structure which began developing over 500 million years ago. It is responsible for instincts (defining everything into edible, sexy or dangerous) and regulating the automatic functions of the body. The midbrain is located above the old brain and beneath the cortex. It evolved after

the old brain and before the new brain. The midbrain is in charge of emotional control. The new brain is made of cerebral cortex. It manages conscious, intentional activities, for example, planning. (Johnson 2014, 132-132.)

These three brains form two minds, which cognitive psychologists call system one and system two. System one consists of functions of the old and mid brain, while system two is only represented by the new brain. System one is unconscious, automatic, irrational, parallel and fast. System two is conscious, controlled, rational, precise and slow. The unconscious or so-called emotional mind usually dominates the conscious one as it works constantly, reacts rapidly and implements actions approximately, without tiring detailed analysis. (Johnson 2014, 132 – 169; Weinschenk 2011, 202.) When a person perceives something, both minds contribute to the thought and behaviour; however, since the unconscious mind is faster and somewhat reliable, a person performs based on this rough irrational estimation even before a conscious decision has been formulated.

Regular life empirical observations likewise serve as evidence of decision making irrationality. People often tend to think one way, speak another way and act in a totally different way. Our brainwork explains clearly why we cannot be rational and why researchers and designers cannot rely only on their dialogues with users.

Another issue about the human brain is that its memory is imperfect and attention is highly selective. Our cognitive system detects something worthy of our note and directs us towards it, leaving out other surrounding information (Johnson 2014, 93; Weinschenk 2011, 47). That is why it is common practice to forget some facts.

For instance, when outside the context, it is normal for a human to eliminate the details of personal actions and reactions while describing them afterwards (Goodwin 2009, 51). A professor can ask his students about what they did before coming to lectures. Most commonly students would say that they got up, took a shower, had breakfast and then came to university. However, they would forget to tell that they put on their clothes before going to lectures. This example clearly demonstrates that provided incomplete information can be misleading for design or research work.

9 CHOICE OF RESEARCH METHODOLOGY

The abundance of research methods help designers and researchers to study potential and actual users with aim of gaining information, which will help to serve actual user need. Nevertheless, designers have a hard job. We are dealing with people, whose complex behaviour, mood and attitudes are constantly changing and cannot be put in order. Moreover, we are people ourselves and our perception of the design process can likewise bias.

Each research method has own advantages and drawbacks as well as particular purpose of use. A conducted literature review revealed technology-based user research methods as the most accurate. However, this study is small, and such an expensive way of conducting research was simply unnecessary. Quantitative research methods cannot provide a deep insight into the human personality. Qualitative research methods are subjective. Besides, there exists a general uncertainty principle, which states, “the act of measuring certain sensitive variables in a system can alter them and confound the accuracy of the measurement” (Lidwell et al. 2003, 198). In case of current paper, when a designer or researcher investigates the customer, this study is already influenced by the fact of performance of the study.

To my mind, it was possible to conclude that perfect objectivity of research is impossible. Therefore, I made the decision to choose research methods which simply seemed most fitting to my case and were interesting to test. I have selected the early user interview, co-design workshop and survey. The following sub-chapters explain why.

9.1 Interview

Interviewing enables observation. Cooper et al. refer to the combination of interview and observation as to the most effective method for collecting qualitative data (Cooper et al. 2014, 43). A designer has the chance to investigate user behaviour and reactions, ask clarifying questions on the spot and generate inquiries about user goals. Therefore, the interview creates a great opportunity to learn.

9.2 Co-design workshop

Co-creation is a fundamental part of service design. It enables idea generation and evaluation within the group, which ensures a variety and diversity of concepts and discussions. Co-creation facilitates communication and makes it easier to gain frank insights from various user viewpoints. A co-creation session can indicate the direction for further design process as well as become an inspiration for future solutions. (Stickdorn & Schneider 2013, 39, 199.) Co-design activities engage creativity and idea sharing (Service Design Tools 2009).

9.3 Survey

Surveys generate good general information about users. They make it possible to reveal certain aspects of the target group. In addition, they provide concrete numbers as a basis for further analysis, which can support qualitative data.

10 GRADUAL STUDY APPROACH

10.1 Interview

10.1.1 Discussion strategy

A method of parallel inquiry has been decided to apply for interviews. It corresponds with the technique of parallel prototyping, when a parallel idea development provided better end results than serial prototyping (Dow et al. 2010). Moreover, parallel strategy refers to the concept development approach. Concept development facilitates alternative concepts to meet the needs and pick up a preferred one as a foundation for system development and implementation (Mitre 2010). This approach recommends having at least two different ideas to test. Alternatives encourage discussions and stimulate thinking about which option is stronger, faster to create, the most reliable and suitable for circumstances.

To stimulate discussions and conversations I have come up with two contrasting ideas to accompany my initial one. In total three concepts were proposed to interviewees. Each concept could act as a tour guide in nature: mobile

application, paper posters located in public places, and a person providing free excursions to nature on a fixed day of the week.

The offered concepts differed. However, they had the same meaning – the goal of reviving the fact of natural beauty and engaging people to go outside to enjoy it. I wanted interviewees to feel the similarity of values that ideas convey.

I asked people to comment on each option, explain the positive and negative aspects of it, and discuss why a person thinks in such a way. The interviews were individual, and I tried to engage storytelling and make it easier for people to talk about nature experiences they have had in their lives and any thoughts concerning offered options. In the end I was offering a person to choose the best one, in his/her point of view, at the moment. I tried to figure out the opinions of potential future users.

I interviewed local residents of Joensuu, citizens of other cities in Finland and students from foreign countries. All participants were notified about the confidentiality of the data they provided. In total eight interviews were conducted. These interviews provided the following findings.

10.1.2 Findings

The mobile application turned out to be most well-liked option. Three interviewees preferred it over the other choices. A guide (person) received the silver on the popularity chart. Paper posters, which seemed the weakest idea to me, surprisingly found two followers and shared the second place with the guide concept. In addition, there appeared an extra option – one interviewee proposed the idea of creating of a nature tour guide web page.

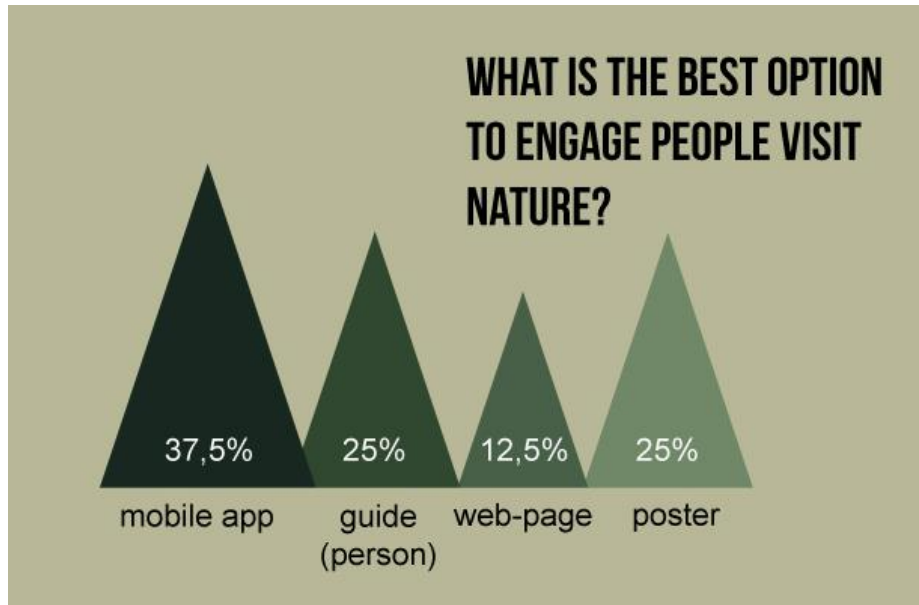


Figure 6. Selection results.

The mobile application was considered to be the most convenient, up-to-date and appealing for younger people. A navigator in the application guides the person precisely and has a good signal everywhere. Thus, there is no need to carry around a paper map, which can easily get wet or rapidly get destroyed after active use. A lot of people have smartphones; therefore, a mobile application guarantees a vast audience of users. There could be financial difficulties for starting up this idea. However, at the beginning it could be a free trial version.

A tour guide has been considered a good option for socializing – excursions would be in groups, and people would need to talk to the guide and with each other. Furthermore, the guide knows the route the best and brings the group to the place easily. Thus, no one could be lost on the way. Additionally, the guide is assumed to always have interesting stories to tell, which guarantees an exciting time. However, the main difficulties with that idea are that the route program has to be carefully thought-out and made in a fascinating way. Plus, the guide himself should have a very creative and charismatic personality. Some inter-

viewees as well revealed that this kind of free excursion practice is not customary for Finland and probably would appear too weird. People in Finland are quite closed, and it is usually uncommon for them to socialize during excursions.

Posters gathered controversial opinions. Some people considered them as the best option as they provide a clear map with no need for an Internet connection. For example, hikers or runners in going to nature do it to free the mind and do not like to take their phone with them. Another advantage of a paper map is that it has no batteries, which can unexpectedly run down. Other people did not agree with that point of view. Some interviewees clearly pointed out that printing of paper posters is unsustainable; it destroys nature.

My original concept consisted of guiding people through some unusual places in nature. However, the interviews revealed that there are not so many of these places in Joensuu. As a result the idea has diversified.

The most beautiful nature locations in Joensuu that people named were the banks of river and lakes, which were considered places with a nice view. People were more interested in activities to be done in nature than in nature itself. The desired activities included grilling, hiking, picking berries and mushrooms and gazing at the northern lights. Mostly interviewees were not willing to share exact information about their favourite places with others. They have been describing the place but not so much in detail, also concealing location sometimes. However, people were interested to know new beautiful places for themselves.

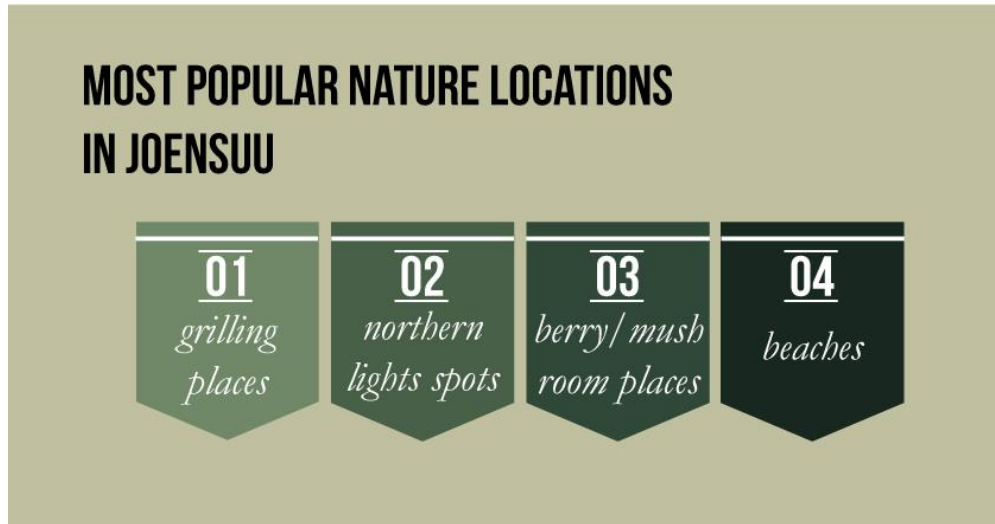


Figure 7. Most visited nature places in Joensuu.

During the process of interviews there were several side discoveries made. For example, there were several replies about lack of events in Joensuu. Another discussion revealed that Joensuu has been home to many historical happenings, but there is no information about them in the city – no signs or symbols with detailed descriptions. These omissions certainly provided inspiration for further design projects.

10.2 Co-design workshop

10.2.1 Workshop strategy

The conducted interviews revealed that mobile application remained the most popular solution. Therefore, I decided to test that idea more and created a workshop. The workshop strategy followed the traditional co-creation techniques along with Innovation Conceptual Engineering Design methodology, also known as ICED. ICED methodology is a special technique developed by NASA

engineers over three decades ago. It is applied to solve extremely complex challenges which have cannot have any perfect solutions. (Camarda et al. 2013.)

ICED employs a building block approach for research and design as well as applies Intelligent Fast Failure principle (IFF). IFF means that in order for the development of a final solution that works when used, a designer needs to fail as much as possible during the stages of development. ICED considers failure as an opportunity to learn. The process of failing removes all the non-working solutions and improves comprehension of the problem to solve. Overall, the ICED method stimulates creativity and problem solving and is proven to work successfully. (Camarda et al. 2013.)

10.2.2 Workshop process

The workshop started with a small theoretical lecture, presenting the personal mobile application idea and explaining ICED, which continued with a practical work session. The practical part consisted of two phases, Problem Definition and Ideation. Usually the ICED workshop employs three stages: Team Learning and Knowledge Capture (Problem Definition), Concept Generation (Ideation) and Rapid Concept Development (Prototyping and Testing). However, this time the third phase of ICED (Rapid Concept Development) was skipped and was not performed on the workshop as the author did not come up with a way of mobile application testing, which could be done in a class with paper only.



Picture 3. Participants working during the workshop.

During the first phase participants were asked to create three documents: a problem definition map, an existing solutions map and a list of critical features. All these documents referred to mobile application design. At the second (and final) phase participants were asked to come up with as many ideas for mobile application features as possible and choose the best one. Later, participants created cardboard prototype of selected idea.

10.2.3 Results

Participants worked very actively and produced amazing prototypes. They have generated variety of interesting ideas and have chosen best ones to present. The workshop definitely provided a lot of new ideas to think of.



Picture 4. Produced prototypes 1.



Picture 5. Produced prototypes 2.

When workshop results were analysed I became convinced that the mobile application idea is worth further development. It can be applied in real life and be benefit people. In addition, the conducted innocamp confirmed that my concept and my research are moving in the right direction. The workshop results demonstrated the strengths and weaknesses of the idea in detail and guided me towards a better user-oriented solution. Thus, the innocamp became a source of inspiration as well as support for further development towards a final design decision.

Despite the positive outcome, I consider that the workshop failed overall. It probably happened due to too diverse strategies used in one combination. Additionally, the host's instructions were probably not clear enough, and participants misunderstood some workshop tasks. However, new questions to discover arose and lot of space for improvement of the mobile application idea and the workshop itself appeared. The workshop and its failure provided me with an opportunity to learn a lot.

10.3 Survey

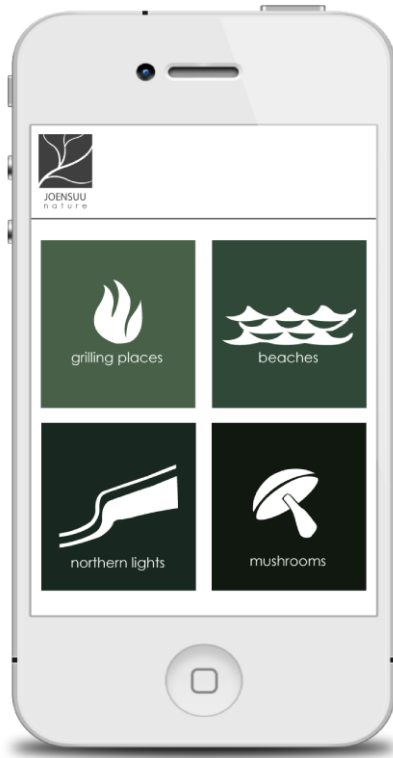
The survey was an integrated part of the workshop. The participants filled in two questionnaires concerning idea development and workshop structure. Their answers provided wonderful feedback for further development. For example, it helped to figure out features of mobile applications participants use most often, how idea could be developed and in which area it could be applied. Questionnaire samples can be found in Appendices 2 1 and 2 2.

11 NEW DESIGN

Based on interview discussions, and an additional literature review, the nature tour guide mobile application got a new appearance. For example, interviews provided information about places in nature people are interested in visiting in Joensuu. Therefore, the decision was that these locations were to be depicted on the screen (Picture 6).

The literature review revealed the fact that many people are colour-blind. Approximately 8% of men and 0.5% of women cannot distinguish certain colours they see (Johnson 2014, 43). Weinschenk (2011, 23) even refers to a higher percentage – 9% of men and 1.5% of women. This information provided me food for thought.

This time in my design process I decided to take a step forward and try to implement a product, which would be suitable for a vast variety of users, including colour-blind people. Our vision is sometimes challenged with colours, but usually good with contrast. Therefore, I decided to use different shades of green to distinguish menu buttons from one another.



Picture 6. Menu screen concept.

The space on the top of the screen has been left blank intentionally (Picture 6). At the beginning of its existence the mobile application will need to attract as many users as possible. People usually prefer free apps over paid ones. A free application with inside advertising is considered the most popular option for monetization. Therefore, the empty space on the screen will be used for advertisements to earn money for further application development.

The overall style was considered to move towards simplicity, purity and serenity, to correspond with the feeling of Scandinavian design. I have created a logo for the City of Joensuu, where the mobile application is going to be applied. From Finnish language “Joensuu” is translated as “mouth of the river”. That is why the created logo symbolizes a river estuary, which can be also viewed as veins of a leaf (Picture 7).



Picture 7. Front screen concept.

At the moment this concept appearance of the application is simply a personal vision of designer. It does not fully correspond with the user need. In order to be improved it needs to be prototyped, tested for usability and analysed. However, it already provided a starting point for a new visual and interaction design process.

12 CONCLUSION

The current paper has reviewed the main aspects of a personal research process and idea development. The key definitions of product and service design were discussed. The methods of user research and ways of user needs acquisition have been analysed. The main sources have been observed for further in-

vestigations in the field. The gathered data provided me with a lot of inspiration and hope for creating something truly necessary for people.

Overall, this study process has been challenging and quite subjective. I believe that chosen research methods have brought certain extent of information valuable to consider for future work. However, study should be continued and technique application strategy should be practiced more and improved to gain more reliable results. A lot of mistakes have been made during the process. For instance, some interview questions have been chosen to fast and did not fit the topic of research. Another reason for biased and doubtful outcome is that selection of respondents has been a personal choice of author of this study. Nevertheless, mistakes have generated new experiences and turned fear of failure into opportunities to learn.

Additionally, this research provoked an idea that a designer should be a multi-functional creature in order to be professional and achieve success. Design is a part of so many spheres, such as anthropology, biology, psychology, sociology, history, geography, economy, and politics. That is why designers should be very careful and really think about what they create. It all has a great power of influence.

These findings will act as a basis for the development of the current research. Future design solutions will definitely benefit from the received information. The current research should be continued, and further investigations should be supplemented with the phase of competitor research, human-computer interaction, user experience, interface design, and user testing, a whole another story to write.

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Initial mobile application concept



Initial mobile application concept



Workshop surveys

IDEA FEEDBACK

1. How old are you? _____
2. How many hours a day you spend outside? _____
3. What is your hobby?
 - cycling hiking photography geocaching camping
 - running Nordic walking skiing orienting
 - other _____
4. Do you use mobile/web applications?
 - yes (then question 5) no (then question 8)
5. How often do you use them? _____
6. Please, name your 3 favourite applications:
 - 1) _____ 2) _____ 3) _____
7. Which features/options there do you use most? _____
8. How do you find the presented idea (nature tour guide)?

9. Would you be using this kind of app yourself?
 - yes no
10. In which else area/manner can it be used, except tour guiding? _____
11. How could it differ from other millions of apps? _____
12. How did you like the representation/explanation of idea? Was it clear enough? _____

13. Would you be willing to participate in the following idea testing sessions?
(on-line testing probably)
 - yes no
14. Other comments and suggestions: _____

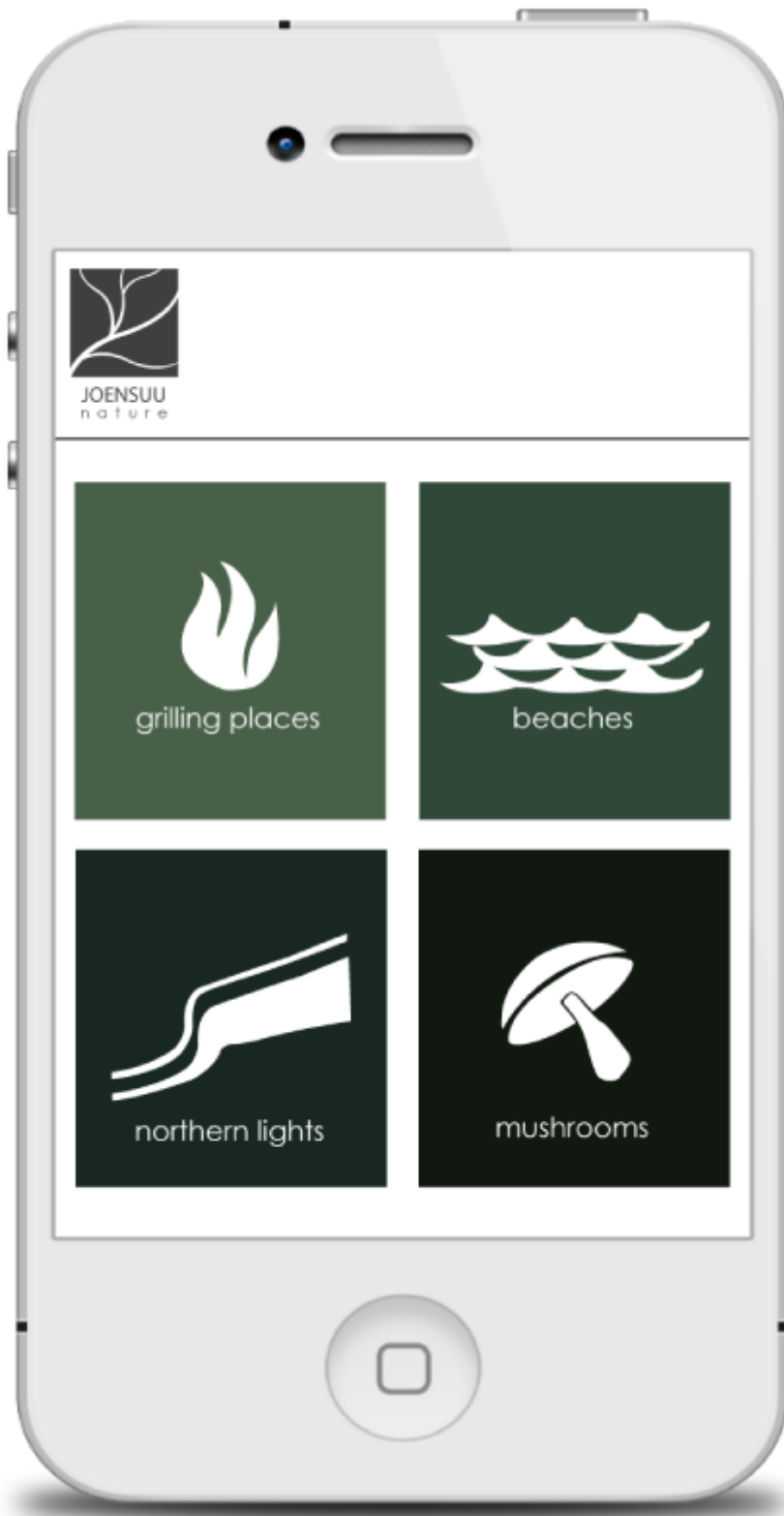
Thank you very much for your patience! :)

Workshop surveys

WORKSHOP FEEDBACK FORM

1. How did you like the workshop?
2. Did you learn anything new?
3. Will you be using ICED methodology in your life? If yes, how?
4. Was the workshop structure clear?
5. Were assignments/requirements well-defined?
6. Other comments and suggestions:

New mobile application design: menu screen



New mobile application design: logo

