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**USER EXPERIENCE PATTERNS FOR/OF INNOVATION BY DESIGN: A
SURVEY ON DESIGN PRACTICES IN THE SOFTWARE DEVELOPMENT AND
INNOVATION LIFECYCLE**

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ABSTRACT

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The User Experience (UX) designers are undoubtedly aware of how many UX design methods currently exist and that sometimes it becomes a problem to choose an appropriate one. What are all of methods that designers have in their “arsenal”? When can they use them? This thesis presents the research on the design methods in the contemporary context of User Experience (UX) and Innovations by using a survey approach. The study is limited to cover the domain of consumer mobile services development and provider companies around the world. The study follows 2 clear objectives: (1) to understand what design methods are currently used in that context and to what extent they are used (2) to identify at what stage according to the UX design thinking process for creating innovations they are placed. The study contributes to the research in the field of UX design and Innovations and extends the knowledge in that field together with communities’ (UXPA, SIGCHI, SIGSOFT) members’ cooperation. The research is vital due to lack of information on design practices and their application in the chosen context.

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Несомненно, дизайнеры, которые проектируют пользовательский интерфейс инновационных программных решений на основе опыта пользователей, осведомлены о немалом количестве существующих методов дизайна. Иногда, это даже становится проблемой выбрать какой-либо подходящий из них. В целом, какие методы дизайнеры имеют в их “арсенале”? Когда именно они могут их применять? Данная работа представляет исследование о методах дизайна в современном контексте инноваций и пользовательского опыта, выполненное при помощи онлайн опроса. Рамки данной работы ограничены областью компаний, которые направлены на разработку потребительских мобильных приложений. В работе преследуются 2 цели: (1) определить, какие методы дизайна используются на сегодняшний день, и в какой степени они используются (2) определить, на каком шаге относительно процесса дизайн-мышления для создания инноваций на основе опыта пользователей они используются. Данная работа вносит вклад в исследования в области создания инноваций на основе опыта пользователей и расширяет существующие знания в этой области совместно с сотрудничеством дизайнеров онлайн сообществ (UXPA, SIGCHI, SIGSOFT). Важность исследования определена отсутствием информации о методах дизайна и их применении в выбранном контексте.

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LIST OF SYMBOLS AND ABBREVIATIONS

HCI	Human-Computer Interaction
LUT	Lappeenranta University of Technology
SIGCHI	Special Interest Group on Computer-Human Interaction
SIGSOFT	Special Interest Group on Software Engineering
UI	User Interface
UX	User Experience
UXPA	User Experience Professionals Association

INTRODUCTION

The section starts with a description of the general idea of the thesis. Then the section continues with an explanation of the goals of the thesis, defines the research questions and delimitations. The structure of the thesis is presented in the end of this section.

1.1 Background

The initial undertaking of the thesis coincides with The Year of Innovation in User Experience (UX) defined by the World Usability Day (2015)[1]. World Usability Day is a series of events that take place during a single day all around the world. These events bring together professional, industrial, educational, citizen, and government groups together in order to achieve a common goal. This event related to Innovation in the context of UX and took place in 25 countries in November, 2015[1].

What is Innovation by User Experience design anyway? Innovation by UX design emerges from three core parts that are connected between each other: Design, Innovation and User Experience (Fig. 1).

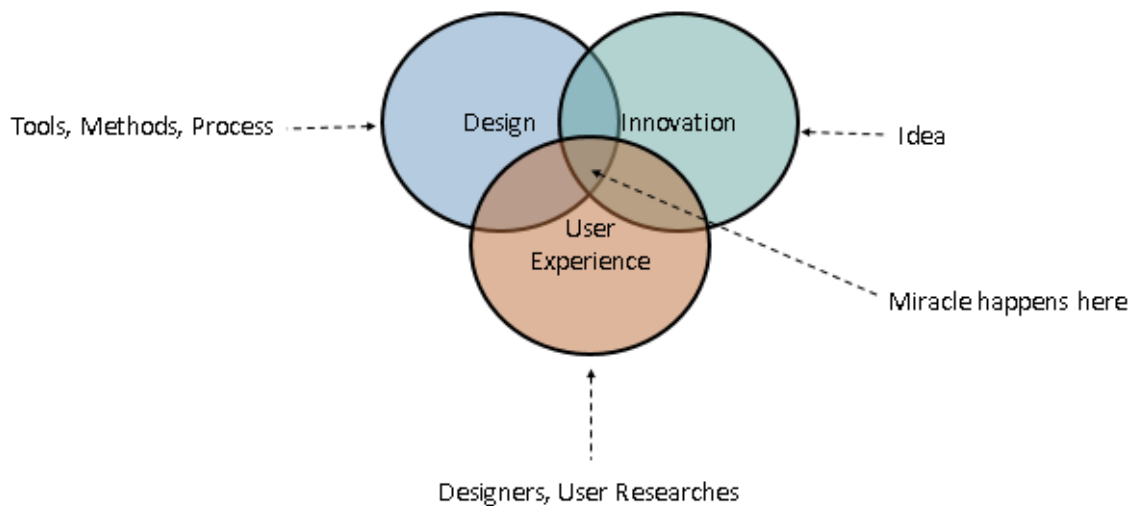


Figure 1: Innovation by User Experience Design

Obviously, that “miracle” (as shown in Fig.1) does not happen on its own. As with everything you want to build, implement or create, it is necessary to have a process. It

works similar to carrying out an idea of a successful innovation: a particular process must be defined, as well as the tools and methods must be chosen. Unfortunately, there are not any guidelines that could help understand what tools and methods must be used and in what situation, what is “the best” process, et al. If it would be known, then it would facilitate the procedure of the design that a designer creates and save him/her time (and everyone knows “Time is money”). In general, it is always better to bear in mind some instructions that you could follow and be aware when you could apply a particular design method. Nowadays, these problems such as lack of information on the design methods, their application, especially in the contemporary context of the UX and innovations need an accurate investigation. The thesis presents a research related to the UX design methods and their place in the software development and innovation lifecycle.

When it comes to the meanings of innovation, UX, UX design, some confusions can take place. To exclude all misunderstandings that can appear among those terms, the definitions are given below.

“The word “innovate” is derived from Latin, in+novare, that is to “make new”, to renew or to alter. Put simply, innovation is about having and applying a new idea, or sometimes applying other peoples ideas in new and novel ways. Succinctly, innovation is the exploitation of new ideas which find market acceptance, often incorporating new technologies, processes, design and best practices.” [2]

According to ISO standard, User Experience is defined as “a person's perceptions and responses that result from the use or anticipated use of a product, system or service”[3]. User Experience, in general, is about all the feelings that the user is getting through the interaction with any system, product or service[4]. UX design is mainly focused and entirely concerned in creating a perfect design through the UX. But what does it exactly mean? As it is stated in [5] “Users have great expectations when they visit your Web and mobile applications. They increasingly want an experience that’s valuable, easy to use, aesthetically pleasing, and emotionally satisfying. To retain and gain customers, you have to continually win their hearts and minds by providing them with a compelling user experience (UX) that is useful, usable, and desirable.” In return to those expectations,

“User experience design as a discipline is concerned with all the elements that together make up an interface, including layout, visual design, text, brand, sound, and interaction. UE works to coordinate these elements to allow for the best possible interaction by users.”[6] UX design as a discipline together with the design practices[5][7][8] can make those users’ expectations achievable.

It is important to mention that those are just single definitions that were adopted from the ISO standard/articles. Nonetheless, many designers do not completely comprehend the terms or just have a fuzzy understanding due to the numerous amount of the existent definitions. The research on this problem is presented in the Master’s Thesis by Malin Osson and Sofia Stenfors[9].

1.2 Goals, research questions and delimitations

In a broad meaning, the purpose of the study is to contribute to the research in the field of UX design and Innovations and to extend the knowledge in that field together with communities’ members’ cooperation. The reason for cooperating with communities is that communities give a possibility to discuss some ideas, ask questions, share knowledge, participate in research, et al. The list of the most famous communities is presented in the Table 1.

Table 1: Communities’ background

Name	Established	Members	Brief description	Website
UXPA (User Experience Professionals Association)	1991	Over 25 thousand	UXPA is the community for professionals, academics and students who are interested in the UX. The UXPA supports people who research, design, and evaluate the UX of products and services.	http://uxpa.org

SIGHI (Special Interest Group on Computer-Human Interaction)	1982	Not known	SIGCHI is the community for professionals, academics and students who are interested in human-technology and human-computer interaction (HCI).	http://sigchi.org
SIGSOFT (Special Interest Group on Software Engineering)	1976	Not known	The ACM Special Interest Group on Software Engineering is the community for professionals, academics and students who are interested in software engineering.	http://www.sigsoft.org

As it was mentioned in the previous subsection (1.1 Background), the study is related to the UX design methods and their place in software development and innovation lifecycle. To be precise, the study is limited to cover the domain of consumer mobile services companies regardless of the type (large-sized enterprises, medium-sized enterprises, small-sized enterprises, StartUps, self-employment) in any country. The reason to narrow the scope to only consumer mobile services development and provider companies did not happen by accident. People always want to make their lives easier. As it is accurately mentioned in [10] “We are quickly moving to a world where everyone will have a smartphone as a primary computing device and connection to the world.” Besides, constant evolution in the IT world and in particular in the mobile devices and services [11] resulted in the appearance of the consumer-oriented mobile services. Now, users will expect that the services they use do not just correspond to usability, but provide them the best user experience. These changes demand new design methods and technologies. Therefore, it is significantly important to find out what design methods are actually in use and at what stage of the design process they are used.

By taking in count all of the details, the following research questions were formulated:

- What are the UX design methods used by consumer mobile services development and provider companies in the world?
 - How popular are they? To what extent are they used?
- How are these UX design methods used for the development of innovative services? In other words, when are they used according to the UX design thinking process for creating innovations?

1.3 Structure of the thesis

Section 1 contains a description of the general idea of the thesis, including the definitions of all the terms that will be used all over the thesis. Goals, research questions and delimitations are also defined in that section. **Section 2** contains a theoretical framework that states behind the whole research. The section is divided into 2 parts. The first part presents the User Experience design overview. The second part is focused on the User Experience design methods. **Sections 3** contains information about the chosen survey methodology and tools. In addition, it contains information about the target population, sampling frame and the research sample. **Section 4** contains summary of the results that were obtained during research. **Section 5** contains the key findings that were identified from the results and contains information about possibility of the future work. **Section 6** contains summary of the results and the conclusions from the results.

2 THEORETICAL FRAMEWORK

The path started from the adopting a User Experience design thinking process for creating innovations from the course that is guided by Professor Ahmed Seffah at Lappeenranta University of Technology (LUT) – “Sustainable Innovation by Design: A User Experience Perspective”[12]. An overview of the UX, UX design, UX design thinking process for creating innovations is given in the first subsection. Afterwards, for every stage that is defined in the UX design thinking process, based on the brainstorming approach and literature review on the topic, a set of methods was chosen. Those methods are described in detail in the second subsection.

2.1 The User Experience design overview

The definitions of the Innovation, UX, UX design were briefly discussed in the first section (subsection 1.1 Background). This section provides more detailed explanation.

2.1.1 History of the User Experience and the User Experience design

All designers must know about the UX and UX design fundamentals that are relevant nowadays, but how many of them have ever wondered: where did it come from, what is the history of the UX design?

UX has its roots in ergonomics: ἔργον, meaning “work”, and νόμος, meaning “natural laws”[13]. Ergonomics was the first peoples’ attempt to build and create something based on the needs of future users. Besides, ergonomics played an important role in the creation and development of industrial design. The history of ergonomics can be traced back to the 5th century BC, where early humans began understand the design of tools and tried to make work easier and more efficient[13].

Designers often bring up an example of the ancient story that is presented in[14]. In the story, the Duke of Milan ordered Leonardo da Vinci to design a kitchen for a high-level feast. Leonardo da Vinci agreed with the task and started working on it. In what many believe to be the first true use of technology, Leonardo da Vinci created a conveyor belt to move food items to the preparers. He is also responsible for what was likely a sprinkler system. Unfortunately for him, the conveyor belts did not work as planned. However, his

invention moved too erratically for the workers to properly work and his sprinkler system ruined some of the food by spraying it. Even many years ago there were attempts (not successful though, but people learn from their mistakes) to design something using UX practices.

The interaction between the worker and the tools was first researched in 1900 by Winslow Taylor[15]. Seeing this research, the company Toyota followed suit many years later. In the 1940's, the company produced a “Human Centered Production system”[16]. Toyota created a system that was much leaner and also considered employee feedback, which was not seen at any other company at this level. The goal of this new system by Toyota was to respect their employees more, seek improvement, and perform the process with the assumption that the correct performance will bring the greatest results. The results were very beneficial to the company. Toyota saw an increased respect to and among their employees, along with a safer and more efficient work environments. The introduction of this new system was seen as a turning point and reference point for the evolution of the industrial design industry.

Donald Arthur Norman (the director of The Design Lab at University of California, San Diego, also, famous for his design books, especially “The Design of Everyday Things”) was the first one who coined the term “User Experience”[17]. Originally, he had intended to create a term that can cover any and all aspects of a user's interaction with a system. These interactions include dealing with graphics, manual, interface, physical interaction, and industrial design. Besides working as VP of the Advanced Technology Group at Apple Compute, Norman was also a cognitive scientist and electrical engineer. His ideas of having a UX can be seen in his descriptions of how to design a stovetop, as described in his book[18]. While Don Norman was a pioneer in UX and was ahead of his time, his works are becoming more appreciated in recent years thanks to user-experience research.

The subsection traces the life of the UX from the time it came to existence, but what does the UX look like in the 21st century?

2.1.2 What is the modern User Experience and why it matters

As it was mentioned in the subsection 1.1 Background: User Experience, in general, is about all the feelings that the user is getting through the interaction with any system, product or service[4], even though it has a more formal meaning defined by ISO standard[3]. Users' feelings mean a lot to designers: "Using feelings as a comparison model allows us to understand that the user experience can be anything from hate to love. From anger to happiness. From indifference to passion. From expectance to nostalgia. From pride to humiliation. And so forth."[19] The UX designers, whose job is to provide the best experience for users of their system, product or service, evaluate and learn users' feelings. The phrase "to provide/achieve/create the best experience for users" was already repeated in the thesis a couple times. However, how can we determine that the experience is indeed the best?

Primarily, the best UX must be[5]:

- Useful. A user using a service serves only one purpose: achieving goals. How easily the user achieves his/her goals is a result of how useful they find that service. Tasks such as using email and applying for important insurances can be used to determine how effective the service can be and how easily the user can perform these tasks;
- Usable. This determines how easily a user can reach their goal. Normally, users drive to accomplish tasks and goals with the least amount of time and effort and in this case they search for an easy service. An easy service will reduce the amount of work needed to complete a task and will provide an efficient and pleasurable experience for the user;
- Desirable. It is important for the service to appeal to a user's emotions and beliefs. Images, fun, language, etc are important in engaging the user in a positive and emotional way. With the user having their emotion engaged and their preferences acknowledged, they will most likely use the service over competitor's services.

Secondary, UX is closely tied to users' expectations[19] and designers should not forget about that. It often happens, for example, to famous companies such as Apple, Microsoft,

etc. Customers, before they try their products, have high expectations about them. Thus, the products must fulfil the expectations, otherwise the result might be very tragic. On the other hand, if the company is not so popular or barely known for people, those expectations are low and the usage of the product can surprisingly astonish customers.

There is a real anecdotic situation: “Some years ago, most people did not feel a need to own a smart phone, since smart phones were seen as complicated high-end devices designed and intended for business people (and they were in fact complicated to use). End users may have had a latent need for many of the core tasks that a smart phone could perform, but the hassle to get these tasks fulfilled was simply too overwhelming. The first iPhone changed the perception of a smart phone being complicated to use. And Apple changed the expectations of millions of users by allowing them to solve desired core tasks in an elegant and easy way.”[19]

Thirdly, distinguish UX from User Interface (UI) and Usability[20]. For sure, UI is an important part of a service. Just imagine the situation: you want to pay for the internet connection through the website of your provider. UI allows a very simple registration and payment that can be done in 3 clicks. Another person would like to just look up monthly prices for the internet connection. In an hour he/she finds them in the 4-th level directory and as a consequence lost a desire to work with that provider. So, even though the UI is perfect, at the same time UX can be poor. Although usability and UX have been seen as the same, they are clearly not. According to ISO standard, usability refers to “the extent to which a product, system or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use”. [21] UX identifies the thoughts and feelings of the user while he/she is using the product, system or service. On the other hand, usability notes the efficiency of the interface and how user friendly it is. Both play a vital role as well, as usability is important in ensuring that UXs are pleasant to the user and user experience allows a designer to determine factors such as psychology and other human factors.

Finally, the first impression should not be the main focus. Of course, the first impression affects the users. It defines whether the users will use a service further or not. But, a good long-term experience plays a bigger role[19]. The goal is to make the users happy and

satisfied about a service every day within a long period. It will result in a positive effect on the user's behavior, so that the users will constantly return to that service.

So, why is UX so important? If someone would simply say that companies create services for customers (their future users) and UX have a deal with users, tries to understand their needs, then, probably the answer would satisfy many people. However, the truth lies deeper. Based on the personal experience of the design team[17], the team created their products without keeping a piece of sensible science behind. As the team states: "Before our clients (and we) understood the value of user-centered design, we made design decisions based on just two things: what we thought was awesome and what the client wanted to see. We did it because the results looked good, because they were creative (so we thought) and because that was what our clients wanted." [17] Later on, the team realized its mistake and the actual meaning of the UX (the problem of terms' misunderstandings was briefly discussed in the subsection 1.1 Background). In support to the answer, it is important to mention that UX can be applied and used in any business areas[19].

2.1.3 User Experience design in the context of Innovations

The essence of the UX design in the context of innovations implies that the UX design is a kind of a decision making process[22]. In other words, it means that a particular idea throughout a set of well-defined steps will be transformed to something either material (a product) or virtual (a service). Only by following a process, a designer can create a successful innovation.

Innovation can be considered successful if it matches the 5 characteristics (Fig. 2)[19].

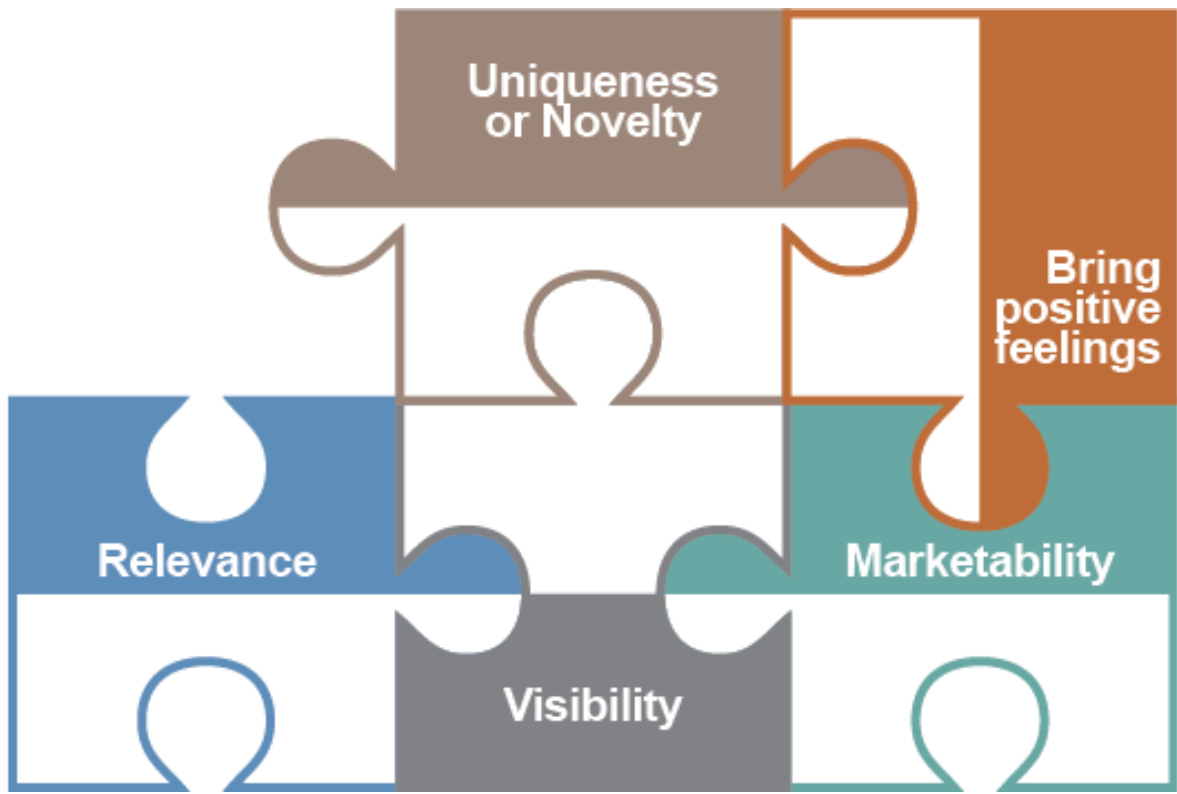


Figure 2: Characteristics of a successful innovation

Uniqueness or Novelty: a successful UX innovation should be unique. Of course, during the process of creation, it is allowed to use already existing tools and technologies. The core idea of such innovation, though, must be new.

Brings up positive feelings or Wow: users have to “fall in love” with a successful innovation and be happy about the UX it gives.

Relevance: a successful innovation should meet the needs of its users.

Visibility: a successful innovation should be put on a place where it will be noticed by users.

Marketability: a successful innovation can be used in marketing campaigns.

There are some advantages of the UX design for creating innovations[19]:

- A successful innovation being created through the UX design will be evaluated in a positive way by your customers; they would prefer your service over many others;

- A successful innovation being created through the UX design creates value to your customers;
- UX design is already a popular approach for creating innovations and soon it can be a field of competition in any business areas.

However, a designer can praise the approach and it will take a while, but the list of disadvantages only covers 2 points[17]:

- Not for all. Despite the fact that having a UX design that is universal sounds easy and cheaper, in some cases it does not work. Humans differ greatly from each other, and one design will not work with every person and every situation. A designer can only create a design that matches a certain experience (set of experiences) or behavior (set of behaviors);
- Metrics do not work. Traditional metrics, such as the amount of users that use a particular service, time that they spend to complete a particular task, etc, are not a viable way of assessing a user experience design. Assumptions can be made, but direct records of the user's experience cannot be made directly.

It is just a small grain in the whole story of the UX design. But, undoubtedly, a designer must know the weaknesses of an approach he/she uses.

2.1.4 User Experience design thinking process for creating Innovations

Saying again that to create an innovation, the designers cannot avoid a process. The UX design thinking process for creating innovations (Fig. 3) is a set of ordered steps that are intended to create a successful innovation.

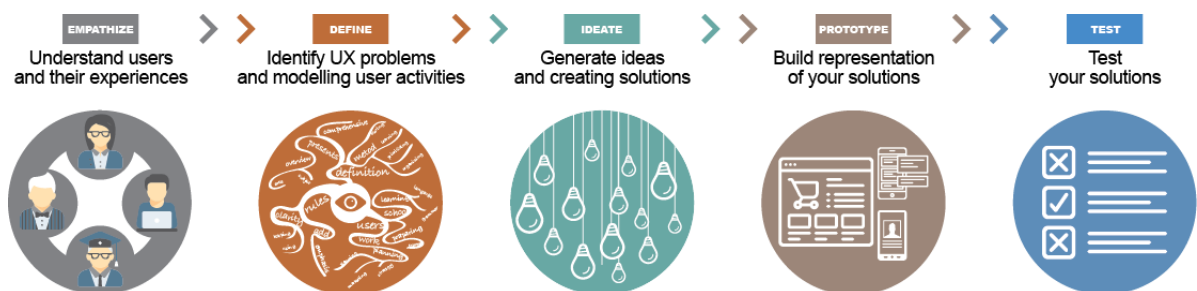


Figure 3: The UX design thinking process for creating Innovations

The UX design thinking process can be divided into 5 stages:

1. Empathize. In the UX design thinking process, empathy plays a vital role. The challenge is to understand your users and their experiences through the observation, engagement, watching and listening. How do users act? What things do they do and why do they do them in that certain way? What are their emotions during the actions? Knowing how a user thinks and feels, and what is most important to them, is necessary in order to give the user the best experience.
2. Define. After using empathy to understand the users and after gathering relevant data, it is important to define your problem statement. Based on that data, the defined problem statement (also known as a point of view) should be a guide to what the insights and goals belong to the user. It is important to define a problem statement in order to get a more focused idea of what is needed, which will return higher quality results.
3. Ideate. For all the defined problem statements in the previous step, the possible solutions have to be generated. This is where a designer concentrates on creating ideas for the project. During this step, the designer should think of a wide range of concepts and results. The imagination of the designer should be in full force, as he/she (however, usually together with your UX team) needs to create as many designs and solutions as possible. “Thinking outside the box” definitely applies to this step. Creating ideas is an important bridge to the next step, which deals with prototyping.
4. Prototype. This step takes the ideas created in the previous step and makes them into artifacts that can help find solutions to problems and lead to a final design. Prototypes should be cheap and easy to construct, as errors can be common in this stage and reconstructing expensive prototypes is cost prohibitive. Also, prototypes should be used to gather feedback from test users or even colleagues. Prototypes can be improved and more refined as data is collected and feedback processed. Anything from a physical product to a type of interactive story or test can be a prototype, as long as the user can be involved with it.

5. Test. The test allows a designer to gain feedback from a user that uses a prototype. Allowing a user to test a prototype will show, in more detail, how the user feels and thinks while using the product. Also, this lets the designer see how the prototype would actually work with the user in his/her daily life. This cannot be seen or hypothesized accurately in the previous steps. Overall, testing will show in more detail how the user will interact with the prototype and the designer can alter or discard any ideas or methods that were previously created.

The adopted process cannot be stated as the one that is “exactly correct” or “the best”, since it can vary among companies, private UX designers, etc. Everyone decides for yourself the appropriate process for creating innovations and the one they are comfortable to work with. In comparison, some of the processes are presented in [7][16][23]. Each step of the process contains plenty of methods that can be used[7][8].

2.2 User Experience design methods by stages

The next step was to prepare an initial list of the design methods and put those methods on the right steps according to the adopted UX design thinking process. The main idea was to identify methods that seem to get the most attention and importance in the UX design sphere. By using a brainstorming approach and literature review on the topic, the list was chosen and the methods were sorted out. However, a huge mountain of existent methods made the task more complicated than it was expected in the beginning. Besides, as it was observed, the same methods can be named differently in articles. For example, Affinity Diagramming and KJ methods used with different names in [24] and [25] under the same meaning. This problem can be critical, especially for new designers and students who just entered the field. A solution can be in the creation of a standard for naming, but this is another story. Some design methods were used during the course at LUT: “Sustainable Innovation by Design: A User Experience Perspective” and the outcome is presented in the section.

2.2.1 Empathize – Understand users and their experiences

For the first stage, the following methods were chosen for understanding users and their

experiences:

- Stakeholder Maps
- Personas
- User Journey Maps
- Touch Points

Stakeholder Maps

The stakeholder map is a visual representation of anyone who can be affected by (or make an affect on) a project[7]. This method is vital when the project starts, since it serves a basis for planning user research activities and for proper engagement/communication among the stakeholders throughout a project. Many project failures were caused by skipping the stakeholders' identification or by poor engagement of stakeholders inside of the project[26]. That is why identification of stakeholders is important in every area, either it is a higher education institutions[27] or restaurant industry[28] All authors highlight the importance of such method[27][28], however, identifying stakeholders is not an easy task and demands a lot of effort.

Personas

Imagine if a certain car would meet the needs of all users. That is impossible. "Design for everyone" seems irrational and not even achievable task. What to do then? There is a solution. Sort the users into several groups and represent them by using "personas". The main goal of the method is describing and illustrating information of the target users such as their needs, features and motives[7]. There is not a defined template for persona, but the representation should include "a name for the person, a photograph (use stock photography to avoid connection to a real identity) or sketch, and a narrative story describing in detail key aspects of his or her life situation, goals, and behaviors relevant to the design inquiry"[7]. There is an infinite amount of studies about creating good personas. Besides, pure truth is that "The methodology of "personas" is a well-known procedure and very often used for characterizing target users in user-centered design projects."[29].

During the course, 3 groups of personas for the airport system were identified and prioritized (primary persona, secondary persona and others). Primary personas drive interactive system design and reflect the group “most difficult to design for”. An application that satisfies the needs of a primary persona will luckily meet the needs of secondary persona. On the other hand, an application specially created for the secondary persona will not meet the needs of the primary persona. The main idea of the innovation (mobile application) was that it is able to guide a user through all the obligatory checkpoints and make a convenient trip, avoiding some unexpected incidents (such as traffic jams), from the current location to the flight, including the necessary managements needed for boarding. Figure 4 shows a list of all identified personas, their brief descriptions and goals.



Figure 4: Personas for the airport system

Figure 5 shows a detailed information (background, customer needs, attributes) about primary persona. Figure 6 shows a narrative story and behaviour of that primary persona.

Rachel Marshall
Account manager in ADM

Background

- 29-year-old, married, woman
- 2 children, twins, Ariel and Angelica (4 years old)
- Bachelor of Science in Accounting
- Earns about \$ 38,000 annually
- Wants to enjoy the whole trip from the first step outside the house
- Queue is the problem number one

Customer needs

- Taxi to the airport
- Stores/launch room/cafes/kid-friendly locations inside of the airport
- Proper navigation
- Avoid all the possible queues

Attributes

- Younger
- Female
- Likes shopping
- Discounts are her obsession

Figure 5: Primary persona

<p>Scenario</p> <p>There is only way for Rachel how to reach the airport - by taxi, since it is not reasonable for her to take other types of vehicles. Also, unfortunately, she does not own a car. Besides that, she wants to know the particular time of the trip to the airport.</p> <p>Rachel wants both comfort and entertained time spending inside the airport while she is waiting for her flight. However with those impatient children, being stuck in lines becomes torture for her.</p>	<p>Behavior</p> <p>Rachel purchased E-tickets in advance and on the day she should leave for the airport, she calls a taxi from the application. Afterwards, she will get a notification about the time when the taxi will arrive and how long the trip will be. It is important piece of information for her, because she can start preparing her children and be ready in time.</p> <p>Once she arrives, she goes through the first check-point and needs to get rid of her luggage, by choosing the luggage button on the application. It will direct her to the right place. She is able to extract the list of stores and other places she desires to visit before the flight (of course, if she still has time left). She is not afraid to be lost, even in a foreign airport, because she is guided by the navigation all around.</p> <p>It is not necessary for her to pay attention to the watch, because she will receive the notification about the time when the registration for the flight begins. She will go through that point easy with her QR-code.</p>	<p>Personal profile</p> <p>Rachel's goal is to visit all countries around the world one day. Her first experience regarding the airport was not pleasurable though, because she was lost in there. This happened when she was trying to find the particular store based on the airport map in the hall, but she ended up in another unknown place and missed her flight.</p> <p>She respects every person in her family, everyone who is acquainted with that family of her can call them united. In spite of the fact that she has two young kids, she is full of energy and travels with her big family quite often.</p>
<p>Feature</p> <ul style="list-style-type: none"> • List of stores/cafes and other places she is interested in • Proper navigation around the airport • Express check-in (Using QR) 	<p>Needs</p> <ul style="list-style-type: none"> • Easy method to call a taxi • Places to spend time • Agile procedures at checkpoints 	

Figure 6: Narrative story

User Journey Maps

A user journey map illustrates all of the users' experiences while using a product or service. "A user journey map tells a story about an individual's actions, feelings, perceptions, and frame of mind – including the positive, negative, and neutral moments – as he or she interacts with a multichannel product or service over a period of time." [7]

Everyone has been through a bad experience. Russian post can be a subject of such an experience. When standing in a line for hours to get a small envelope and then the worker says "no, please, to get that envelope move to another line". Then you continue to wait (or just go home). That is why using a user journey map is crucial. That would help to better understand both the users and their experiences. Besides, it helps to identify all the weaknesses of a product or service that are necessary for future improvement.

Touch Points

The method should not be mixed up with the previous one, since it defines all the points of interaction (not the experiences) between a user and a product or service. However, the touch points can usefully supplement the user journey maps to provide more detailed user experience.

2.2.2 Define – Identify UX problems and modelling user activities

- Affinity Diagramming
- Mind Mapping
- Task model

Affinity Diagramming

Affinity diagramming is a very cheap and absolutely simple method to perform. The only things that are needed: sticky notes, paper (A3 size will be enough) and a bit of effort. When a specific UX problem is found, it is necessary to identify all the reasons that caused the problem. Then, those reasons should be written on sticky notes and put on the paper. Afterwards, the notes can be divided into groups or sub-groups (if necessary) for further analysis and investigation. Mostly, the method is in a wide use only owing to its cost efficiency and simplicity.

Mind Mapping

The main idea of the mind mapping is similar to the previous method. By analogy with affinity diagramming, mind mapping helps to better understand a UX problem by visualising it in a “spider” diagram. The problem is placed in the center of the diagram and branches that comes out of it represent classified issues related to that specific problem. “By drawing mind maps, we make associations about issues that seem unrelated yet are linked.”[30] So simple to perform, yet so useful method that promotes a better generating solutions for the next stage of the process.

Task model

Task model is a method for modelling user activities. There are different types of task models defined by Fabio Paterno (Research Director and Head of the Laboratory on Human Interfaces at Istituto di Scienza e Tecnologie dell'Informazione, Consiglio Nazionale delle Ricerche in Pisa, Italy, also, co-chair of W3C Group on Model-based User Interfaces): the system task model, the envisioned task model and the user task model[31]. During this stage, the user task model, which presents a “description of the task to be accomplished by the user of an application through the application's user interface”[32] provoke the most concern. The creation of the task model will support two sides of the UI: the presentation and the dialogue[31].

2.2.3 Ideate – Generate ideas and creating solutions

- Concept mapping
- Card Sorting
- Bodystorming
- Solution Storyboard
- Morphological Analysis

Concept mapping

Concept map is a visual representation of well-connected concepts in a hierarchical form[7]. A focus idea should be put on the top, while the branches go down from more general to specific concepts. Besides, there should be strong thorough connections among all concepts. The concept map (as it said in a famous idiom “a picture is worth a thousand

words”) helps to find new insights while generating ideas and creating solutions for the problems identified in the previous stage.

Card Sorting

Card sorting serves a good chance for generating ideas for how the information should be categorized. While conducting a card sorting, “participants are given cards with printed concepts, terms, or features on them, and are asked to sort them in various ways.”[7] The method would efficiently help with problems related to the organization of navigations, menus, etc of the future innovation. An example of a practical case study can be found in [33], where card sorting was used for categorizing content for the library website at the University of Illinois in Chicago.

Bodystorming

“Bodystorming situates brainstorming in physical experience, combining role-playing and simulation to inspire new ideas and empathic, spontaneous prototyping.”[34] For sure, generating ideas become more efficient while experiencing user situations on your own.

Solution Storyboard

The solution storyboard is a collection of sketches arranged in a sequence that outlines all parts of a story[8]. This also describes how the components of a concept system interact in certain situations[8]. The idea is to show the solution through the illustrated user experience. Those illustrations would help with refining concepts and improving solutions[8].

Morphological Analysis

Morphological analysis as well as the other methods for generating ideas can be a powerful tool[35]. Morphology analysis states that any subject can be divided into dimensions that represent it[36]. This allows it to explain complex problems and create ideas based on combinations of dimensions[36]. Some case-studies of applying this method in development of new services can be seen in[35][36].

2.2.4 Prototype – Build representation of solutions

- Mock-ups
- Sketches
- Video prototyping
- Pictive prototyping
- Wireframes

The prototypes are models of the product or service to be implemented. All types of the prototypes follow common goals such as: validate requirements, estimate the difficulties in design, etc[7]. However, there are still differences among all of the types.

Mock-ups

The mock-ups are simple models that show only how a product or service will look like without any functionality.

Sketches

The sketches are rough and quick drawings on a paper.

Wireframes

The wireframes are low fidelity representations of design, mostly focus on layout and include basic functionality.

Video prototyping

The video prototypes are video representations of how the users would interact with a product or service to be implemented.

Pictive prototyping

The pictive prototypes are made of sticky notes on a paper (usually). Then interaction would be demonstrated by manipulating those notes. The process can be recorded on a video for further analysis.

Examples of Wireframes can be seen on Figure 7 and Figure 8.

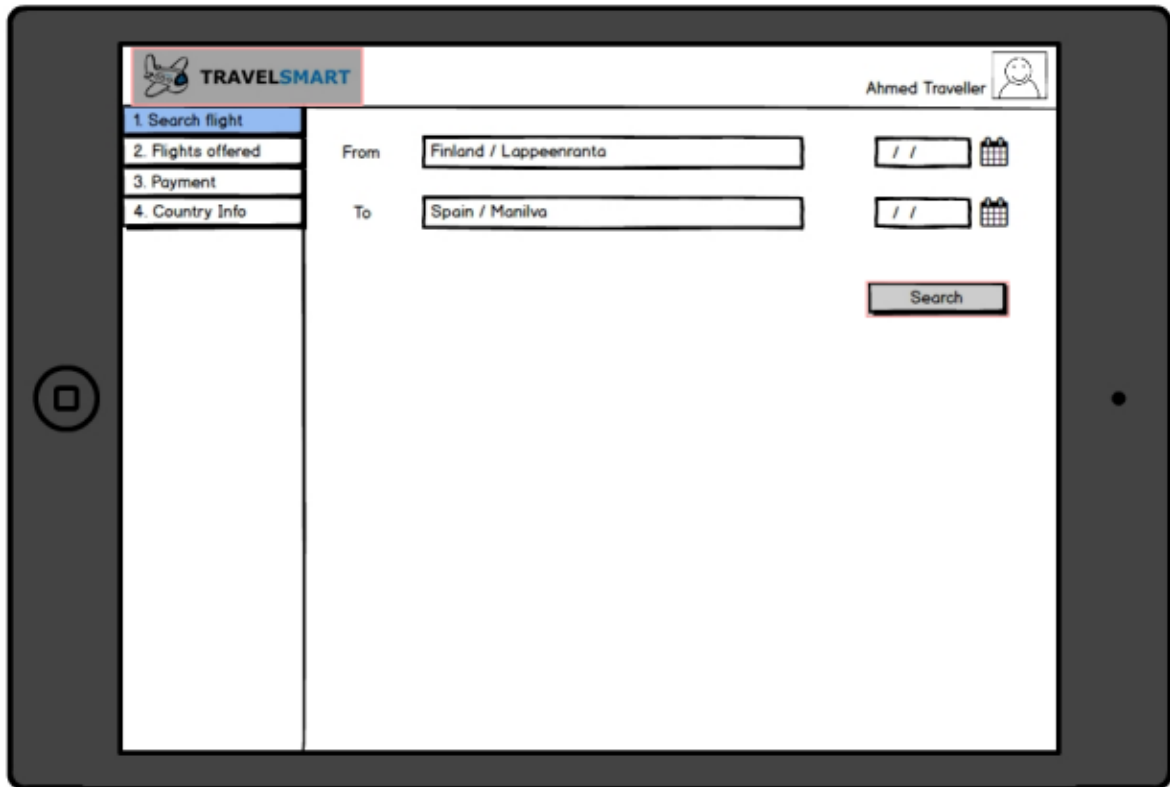


Figure 7: Wireframe example 1

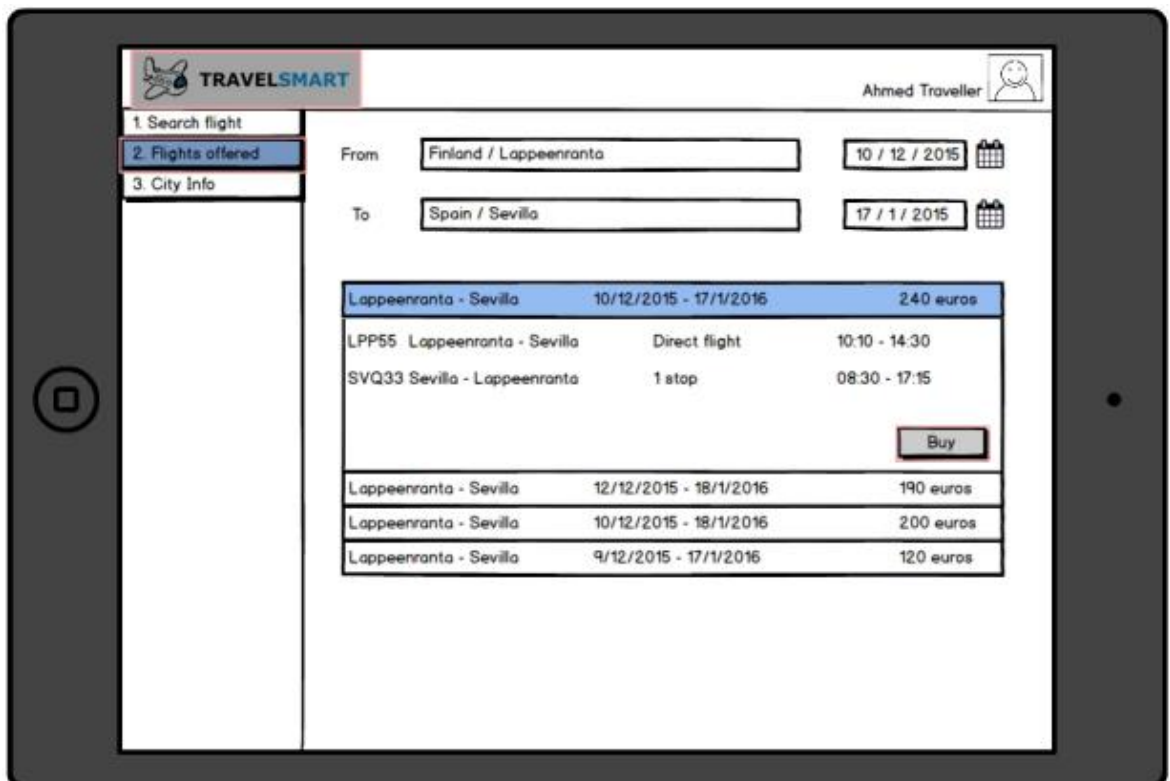


Figure 8: Wireframe example 2

2.2.5 Test – Test solutions

- Cognitive walkthrough
- A/B testing
- Thinking aloud
- Wizard of OZ

Cognitive walkthrough

“The cognitive walkthrough is a usability inspection method that evaluates a system’s relative ease-of-use in situations where preparatory instruction, coaching, or training of the system is unlikely to occur.”[7] The main goal of the method is to assess each point of interaction between the user and the UI. It helps to understand whether that point would support the user to move forward to his/her goal or not. If not, then it would be necessary to identify what could prevent the user from achieving his/her goals and fix that defect. In general, the methodology is widely used, especially in the pair with usability testing[7]. A practical example of a case study can be found in [37], where 4 multimedia applications were evaluated by using the cognitive walkthrough approach.

A/B testing

The idea of the A/B testing is to test two different versions of the same design simultaneously. Actually, it can be more than 2 versions, just depends on the needs. For example, if nobody wants to sign up in your application, you might test the designs with different sign-up buttons, backgrounds, etc and to determine which one of them has the highest sign-up or conversion rate. The method has a great power in the field of testing and even once could raise 60 million dollars for Obama[38].

Thinking aloud

Jacob Nielsen (Ph.D., User Advocate and principal of the Nielsen Norman Group which he co-founded with Dr. Donald A. Norman) defines the thinking aloud methodology as a test where “you ask test participants to use the system while continuously thinking out loud – that is, simply verbalizing their thoughts as they move through the user interface.”[39] He states that the method is “the single most valuable usability engineering method”[39]. Besides, the method is cheap, does not require extra equipment, but serves itself as a

“window of the soul”[39], by letting participants to express what opinion they have about the design. The received feedback would help to understand what the participants liked about the UI, what they did not like, some misunderstandings regarding to the UI, et al.

Wizard of OZ

The main idea of the Wizard of OZ technique is to try out the unimplemented technology by a random person, while a “wizard” would control that process and simulate systems’ responses in a real time[7]. In comparison to other proposed methods for tests, this one would require more time and efforts. However, the method can be still useful in some situations such as testing interactive speech systems[40], for example.

3 METHODS

The first subsection explains the chosen methodology and tools used for data collection. The second subsection defines the target population, sampling frame and the research sample.

3.1 Data collection method and tools

A survey methodology was considered as the most appropriate to meet the goals of the thesis and to answer the research questions (as it was discussed in the subsection 1.2 Goals, research questions and delimitations, the need is to understand what design methods are currently used and at what stage of the UX design process for creating innovations they are placed). The survey was set up online by using the tool – “Google Forms”.

The questionnaire included a total of 9 close-ended questions. However, every question contained an “Other” field, where the respondents could give their answer on the question if the offered answers were not enough. In the first part of the survey, the respondents were asked about the background information of an UX team an organization they are working for. They were asked for information such as: location of an organization, type of an organization, focus of an organization and the amount of members in an UX team. All questions were multiple-choice type. The second part was divided into 5 subsections (each subsection represents a stage of the UX design process for creating innovations as discussed in the subsection 2.1.4). For each subsection the list of methods was given. The respondents were asked to rank the design methods based on their popularity or usage in their UX design team. All questions in the second section were multiple-choice grid type.

The survey was intentionally sent to the communities (UXPA, SIGCHI and SIGSOFT) that are focused on UX design through the major mailing lists. To send the survey, it was necessary to subscribe to those mailing lists. Only people who were subscribed to the mailing lists of the communities could receive and participate in the survey.

Everyone who needed the results of the survey could write an e-mail in a special text-box. Results will be sent after the thesis is completed. The survey was conducted in English

language and was kept online through the period of around 1 month: from 12/03/16 to 19/04/16. The full survey structure is presented in the Appendix 1 in the order the questions were asked from the respondents.

3.2 Target population, sampling frame and research sample

3.2.1 Target population

At first, the target group of the survey was made up by all UX designers working in consumer mobile development and provider companies in Europe. However, in some time the decision was changed and the location of designers no longer mattered.

3.2.2 Sampling frame

The sampling frame consisted of all UX designers working in consumer mobile development and provider companies all around the world. Besides, the UX designers must be a part of at least one of the communities from the following: UXPA, SIGCHI or SIGSOFT and subscribed to their major mailing lists.

3.2.3 Research sample

The research sample covered 133 UX designers working in consumer mobile development and provider companies all around the world. Each UX designer is at least a part of one of the communities from the following: UXPA, SIGCHI or SIGSOFT and subscribed to their major mailing lists. Each respondent completed 9 out of 9 questions presented in the survey.

As a consequence, it definitely can be stated that neither research sample nor sampling frame represent the target population. However, lack of data does not allow one to compare the sampling frame and research sample. Besides, as with any survey method, the internet can be a subject of bias results. Target population includes the UX designers around the world, but a major part of them might be not a part of UXPA, SIGCHI and SIGSOFT communities and subscribed to their mailing lists. Despite the fact that the research sample and the sampling frame are not representatives of the target population, the minority can be analyzed.

4 RESULTS

The section represents the results of the empirical research. The results give an answer to the research questions defined in the subsection 1.2 Goals, research questions and delimitations. The section is divided into two parts: the first part presents summary of the organizations' and UX teams' backgrounds of the respondents, the second part presents summary of the UX design methods.

Summary of the collected data

The line graph (Fig. 9) shows a growth in the number of responses over a one month period (from 12/03/16 to 19/04/16). Based on the graph it can be seen that the most amount of responses were received in April, 2016. The total number of gathered responses: 133.

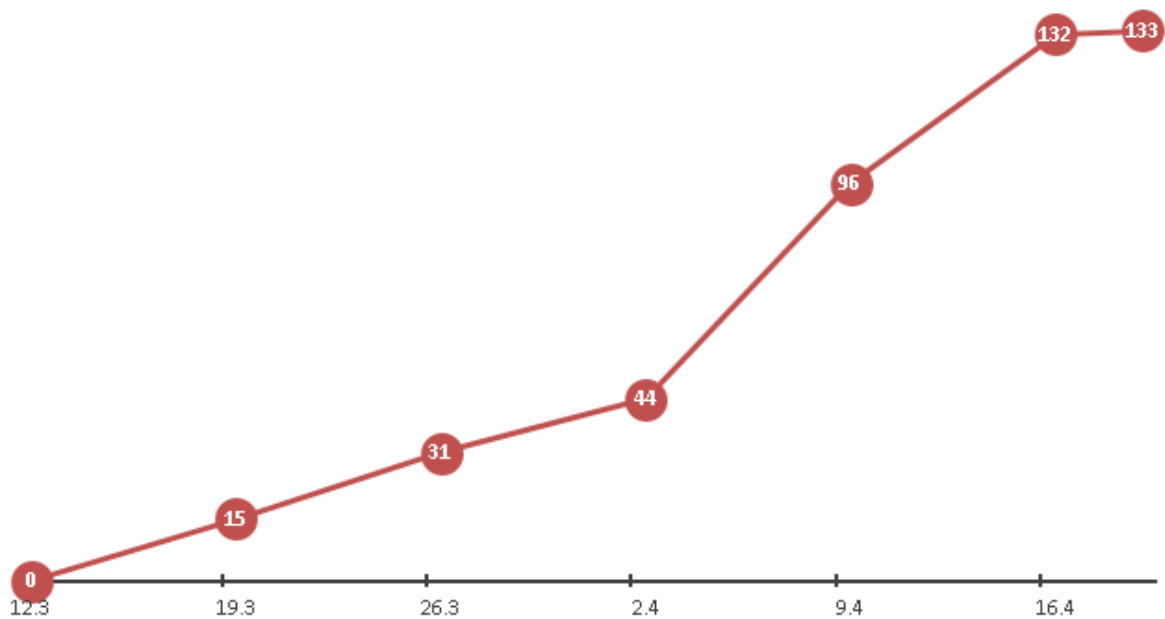


Figure 9: Number of responses over one month period (from 12/03/16 to 19/04/16)

4.1 Summary. Background

Number of respondents for this part: 133.

In the first question the respondents were asked to indicate the location of the organization

they are currently working for/cooperate with. Accureately a half of respondents represent the United States (27%) and India (23%). This proportion can be explained by location of the local chapters. A significant part of the local chapters of the UXPA, SIGCHI and SIGSOFT communities is located in the United States. However, only 3 local chapters are situated in India. Nevertheless, in comparison to European countries that have at the most one chapter per country, it is not that bad.

Table 2. Organizations by location

Location	Top results	
United States	27%	36
India	23%	30
Finland	7%	9
Germany	5%	7
United Kingdom	5%	7
Canada	3%	4
Sweden	3%	4
Others	27%	36

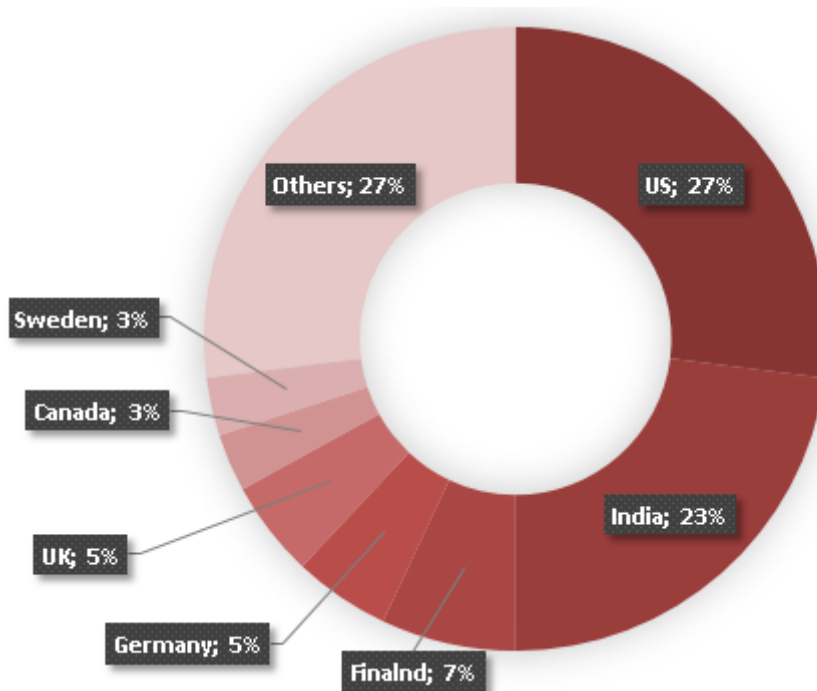


Figure 10: Organizations by location

Figure 11 shows chapters' locations of the UXPA community (as an example).

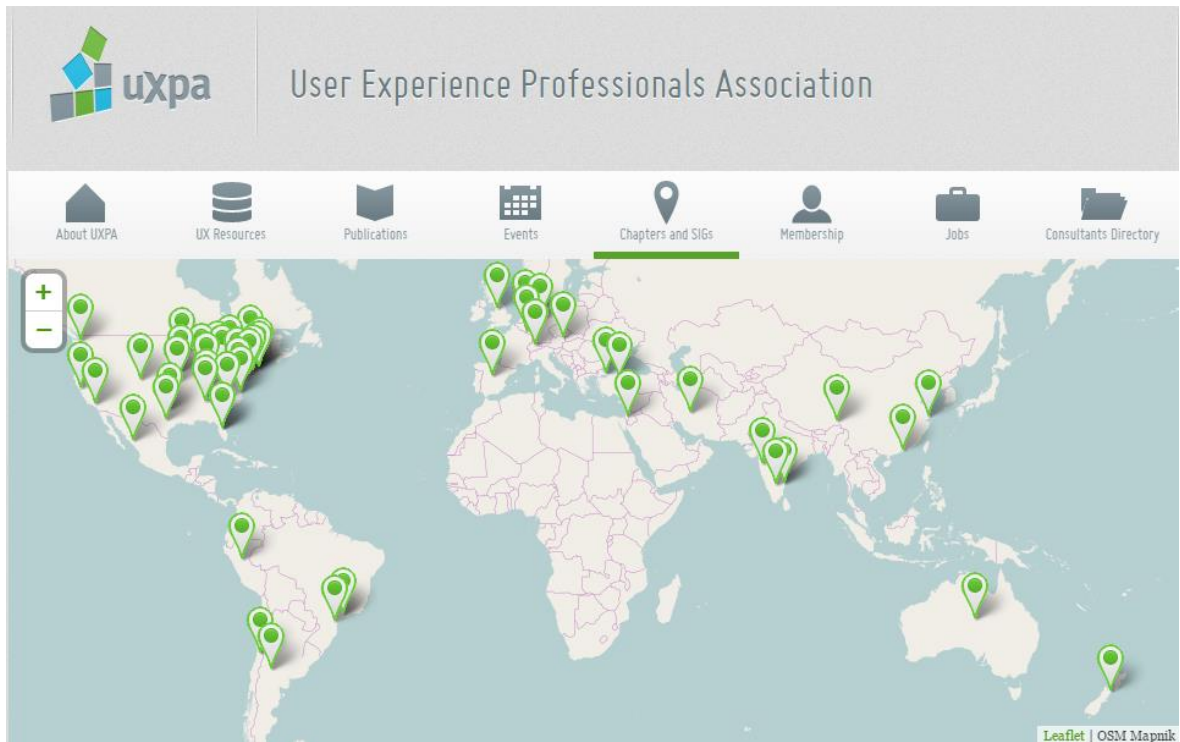


Figure 11: Local chapters of the UXPA community by location

In the second question, the respondents were asked to choose a type of the organization they are currently working for/cooperating with. Approximately one third (36%) of them have a deal with large-size enterprises (more than 100 employees) and 20% of the respondents with medium-sized enterprises. In contrast, there are only 6% of respondents who negotiate with small-sized enterprises (less than 10 employees).

Table 3. Organizations by type

Type	Top results	
Large-sized enterprise (more than 100 employees)	36%	48
Medium-sized enterprise	20%	26
StartUp	14%	19
I am self-employed	14%	18
Small-sized enterprise (less than 10 employees)	6%	8
Others	10%	14

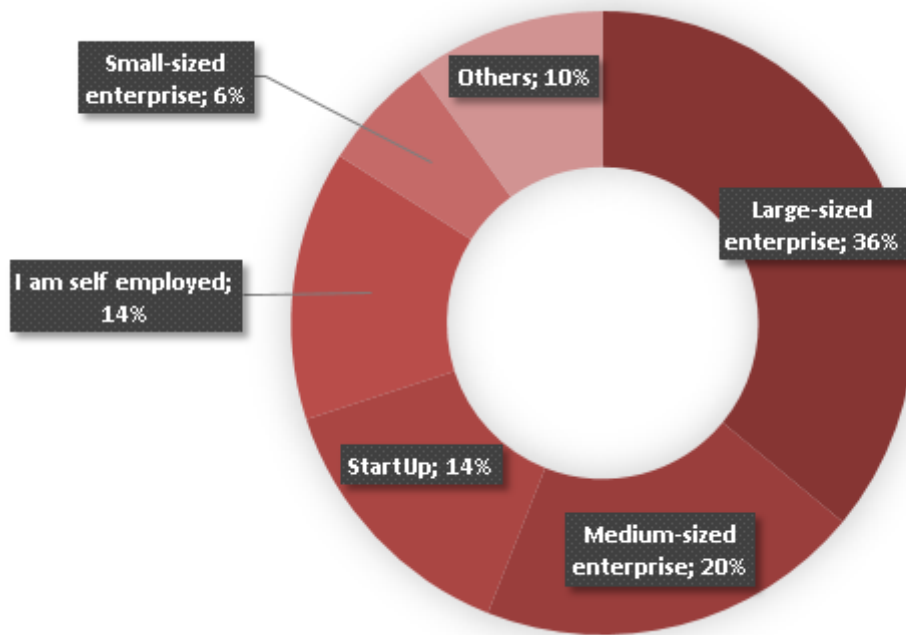


Figure 12: Organizations by type

As it was previously mentioned, the UX design together with UX design practices can be used and applied in any sectors of the industry[19]. The received results approve that statement (Fig. 13). Besides, the most popular sectors for placing mobile innovations are: communication and education which received 17% each.

Unfortunately, no dependencies were found between the UX design methods and the sectors of industry. Thus, there is not “the most relevant” method for a particular sector.

Table 4. Organizations by focus in the field

Field	Top results	
Communication	17%	30
Education	17%	29
Multimedia	10%	17
Finance	7%	12
Games	5%	8
Health, Fitness & Sports	3%	6
Others	41%	72

Other fields include eCommerce, Security, Government, etc.

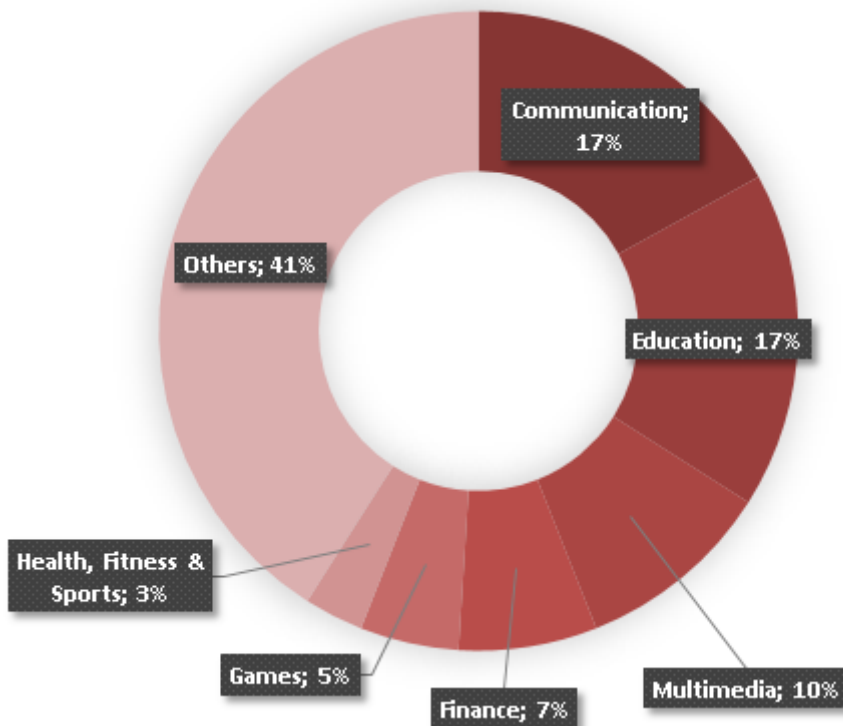


Figure 13: Organizations by focus in the field

The UX team should at least consist of one manager, a user researcher/usability analyst, an interaction designer and a visual designer[41]. However, reality is that quite often you are the only person who actually understands what is going on and has a sensible meaning of the UX. As it was mentioned in[42]: “Many organizations have only a modest understanding of user experience. Some have none at all. In such an environment, if you are the key person driving for a more user-centered way of working, you are a user experience team of one. (And that’s true whether it’s your official job title or not.)” That is the reason why the option “1-3 members” was included in the survey. By a big surprise, that answer was the most popular and took the lead place with almost two thirds of respondents (63%). In general, it seems that the small UX teams are preferred over the big ones (Fig.14).

In addition, it was observed that large UX teams are mostly used in large-sized enterprises and medium-sized enterprises (Fig.15).

Table 5. Organizations by number of members in their UX team

Number of members in UX team	Results	
	1-3 members	63%

4-7 members	17%	22
8-14 members	8%	10
15-20 members	7%	9
20+ members	5%	7

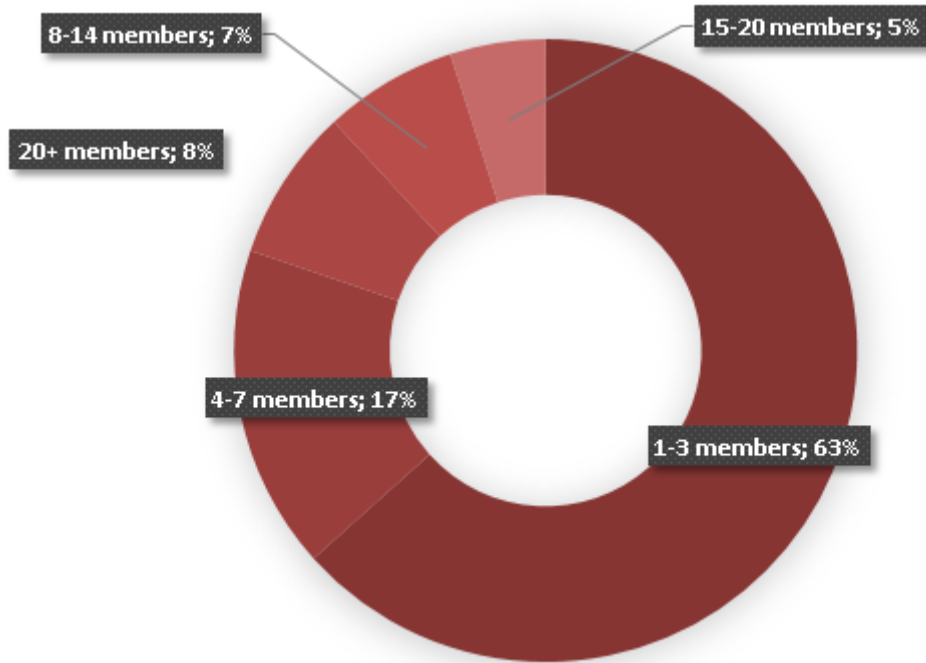


Figure 14: Organizations by number of members in their UX team

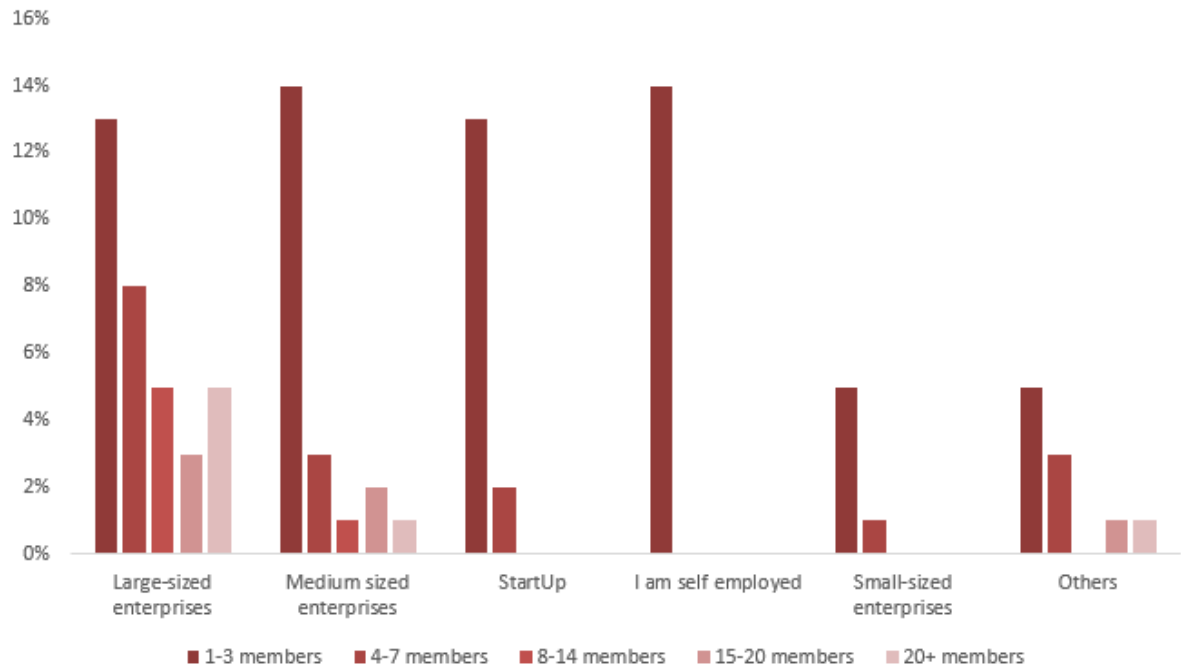


Figure 15: UX teams by organization's type

4.2 Summary. Design methods

For interpreting survey results on the UX design methods, a diverging bar chart was created for every stage of the UX design thinking process for creating innovations. That kind of chart greatly visualizes ordinal data and gives a possibility to measure the length of each bar very quickly.

Empathize – methods for understanding users and their experiences (Number of respondents: 133)

Key observations:

- Over one third of respondents consider both Personas (34%) and User Journey Maps (35%) as the most used methods;
- A significant number of respondents use all four methods from time to time: Stakeholder Maps (34%), User Journey Maps (46%), Touch Points (47%), Personas (53%);
- More than a half of respondents avoid Stakeholder Maps (58%).

Table 6. Usage and popularity of the design methods (Empathize stage)

Method	Not used	From time to time	The most used
Stakeholder Maps	77(58%)	45(34%)	11(8%)
Personas	17(13%)	71(53%)	45(34%)
User Journey Maps	25(19%)	61(46%)	47(35%)
Touch Points	46(35%)	63(47%)	24(18%)

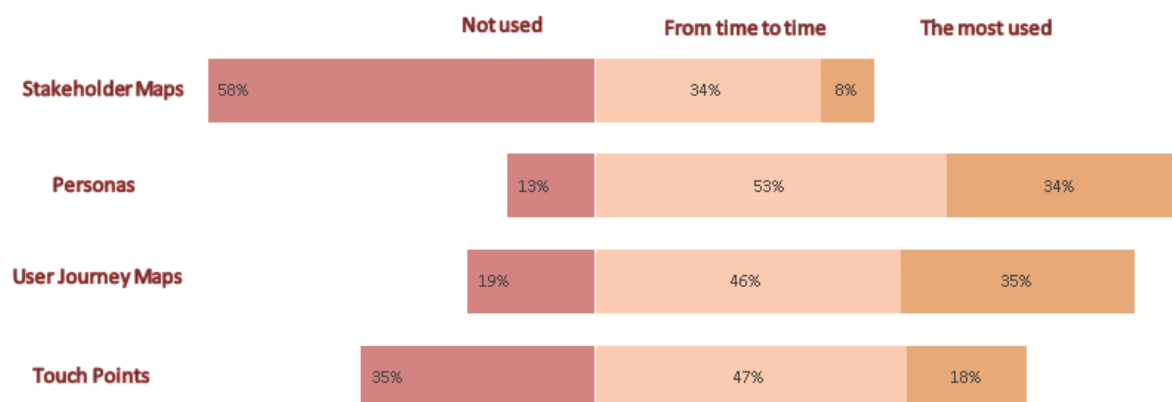


Figure 16: Usage and popularity of the design methods (Empathize stage)

Other methods suggested by respondents: A day in-the-life Shadowing, Card Sorting,

Ethnography, Fly-on-the-Wall, Interviews, Observations, Storyboards, Scenarios, Surveys, Service blueprints.

Define – methods for identifying UX problems and modelling user activities (Number of respondents: 133)

Key observations:

- Task Model takes the lead place (27%) as “the most used” method in comparison with 2 others: Mind Mapping (22%) and Affinity Diagramming (19%);
- A significant number of respondents use all three methods from time to time: Affinity Diagramming (32%), Mind Mapping (47%) and Task Model (47%);
- Nearly half of respondents avoid Affinity Diagramming (49%).

Table 7. Usage and popularity of the design methods (Define stage)

Method	Not used	From time to time	The most used
Affinity Diagramming	65(49%)	42(32%)	26(19%)
Mind Mapping	41(31%)	63(47%)	29(22%)
Task Model	34(26%)	63(47%)	36(27%)

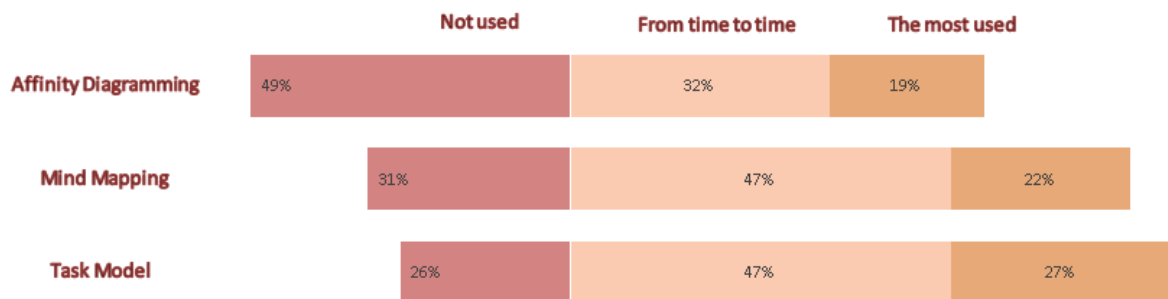


Figure 17: Usage and popularity of the design methods (Define stage)

Other methods suggested by respondents: Use Cases.

Ideate – methods for generating ideas and creating solutions (Number of respondents: 133)

Key observations:

- Almost one third of respondents consider Concept Mapping (32%) and Solution Storyboard (32%) as the most used methods;
- All 5 offered methods are used at least from time to time: Card Sorting (50%), Concept Mapping (42%), Solution Storyboard (38%), Bodystorming (26%) and Morphological Analysis (23%);
- A dramatic number of respondents do not use Morphological Analysis (74%). In addition, Bodystorming takes the second place in this group of outsiders with 62%.

Table 8. Usage and popularity of the design methods (Ideate stage)

Method	Not used	From time to time	The most used
Concept mapping	34(26%)	56(42%)	43(32%)
Card Sorting	37(28%)	66(50%)	30(22%)
Bodystorming	83(62%)	34(26%)	16(12%)
Solution Storyboard	40(30%)	51(38%)	42(32%)
Morphological Analysis	99(74%)	30(23%)	4(3%)

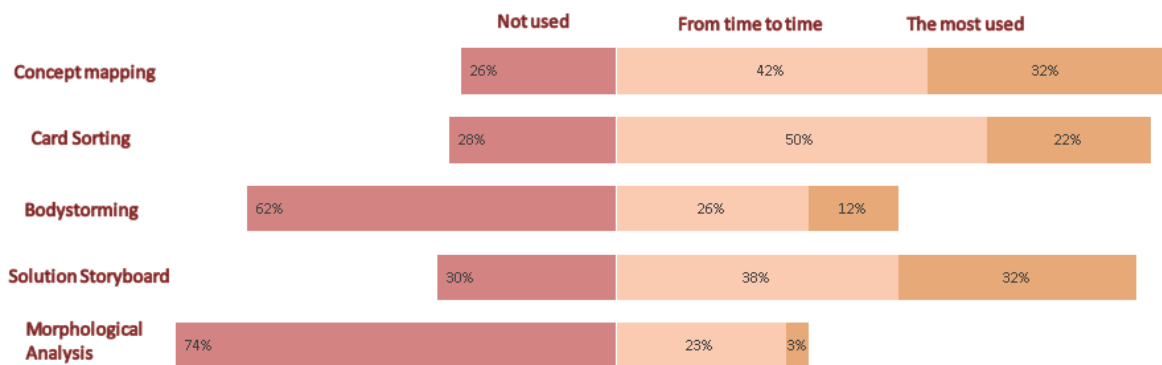


Figure 18: Usage and popularity of the design methods (Ideate stage)

Other methods suggested by respondents: Affinity Diagramming, Brainstroming (method was proposed by many respondents), Innovation Workshops, How might we?

Prototype – Build representation of solutions (Number of respondents: 133)

Key observations:

- Mock-ups, Sketches and Wireframes are in “the most used” group with almost equal percentage: 69%, 67% and 72%;
- Approximately one quarter of respondents use each offered method: Mock-ups (26%), Sketches (28%), Video prototyping (25%), Pictive prototyping (30%), Wireframes (22%);
- A bit over two thirds of respondents do not use Video prototyping (69%). Besides, more than a half of respondents do not use Pictive prototyping (54%).

Table 9. Usage and popularity of the design methods (Prototype stage)

Method	Not used	From time to time	The most used
Mock-ups	6(5%)	35(26%)	92(69%)
Sketches	7(5%)	37(28%)	89(67%)
Video prototyping	92(69%)	33(25%)	8(6%)
Pictive prototyping	72(54%)	40(30%)	21(16%)
Wireframes	8(6%)	29(22%)	96(72%)

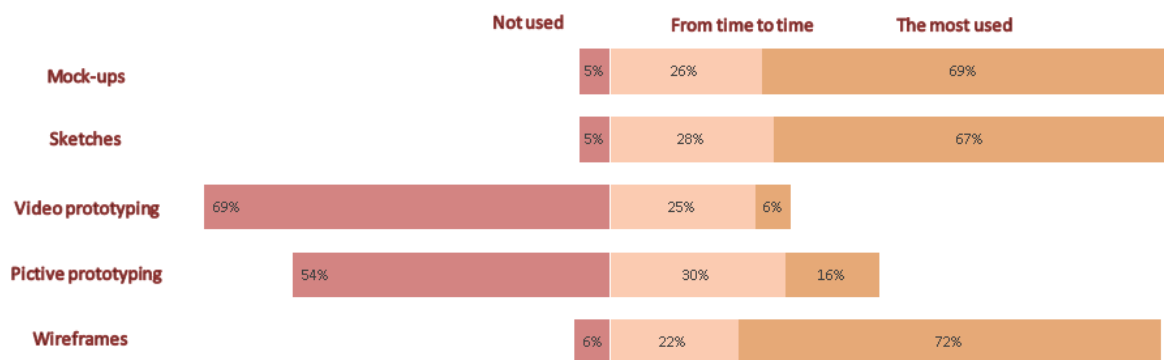


Figure 19: Usage and popularity of the design methods (Prototype stage)

Other methods suggested by respondents: Interactive prototypes, Paper prototypes.

Test – Test solutions (Number of respondents: 133)

Key observations:

- A bit less than half of respondents consider Thinking Aloud as the most used method (45%);
- All testing methods are in use from time to time: Cognitive Walkthrough (47%), A/B Testing (45%), Thinking aloud (38%), Wizard of OZ (25%);
- Almost two thirds of respondents do not apply Wizard of OZ technique (65%).

Table 10. Usage and popularity of the design methods (Test stage)

Method	Not used	From time to time	The most used
Cognitive Walkthrough	37(28%)	63(47%)	33(25%)
A/B Testing	36(27%)	60(45%)	37(28%)
Thinking aloud	23(17%)	51(38%)	59(45%)
Wizard of OZ	87(65%)	33(25%)	13(10%)

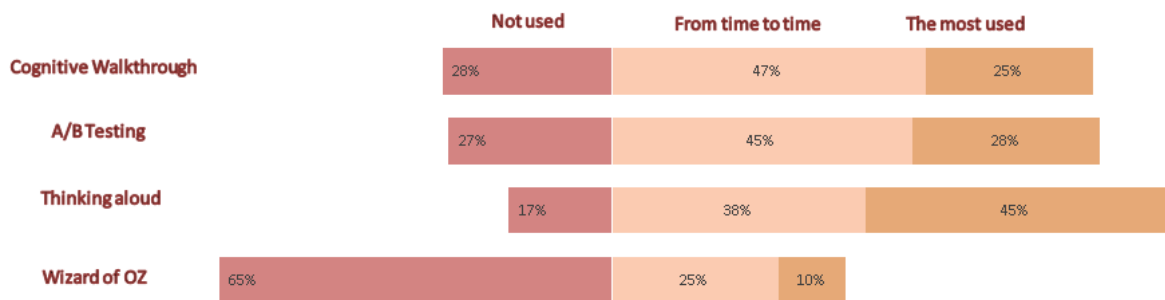


Figure 20: Usage and popularity of the design methods (Test stage)

Other methods suggested by respondents: Generative Walkthrough, Usability testing, Heuristic Evaluation (Expert Evaluation), Gerilja testing (go out on the street and get random people to test the prototype).

5 DISCUSSION AND CONCLUSIONS

The first subsection contains information about the main results and new findings. The second subsection contains information about future work related to the research topic.

5.1 Discussion of the results

Key findings of the results include the following points:

- “A team of one”. Even though it is not a right approach to structure UX teams, based on the results, uncompleted teams or teams that consist of only one member are very popular in reality. As it was accurately mentioned in[42]: “Many organizations have only a modest understanding of user experience. Some have none at all. In such an environment, if you are the key person driving for a more user-centered way of working, you are a user experience team of one. (And that’s true whether it’s your official job title or not.)” Thus, it seems that the problem can be considered as the common one. However, the question is: does it affect the process of design and the outcome of that design somehow?
- “Industry sectors and methods - independent”. During the analysis, any relations between industry sectors and UX design methods were not identified. It means that there is not “the most relevant” method for a particular sector.
- “Choose any”. As it was observed from the results, all the proposed UX design methods are used (to a certain extent) by UX designers in consumer mobile service development and provider companies. Besides, the survey respondents suggested some methodologies that they actively use in their companies. This finding answers the first research question that was defined in the subsection 1.2 Goals, research questions and delimitations.
- “Dynamic techniques”. It was noticed that some UX design methods can be used at more than one stage. For example, Card Sorting can be used at the first and at the third stages of the UX design thinking process. This finding answers the second research question that was defined in the subsection 1.2 Goals, research questions and delimitations. It helps to clearly understand the concrete place of each UX design method according to the UX design thinking process.

- “Learning new”. By getting responses like “I have never seen this method before, interesting!”, “What is Pictive prototyping?” and so forth, it was observed that not all respondents were familiar with the offered UX design methods. It reflects the numerous amount of existing UX design methods. Simply it is impossible to be aware of all the UX design methods. On the other hand, the respondents suggested some methods that I was not familiar with before. It is a kind of sharing knowledge while aiming to something bigger.
- “Какой метод Вы бы хотели использовать? Sorry, I do not understand you” There is a huge problem in naming. Some methods can be used by different names but under the same meaning in both academic and non-academic materials. Thus, it makes it more complicated, especially for beginners.
- “Proper testing is rare”. Some respondents stated that they get rid of the last stage of the process and do not execute tests at all (or at a very poor level). It is shocking, but apparently, it is how a part of companies works.
- “Failure is a fairy-tale”. At least some part of the respondents thinks so. Despite the fact that some respondents said that they do not test, a significant part of them avoid UX design methods that can lead to a project failure. An example of such method is Stakeholder Maps. Many project failures were caused by skipping the stakeholders’ identification or by poor engagement of stakeholders inside of the project[26].

5.2 Future work

The subject of the issue has three directions for further work.

At first, the conducted study can be improved by using iteration approach: a set of methods should be picked from the results of each survey until it would lead to a concrete group of the used UX design methods. In addition, it is necessary to find out what tools/instruments the designers use while applying each method. Based on the received data it is possible to build an interactive kit for UX designers. They would clearly show when, why and how a particular UX design method can be applied.

The second direction can be focused on the naming of the UX design methods. A kind of a naming standard can be created. It would make the things clearer for everyone whether it is a beginner or an experienced professional of the UX design.

The third direction can be related to the UX teams and their structure. Do uncompleted teams affect both the process of design and the outcome of that design somehow? This problem can be a subject of interest.

6 SUMMARY

The study determines the UX design methods that are currently used in the consumer mobile services development and provider companies in any country. The study was conducted by using an online questionnaire. The results of the survey (presented in the section 4 Results) revealed the UX design methods that are currently used (to a certain extent) in that context. Besides, the study shows at what stage of the UX design thinking process for creating innovations each method should be placed. Thus, the objectives were defined in the abstract and in the section 1.2 Goals, research questions and delimitations were successfully met. Additionally, the research questions were answered as a result of this study.

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APPENDIX 1. SURVEY.

User eXperience (UX) design methods

We, researchers and graduate students from the Department of Innovation and Software at Lappeenranta University of Technology (www.lut.fi), share the same passion ("love") for User Experience Design Methods and their usage as you, the potential participants in our study. Your participation will greatly help us in understanding what the UX design methods are currently used for and when they are used for co-creating innovation in consumer mobile services development. Your answers are anonymous and the questionnaire will take no more than 15 minutes to complete.

The study is being conducted by master's student Aleksandra Ilinskaia and Prof. Ahmed Seffah. If you have any further questions, feel free to email us at Aleksandra.Ilinskaia@student.lut.fi. For those among the participants that will be visiting Saint Petersburg, we will be happy to meet with you. We offer a free guided tour around Peterhof during summertime. This place contains lots of beautiful palaces, fountains and gardens. For more information you can visit the official website: <http://eng.peterhofmuseum.ru/>.

* Required

1. Please, provide us your e-mail address if you need the results of this study

Section 1 out of 6

2. The organization that you are a part of is located in *

(select only one)

Mark only one oval.

- Denmark
- Finland
- France
- Germany
- Norway
- Spain
- Sweden
- United Kingdom
- Other:

3. The organization is a *

(select only one)

Mark only one oval.

- StartUp
- Small-sized enterprise (less than 10 employees)
- Medium-sized enterprise
- Large-sized enterprise (more than 100 employees)
- I am self-employed
- Other:

4. The organization's main focus is in the following field(s) *

Check all that apply.

- Communication
- Education
- Finance
- Games
- Health, Fitness & Sports
- Multimedia
- Other:

5. Your UX team consists of *

(select only one)

Mark only one oval.

- 1-3 members
- 4-7 members
- 8-14 members
- 15-20 members
- 20+ members

Section 2 out of 6

6. The following methods are generally used for understanding users and their experiences. Rank them from 1 to 3 based on their popularity or usage in your UX team. Please, add any other methods that you use. *

Mark only one oval per row.

	1 - not used	2 - from time to time	3 - the most used
Stakeholder Maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
User Journey Maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Touch Points	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. Other methods:

.....

Section 3 out of 6

8. The following methods are used for identifying UX problems and modelling user activities. Rank them from 1 to 3 based on their popularity or usage in your UX team. Please, add any other methods that you use. *

Mark only one oval per row.

	1 - not used	2 - from time to time	3 - the most used
Affinity Diagramming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mind Mapping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Task Model	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Other methods:

.....

Section 4 out of 6

10. The following methods are used for generating ideas and creating solutions. Rank them from 1 to 3 based on their popularity or usage in your UX team. Please, add any other methods that you use. *

Mark only one oval per row.

	1 - not used	2 - from time to time	3 - the most used
Concept Mapping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Card Sorting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bodystorming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Solution Storyboard	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Morphological Analysis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. Other methods:

.....

Section 5 out of 6

12. The following methods are used for prototyping. Rank them from 1 to 3 based on the popularity of usage in your UX team. Please, add any other methods that you use. *

Mark only one oval per row.

	1 - not used	2 - from time to time	3 - the most used
Mock-ups	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sketches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Video prototyping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pictive prototyping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wireframes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. Other methods:

.....

Section 6 out of 6

14. The following are methods for testing. Rank them from 1 to 3 based on their popularity or usage in your UX team. Please, add any other methods that you use.

Mark only one oval per row.

	1 - not used	2 - from time to time	3 - the most used
Cognitive walkthrough	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A/B Testing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thinking aloud	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wizard of OZ	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. Other methods:

.....