



ar visualization



THE PROBLEM:

Printing 3D models for client pitches is an industry standard in architecture, because visualization of a proposed project is very important. However, 3D printing is extremely expensive (up to 40k for a model) and because they are needed during the proposal period, architecture companies loose a lot of money when the client chooses not to sign onto the project. What are some other ways to **visualize a 3D model**?

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THE SOLUTION: AUGMENTED REALITY

1. A **mobile app** that uses AR and an image tracker (a site plan) that will make it appear as if the 3D model were there in real life.
2. Allows clients to see **different options** and **iterations** of a design.
3. **Low cost** compared to 3D printing

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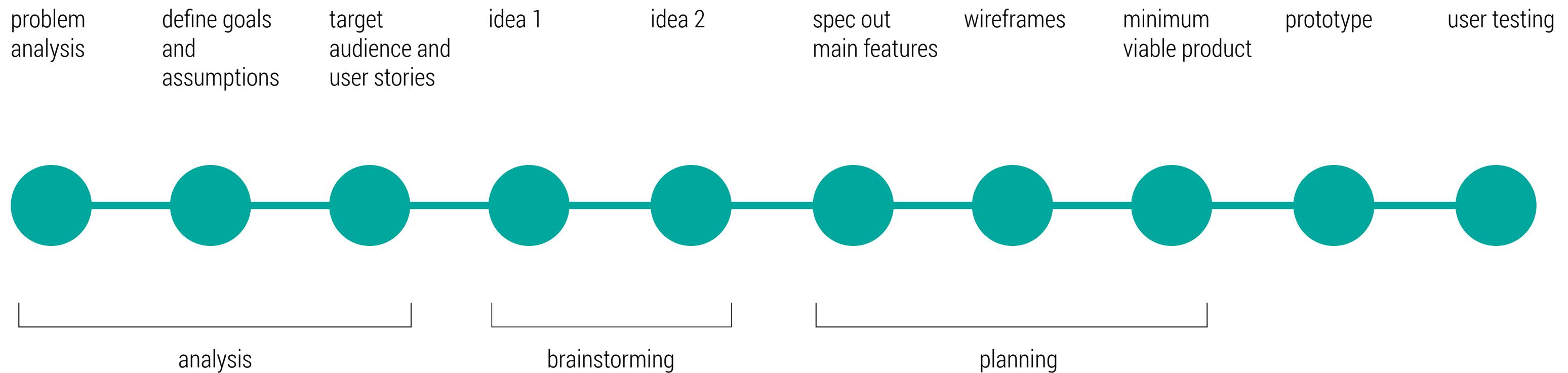


MY ROLE: RESEARCHER, PROGRAMMER, DESIGNER

The Design Applications group consisted of 3 full time employees and me. Because this idea was my creation, I had a lot of say into how it would be designed and how it would be made.

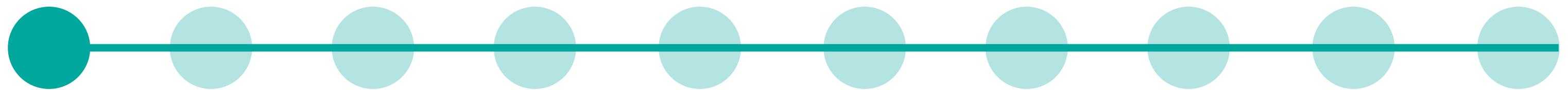
A visualization specialist provided 3D models for me, and my supervisor provided me with resources and materials.

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problem analysis

define goals and assumptions target audience and user stories idea 1 idea 2 spec out main features wireframes minimum viable product prototype user testing

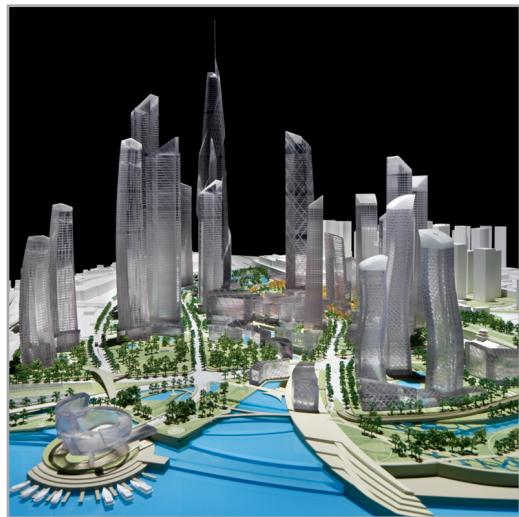


analysis

brainstorming

planning

PROBLEMS



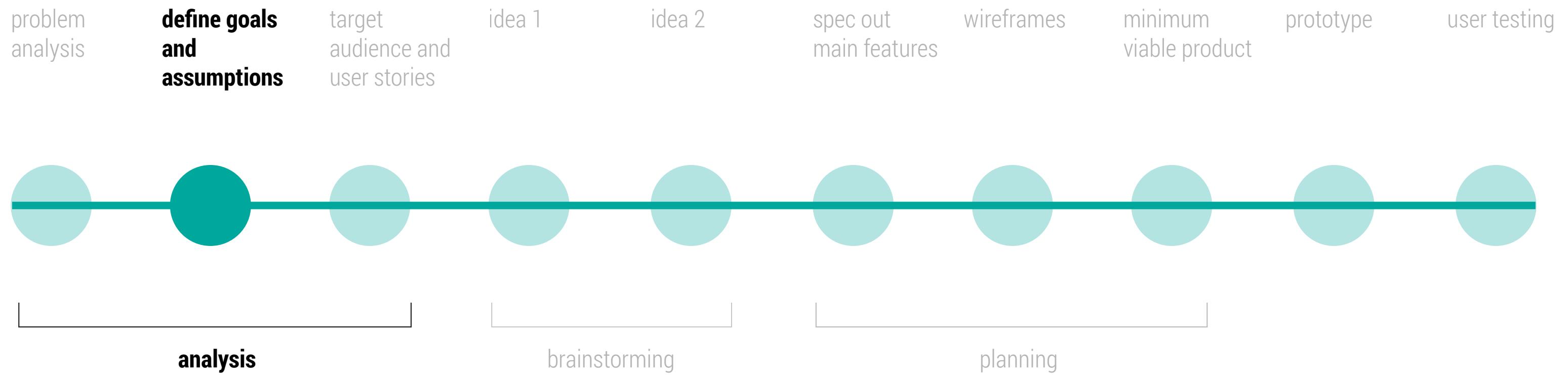
COST OF PHYSICAL 3D MODELS

1. Some up to \$40,000 for single model
2. No way of seeing different options or iterations
3. If project is not signed by client, huge loss of money



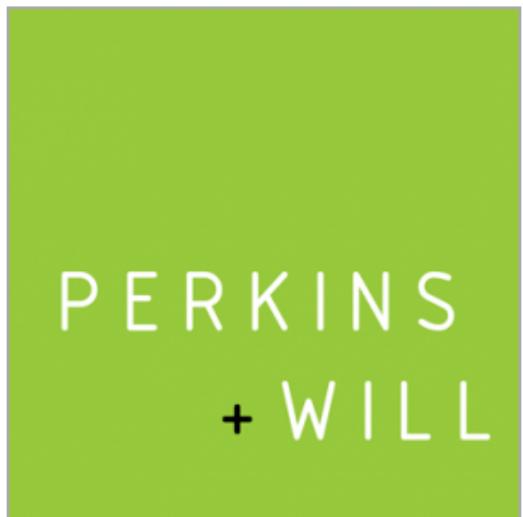
STATIC PRESENTATION METHODS

1. Presentations are a large part of the architectural design process
2. Most presentations were non-interactive
3. Need to engage clients and wow them



GOAL: to create an **alternative presentation method** for 3D models that conveys **information, engages** the audience and **alleviates the high cost** associated with 3D printing

ASSUMPTIONS

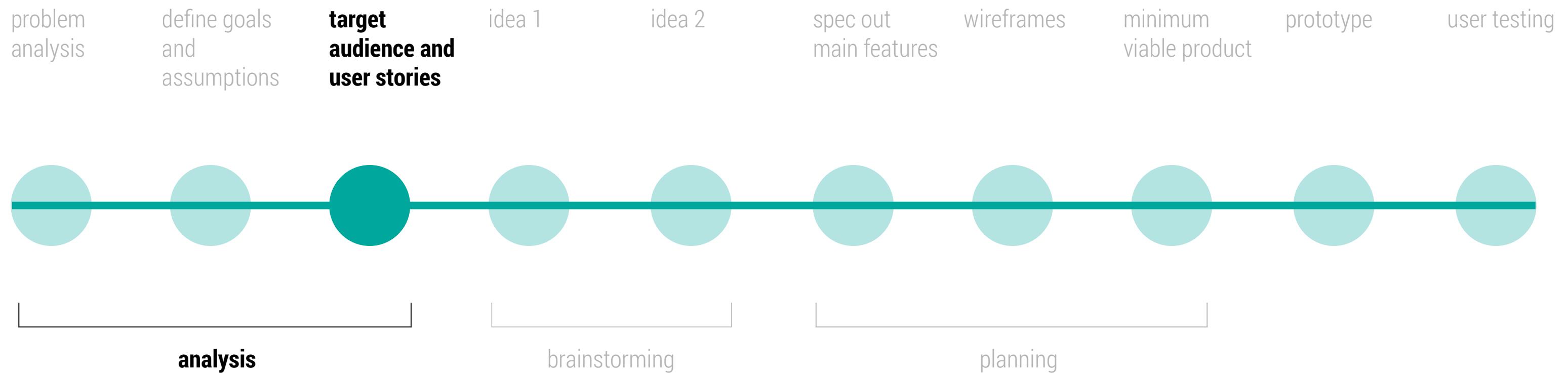


COMPANY

1. has the funds required for software and hardware
2. is capable of bringing a device such as a tablet to a client meeting
3. is interested in further developing this app

CLIENT

1. familiar with using current technology such as a tablet



TARGET AUDIENCE



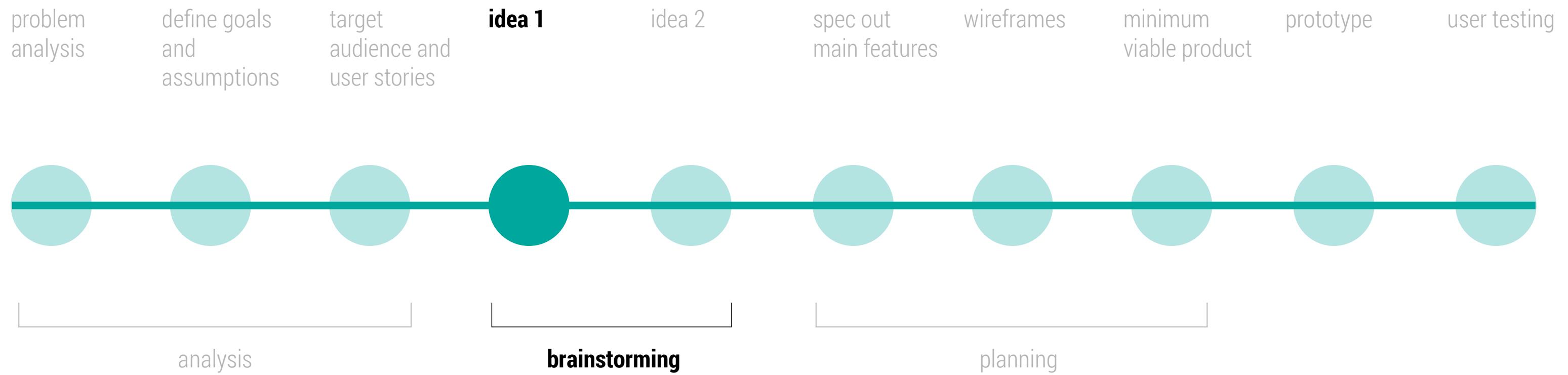
PROJECT MANAGERS

User Stories:

1. Want to save money while still winning projects
2. Want to wow clients during presentations
3. Want an engaging way to convey information

PROJECT CLIENTS

1. Want to be able to visualize a building proposal
2. Want to fully understand a project idea before putting down the money
3. Want to see different options and design iterations





IDEA 1: KINECT GESTURE NAVIGATION WITH PANORAMA

Using the **Kinect** to capture hand gestures to simulate toggling and movement, the user can **navigate a 3D model** during a presentation without having to touch the mouse or keyboard.

PROS

1. Not very costly (Kinect ~\$180)
2. Allows presenter operate this hands free
3. Ability to see all angles and areas

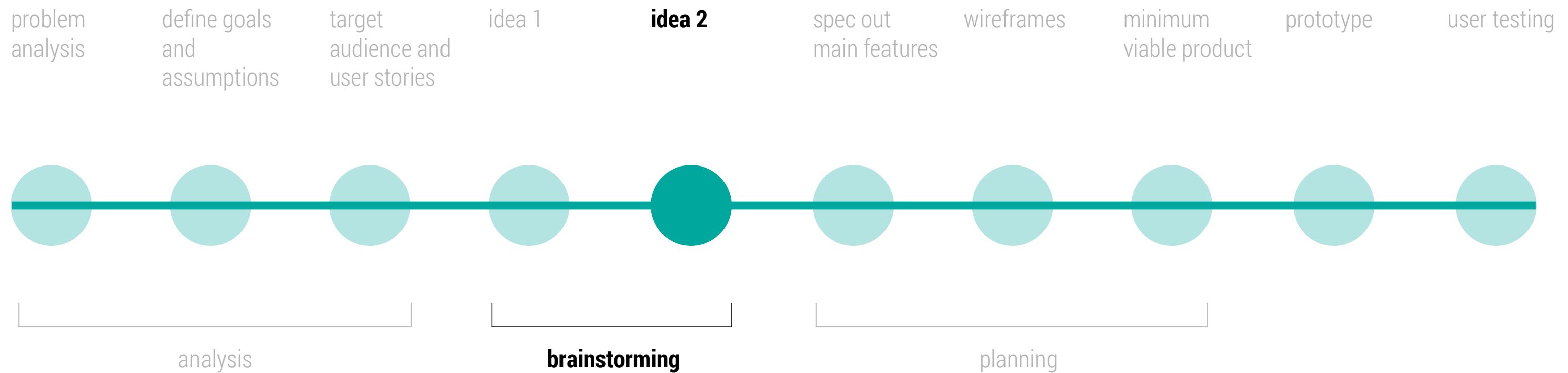
CONS

1. Kinect technology was relatively new; not always precise
2. Cumbersome to set up
3. Useful for interiors, but not very useful for getting a full view of a building
4. Doesn't fit into existing work pipeline

MEETUP: ARNY

The screenshot shows the ARNY - Augmented Reality New York page on Facebook. The header reads "ARNY - Augmented Reality New York". Below it, there's a post from a user named "New digital" with a profile picture of a man. The post text says: "Augmented Reality (AR) will one day change the way we interact with the world. AR technology has come a long way and is now ready for the market. It is now used by developers, designers, entrepreneurs, scientists, educators, investors, artists, makers, hackers, journalists, and more - to bring the augmented reality experience to consumers in a fun, productive - and lucrative way." There are 1,454 likes, 45 comments, and 1 share. Below the post, there's a section titled "Welcome!" with a "Join us" button and a "Who do I know here?" button. A note says "Join us and be the first to know when new Meetups are scheduled". A "Log in with Facebook to find out" link is also present. At the bottom, there are links for "Upcoming 1", "Suggested 69", "Past", and "Calendar". The footer says "ARNY - Augmented Reality New York Monthly".







IDEA 2: AUGMENTED REALITY APP

An app that augments a 3D model and makes it appear as if it is physically there

Requirements:

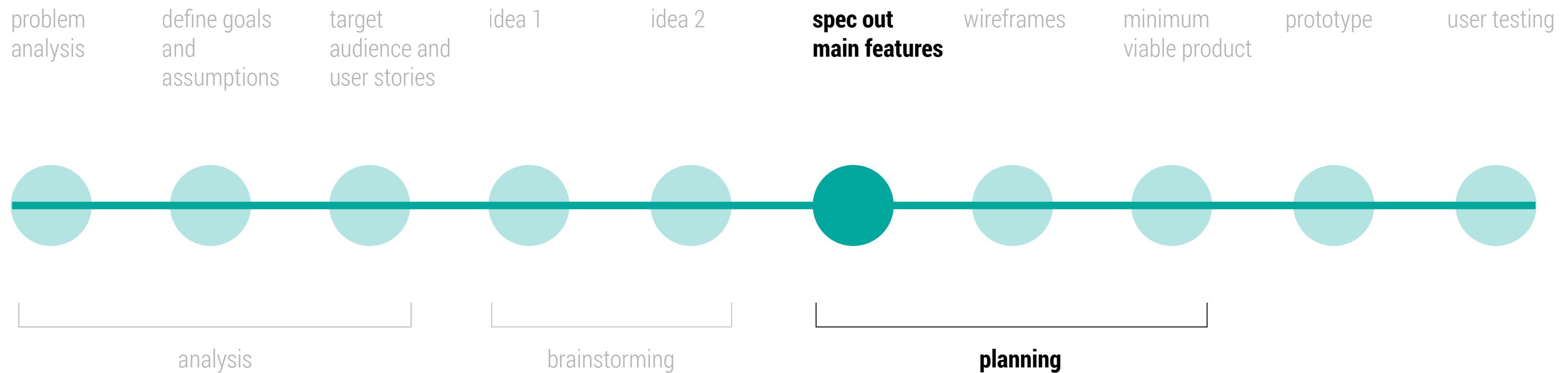
Tablet, Unity3D (Game Engine), Qualcomm SDK

PROS

1. Office already had many iPads used for client meetings
2. Replicates the idea of having a physical 3D printed model
3. Since it is digital, it can show different designs, options and iterations
4. Fits into current design pipeline

CONS

1. Unity3D is expensive (\$1,500 + \$1,500)





FEATURE 1: AUGMENTED 3D MODEL

The user should be able to open the app, and look through the viewfinder. If the user points the viewfinder at the image target, then the 3D model appears on top of it.

User stories supported:

Project Manager - Want to wow clients during presentations

Project Manager - Want an engaging way to convey information

Project client - want to be able to visualize a building proposal

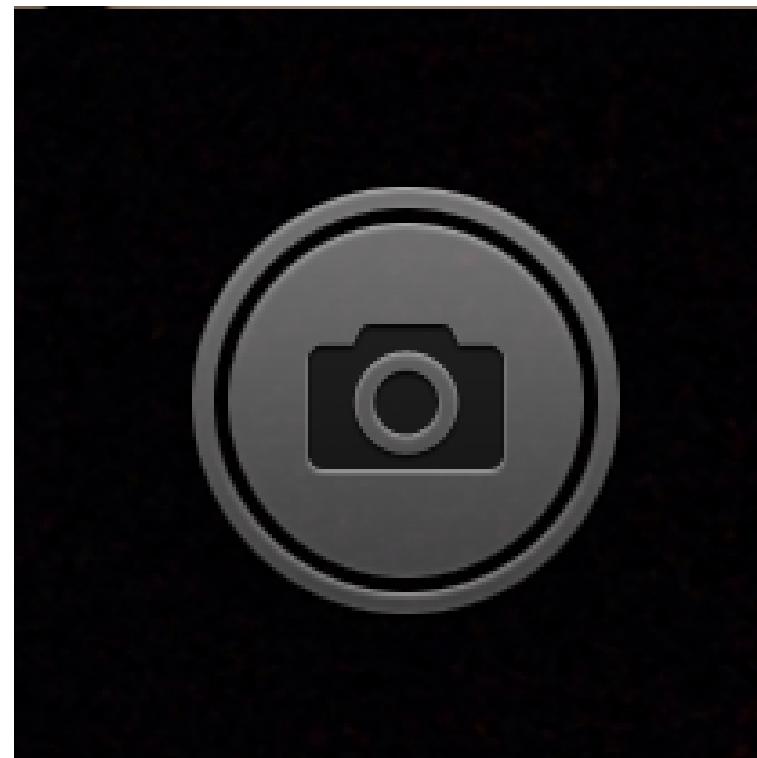


FEATURE 2: ABILITY TO SEE DIFFERENT ITERATIONS

Buttons to control which layers are visible and which sections to see/hide

User stories supported:

Client - Want to see different options and design iterations



FEATURE 3: CAMERA AND VIDEO CAPTURE

Camera and video buttons to take a snapshot of the augmented 3D model and jot down notes. Video capture would be useful to convey what kind of camera movement would be needed in a video walk-through

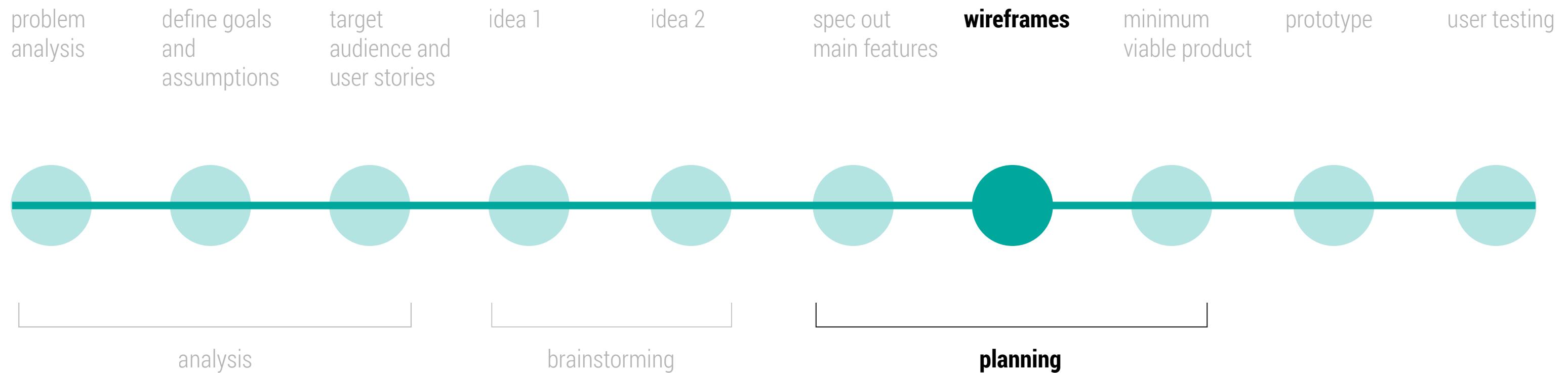


FEATURE 4: DOWNLOAD MANY DIFFERENT FILES

Different models can be uploaded to a server and downloaded through the app.

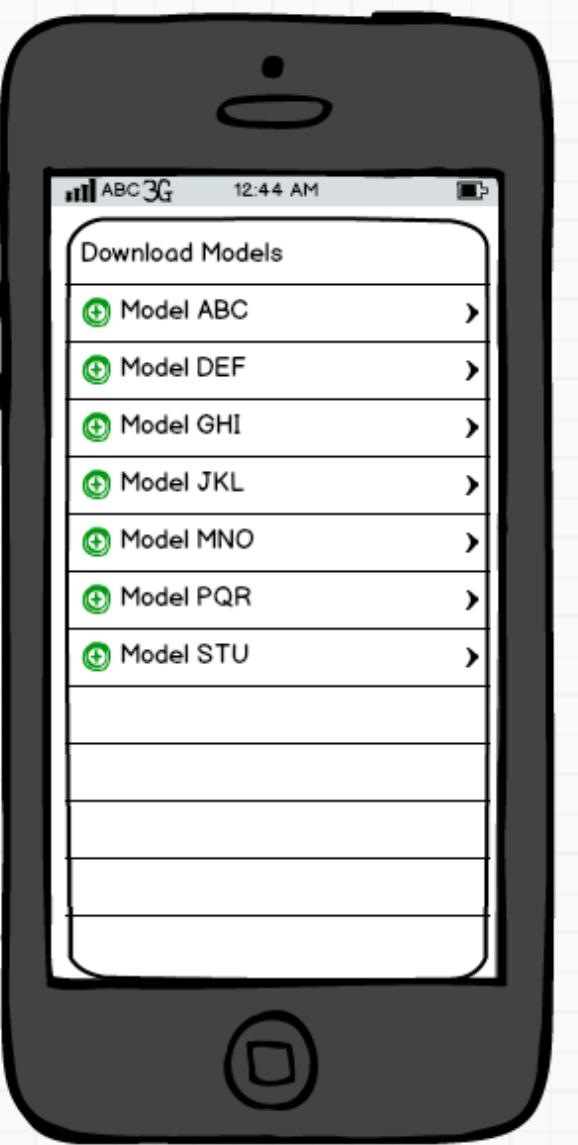
User stories supported:

Client - Want to see different options and design iterations

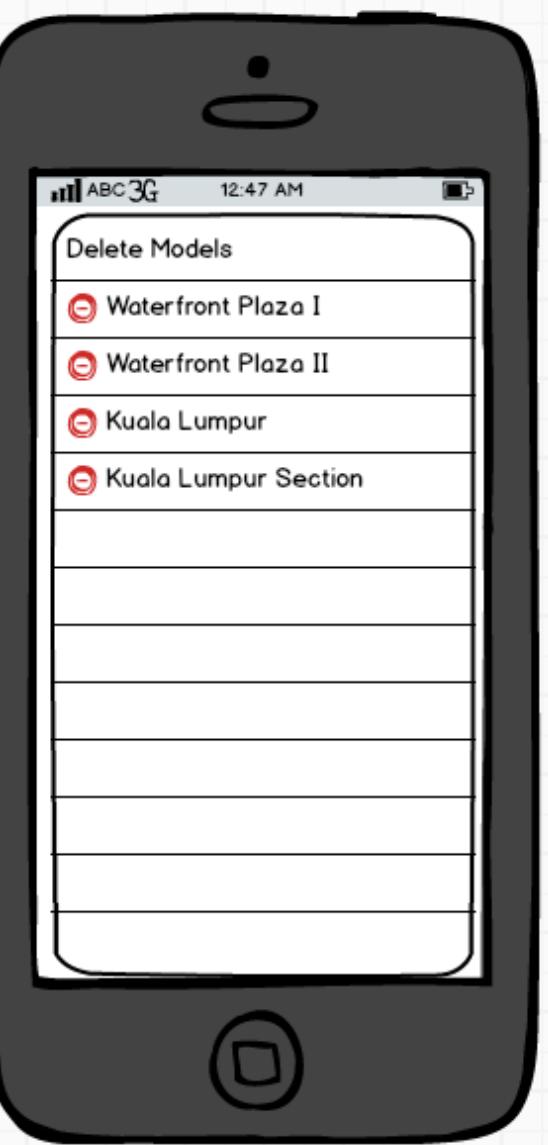




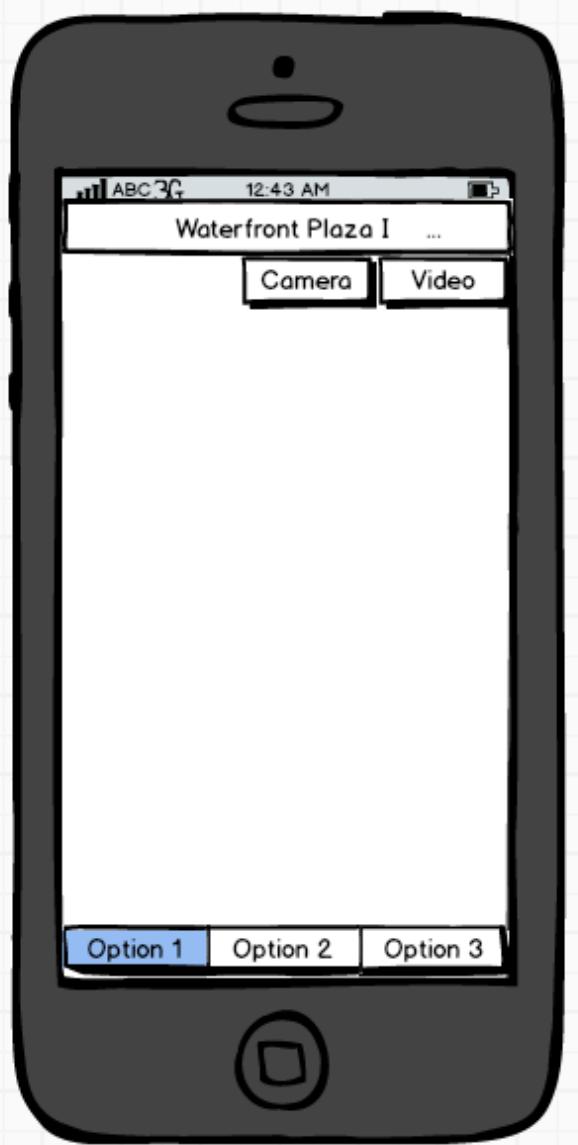
Main page shows all models



Download more models from server



Delete models



Augmented Reality viewfinder

