Tampere University
Faculty of Information Technology and Communication Sciences
HTI.310 Methods in Human-Centered Design

Big Mac
Storytelling AR application

Design brief

Joni Riikola
Seyediman Noorbakhsh
Mahammad Kazi Zafor Ullah

Contents

1 Starting points

Customers need more impressive storytelling about the paintings all over the cathedral. Currently, there is no storytelling. They also want deft people to have a higher chance to learn than just text because it isn't the most effective way for them to learn. With listed needs, the cathedral would be more informative for everyone and those who might not be able to join the cathedral could get the same kind of experience as in the cathedral.

We as a group chose to work specifically about the storytelling of the paintings. Our main focus is on making the paintings be more informative and making them "alive". This is because we made some user research about the paintings speaking and moving. We also chose not to implement the last task that was to make deft people understand paintings more than just through texts just because we have limited time with this project. We want to focus on tasks that we already have used time in. There are photos of the frescos that we are planning to work on.

Joni's goals are to learn more about interviewing people and learning more about gathering data for analysis and also analysis itself. Also interested in making prototype of the idea at the end.

Seyedimans's goal is to gain more experience in conducting onsite and online interviews. Additionally, I was interested to learn how to analyze the data and different methods for finding themes in our data.

Mahammad Kazi Zafor Ullah's goal is to gain hands-on practical experience in human-centered product design. To do this, my target is to know the basic models which are widely used and convenient. I am more interested in analyzing the interview data and gathering more useful data from the users. Hopefully, by the end of this project, I can learn more about this.

Our groups' schedule is following the deadlines that are given to us. Although our group lost some members we are almost on time. We have meetings every week and discuss what we all should be doing and discuss overall about the project if there are any problems. We are communicating with telegram and having our meetings in teams. Roles in the group aren't so strict and we all are doing our parts. The rest of the data will be gathered later. Our group will have a meeting about it later after the discussion with the tutor teacher.

2 Users and context of use

After doing two more interviews and extracting data, we revised our affinity diagram and organize our ideas and to better understand users' needs. Below, you can see the diagram and the themes that we identified.

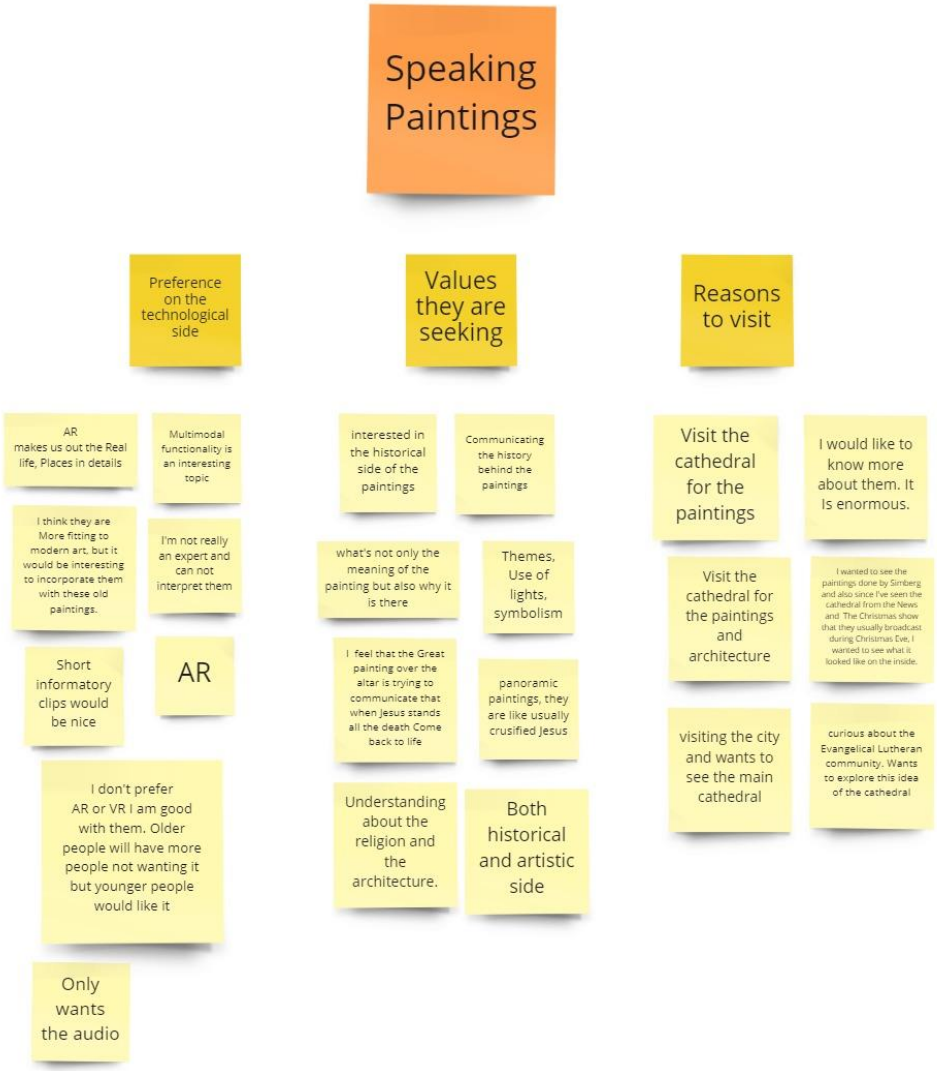


Figure: Affinity Diagram

After the interviews and analyzing session, we realized that although people may not visit the cathedral a lot in their lifetime, they are still very much interested in the historical side of paintings. They can see the magic behind the paintings but don't see themselves in a position to make any interpretation of them. We have also come to realize that most people prefer AR over virtual reality for interacting with speaking paintings.

Overall, it was a great experience and a big step toward the goal that we follow in this project. We get to visit the cathedral for ourselves and interview almost anyone who was willing to participate. Afterward, using what we have learned during our lectures we have applied that

knowledge to better understand users' needs and desires and how our product is going to address them.

2.1 User characteristics

There are multiple user groups. First, there are elderly people that visit the cathedral every Sunday (can miss some Sundays but will be there most of the time). They are already retired and are into religion. They have more free time than other age groups and they possibly go to church more often than other groups. They have not yet learned enough about technology and using smart phone might be problematic. The second group is middle-aged people that are interested in religion. They are working 9-5 job and probably have kids and families and won't have much spare time. They know how to use current technology but are more into old-school things. The third group is younger people like 25-35 aged people that are mainly interested in the architecture of the cathedral rather than being religious people. They are just graduated or still studying and usually spend time with their friends at different activities. They are excellent with current technology and they like to use it. The final groups are children and young adults from 0-24 years of age. They might not be religious but are interested in how the cathedral looks and interested in its history. They easily get influenced by parents and through advertising. At this point if parents are into religion kids will most likely also be. Studying each one of the groups will tell our team what different groups prefer and make choices that most of the groups prefer.

We decided to do some user research by doing interviews on-site choosing random people that visited the cathedral (preferably one sample from each user group). This will give us some hints on what we should focus on and continue our project (Link to the recording of the interviews is shared with their verbal consent)

2.2 Environment

Church as a holy place is not a high-tech environment and we need to incorporate that in our designs. We first came up with the idea to present speaking paintings using AR glasses or contact lenses. However, considering that everyone has their personal smartphone, we decided to implement our AR based application and use the smart phones integrated camera.

3 Quality goals

Our product quality requirements include users' option to use it as easily as possible. This is the reason for the smartphone app. It has users control and freedom because users can choose if they want to use only audio or watch the introduction about the painting. The quality

requirements should follow at least these parts of the Nielsen's heuristics: Product status visibility, realistic, user's control, preventing errors and guidance and instructions. These options should be contained at the end. The product should be realistic so users will understand the explanations. It will have user control because the option to choose between audio and visual presentation. The app will have instructors on how to use the app and will guide the user to use it. App will have option to have choose if the user is visiting the cathedral and can choose if they want to use audio or video instructions.

3.1 Usability / UX goals

3.1.1 Goal 1

We want the product to be available to everyone and that they would like to use it again later. The most critical aspect is to please as many users as possible. Some of the participants in the interviews told us different preferences so we made different options dedicated to those answers. Our goal is not to pleasure everyone but most of the people. This is because it is hard to pleasure elderly people with electronic devices. Measuring if the goals have been reached is by asking users what they think about it after making prototype and have them test it.

3.1.2 Goal 2

One of our usability goals is to make it interactive for younger audiences. They are born to use mobile phones. We want to utilize it to make cathedral visiting more rewarding and make it smoother for younger audiences that use mobile phones in their normal life more than elder people. They watch movies, animations etc. Our solution would make it familiar to them and it would also make it more understandable.

3.2 Other goals

User segmentation is the way of dividing a user base into groups of individuals that are similar in specific ways relevant to promoting, such as age, gender, interests, etc. User segmentation depends on recognizing key differentiators that separate users into groups that can be targeted. Information such as users' demographics (age, race, religion, gender, family size, ethnicity, education level), geography (where they stay and job), psychographic (social class, lifestyle) trends are considered when shaping user segmentation methods.
We hope to gain a deeper understanding of Tampere cathedral users' preferences and needs with the idea of discovering what each segment finds most valuable to more accurately tailor presentation materials toward that segment.

Based on the user's demographic situation our target main users are mostly young and children. Elderly people who are Tampere residents visit the cathedral on a regular basis. However, young people who live in Tampere are presently visiting the cathedral to a lesser extent. When we introduce the new technological innovation in this part, Tampere Young people will be more fascinated by this service. Young generations will learn further about this cathedral's history and paintings with additional interest. Teenagers who mostly visit with their family or friends will create a passionate connection with the cathedral with the help of this use of technology.

Another main target users are tourists who visit Tampere city. Every year a substantial number of tourists visit Tampere city. At present, travelers visit the cathedral seldom and it is declining. Our goal is to invite more tourists to the cathedral by using this high-tech innovation. Travelers from all over the world will learn more about history and paintings and it will promote more about Tampere Cathedral.

4 Design Brief

4.1 Vision

Our final design concept turns out to be pleasing. We successfully consider all the factors that influenced our design. We were able to identify all the negative sides related to the design and used all the gathered data from the interview in our data-driven design process. For example, most people preferred AR as a combination of virtual and real-world over a fully implemented virtual environment. Considering this, we decided to use augmented reality to create storytelling for the paintings.

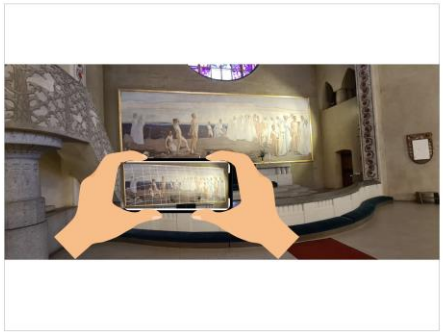
The first thing that we considered was the fact that our users are from different age groups. So, as mentioned in the design goals, we wanted to design a product that is accessible to anyone while keeping the interactions as easy and as naturalistic as possible.
After doing many interviews with different user groups, we realized that many people don't know the real meaning behind the paintings and cannot interpret them properly. Our design offers a solution to address this issue by creating immersive storytelling with the help of augmented reality.

We were able to successfully seize the opportunity to increase community engagement by hearing everyone's opinion and identifying what are the user's needs and expectations from this product.
As mentioned in one of our interviews, creating immersive storytelling is a great way to use technological advancements to deliver meaning behind paintings. However, at the same time we need to consider that this should not be seen as entertainment to anyone.
Considering all these essential factors, we created an AR application which can scan the paintings and retrieve the specific information related to them from the database. Using augmented reality, a person will appear at the scene which is only visible through the screen of your smartphone. Our virtual agent will start speaking about the chosen painting and the script will also appear on the screen.

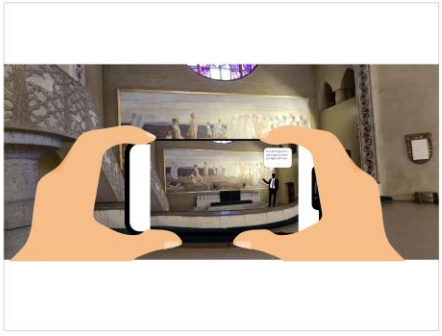
Storyboard
Based on the customer segmentation and our design goals, we created two storyboards to dive deeper into the context and show how different user groups will interact with the product. In the first scenario, our targeted user group is a tourist. In the second scenario, our targeted user group is a local family who is Finns.

Link to Storyboard on Miro:
https://miro.com/app/board/uXjVOBhb2qk=/?invite_link_id=774843788342

Trigger **Action**	
Who	Tourist
Where	Tampere Cathedral
What	David is a tourist originally from United States. He decided to visit the cathedral because he heard many things about it and wanted to see the paintings for himself



Discovery **Looking for Inspiration**	
Who	Storytelling AR Application
Where	Tampere Cathedral
What	Using our AR application, David will scan the paintings to see what is the meaning behind this artwork and who is the painter of it



Journey Step **Action and Conclusion**	
Who	Storytelling AR Application
Where	Tampere Cathedral
What	After that application detected the painting, a virtual person will be visually presented at the scene to tell you about the background of the painting, meaning behind it, etc.

Trigger **Action**	
Who	Locals
Where	Tampere Cathedral
What	Venla and her family are on their way to the cathedral to attend church Sunday service

Discovery **Looking for Inspiration**	
Who	Locals
Where	Tampere Cathedral
What	Venla's daughter has always saw this painting but never understand the meaning behind it. she tried to ask her mother to see her opinion

Journey Step **Action**	
Who	Storytelling AR Application
Where	Tampere Cathedral
What	Venla pulls out her phone to launch our application that enables her to scan the painting and get all the information related to it

Conclusion **Happy End**	
Who	Storytelling AR Application
Where	Tampere Cathedral
What	A virtual agent will appear in the scene which is only visible through the smartphone's screen. he will give explanation about the paintings which is available in audio format with the script appearing on the screen

4.2 Functionality & features

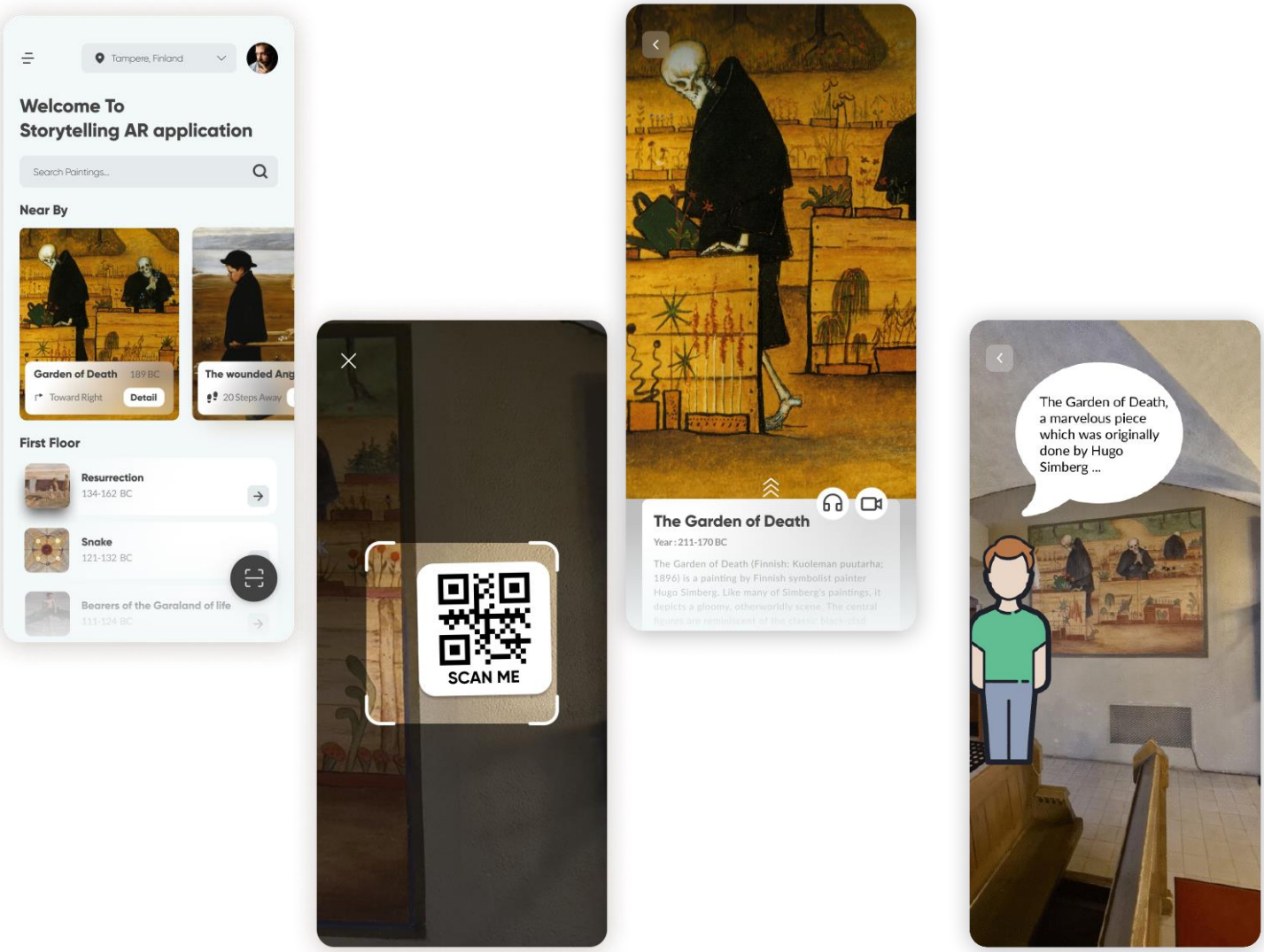
4.2.1 Narrative story telling

The very first goal of our system that thrives design decisions was to increase the community engagement in the cathedral. Immersive storytelling is an important feature in our application.

4.2.2 Providing precise information

Another important feature is to use accurate data and interpretation of the paintings and deliver that to our users. Each person can have their own perspective, but they don't really know what the real meaning behind that painting is and what the artist was trying to convey through his artwork. By using researched materials and relying on validated resources, we can provide our users with accurate data

4.3 Overview of the UI



4.4 Detailed views & interactions

As per our mission that was defined at the beginning of the project, teenagers are considered one of our main targeted users in our customer segmentation model. Thus, we decided to create a sharp and dynamic interface. However, this age group is not the only ones who will use our product. The design is elegant, and interactions are simple. We don't want to lay all the options in front of the users, so they have the chance to explore the interface for themselves and not be bored with it. Furthermore, we decided to expand the scope of the project and see if it is possible to make something more scalable that can be used in any museum, etc. to better success in the international market, we need to have a deep understanding of user's cultural characteristics and reflect that in our interface design. However, with the limited time and resources this will be left to future development.

Link to interactive prototype:
https://www.figma.com/proto/5k3E0g9kUo9K8ffOQuSnfe/Brainstorming?node-id=20%3A2&scaling=scale-down&page-id=0%3A1&starting-point-node-id=20%3A2

Instruction
Open the link to interactive prototype → Click on the scan icon at the bottom right corner → Wait 3 second until the QR code scanning process is complete → Click on the video presentation button to start AR storytelling → A gif will be played repeatedly that demonstrate how the immersive storytelling works

4.5 Competing systems

When searching for competitors in this market, we identified two major players. "Smartify" is one of them which is available both as a website and application. "History of Art" is another competitor which is only available as a smartphone application. Below you can find the screenshot of the mobile applications showing us information related to one of Hugo Simberg's Frescos, Garden of Death.

None of these application support Augmented reality storytelling. Both are providing related information in the form of text and doesn't include any other sort of media. Smartifiy shows you limited information in the description part of paintings while providing you with a link to Wikipedia, etc. same thing happens with the other application. History of Art fetches the data from Wikipedia and shows you the description of the frescos. Each artists has a profile in both apps that is a collection of all their paintings, frescos, etc. History of Art also allows you to play a puzzle with the paintings which doesn't seem to be relevant. These features are not the kind of values users are seeking in this kind of platforms.

Our product is better in many ways. First of all, we have a deep understanding of our users and their demographical background. We also know which features are the most important one that needs to be included in our minimum viable product. We understand that gathering all the available information on the internet into one single app is not a hard thing to do. instead, by conducting multiple interviews and gathering qualitative data, we realized that what users are seeking is not an available in website but requires you to read books and articles that gives a deep interpretation of the frescos.

5 Open issues and ideas for the future

We made an interactive prototype with Figma. It will show the idea we have, the guidance, and the possible audio for the paintings. Interviews made us choose a mobile application rather than going with virtual goggles just because it will be more efficient for the cathedral and for the users. Also, we thought at the beginning of making changes to the cathedral but soon we decided not to make many changes to the cathedral itself because it is a holy place, and we don't want to change that. It also has a historical side and doesn't want to modernize it too much.

We have a few more plans which we can implement in the future. For example, in our smartphone app's usage of AI (Artificial Intelligence). If we can successfully implement it, we can introduce more features in the digital speaking paintings. Users can enjoy the lively paintings on their phones easily.

We try to implement the UI design in a very plain and easy to use. Our designs are mainly influenced by the user's needs and expectations. What we first considered was using virtual reality which gives us more freedom to implement various animation and visual styles. However, after conducting multiple interviews, we realized that this is not what users are looking for. Although it seems to be a cool idea, it's not an efficient way to approach this project with this mindset and if it ended up being developed into a real product, users will avoid using it.

6 Methodology

Human-centered design is an innovative methodology for problem-solving. It's a procedure that starts with the individuals you're creating for and ends with brand new solutions that are customized and made to suit their needs. Human-centered design is all about developing a deep compassion for the people you're designing for, producing tons of ideas, creating a lot of prototypes, and discovering what you've made with the individuals you're designing for. Eventually, put your innovative new solution out in the world. In our project, we also followed the innovative methodology for problem-solving.

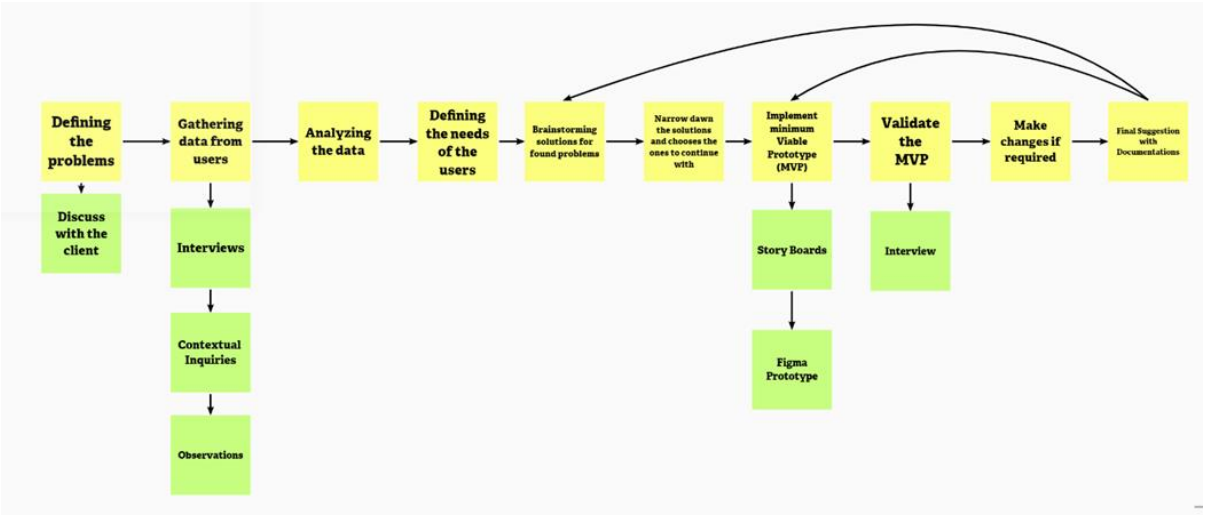


Figure: Methodology of the Project

6.1 Defining the problems

At the beginning of the project, we start with the focus of our problems. For focusing on the problems, we had to discuss them with the client. After the successful meeting with the client, we got an idea of the problems. The purpose is to improve community engagement that would give further validation to the actions of the cathedral. At present, there is no exact technique of interesting and immersive storytelling for the visitors.

6.2 User research

While gathering data from the users, we had to visit the Tampere Cathedral physically. We did some user research. During our visit, we did some interviews with the individuals who are the visitors to Tampere cathedral. Based on gender, age, and personal characteristics, we choose separate types of interviewees. In total, we did four interviews with the visitors. For contextual inquiries, we did a semi-structured interview method to obtain information about the context of the use. For research questions, we focused on the questions about the user's lifestyle, user competency with technological devices, inspirations, challenges, and motivations for visiting

the paintings. We also asked questions related to arts with multimodal functionality. We, the three members of our team, were entirely present during each of the interviews. Furthermore, we had a profound observation of the Tampere cathedral.

6.3 Analysis and modeling of user data

For analyzing qualitative research data, the affinity diagram is the simplest way to organize field data. It arranges the notes from explanation meetings into an order that exposes common issues and ideas across all users. The affinity diagram shows the scope of the difficulty. It reveals in one place all the matters, concerns, and key aspects of the users relevant to our team's focus. In our affinity diagram based on the interview, we organize the data related to the speaking paintings.

Figure: Affinity Diagram

6.4 Defining the needs of the users

User needs are the needs that a user has for service and that assistance must be fulfilled for the user to get the right product for them. It helps more individuals get the right product for them. Based on the analyzed data that we gathered, we define the needs of users of Tampere cathedral. We understood that many individuals don't know the real significance behind the

paintings and cannot understand them appropriately. We identified Immersive storytelling as the major need of the users.

6.5 Brainstorming solutions for problems

The Brainstorming meeting's purpose is to produce as many ideas as possible. Give individuals plenty of quiet time at the start of the session to generate as many of their individual suggestions as they can. Once defining the needs of users, we the team members brainstorm the solutions for the discovered problems. Well, we had plenty of ideas while performing the brainstorming session.

6.6 Narrow down the solutions and choose the ones to continue with

From all the way out for the discovered problems, we narrow down the solutions in our meetings. We decided that we should offer a resolution to focus on this issue by designing immersive storytelling with the aid of augmented reality (AR). Clearly, we rejected a lot of ideas based on our user research data. For example, our user study showed Virtual Reality (VR) is not much popular and appreciated compared to Augmented Reality (AR). So, we refused to go for any solutions related to VR.

6.7 Implement a Minimum Viable Prototype (MVP)

A minimum viable prototype is the minimum extent of effort and a simplified method for building a prototype. Based on the user's breakdown and our design objectives, we created two storyboards to jump higher into the context and exhibit how diverse user groups will relate to the product. Additionally, we also design the user interface (UI) of the AR-related mobile apps in Figma Prototype. We created an AR smartphone application that can scan the QR code of the paintings and retrieve the information associated with them from the archive.

6.8 Validate the MVP

We know that building an MVP is not sufficient. We must also test our MVP and validate it against key principles. It will make sure that our MVP meets the user's needs and the quality guidelines. For doing that we follow the user's interview again with our solutions. User interviews are a goldmine of actionable intelligence. They can help us gather insights from users about our MVP that otherwise may be impractical to gather. Therefore, there is no safer way to test an MVP than to ask users who are going to use it. During the interview, the users check the Figma prototype and evaluate it. We list all the problems we think our users might face. Finally, we found some decent feedback from our interviews and worked on it.

6.9 Make changes if required

Based on the user's interview data, we considered the point that our users are from diverse age groups. So, we needed to shape a product that is accessible to any person while maintaining the interactions as effortlessly as possible. We create the User Interface (UI) of the application as clean so that anyone can use it without problems. We try to follow the iteration of our work for maintaining the principles of human-centered design.

6.10 Final Suggestion with Documentations

Due to the time limitations, we have not done any explainer videos. However, we believe our system will increase the community engagement in the Tampere cathedral. We understand that, by using the AR-based smartphone application which uses examined materials and relies on validated sources, we can deliver our users with precise data.

7 Reflections and lessons learned

In the overall process the hardest was to keep subject wide optimal for us. Since the original pdf had three different problems to solve but after losing two members it wasn't easier anymore. So, keeping this project wideness suitable for our group and working even though we lost two members early in the process. We think as a group that it happened right away so we still could handle the project and keep doing it as a three-person team.
Insite interviews were eyes opening in that case that finding suitable interviewee isn't that easy. Also figuring out the questions and how they should be formed so they can only be understood one way, so we get as good data for our research. At least in our subject because usually in the cathedral visits about 25 person per day according to people working there.
Moving through different phases wasn't hard for our team and we handled it well. We had long talks with the group about what user research told us and what kind of solution we would implement in low detail. We had different ideas about it but with good compromises we managed to create an idea which pleased everyone.
For us the most time-consuming was doing onsite interviews. Because there were not many people visiting the cathedral and we had to wait a while for possible interviewees. Also making transcripts from the interviews took some time because they were recorded inside the cathedral and urns were played at the time, we did interviews.

References

https://www.netsolutions.com/insights/10-ways-to-validate-your-minimum-viable-product/
https://rubygarage.org/blog/human-centered-de-sign#:~:text=Human%2Dcentered%20design%20is%20a,product%20that%20satisfies%20their%20needs.

Appendix

Interview questions:

The objective is to increase community engagement that would give more validation to the activities of the cathedral. Currently, there is no exact method of interesting and immersive storytelling for the visitors. The authority expected some specific engagements as follows which would be in the possible solutions

Purpose of the interview:

We are trying to better understand users' needs and expectations from this service. We will ask questions about your life style, your competency with technological devices

Background Questions

Age range?

Why do you visit the church to watch the paintings?

- What are your inspirations, problems and motivations for visiting the paintings?

Needs and Products

How often you visit the cathedral?

How much time they spend there in one visit?

What do you find interesting about the paintings?

Are you interested in the historical side of the paintings or just the artistic side?

Are they happy with their visit or what they learned from the paintings?

What are your interpretation of art, paintings?

Do you have experience with VR/AR?

Do you prefer AR or VR?

Are you ok with speaking paintings?

Would you like to experience the arts in the form of movies, games etc?

What do you think about Arts with multimodal functionality (speaking paintings)?

Would you like the information to be presented (like weather forecasts) by person or just have audio behind painting and it would zoom to exact spot it is explaining?

Are there any other comment that you want to add?

Any other question about this interview or our project?