SI 699 **Mastery Project**

Group 5: Wendi Ding, Chaitrali Gandhi

Mastery Project Milestone 3

Overview

Architecture students rely a lot on models for presenting their work to get feedback for design iteration. The physical model is convenient to get feedback as it is accessible to observe the design, while the Digital 3D model is faster to build and modify. Therefore, architecture students use both models to present their design. However, the current presenting method limits students getting feedbacks from a broader community who are not in the same physical place with them. It's important for students to have their designs reviewed and fully understood by more people, which is why a more convenient online sharing platform that could show an architecture design completely and immersively is necessary.

The Formative Research

Formative Study: Observations

As we were new to the Architecture School and our users, we started with observing the space where our users spend most of the time. Our main aim was to understand the capability of the studio space in Taubman College of Architecture and Urban Planning to support architecture students to complete their exhausting work including physical models efficiently and come across the pain points. Photos from our observation can be found here

Insights

- For building physical models, the assigned space in the studio is limited
- The desk each person has have their pros and cons and need a lot of improvement to enable architecture students to work efficiently
- Architects don't have access to tools they need making them find it on other students' desk
- Basic essentials required for the desk are not provided
- The storage space is not enough for storing all their tools
- Just one desk is not enough to work for architecture students
- Presenting and sharing design is an important part of architecture education

Formative Study: Interview

After observing the space we got a rough overview of how architecture students work and to get a deeper knowledge of their education pattern and pain points we conducted interviews with architecture faculty and students.

Students

We interviewed 4 students from the architecture school to understand how they have been provided education at the Taubman School of Architecture. Our main focus of the interview was to understand how architecture students connect to the real world while working on their academic projects. These interviews helped us understand the challenges faced by students while working on projects in the school setting. Here are the results from the interviews:

Questions	**Student 1**	**Student 2**	**Student 3**	**Student 4**
What methods have you used to do research about problem context/environment?	Client meeting, airport around the environment, normative scenario(GIS,1.environment,2.economics development,3.culture), Field study(School provide resources like), if not, using google map to look around	Problem statement in assignment instruction, Interview with users, build story map, literature review	Interview with users, contextual inquiry, online research, literature review	Look at the context, what's lagging or in abundance in the physical environment. And make sure to include the lagging part in the design. Necessary to talk to people to get insights about the area. Look at the entire area and not just the site area
What were the challenges that you faced?	The feeling is affected by the skyline, sight view, weather, sunshine-time...the factors that could be best observed in a field trip, but the school doesn't provide a field study resource.	What people said during the interview sometimes doesn't match what they actually did, but we don't have a setting to let us observe their life to find important details for design. I didn't have a chance to interact with the real user experience of the problem during the design process.	Inability to go to the field to do extensive research and not getting access to the actual workplace due to privacy setting	The most important challenge is to rely on people or things at that very instant but you don't know the history of the place or people. You just see what it is right now and not what was there 10 years before.
What are the differences you saw when you did projects out of school?	Limitation on choosing environment design exercise	The internship provides real-life context and you can actually go field study and immerse yourself into user's living environment.	Got the actual experience through an internship as I was in the environment where the product is used. On the contrary, in a school setting, it was completely on the hypothesis.	In terms of college, you won't always go for field research and you always look for the ideal state. On the contrary, you looked for the practical knowledge and the actual client interaction put a lot of constraints that don't exist in a school setting

Faculty

We spoke to a professor who is the head of the entire studio in Taubman College of Architecture. We saw a lot of the work her students have been doing which was a great source of inspiration. Our main focus through this interview was to understand how the current education structure for architecture students work. We presented our concepts to her and asked to give her views if those solutions would solve the problems faced by the students. Through this interview, we came across a lot of key insights that lead us in scoping our problem. The questions asked to the professors can be found here and we also have notes from the interview.

Insights

Through the interviews, we identified the following key insights that led us to the next part of the formative study:

- Limitations on getting feedback from a wide audience
- Inviting external professors for feedback can be a costly affair
- No direct connection to the environment of the user while working on real-world projects
- The physical model is the most used way of presenting designs
- Digital Model is always presented physically for seeking feedback

Formative Study: Survey

We conducted a survey to understand our user's needs in a better way. You can find the entire survey here and the results can be found here

- Target Population: Architecture students
- Period of the Survey: 10/20 - 10/23
- Number of participants: 12
- Survey Objectives:
    - Understand the pros and cons of the physical and digital model
    - Understand architecture students' current way of presenting their designs
    - Understand their pain points while building physical models and digital models

Insights

- Physical Models are difficult to build and modify
- Digital Models are easier to build
- Physical Model is the best method to seek efficient feedback
- Digital Model is very hard to get feedback as it is difficult to share it in the same format
- Students use various method to seek feedback however, the feedback is only restricted to the physical setting and cannot be given online

Formative Study: [AR/VR Lecture]

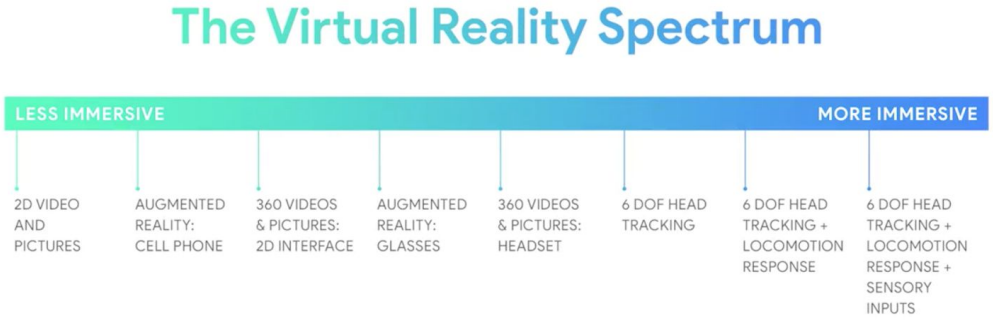


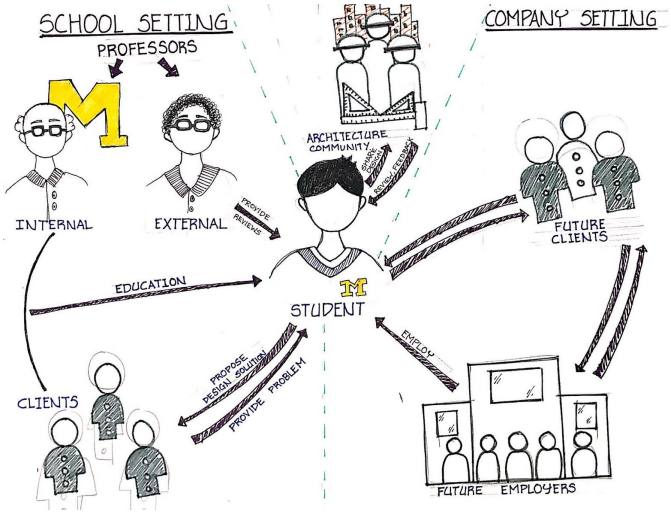
Image credit:[VR and 360 Video Production] by Google AR & VR

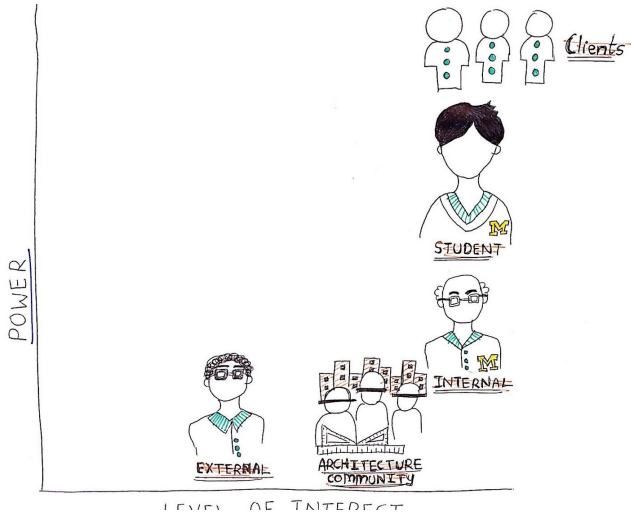
VR video is one piece of the immersive spectrum, like VR games, it is intended to be viewed in VR headset, but it can also be viewed on flat screen devices like our phones or computers, where you drag the viewpoint using a mouse or your finger. Unlike VR video games which use computer generated characters and environments, like [WORLD TOUR: A Jump VR Video], 360-degree videos are made by capturing live action in the real world with 360 cameras. 360 video differs from the 2D video as it presents an entire 360-degree view of the world rather than just one part.

From Insights to the design proposal

Understanding stakeholders

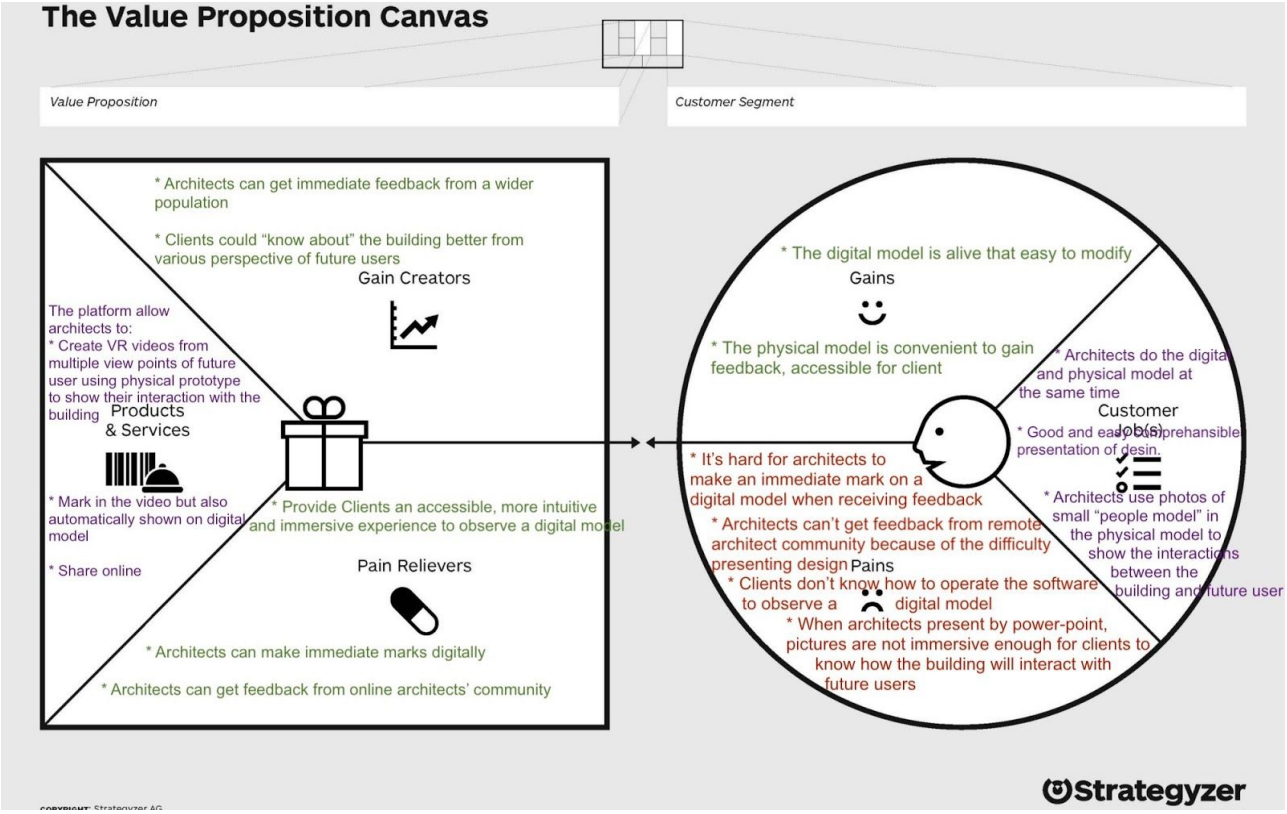
We built a stakeholder map to highlight the different stakeholders who have a major stake in this project and their relation amongst each other. This helped us understand the needs of the stakeholders in a better way. The insights would help us address the different level of interests for multiple stakeholders through the project. Based on our formative research we have listed out the stakeholders based on their power and level on interest in this project.





Through the stakeholder map, we have listed architecture student who are the target audience for this project. We have divided the stakeholder map into school and company setting where students interact with different kind of stakeholders when they work on the projects in different context.

Empathy for the context of use



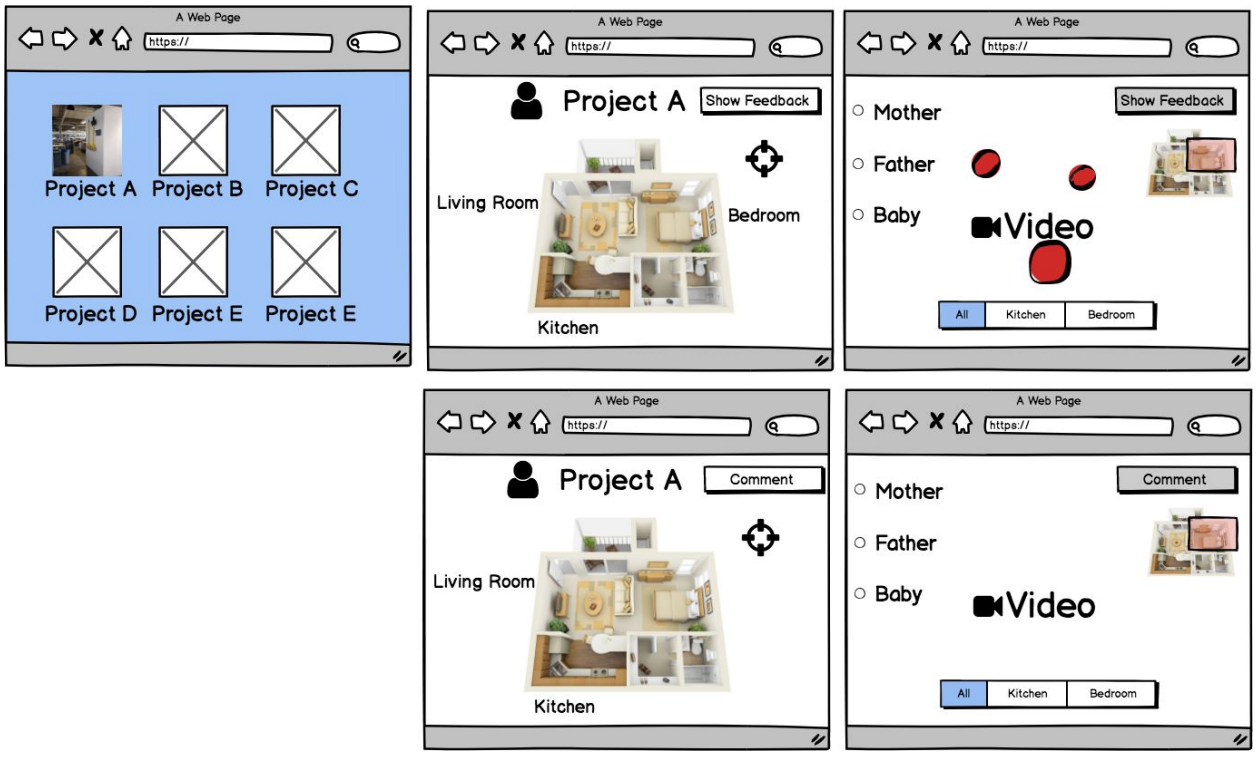
We created a value proposition map which helped us propose a design concept based on our target population expectation.

The right part of the canvas is user profile. "Customer Jobs" describes the tasks architecture students are trying to get done. To have a good and comprehensible presentation of their design, they build both 3D digital model and physical model at the same time, take pictures of small "lego" people being inside the physical model as scenarios to help explain how would different people interact with space. "Gains" show that the students using physical model for presenting design is not only convenient to gain feedback and accessible to people without architecture background(clients) but also fast to modify. "Pains" reveal that 3D digital model is difficult for people to observe and have a spatial understanding of the architecture compared to the physical model, especially people without architecture knowledge. This difficulty also leads

to the limitation that students now get feedback from the population who are in the same geographical place.

The left part of the canvas is the value map which helps us generate the main functions our design concept should have. Through our design concept, we hope the students get immediate feedback from a wider population, give more convenient access to people without architecture background, better interaction with the building from multiple perspectives of the populations the architecture design aims for. Based on these "Gain Creators" and "Pain Relievers", our design concept should let students easily publish and share their design online, get efficient feedback without the geographical limitation which would enable architects to come up with better design structures. The published 3D digital model should be accessible to observe, interactive for people without architecture background. More amount of people are able to experience immersively how the building works for different populations and can provide feedback whenever they have a concern virtually.

Design concept proposal



This is an online platform where people share their architecture design. Project A has a profile which shows a 3D digital model that we could drag around to observe 360-degree view. You can click into any area of the model, then there will be VR video experiences providing the observation of the space. For example, click into project A's bedroom area, you can choose one perspective from "Mother", "Father" and "Baby", and mark the space where you have a concern during the VR video experience. We created 2 draft VR video experience for project A: 1.

observe bedroom and balcony from a baby's perspective 2. Observe living room from a father's perspective.
If you are project A's owner, you can choose to see all the other people's concerns and comments about your design mapped on the 3D digital model. Every place other people marked or commented when they were in the VR video experience will show on the 3D digital model.

With this concept, we believe students will no longer have the geographical limitation to present their work and they can get feedback from a broader population. Faculty and other architects would make comments more intuitively on the digital model and with all the feedbacks shown on the digital model obviously, students could modify their design faster accordingly. Clients would be able to observe the digital model conveniently as a physical model and get more insights from playing different roles interacting with the architecture. We hope this concept could help to build bigger online communities for architects around the world.

Design Plan Preview

We are confident to go in the direction of helping architecture students share their work with broader population using VR video, we believe with only 360 cameras, they could generate immersive experiences without much cost, which will improve architecture design presentation to a higher immersive level.

For the next steps, we will start the design process and we have scheduled some field studies on Oct 26th to get deeper understanding of the direction of our design concept.

- Interview with professors from Taubman College of Architecture and Urban Planning
    - Prof. Matias del Campo, who is interested in VR application in architecture
    - Prof. Christian Unverzagt, Object design
- Observe "City Hall Design Studio" mid-term design review

For Milestone 4:

- Check out 360 cameras from Duderstadt center and get familiar with how it works.
- Book Google cardboard and make the system works for the prototype.
- Go to Duderstadt center Multimedia room orientation to get room reservation access.
- Prepare 2-3 versions of the lo-fi prototype (Use 2D video to replace VR video) and test with architecture students to make the design decisions and changes.

For Milestone 5:

- Prepare mid-fi prototype with detailed demo storyboard and production plan (Use simple 360 video to replace VR video), test with architecture students, faculty to gain more feedback and make design modifications.
- Finish hi-fi prototype with VR video