Really

Augmented Reality Platform for Rapid Prototyping

Ikmal Azman

Final Project, 22 May 2025

Rationale

This project motivated by the goal to **democratize** the creation of **Augmented Reality (AR) experience** and make it more accessible to non-technical users namely **UX, Interaction** and **Jewelry designers**.

The aim is to enable these users to explore the AR space as creative medium and drive innovation without the needs of technical knowledge.

To support this motivation, Ikmal's explores the use of a **drag-and-drop interface** in development of the platform that allow users to easily create AR Jewelry try-on experiences.

By lowering technical barriers, the platform allows designers to focus on **experimentation** and **rapid prototyping**, making AR more approachable and inclusive.

Goals

- ✓ Create drag and drop interface platform for designing AR experiences
- ✓ Empower users to create custom 3D Jewelry models for try-ons
- ✓ Enable designers to create AR Try-on prototypes

Project Timeframe

13 Weeks

Visual Synopsis

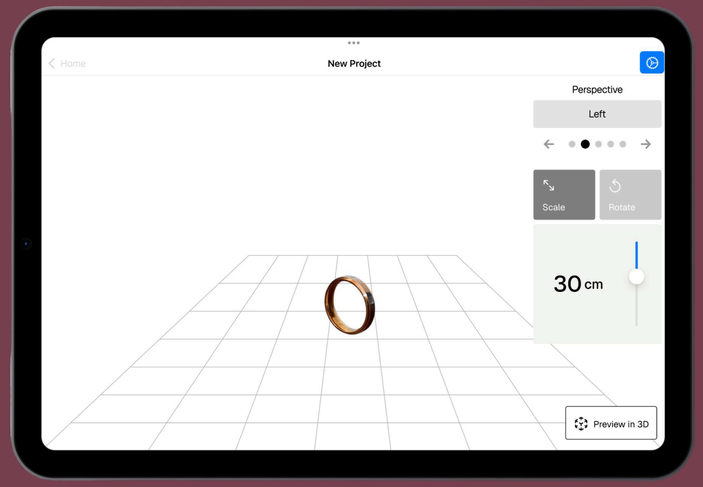
This project explores a drag-and-drop platform that enables non-technical users namely UX, interaction, and jewelry designers without writing code. Through human centred design process, the platform was designed to support rapid prototyping and preview jewelry design aesthetics in AR.

The outcome is a functional prototype that allows users to upload, preview, and share 3D jewelry models with ease. The project also identifies opportunities to scale the platform for devices like Apple Vision Pro in future development.

Create

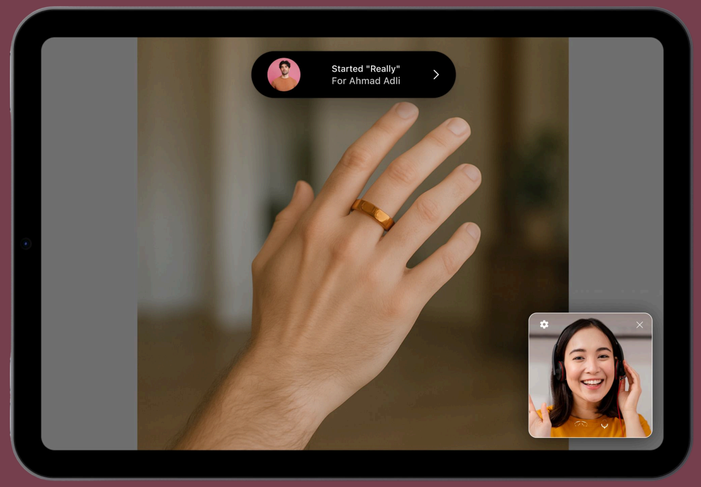
Screen of Creating 3D Model for Jewelry.

Preview



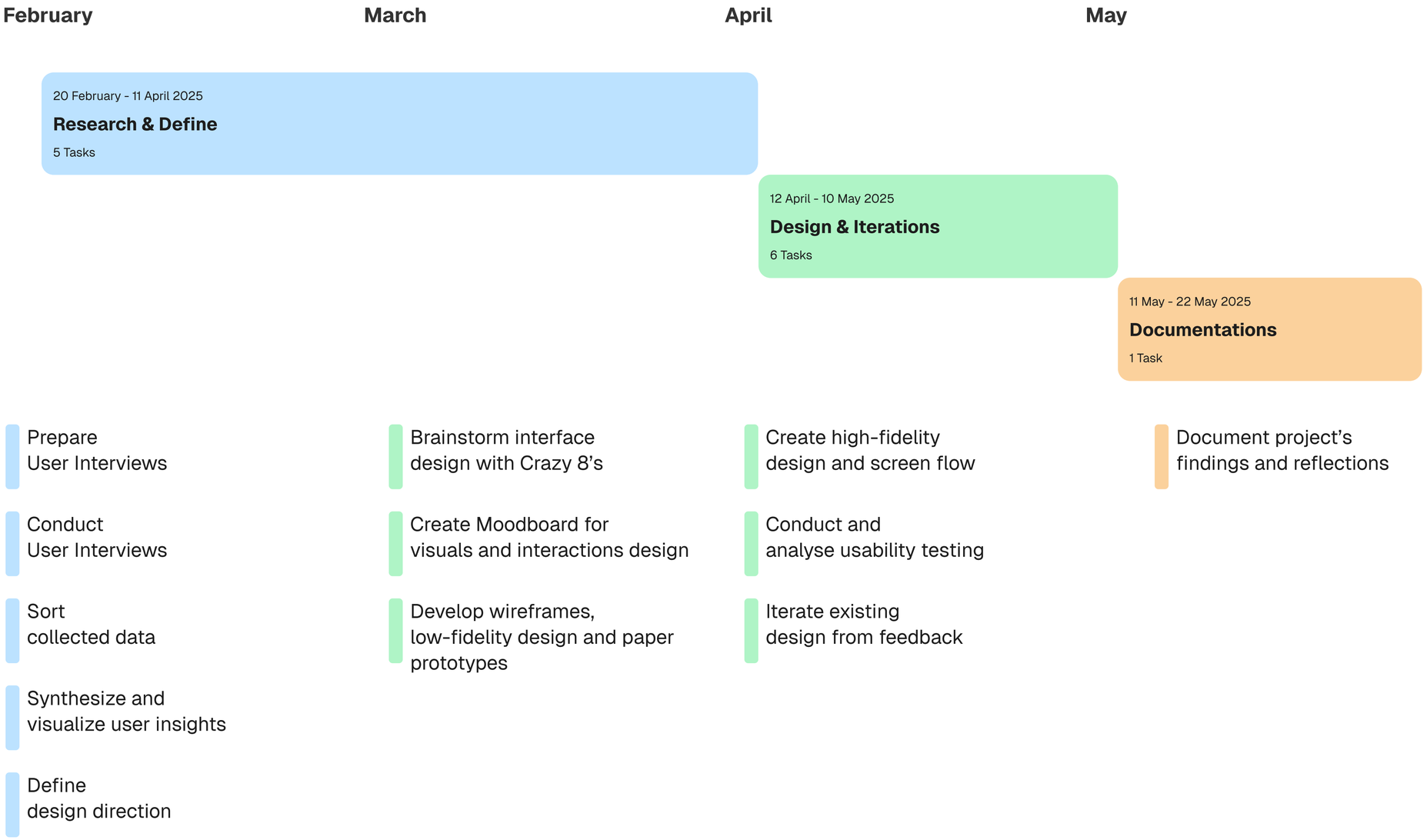
Screen of Viewing 3D Model.

Share



Screen of Share AR Experience for Try-on.

Project Timeline



Contents

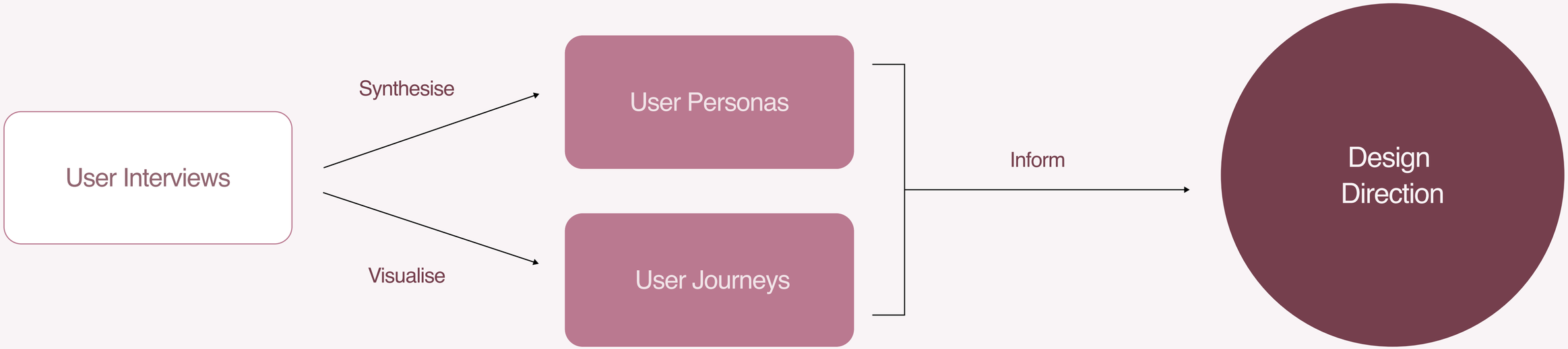
Research, Analysis & Insights.

Research, Analysis & Insights.

To support my desk research and guide the direction of my solution, I conducted **User Interviews** with 2 experts from my project's target audience: AR/XR Lead Engineer and Independent Jewelry Designer. The goals are to focus on understanding their **workflows, tools**, and **key challenges** during their design and creation process.

From these interviews, I synthesized the findings into **User Personas**, which represent each individual's goals, interests, pain points, and challenges within their discipline.

Additionally, I mapped out **User Journeys** to visualize the high level overview of their workflows. This helped me identify key insights and opportunities that directly inform my design approach.



User Interview 1.

1

Roxana Monica Nagy

AR/XR Lead Engineer

Topics

- Workflows
- Tools
- Challenges

Insights

Workflows

- Concept Ideation with AI, 3D Modelling, Coding, Deployment
- Structured process with clear phases, tech heavy

Tools

- Mostly work with Digital: MidJourney (AI), Houdini, Xcode, Reality Composer Pro
- Using cutting edge spatial computing hardware i.e Apple Vision Pro

Challenges

- Context switch between tools
- High cost of 3D modelling

User Persona 1.

Roxana Monica Nagy

" Interaction & UX Designer Archetype"

- *Creative Technologies, Immersive Technologies Lead Engineer*
- Dubai, United Arab Emirates

Bio

- Co-founder of a studio dedicated to Apple Vision Pro and spatial computing projects focusing on immersive experiences like games and collaborative tools.
- Professional Background: Former iOS developer who transitioned into specializing in augmented reality (AR) after Apple released ARKit in 2017. Now focuses on spatial computing and Apple Vision Pro.
- Experience: Worked on AR projects for industrial applications (e.g., auto lifts visualization) and explored jewelry try-on prototypes. Passionate about AR/VR conferences, prototyping, and sharing knowledge through talks and articles.
- Tools Familiarity: Proficient in Houdini, Blender, Reality Composer Pro, Xcode, and procedural modeling. Explores AI tools (e.g., MidJourney) for concept art and prototyping.

Interests

- Spatial computing, Apple Vision Pro
- Innovation in 3D Modelling & Prototyping (Procedural modeling, AI-generated concept art, Rapid "blocking" techniques, Photogrammetry)
- Engages with communities (Participates in conferences, Writes articles, Mentors others)
- Collaborative & Shared Immersive Experiences (Multi-user AR) which enable real-time co-presence
- Artist-friendly AR tools for rapid prototyping (e.g., custom "brushes")

Pain points

- Tool Limitations such as Blender required 90+ extensions for their needs which make the workflow cumbersome and Reality Composer Pro lacks advanced functionality for complex projects.
- Resource Barriers whereas High cost of 3D modelling and the learning curve for new tools (e.g., Houdini) despite their benefits.
- Struggles to balance low barrier tools in workflow such as Spark AR for custom development needs

Needs

- Efficient Prototyping Tools for rapid Iteration
- Cost-Effective 3D Modelling Method for procedural generation
- Advanced Spatial Computing and Collaboration features like co-presence, shared environments and multiplayer for AR design

Relevants Insights

- Take inspiration from Drawing apps (e.g., Crayola) and repurposed for prototyping or calligraphy AR tools for artistic collaboration
- Interest in AI Integration in workflow, photogrammetry, and cross-platform AR (ie. iPhone, Vision Pro).
- "If you develop your experience with RealityKit API, you can extend it to Vision Pro later."

User Journey 1.

Goals

Creating an immersive experience from early process to deployment

Scenario

Building immersive experience of Art/ Storytelling in Apple Vision Pro

Expectation

Able to utilise all features in platform and spend less time to switch context between tools and pipelines

Phases

Ideation	Modelling/Assets Development	Prototyping	Deployment

Steps

1. Define the idea of project 2. Use AI i.e Midjourney to create concept art ideas for the project 3. Speak with peers/clients to discuss and confirm the concept ideas	4. Bring the confirmed concept as inspiration for assets modelling 5. Use 3D modelling tool to create assets 6. Export 3D model from modelling tool and import to development environment ie. Xcode, Reality Composer Pro	7. Add interactivity layers on 3D model 8. Setup the 3D model for immersive scene 9. Handle advance logic in code through Xcode (optional, depends on use case) 10. Test immersive experience before proceed for deployment	11. Upload and submit project to Apple App Store Connect from Xcode for vendor verfication 12. Invite beta testers to test the project through TestFlight 13. Iterate project based on early feedback (optional) 14. Release project to Apple Vision Pro App Store, ready for public/ client use

Insights + Opportunities

- Learning new tool can be a barrier
- Creator need to jump into 4 different tools to build the immersive experience
- “We use AI for creating concept to avoid misalignment with peers/clients, what I imagine vs what others wants ”

- Using RealityKit API is extensible to transfer the developed immersive experience from iOS to VisionOS
- Make experience for group/share experiences allow people from remote to feel similar experience
- Before create complex assets, create simple version to test the idea
- Use AI to accelerate process of modelling i.e first concept, building 3D model
- Can use brush to sketch the jewelry and toggle optons to switch materials

User Interview 2.

2

Louisa Borneman

Independent Jewelry Designer

Topics	Workflows	Tools	Challenges
Insights	• Client consultation, hand sketching, wax carving, casting, finishing, delivery • Flexible process, driven by client feedback	• Analog: Wax, polishing kits, paper sketches • Open to work with digital tools	• Time consuming feedback loops • Operation setbacks i.e error sizing, limited resource access to caster

User Persona 2.

Louisa Borneman

"Jewelry Designer/Business Owner Archetype"

- *Independent Jewelry Designer*
- London, United Kingdom

Bio

- Self-taught jewelry maker who started with a local lost-wax carving course 3 years ago. Transitioned from hobbyist to small commissions.
- Current Focus: Creates organic, chunky rings using traditional wax sculpting methods. Sells primarily to friends or friends-of-friends via social media like Instagram.
- Tools: Relies on physical tools (wax, files, polishing kits) and hand sketches. Open to but inexperienced with digital tools.
- Business Stage: Planning to grow the businesses and launch on Etsy but faces logistical barriers namely hallmarking costs.

Interests

- Handcrafted Jewelry Design (Chunky and Fluid rings design aesthetic)
- Prefers hands-on work such as wax carving, filing, polishing and perfecting finishes of the wax before casting
- Want to incorporate digital tools in the workflow such as digital sketching and AR try-on.
- Growing current small business more than through social media
- Scaling the business sustainability such as find affordable casting/hallmarking options and accessible information towards legal compliance and digital workflows

Pain points

- Transition into Digital workflows to storing designs digitally and overwhelmed by options to begin
- Sizing & Measurement where clients struggle to self-measure fingers accurately which can leads to costly remakes
- Resource Barriers whereas difficult to find reliable/affordable casters (no centralised digital network) and relying on third-party markings

Needs

- Visualisation tools to allow client see the design on them before send for casing
- Digital storage for storing hand-drawing sketches

Relevants Insights

- Prefers tactile creativity (ie. direct wax carving) over pre-planning.
- "Sending endless videos for sizing comparisons and envision design is exhausting."
- "It would be so useful if clients could design(rings) on their hands first."
- "I want to use digital tools for work but don't really know where to start"

User Journey 2.

Goals

Create unique handcrafted design in collaboration with client

Scenario

Design and create a custom chunky ring for client

Expectation

Smooth process from sketch to making tangible ring with clear alignments from client and minimal rework

Phases

Discovery	Design	Development (Casting)	Delivery

Steps

1. Discovery call/talk with client about the design they wants 2. Sketches some ring designs for client to choose 3. Request design confirmation from client 4. Ask client for the finger measurement	5. Prepare and purchase the wax 6. Start carving the wax and shape it based on the design 7. Send photos/videos to client for final design confirmation	8. Find available third party casters 9. Send the wax for casting 10. Wait for raw silver ring to be produced and return by caster 11. Snap, fill and polish the ring until the silver is shining	12. Send handmade ring to client via mail or in-person 13. Rework the ring again(optional, depends if measurement not fit)

Insights + Opportunities

• Prefer jump into 3D model instead of start from 2D • Want to utilise digital tool in the workflow but not sure where to start • “It would be useful if client can see the design on their hands before I cast them ”	• Finger measuring tool for client(Sizing Guide) • Digital storage to save sketches • Designer can share to client the ring design in effective way • Place to find available options for casters online

Overall Insights and Directions.

Based on data gathered from user interviews, personas, and journeys, I was able to define direction of my project by exploring solutions that align with initial project goals.

From these research findings, I concluded with a design statement within User Stories format that outlines the core paint points and guides the development of my design solution.

Design Statement

UX Designer User Stories

1. “As a UX Designer, I want to accelerate my process mainly in early process i.e 3D model and avoid too much context switching between tools so that I can test the idea quickly with low cost i.e time, budget”.

2. “As a UX Designer, I want the AR experience is available as share experience so that they can see similar experience like I see.”

Solutions

Images to 3D
- This can help them save time to create proof of concept model to show their ideas before refine further

Shared AR Experience
- This can help other people to experience the content develop by designer in the same space and also help to communicate their ideas of needs and wants

Jewelry AR Preview
- This help designers to share their ideas and get feedback while client can visualise how the design aesthetics of the jewelry clearly

Jewelry Designer User Stories

1. “As a Jewelry Designer, I want to share to the client to see the aesthetics of the design I envision before sending to caster so that I it can reduce the cost of rework”.

* All insights synthesise from user interviews transcription listed in appendix in page 33-39.

Designs, Iterations & Outcome

Crazy 8‘s.

Using insights from past research, I utilise Crazy 8’s exercise to explore interface design ideas.

Takeaways

I share ideas with peers to gather feedback and prioritize interface design that aligns with user needs and project goals.

Key design features include:

1. Preview Ring Aesthetics in AR

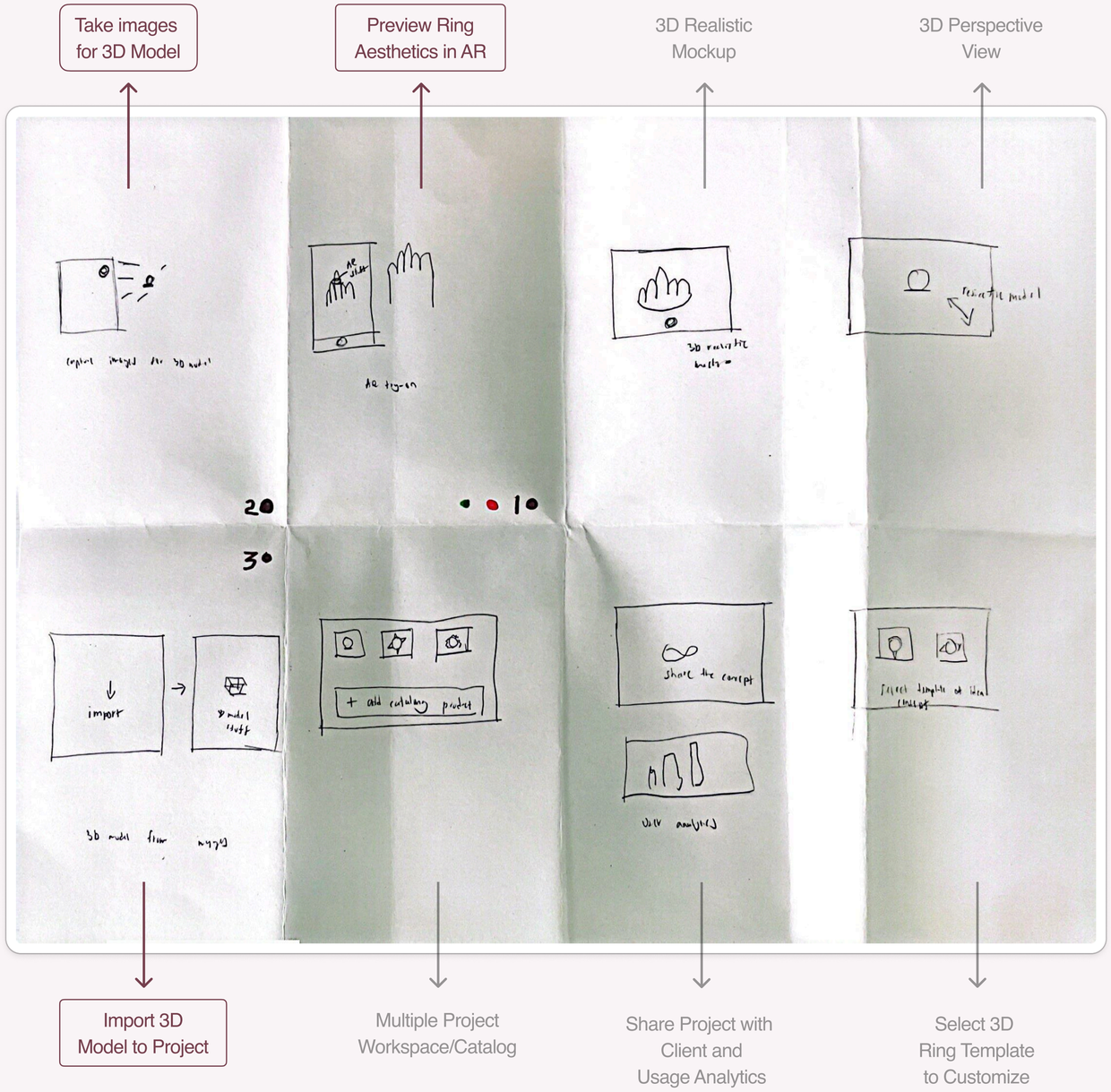
- Allow user preview and virtual communication of ring design.

2. Take Images for 3D Model

- Enable users to create 3D models from physical to digital quickly for rapid prototyping.

3. Import 3D Model to Project

- Allow user to use existing ring 3D models and share for AR preview.



Moodboards.

Reality Composer

Play

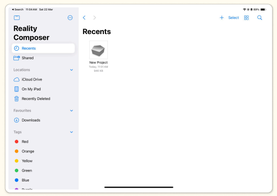
Mockup

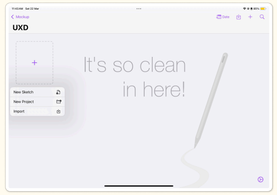
I drew inspiration from 3 apps to reimagine visual and interaction design of my platform's use interface. These references helped me explore the **aesthetics, layout structures** and **drag-and-drop interaction patterns**, particularly in how they organize and manage project workspaces.

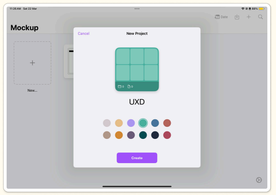
Type of screens I analyse for visuals and interactions design:

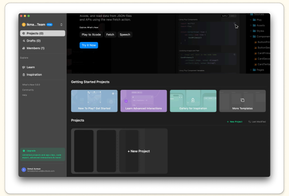
1. Project dashboard
   - Entry point for users to view, organize, and manage their projects
2. Create New Project
   - Layout for starting a new project with clear templates and options
3. 2D/3D Model Preview, Interaction
   - Interfaces with object manipulation, drag-and-drop elements in workspaces
4. Share the project
   - Export and share the work in various formats

Moodboards.



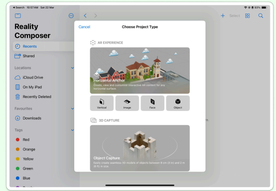


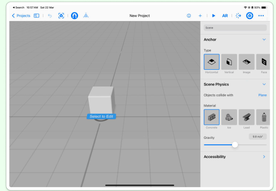


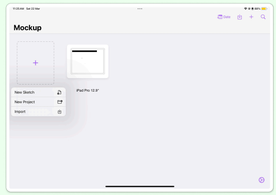


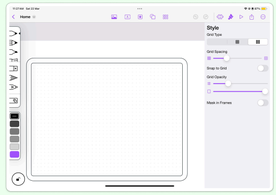
Project dashboard screen

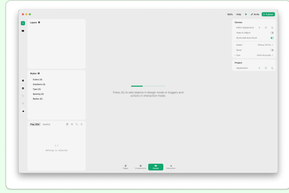
- The visuals heirarchy are clean and minimal, allowing users to focus on their workspace without distraction
- The subtle visual nudges i.e clearly labeled buttons, guide users towards creating a new project.

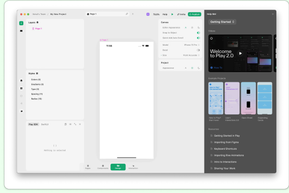








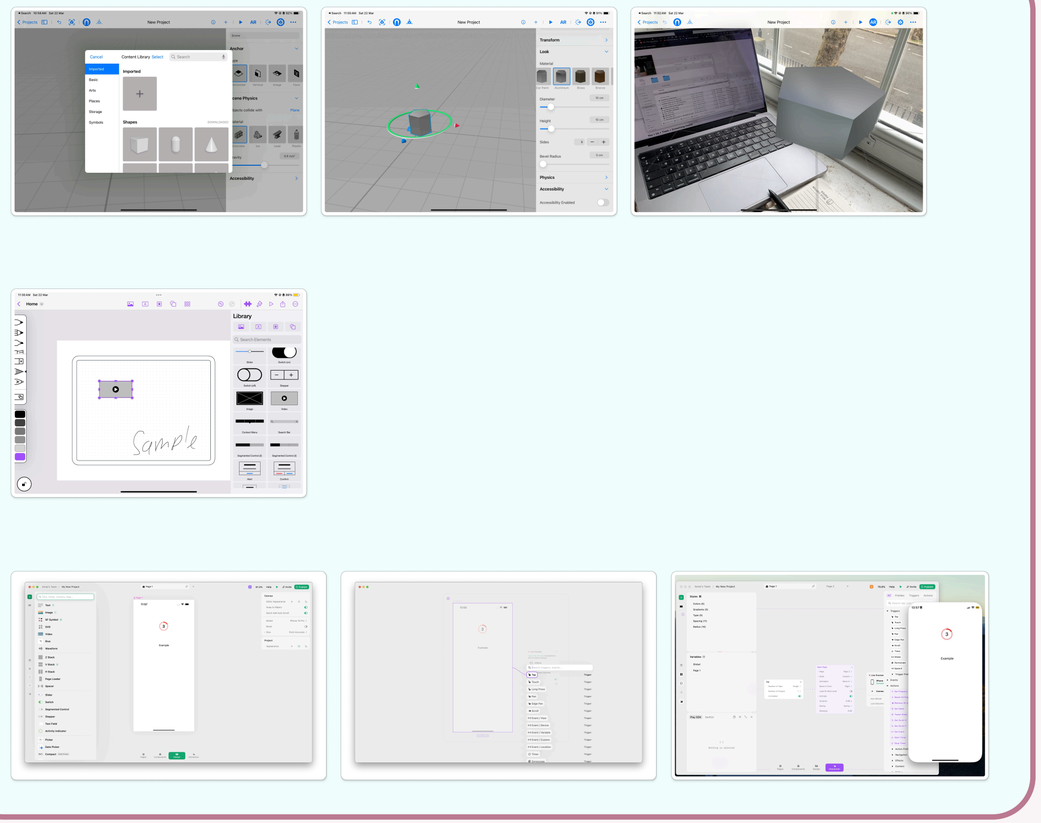




Create new project screen

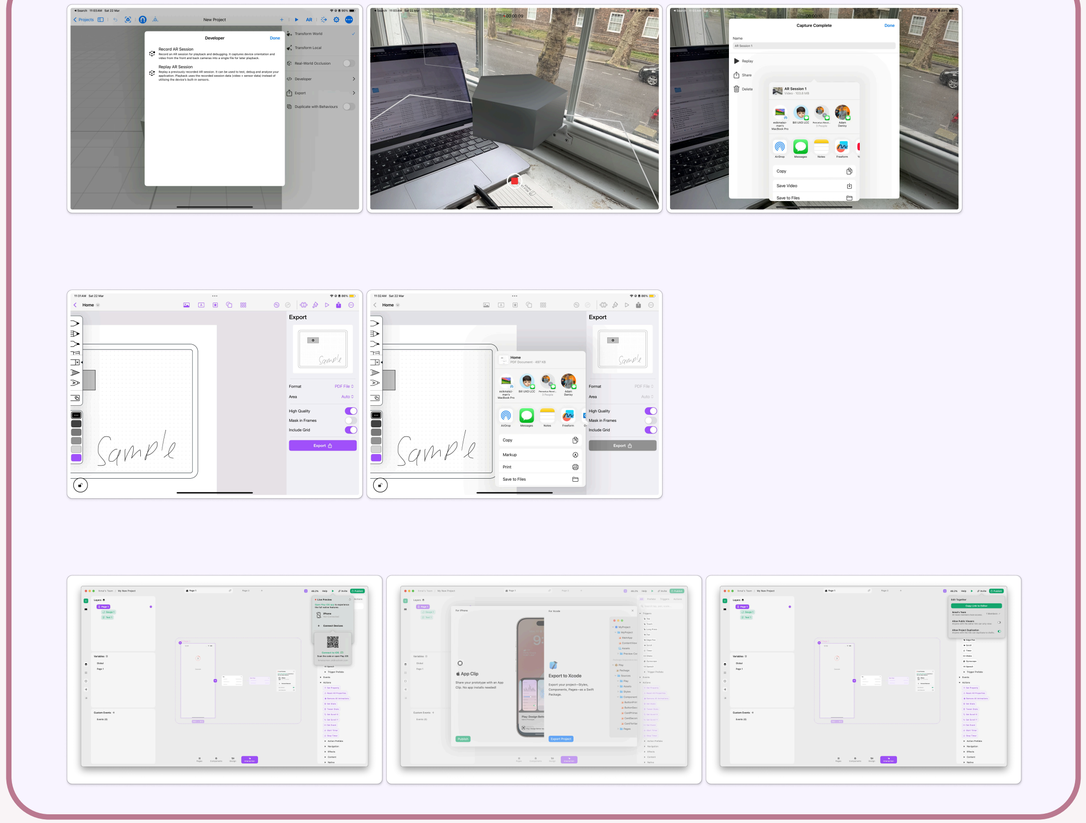
- The design patterns across these interfaces clearly provide users with context and guidance during project creation process.
- The visual previews, labeled templates informed users what actions they can do when starting a new project.

Moodboards.



2D/3D model preview and interaction screen

- The interface presents available elements that users can drag and drop into their project, make it easy for users to create their prototypes or designs while receive immediate visual feedback.
- The sidebar and navigation bar display configurable options, enable users to adjust the project settings without cluttering the main workspace.



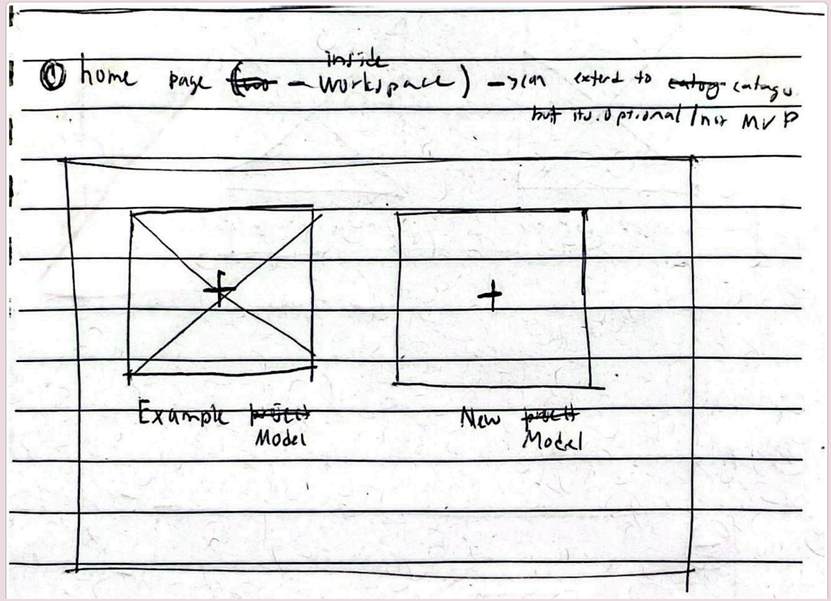
Share the project screen

- These 'Share' interfaces offer users a variety of export options i.e videos, images and QR codes, giving the flexibility for user to share their ideas in the format that best suits their needs.

Wireframe.

After previous exercise, I identified key screens to wireframe and analyzed each one to distinguish essential elements from nice-to-have features.

1. Project Dashboard Screen



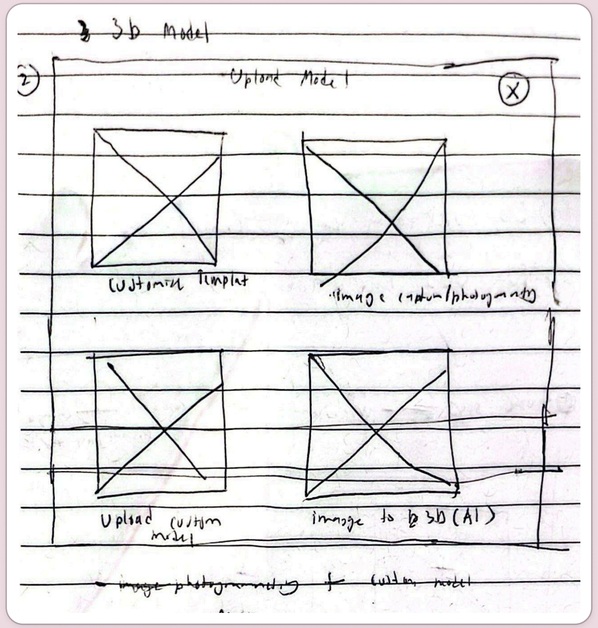
Essentials

- Add 3D Jewelry
- Example 3D Jewelry

Good To Have

- Project Workspace (Can handle multiple client projects)

2. Upload or Create 3D Model Screen



Essentials

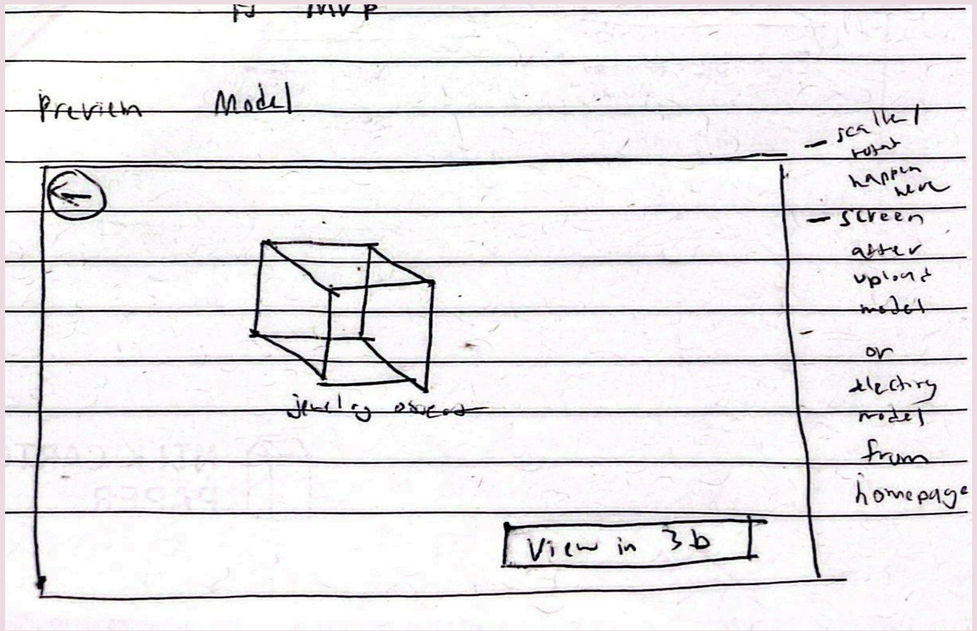
- Photogrammetry
- Upload custom models

Good To Have

- Project tips for each model creation methods
- Customise Jewelry from Template
- Image to 3D (AI)

Wireframe.

3. Preview 3D Model Screen



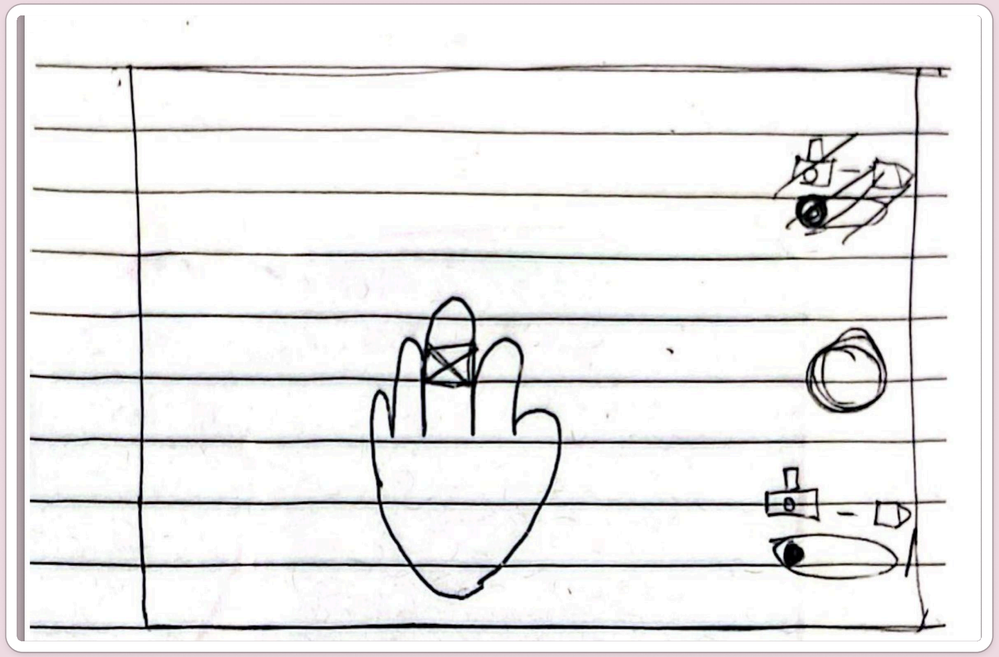
Essentials

- 3D Model Preview in non-AR scene
- CTA to View Jewelry in 3D

Good To Have

- Model Scale & Rotation
- Hands image template to vision how it looks on hand before see in 3D

4. Preview 3D Model in AR Screen



Essentials

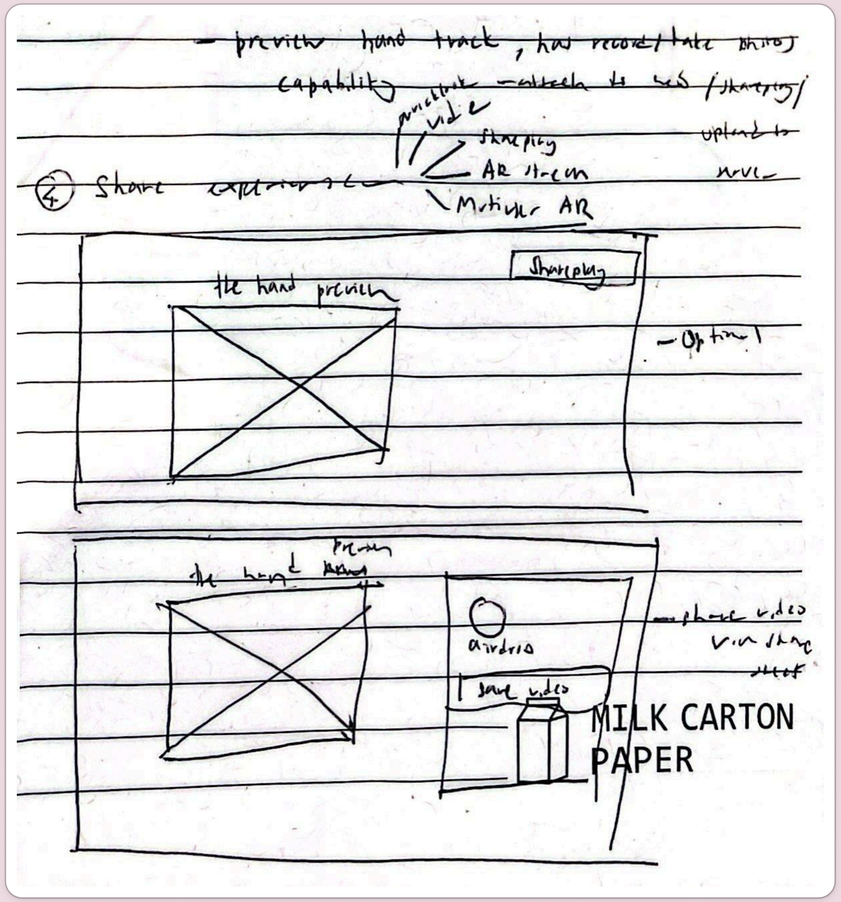
- AR Ring Preview on Finger
- Capture/Record preview image

Good To Have

- Can switch preview between jewelry available in catalog

Wireframe.

5. Share AR experience for Try-on Screen



Essentials

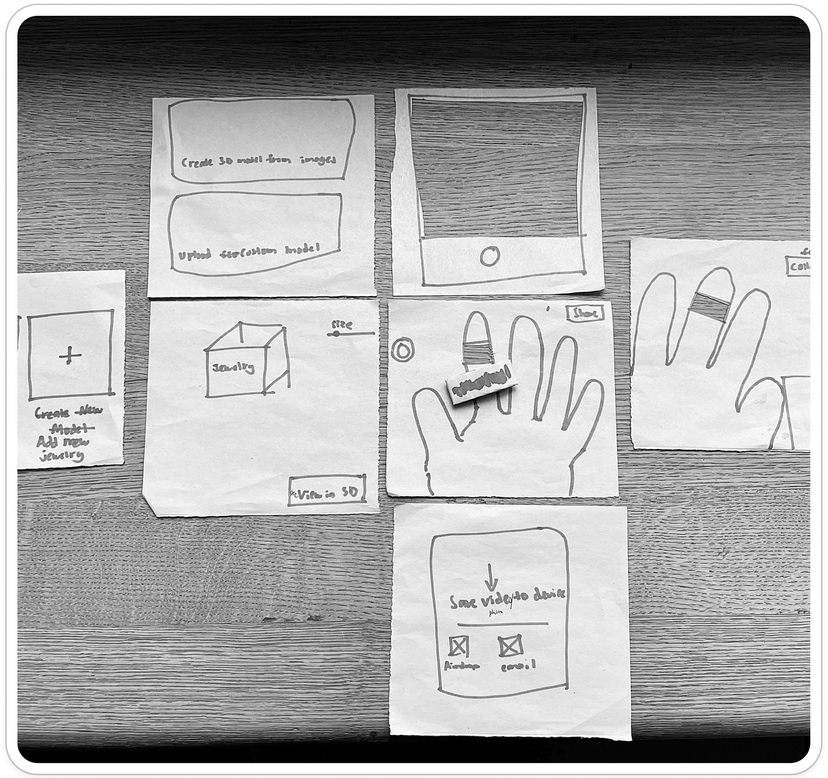
- Save or Share Image/ Video to others (Airdrop, etc..)

Good To Have

- Shareplay (Shared AR experiences and transfer files, 3D model to others)
- Host 3D model online and share link for preview in App Clip/ Quicklook
- AR Stream or Multiuser Experience

Low Fidelity + Paper Prototype.

Next, after creating initial wireframes, I transition from digital sketches to low-fidelity paper prototypes to bring the interface into a tangible form. To validate concept, I conduct informal usability testing to gather feedback on the core idea and user flow.



Screens of paper prototypes

Usability Testing Feedback

1. Tooltip for each function i.e onboarding to inform user the function.

2. Changing the size/variable during preview in 3D make it more senses and interactive.

3. Add clear visual graphics for the jewelry example object in Home page.

High Fidelity

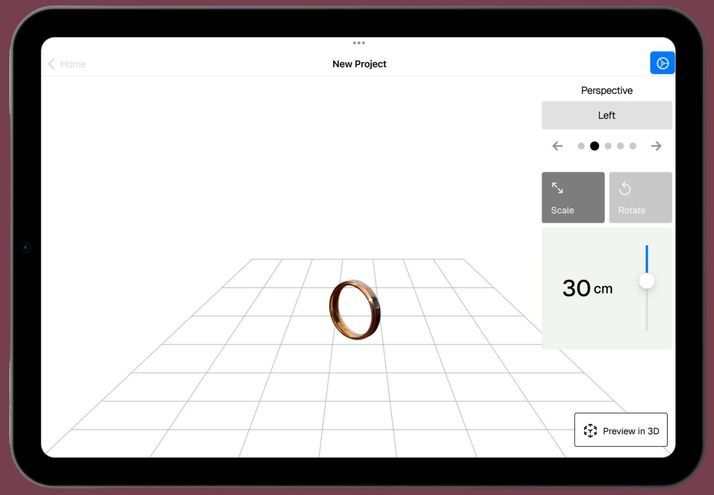
I used feedback from wireframe, low-fidelity mockup, and paper prototype to create 1st high-fidelity design. To speed up visual development, I used Gumroad Design System due their design emphasize creative freedom and flexibility which align with my project rationale, democratize content creation for AR.

Key Features

Create

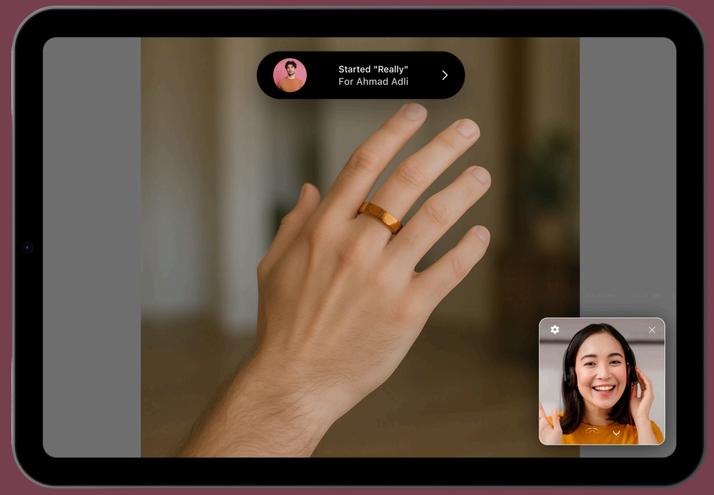
Screen of Creating 3D Model for Jewelry.

Preview



Screen of Viewing 3D Model.

Share



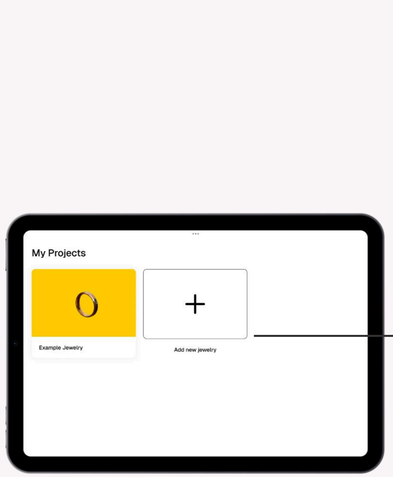
Screen of Share AR Experience for Try-on.

* Demo Videos of App Walkthrough:
1. Ikmal Azman (2025) Create - really app prototype walkthrough. https://youtu.be/MctvxWpajnU
2. Ikmal Azman (2025) Preview & Share - App Prototype Walkthrough https://youtu.be/V1cQMFxlY5U

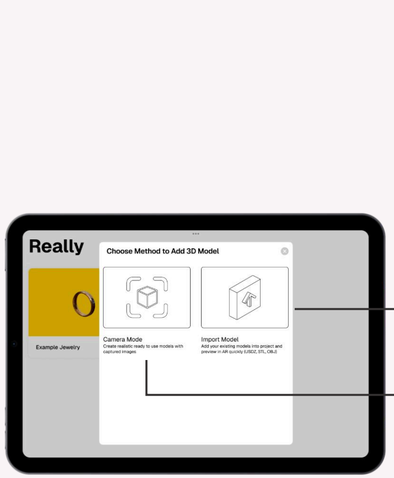
High Fidelity

Screen Flow: Create

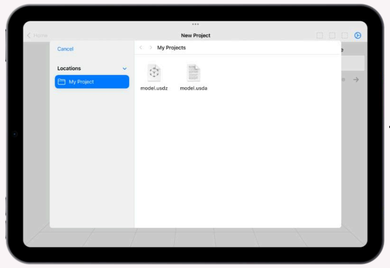
This feature allows users to create 3D Jewelry models from physical objects using Camera Mode which ideal for rapid prototyping. Alternatively, they can upload existing 3D models into the app.



Screen of the Project Dashboard.

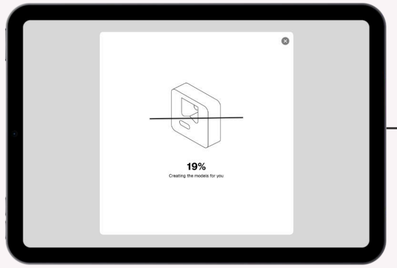


Screen of the Method to Create 3D Model.

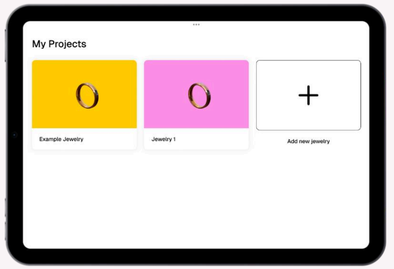


Screen of selecting 3D model file to import.

Screen of capturing images to create 3D model with Photo mode.



Screen of the app is creating a 3D model.

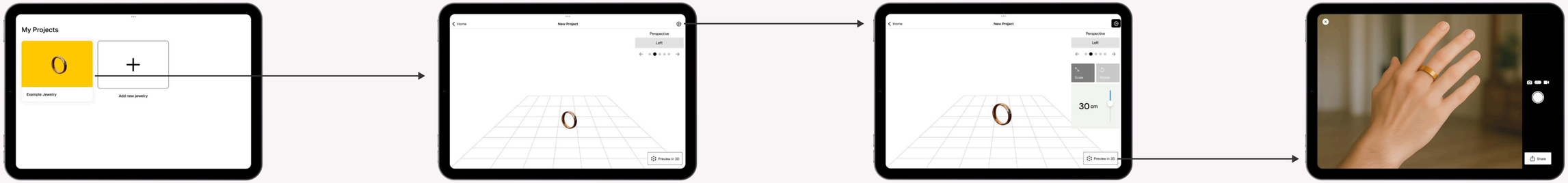


Screen of created/imported 3D model in Project Dashboard.

High Fidelity

Screen Flow: Preview

This feature allows users to preview 3D jewelry models in Augmented Reality (AR) to evaluate the design aesthetics, and also adjust properties such as scale and rotation in a non-AR environment.



Screen of the Project Dashboard.

Screen of previewing Jewelry in non-AR scene.

Screen of adjusting scele Jewelry during preview.

Screen of previewing Jewelry in AR.

High Fidelity

Screen Flow: Share

This feature allows users to share the AR try-on experience for Jewelry with others, enabling collaborative feedback. It lets other users visualize the design in real time and provide input during experience.

Screen of the Project Dashboard.

Screen of previewing Jewelry in non-AR scene.

Screen of previewing Jewelry in AR.

Screen of modal interface to share AR experience with others.

Screen of share AR Try-on experience for Jewelry.

Usability Testing

Overview

To evaluate the usability and visual hierarchy of my high-fidelity design, I conducted tests through both in-person sessions and remote testing via Maze. Participants need to complete the tasks using interactive prototype which allows me to observe their interactions, identify pain points, and gather actionable feedback.

5 Participants

- 1 Jewelry Designer
- 4 UX Designers

4 Tasks

1. Preview a 3D Jewelry Model in AR
2. Create a 3D Jewelry Model Using Camera Mode
3. Upload a 3D Model of a Jewelry
4. Share Your Jewelry for Others to Try On

Key Insights

1 Clean Visual Design

5 Users found the interface simple, clean, and easy to navigate.

2 Share Feature Hard to Find

2 Users struggled to locate share option, to suggest place it in dashboard.

3 Unclear Labels

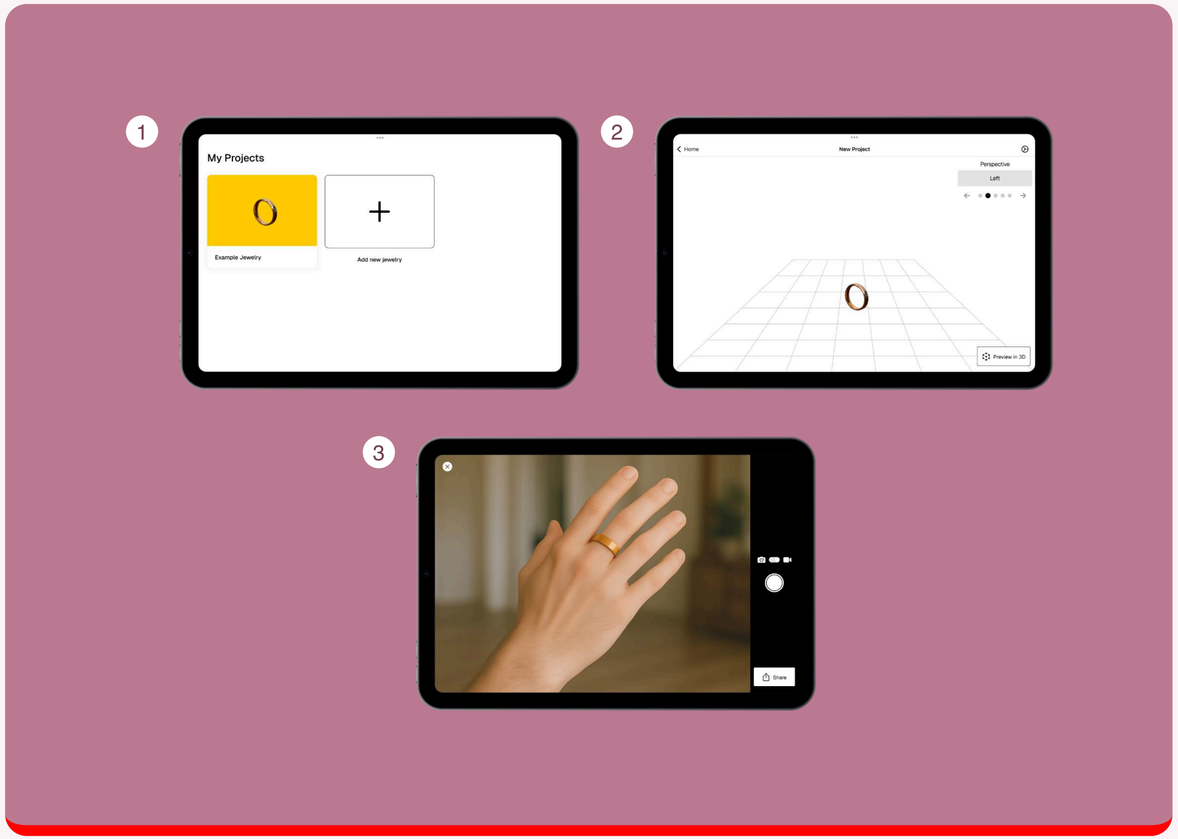
Terms like "example ring" were confusing, recommend to make it clear.

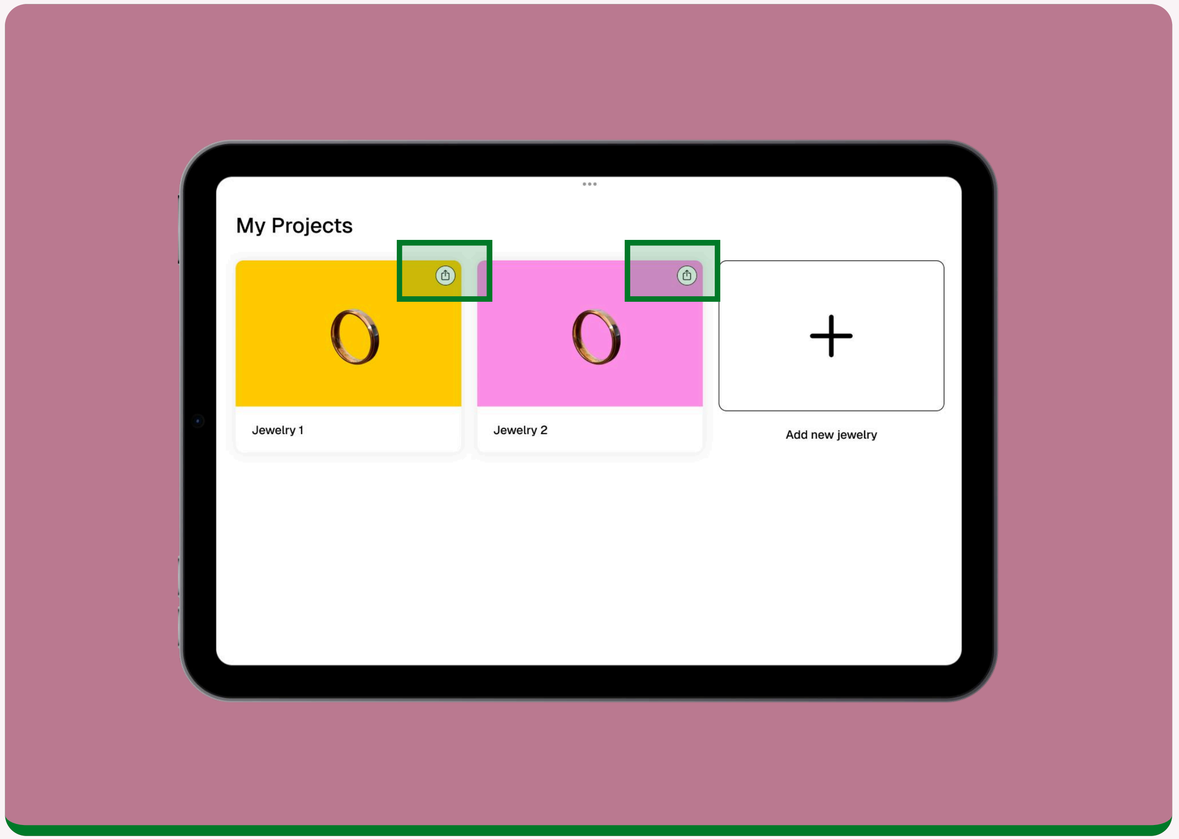
* All reports from usability testing listed in appendix in page 40-41.

Final Design + Iterations

Based on feedback I received from usability testing, I refined and iterated on design to improve clarity, navigation, and feature discoverability .

1. Improve the discoverability of Share option



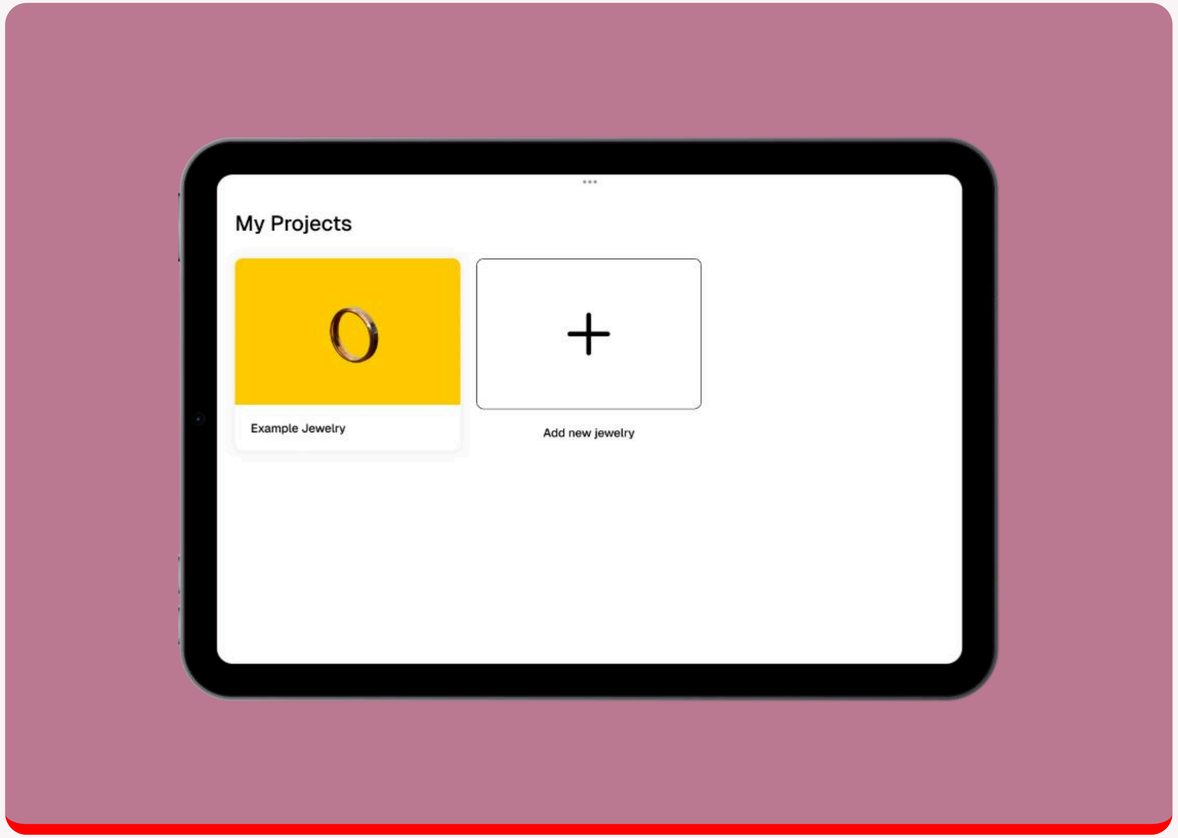


❌ Share option was hidden in nested navigation, which made it difficult for users to find and use efficiently.

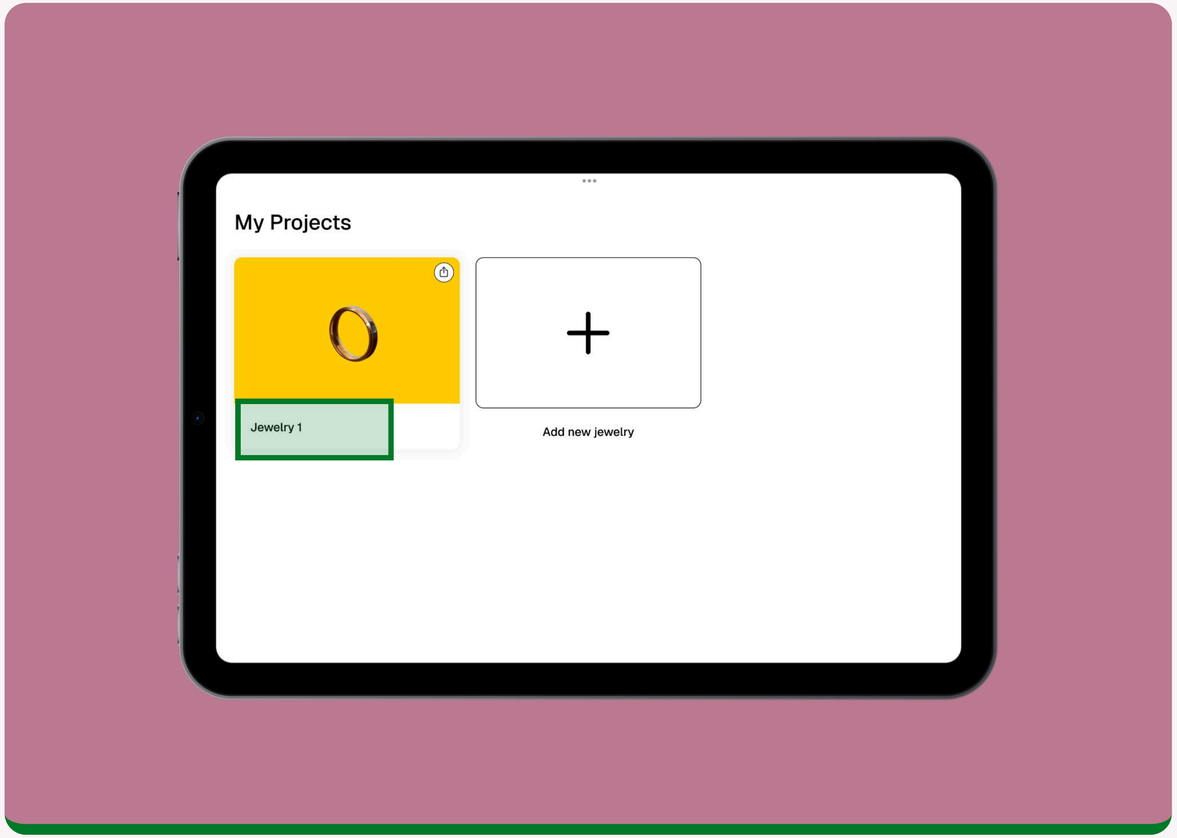
✅ Share option is placed in both the Dashboard and AR Preview, giving users flexibility to choose when and where to share.

Final Design + Iterations

2. Refined UX writing for labels



❌ The example jewelry project in dashboard was labeled "Example Jewelry," which confused users and lacked context.



✅ The label was changed to "Jewelry 1" to clearly indicate it's a sample project, making it easier for users to recognize at glance.

Reflections

Outcome

As I worked on this project, the design solution successfully met the early goals I had set.

1. This was evident during user testing, where participants found the interface easy to use and engaging. These confirms the idea that using a drag-and-drop interface can lower the entry barrier for creating AR experiences, even for users without technical skills.

2. The platform proved effective for rapid prototyping as users able to create, preview 3D models for AR directly without needing to code, making the process faster and accessible.

3. Early design revealed usability issues.The participants had difficulty finding the option to share their AR experience, which is hidden in other screens. I originally assumed this option only happen during AR preview stage, but users expressed they also want to share their experience earlier in the process.

4. I made several design iterations. I added share option directly accessible from the project card on the dashboard and renamed default project from “Example Jewelry” to “Jewelry 1” to make it clearer.

Opportunities

- Further develop the platform into a fully functional application with more time and resources.
- Expand the experience beyond iPad to devices like Apple Vision Pro, which offers higher-end capabilities for spatial computing and AR interactions.

Appendices.

User Interview Transcripts - AR/XR Lead Engineer Part 1

Roxana 0:18
Yeah, sure. So I my background is in mobile development. So I used to be an iOS developer for, yeah many years and then I transition into specialising in augmented reality and that was pretty much triggered when I think it was 2017 with Apple released the AR kit.
And I had to try at it and I really loved it. And I saw the potential of augmented reality.
And since then I was always kind of like trying to learn more.
And participate at conferences, write articles and I was working at this agency where I was part of the technical team, but we didn't have a department for augmented reality and I was keep pushing for it for it. And I was like, getting more senior into the senior role.
I managed to start a practise that focuses on augmented reality. It then turned a bit into virtual reality and metaverse as well. Just because it people were grouping those together.
And I worked on a few projects with augmented reality. The first one was.
There was like.
Auto lifts company from from Europe, where they had this experience where you would place the auto lifts in your space. So for example if your car mechanical car owner like the car shop, you would be able to see this equipment in your space and look at the details of it and understand if it fits and if you should order it because this company didn't have showrooms so they just wanted to make it easier.
To to go through that process.
I've been and then I've been doing some other stuff as well, a lot of prototyping. I I remember there was at some point a request for a project with jewellery, but this was a few years back when essentially a company that does jewellery wanted to make an AR experience to try their jewellery but it was quite expensive to at least expensive for them to make the 3D models.
Replicas of Apple jewellery so they didn't proceed with that. That was kind of like a deal breaker for them at that point.
And actually since then we have seen.
Quite a lot of advancements in photogrammetry where you kind of can capture an object. I don't how well that works for jewellery because it's usually small and and I think it will be maybe it'll be interesting to just give it a shot and see if I can scan some of my jewellery after this.
But as you probably maybe already know, photogrammetry you just that's another way to create models and you just use your camera to take pictures and it'll make a reconstruction of that.
And then I've been doing some some other stuff right now since last year I was.
I'm now running my own studio. I would say together with an all colleague, and we only focus on Apple Vision Pro and spatial computing, so we're still trying to figure out what we do, but we wanted to be essentially makers first and we wanted to have a project that we start building on and really learn about Apple Vision Pro.
Have you tried the Apple vision pro?

Roxana 3:49
Yeah, ever since I started being interested in augmented reality, I was waiting for this kind of device and not the the one on the phone, but that has its own use cases as well. And right now we're doing an escape room style game for Apple Vision Pro 'cause. We just wanted to do like a game so we can test and use all the features of the platform, and there's a lot of art and storytelling as part of it, so.
That's kind of like what I'm focusing my full time on it.
Right now.
know.

Roxana 5:31
So we're we're spending quite a lot of time right now to also figure out the best like we call it like the pipeline, right of how you go from idea to something you put out there.
And we've been trying to use AI as well. We've been to our process. So if I would give the exact the the example of what I'm working on right now, when we started to build this experience, we went to a mid journey to kind of make some concept art and that was very helpful for us because you know when you speak with somebody and I was like, yeah, you imagine something, it's a very high risk that when you actually do it.
Might not be the same thing that you had in mind, so to avoid for example, my colleague to go and do the design of the environment, the the design of the 3D assets and then for me to be like oh, but this is not what I had in mind. We put our thoughts into into mid journey and we make these different variations and we we said OK this is the one we're going to try to follow this concept art and then develop all the work on top of it.
We started with Blender in terms of modelling.
And.
It turned out to be quite limiting for us. You had to install a lot of extensions to be able to do what we wanted to do. I think my colleague counted like 90 something extensions that we had to install, so it was very difficult.
And then we switched to Houdini, which is a much more advanced.
It's actually using in a lot of industries, not just what we're doing but it's, but in the same time it has been really, really good tool for us.
And we're trying to also use make use of procedural.
Modelling right. So there's like different ways to do modelling when we're trying to use procedural as well, which has been interesting. And then once we have the assets.
We take them into reality composer Pro and Xcode and then add a layer of interactivity to it.
Reality composer Pro has been good, but the more you, the more you at. You need something more advanced.
Turn out for us to be better to just handle it in code and not in the reality composer Pro. But it depends on the use case. Actually, a few weeks ago we went to China to the Let's Vision Conference where we had an A booth with our game and we also did a talk about our pipeline and the process and I can share a video with you if you want to look because my colleague goes into even more details of that.
And examples of Houdini and how it's connected then in the code, if you want to have a look.

Roxana 8:26
Yes, yes, yeah.
It was very, very, very, very good last year. They've done only vision OS and this year they extended to like all Apple platforms.

User Interview Transcripts - AR/XR Lead Engineer Part 2

But there were a lot of people from the vision OS community, so that was very good.

Roxana 9:15
Mm hmm.

Roxana 10:05
I think, yeah. So I think Houdini is we're big fans of it because of what we can do with it. And then Xcode is pretty much the core, the, the, the foundation and and everything with it.
There is some tools that we haven't explored enough, and that's more for prototyping actually.
And I can send you some links. I haven't tried them yet because yeah, you just feel like you want to.
Into it, but it's also the the barrier of learning new tools. But it's the whole idea of being able to do faster prototyping, and I guess that's the purpose of your project as well. And yeah, I can send you some of those links, some of those tools, if you want to check them out. And there is this concept that we already use. And I think those tools are great for it. It's called like blocking.
Where you.
Before you go and build something.
Complex and in detail you maybe it's sometimes it's enough just to put like a a sphere or a cube or something.
Just to get an idea of how that will be and also I want to ask you, are you considering this to be like a like an iPhone Android experience or are you looking into Apple Vision Pro as well?

Roxana 11:35
Mm hmm.
OK, because what I want because I want what I wanted just to also mention is that we are we are building this experience multiplayer and it's kind of like the best and the worst decision we make for the project. The best is like this is really, really great for collaboration Co presence. It's really great device for that. Well, I think when it comes to your use case, the jewellery.

Roxana 12:21
Prototyping and everything, I feel like there's.
Really, really that a lot of value into making this some sort of like shared right and even in in a iPhone or iPad, you can look into group activities or something that where people from remote location they can kind of look at the same thing.
And and play with that again, I'll. I'll make some notes as well and send you some more resources.
But I would highly highly recommend it, because it's one of the most, maybe underrated at the moment, but very, very valuable when it comes to using augmented reality for stuff like this for prototyping.
And and yeah, and it's what what is really great is that if you if you develop your experience right with let's say reality kit and stuff like that, you can then at some point if you have access to Apple Vision Pro you could extend it to that as well. And then maybe if you even put it as default to be on Vision Pro as where I can test it if you want to have some I have an Apple vision pro.
So yeah, that's very interesting and.
What I'm not too familiar with is the actual process of jewellery design. So maybe if you give me like a really quick like note, if you've done some research on that, maybe I can even give you more ideas in terms of what you could use, right?

Roxana 14:01
Mm hmm. Mm hmm mm hmm.

Roxana 14:15
OK, the rings.

Roxana 14:19
And and do you know when, when, when they make this kind of designs?
Is it? Do they use like shapes or do they like kind of maybe use the technique of like kind of even sculpt sculpting stuff or?

Roxana 14:40
And.
Mm hmm mm hmm.
What I have in mind for for something like this is if you know those like Arkansas drawing experiences.
You could have something like that being used for actually for this and then if you have the right brush.
It doesn't have to be like a solid, you know, kind of like circle brush. Maybe there's something that is very specific to jewellery that could work and maybe imitate some of the materials and how it looks, because I've I've there's some apps that I've been following.
And when you think of those apps, the drawing apps, the drawings, your space app, they seem very I don't like, it's just something you would do for fun. But when you actually go to use it, a lot of people are using it for prototyping and and stuff like this.
There's an app called Cray Crayola, I think.
Where she does, there's a podcast, very short podcast. I can send you that where she speaks about this and that. She was so surprised that she did it like a drawing app. And then people were using it for prototyping.
And a few years ago, I did this shared experience at the Museum of the Future. We there was an event we were celebrating between some diplomatic relationship between UAE and Japan, and I had to do an experience that would make sense for this team. So I was thinking, OK, what do UAE and Japan have in common? And that's calligraphy and this very intricate calligraphy.
Things that they do in art, it's it's an art in itself.
So I use HoloLens and I had an artist in Museum of the future.
And one artist, calligraphy artist in Japan, and they connected to the same drawing. It

User Interview Transcripts - AR/XR Lead Engineer Part 3

was. It was already a tool that was on the HoloLens. It was not that great, but it would. It was proving the point, and they just used this drawing tool that they had in there to make the calligraphy art in the same space live together. That was kind of like a pretty fun experience. And when I was looking at this podcast and I saw this girl talking about all this.
Variation of.
Use cases you could have for something like this. I was thinking imagine having a brush and maybe even she mentioned it but having a brush that is specifically for calligraphy so maybe I don't know if if that's what you're looking for, but maybe that's some points of inspiration you can look into because I imagine that's like.
And I think Apple has some demo projects you can you can already check out with this drawing experiences. They I know for sure they have one for vision OSI don't if they have it for iPhone you can go and check that out. I'll send you the link and yeah and maybe you can find that brush right to use.

R Roxana 18:35
Mm hmm, I used quite recently. We have some friends who released a tool called scenery and it's kind of the same mission to lower the barrier to do AR experiences. I played a little bit with it.
Oh, sorry, just.

R Roxana 18:58
Sorry.
Scenery. Yes, it's envisionos. I don't know if there are. Yeah, they just released. I think they're from Germany and.

R Roxana 19:13
And yeah, they I I tried that one. It's very interesting.
It doesn't really fit my needs. 'cause we're doing all this natively ourselves, but I can see the potential for people to to use it, and then we we think back of tools like

Spark, Arkansas and all this AR phase philtre tools from Facebook.
Snapshots, Snapchat and even Tiktok. They have these tools which lowered the barrier and I think that's good. You just need to understand the audience of who you would use, something like that, and it's usually something like artists and people who don't even have the interest to go into the technical stuff.
There's also a really cool app from China that I learned when I was in China. It's called story, which is like a storytelling is really I really enjoyed some of the content they have there.
But I think those are good, right? And it allows artists to just do something without being technical, right? So that's really great.

User Interview Transcripts - Jewelry Designer Part 1

Louisa Borneman 0:13
Yes, I'm quite new to join making. I've probably started like.
I did a course about three years ago and specifically like lost wax.
Like the lost wax method of like jewellery making and that was just a little small cause, my lady. You know I live and then that kind of turned into a hobby. Slightly expensive hobby of making my own rings with friends and things. And I've just started kind of being commissioned by friends and I've just started kind of selling them and things.
So yeah.

Louisa Borneman 0:55
Yeah. So it's quite chunky rings and the methods like lost wax carving. So you carve it kind of in wax 1st and this means you you've locked freedom with it's kind of like making these mini sculptures out of wax, which you then get sent off and get cast. So this is one of my rings. You can see it's like quite chunky and quite fluid form.

Louisa Borneman 1:17
Yeah, yeah.

Louisa Borneman 1:32
So far, it's one by one, but I would love to kind of start setting up an Etsy sometime soon.
But yeah, it's really like a one by one basis because as I said, it really is like a hobby and an expensive hobby.
And that I can't really make a bunch of rings all at once at the moment without knowing I've got someone to sell them to you straight away.

Louisa Borneman 1:54
Yeah, I'd like to have to make you one. And there's a lot of freedom with it. Like, obviously I like I have my own style and mine kind of designs and things, but people can really also decide what they want and like, help me, like in the design processing. That's like a lot of freedom in it, which is really nice.

Louisa Borneman 2:14
I think you'd see that.

Louisa Borneman 2:38
Yeah. So it kind of changes if I'm working with a design with someone like if it's been commissioned, I'll really start talking to them about it, create some sketches and things first.
And then, but also like if I well, sorry, I'll start with that if I'm designing it with someone, I'll talk with them about it. Maybe they'll see something I've made before will kind of just design it some sketches. It's kind of like a back and forth for a little bit and then I will buy the wax and you can start carving into the wax and making it and everything and use all these different files. You've got to make sure it's super smooth, super smooth and.
Kind of exactly how you want the ring to be once it's cast like you can't have any scratches in the wax or anything like any little marks, because that will all get picked up on in the silver and it's a lot harder to file it off the silver once you get it cast from then on. I I used to go to this casting place in London, but I've started actually sending my rings or like the little wax.
Carvings to a pace of Birmingham where they because they do student discounts and they've just like that's a bit cheaper.
And they'll get it cast there. And they also hallmark it for me, which is quite important if you want to sell your designs and a lot of jewellery designers kind of make their own hallmark, which they ask casters to then stamp onto the designs. But I'm not at that stage yet because it's quite expensive to make your own hallmark. So this place, like hallmark it themselves, which is really nice. And then.
They will send the ring back to me, but the ring is kind of in this very raw state, so it will be cast into the silver, but it has like.
Like because of the lost lost wax carving methods.
All the rings are kind of hung on all the wax rings are like hung on to this tree and then then get cast and snapped off and sent to me. So lot of the rings like this will have like little branches coming off. So you've got a like file that all down and then yeah and then it's a big like filing and polishing process because the metal also comes back like a really dull colour and you've got to file it file it and Polish it and push it until it comes all shiny again and you've got to work through like lots of different filing.
Gradients. And then yeah, that's kind of the finished thing. Get it sent off.
But if I'm making my own rings, like sometimes I'll start sketching that out first. But I really like to just file straight away. That's kind of the way I work is more 3D rather than drawing it 2D first and then work out designs. I prefer just to kind of start going straight away and learning the shape kind of unfold itself I guess.

Louisa Borneman 5:27
Hallmark it's a hallmark. So it's like on most on silver rings and stuff.
They'll have this tiny like little like this one says 95. Like, you can't really see it in the camera, but it's got this.

Louisa Borneman 5:43
Yeah, just to prove like what metal is left?
Yeah. It's to kind of prove what metal it is and like who made it. And then it means, like, you can't, you can't sell it online or on like business. Like you can't sell it through businesses or online or anything unless you do this. So I've kind of gotten away with it before because I'm just selling to friends. But if I want to start putting it on Etsy and things and selling it to people who aren't my friends and things you've got to, you've got to do it. Otherwise, it's legal.

Louisa Borneman 6:34
Yeah.

User Interview Transcripts - Jewelry Designer Part 2

Louisa Borneman 6:43
Yeah. So I'm more on for paper and pen kind of person and very old school. I'd love to. I'd love to experiment and start using doing it digitally and stuff. I just don't really know where to start. I think it would make my life a little bit easier because then as well I could store all the digital stuff in one place and everything rather than just these little loose sheets of paper. But yeah, I haven't worked out really how to do that yet.

Louisa Borneman 7:14
No, no, no.

Louisa Borneman 7:43
Yeah. So I normally kind of advertise on my art Instagram.

Louisa Borneman 7:49
It's not the best method. I'm in. Yeah, I'm in the process of setting for website for my art. I'm in the process of I'm not really in the process yet, but I'm wanting to set up an Etsy but so far because it's really just like 3 friends or friends of friends. It's the only people I've been selling to. It's just through Instagram. I put up all the like designs I've already done and things and that seems that seems to have kind of worked for me so far.

Louisa Borneman 8:16
Yeah, hopefully.

Louisa Borneman 8:40
Yeah. So.
Yes, recently I was sending to my friends, asked me to make a room for her friend's birthday. So it's a friend of a friend, and that friend loves the ring and everything and then wanted me to make the matching one for her boyfriend, which was great. So I have to do that.

Louisa Borneman 9:07
And there was we kind of adjusted design to fit the boyfriend everything. But when I asked them to give me a measurement, they weren't really sure how to correctly measure finger and everything. She wanted it to be surprised. So she kind of just told me the same as.

Louisa Borneman 9:21
Spring is the size as the last one I've made.
Like the same size and everything, but because I hadn't had like a set measurement, I kind of did it roughly. And she's like, oh, make it a little bigger though. And it was, I don't know, it was really frustrating that the measurement wasn't exactly right. So I made the ring and sent it to them, and it was too small on the wrong size.
Which is just so annoying. So I had to get them, send it back and I'm now making him a new ring, a little bit bigger than the one I made, but it's just really frustrating. Because I don't have a lot of money to be doing that, but I also, you know, it was a commissioned ring. I want to make sure it's perfect and right, but that definitely was some kind of miscommunication about the sizing and how to correctly measure your like your ring finger and everything. So it was just a little frustrating and a little bit of money wasted. And then I'll be able to sell the ring, I'm sure. But yeah, it's just annoying a little bit.
Yeah, I think that's mainly my. That was the kind of the biggest problem so far. It's quite yeah, as it's a hobby, it's quite experimental and everything anyway, so any problems that do come around are just, I think, just part of the learning process and everything. Yeah, there's been no major problems yet.
Apart from that.

Louisa Borneman 10:54
I yeah, there are tools to measure.
Yeah. Yeah, no, I haven't tried the digital ones, but yeah, I literally I like, I personally have these little this like ring tool, which is, yeah, it's like a ring measure. And you put on all these little plastic rings and then you whatever one fits while you size it on to the ring size it and it's just so easy. And I wish everyone had one of those at home because it would make my life a lot easier.

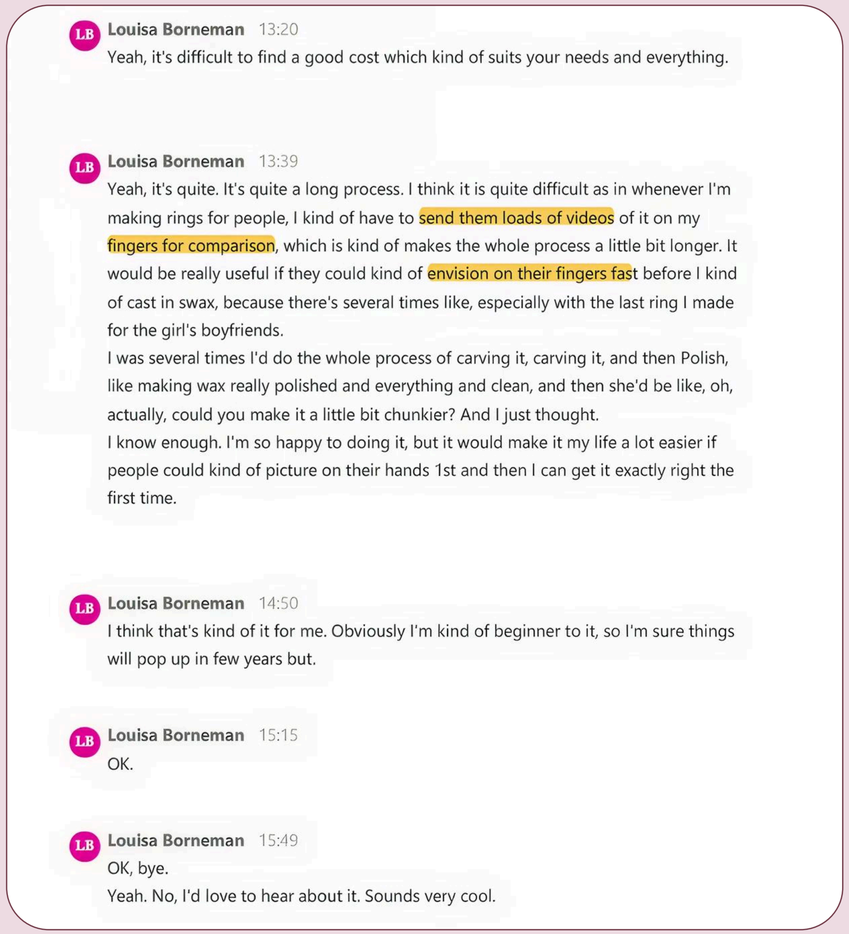
Louisa Borneman 12:05
Well, yeah, I'd love to try digital sketches that digital measuring tool.

Louisa Borneman 12:11
You mentioned would be so useful, and I'd love to understand people that.
Yeah, I'm trying to think.
Cancel.

Louisa Borneman 12:24
I was saying I'm not. Yeah, I'm not too, exactly sure what you mean by digital tools, but I'm just trying to think of anything digital. Like it's quite hard to find.

Louisa Borneman 12:33
Casters for for lost wax casting and like I've tried doing it in the Netherlands when I was on exchange. That and it was impossible. I had to send it to the UK like there's not really a good list of.
Like, it's not like a good network list online of like these are good like, these are the people who do lost rights casting and it's quite a complicated thing to find people. And I managed to find this place in Birmingham, which does actually in discounts through word of mouth like I can if I looked it up online, it would have been a bit harder to find. I think so, yeah. I don't know if that counts the digital at all, but like a digital network would be really nice.

User Interview Transcripts - Jewelry Designer Part 3



Louisa Borneman 13:20
Yeah, it's difficult to find a good cost which kind of suits your needs and everything.

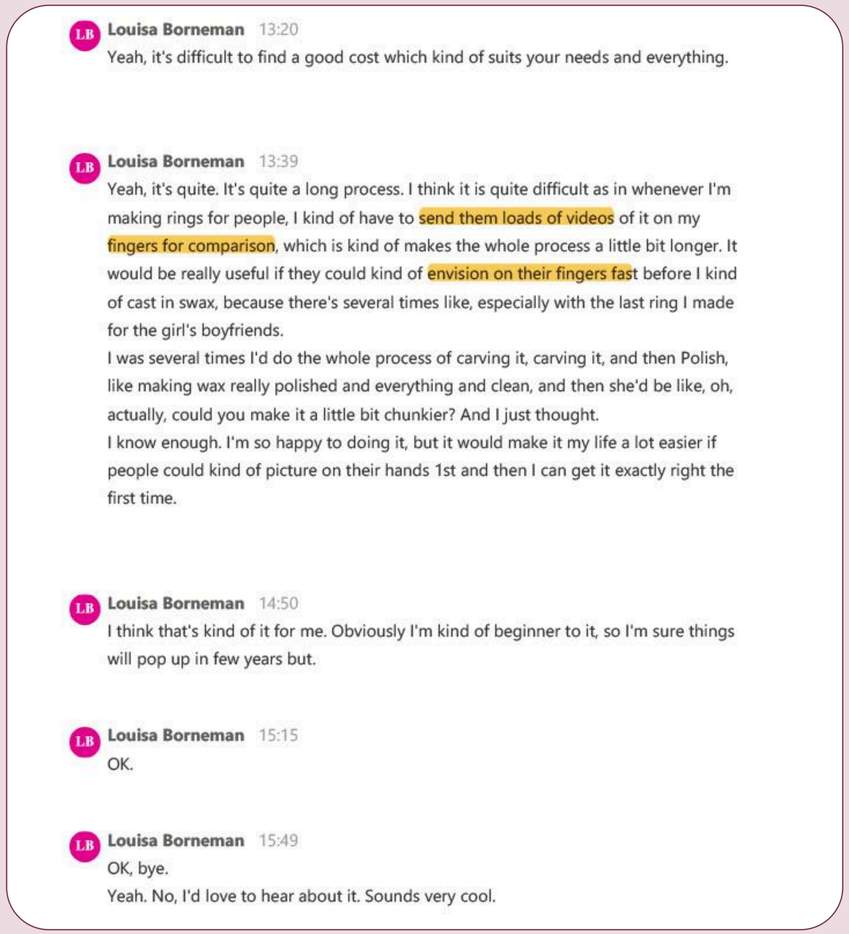
Louisa Borneman 13:39
Yeah, it's quite. It's quite a long process. I think it is quite difficult as in whenever I'm making rings for people, I kind of have to send them loads of videos of it on my fingers for comparison, which is kind of makes the whole process a little bit longer. It would be really useful if they could kind of envision on their fingers fast before I kind of cast in swax, because there's several times like, especially with the last ring I made for the girl's boyfriends.
I was several times I'd do the whole process of carving it, carving it, and then Polish, like making wax really polished and everything and clean, and then she'd be like, oh, actually, could you make it a little bit chunkier? And I just thought.
I know enough. I'm so happy to doing it, but it would make it my life a lot easier if people could kind of picture on their hands 1st and then I can get it exactly right the first time.

Louisa Borneman 14:50
I think that's kind of it for me. Obviously I'm kind of beginner to it, so I'm sure things will pop up in few years but.

Louisa Borneman 15:15
OK.

Louisa Borneman 15:49
OK, bye.
Yeah. No, I'd love to hear about it. Sounds very cool.

User Interview Transcripts - Jewelry Designer Part 3



Louisa Borneman 13:20
Yeah, it's difficult to find a good cost which kind of suits your needs and everything.

Louisa Borneman 13:39
Yeah, it's quite. It's quite a long process. I think it is quite difficult as in whenever I'm making rings for people, I kind of have to send them loads of videos of it on my fingers for comparison, which is kind of makes the whole process a little bit longer. It would be really useful if they could kind of envision on their fingers fast before I kind of cast in swax, because there's several times like, especially with the last ring I made for the girl's boyfriends.
I was several times I'd do the whole process of carving it, carving it, and then Polish, like making wax really polished and everything and clean, and then she'd be like, oh, actually, could you make it a little bit chunkier? And I just thought.
I know enough. I'm so happy to doing it, but it would make it my life a lot easier if people could kind of picture on their hands 1st and then I can get it exactly right the first time.

Louisa Borneman 14:50
I think that's kind of it for me. Obviously I'm kind of beginner to it, so I'm sure things will pop up in few years but.

Louisa Borneman 15:15
OK.

Louisa Borneman 15:49
OK, bye.
Yeah. No, I'd love to hear about it. Sounds very cool.

Usability Testing Tasks

Maze version - Usability Testing App Design

Really - AR for Designers

Task 1: Preview a 3D Jewelry Model in AR

Prototype Test • Screen-based

20.7s Avg. duration | 7 Responses

You're exploring the app and want to see how jewelry appears in different environments. Navigate to the dashboard and view an example 3D jewelry model.

First, preview it in the regular 3D viewer, then switch to the AR mo...

100.0%	0.0%	0.0%
Success rate	Drop-off	Misclick rate

Task 2: Create a 3D Jewelry Model Using Photo Mode

Prototype Test • Screen-based

22.2s Avg. duration | 6 Responses

You've just made a physical prototype of a ring and want to turn it into a 3D model using the app's photo mode.

Use the app to capture the object and generate a 3D model.

100.0%	0.0%	25.0%
Success rate	Drop-off	Misclick rate

Task 3: Upload a 3D Model of a Jewelry

Prototype Test • Screen-based

7.8s Avg. duration | 6 Responses

You've just finished designing a ring in another 3D tool and want to showcase it using this app.

Upload the existing 3D model to begin the try-on process.

100.0%	0.0%	0.0%
Success rate	Drop-off	Misclick rate

Task 4: Share Your Jewelry for Others to Try On

Prototype Test • Screen-based

49.7s Avg. duration | 6 Responses

You want to show your 3D-designed earring to a potential customer or collaborator.

Share the model using the app so others can try it on themselves.

100.0%	0.0%	40.0%
Success rate	Drop-off	Misclick rate

Usability Testing Reports

Task 1	Task 2	Task 3	Task 4	Feedbacks & Suggestions
• Simple and very clear to navigate Ikmal Azman	• Ask if the prototype will present real camera Ikmal Azman	• Already know how to navigate interface since they learn from previous task Ikmal Azman	• Take time to find the Share button to accomplish the task Ikmal Azman	1. The visuals is simple, easy clean to use 2. The label of example ring in dashboard is confusing (can be rename to Jewelry 1) 3. Suggest to add 3 dots on the jewelry card in dashboard to allow use Share the project right away Ikmal Azman
• Complete the first task easily Ikmal Azman	• Complete the task no questions Ikmal Azman	• Complete the task no questions Ikmal Azman	• Accomplish the task quick Ikmal Azman	1. During the Share task, did the photo/video can share too? - The media will save into photos 2. How does the Share feature work? - The user will have same screen with collaborator and they can try it right away Ikmal Azman
• Easy and happy to explore when the test accomplish Ikmal Azman	• Able to accomplish the task till end Ikmal Azman	• Learn from previous task, user navigate confidently Ikmal Azman	• Able to navigate smoothly and figure out the location of the button Ikmal Azman	1. Not clear when doing Task 4, the “preview in 3D” not obvious Ikmal Azman
• Easy to complete the task and happy to continue Ikmal Azman	• Can navigate smoothly within the interface Ikmal Azman	• Use knowledge from previous task to figure out where to accomplish the task Ikmal Azman	• Take time to into share button Ikmal Azman	1. The visual on interface is good and simple 2. During Task 4, the use feels bit lost, the user think if they want to share the project with client from their dashboard too instead of during preview in 3D Ikmal Azman
• Able to accomplish the task quickly Ikmal Azman	• Steadily navigate the interface and accomplish the task Ikmal Azman	• Complete the task no questions Ikmal Azman	• Complete the task no questions Ikmal Azman	1. Since the task is in English the user navigate the interface through instinct first before understand the what in interface 2. In Share feature, it takes 2 steps to accompllish (first open jewelry then preview & share) • Difficult to discover the share button, take time to explore • Suggest to put share in the dashboard Ikmal Azman