

# Axolotl Industries

## **Team B03-2**

**Deliverable F - Prototype I and Customer Feedback**

**Engineering Design - GNG1103**

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## ABSTRACT

*In the previous deliverable, a project schedule and cost estimation was done to prepare for the rest of the project. The purpose of this deliverable was to outline the features of the first prototype of mobile application, as well as discuss the client feedback that was received. The feedback from the client EllisDon was positive, indicating that the prototype was a success, and the development can move forward.*

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## 1. Introduction

In the last deliverable, a project schedule and cost estimation was created to organize the rest of the project and layout all milestones and goals. The purpose of this deliverable was to put the previous conceptual design into development on Unity, as well as receive customer feedback from the most recent. This deliverable will be divided into three parts discussing the prototype, customer feedback, and finally, what is the next step in the project.

## 2. Prototype I

The main focus of the prototype was to lay out the basics of the application. Such basics include the home screen, the main screen and their functions. The prototype was also designed to be a focused prototype, where not everything was included in this version, but it has a few attributes open to client feedback.

### 2.0.1 The Home Screen

The application home screen will be the first screen the user will see once they open the application. It features buttons that include opening previous B.I.M files, accessing the file cloud, watching the tutorial and entering the AR or VR mode. Figure 1 below is a screenshot of the application on Unity. It can be seen how all the previously mentioned buttons have been developed, and most of them have been associated with a function using a unity script. Namely, the enter AR (camera icon) and VR (black figure in front of the building) buttons that will open the AR and VR scenes, as well as the tutorial button that will open the user tutorial video (refer to figure 2).

In regards to what is left to be done, the home screens icons will be redesigned to be more professional, a proper tutorial video will be filmed, and the settings button will be coded. The settings button will be designed to change to a new scene where the user will be able to change the language between English and French, application sound volume, B.I.M resolution or quality, and account information. The tutorial video will be a step by step “how-to” video that will teach the user the basics of the application, and will not be more than 10 minutes long.



Figure 1. Application Home Screen

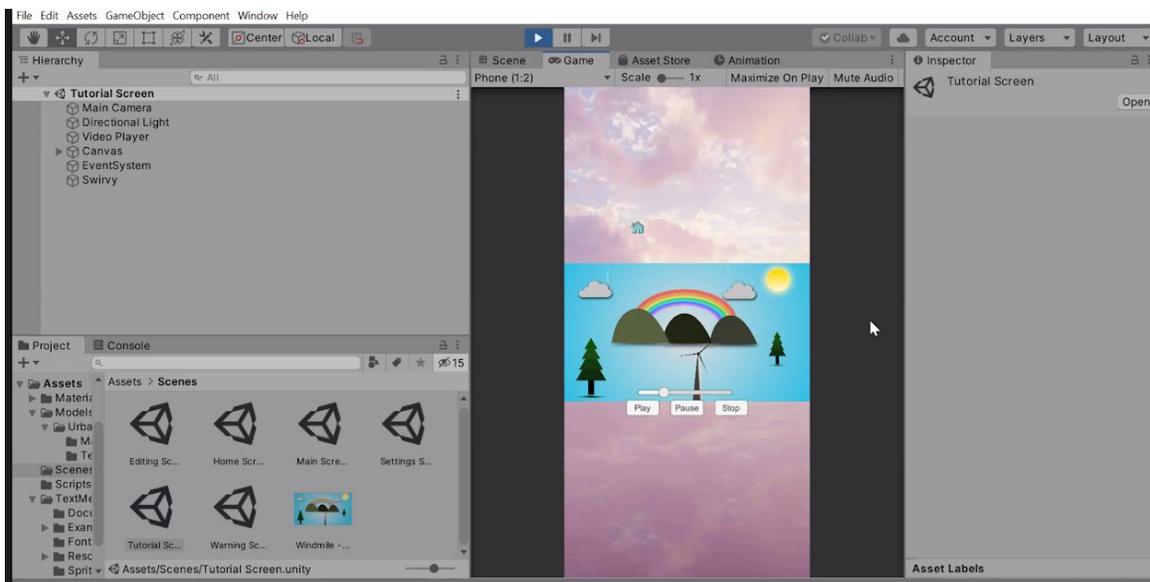


Figure 2. Tutorial Video

### **2.0.1 The Main Screen**

The main screen, also classified as the AR scene or the VR screen, is the most important screen of the application. It will be implemented with the most functions, and the main purpose of the application will be experienced through this screen. Figure 3. below illustrates how the main screen will look. The black background indicates that the main screen will take the camera input as the background, and thus, will put the selected B.I.M model in that AR setting. Other features of the main screen include view toggling, floor selection, editing the model, returning to home screen and joystick controls.

The view toggling feature, illustrated in figure 4, will be used to isolate and switch between the mechanical, electrical, architectural and plumbing views. It has been coded to be a drop-down menu, where the user can select a single view or multiple views, and each view will be colour coded. The floor selection feature (the building icon) will be implemented for the user's ease of use. Instead of manually manipulating the screen from the bottom floor, to reach the top, the user will be able to enter the AR of only selected floors. The model editing feature (the pencil icon) has the main purpose of allowing the user to make small edits of the B.I.M model, as well as further isolate certain parts of the model for ease of use. By pressing the editing button, the game will switch to another scene, with different features. Finally, the home screen button will be used to return to the home screen, and the joystick controls will be used for easier, more controlled manipulation of the model.

In regards to what needs to be completed for the next prototypes, all buttons on the main screen will need to be scripted for their respective functions. All the buttons mentioned above are mere icons with actual use as of prototype I, but will be completed for prototype II. Additionally, the editing screen also needs to be created along with its respective features (view toggling, annotations, dimensioning, and basic model editing).

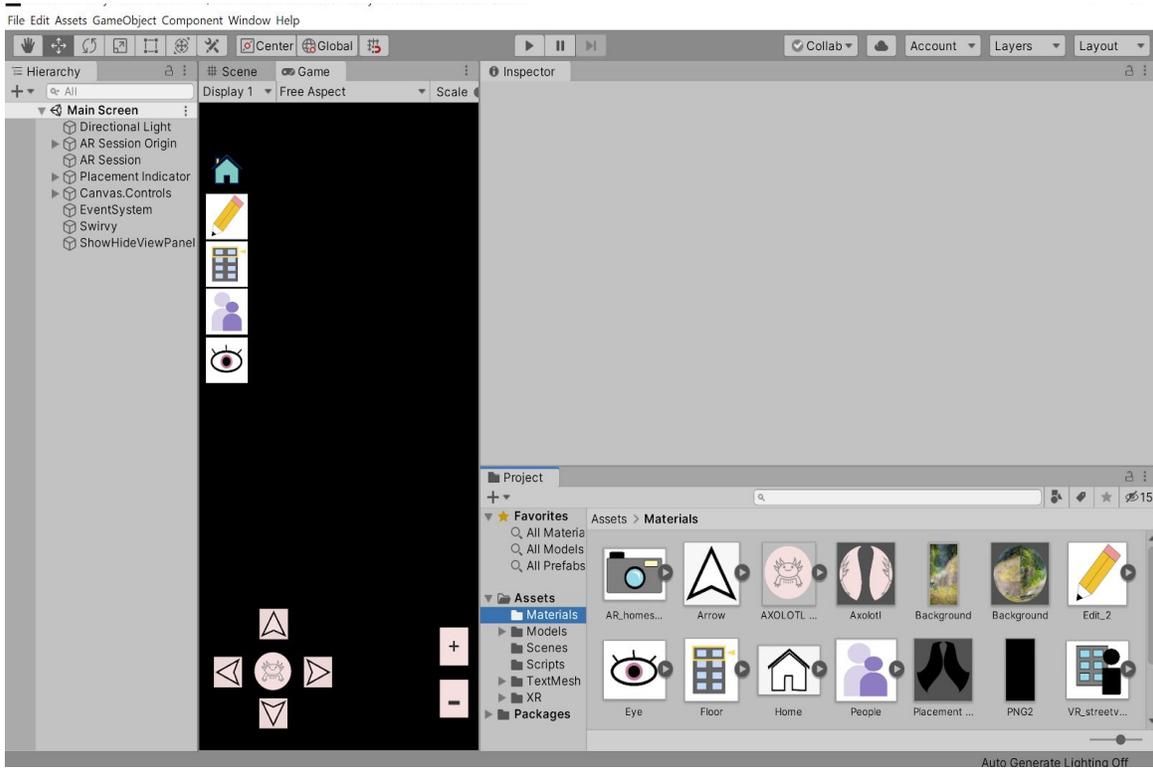


Figure 3. Application Main Screen

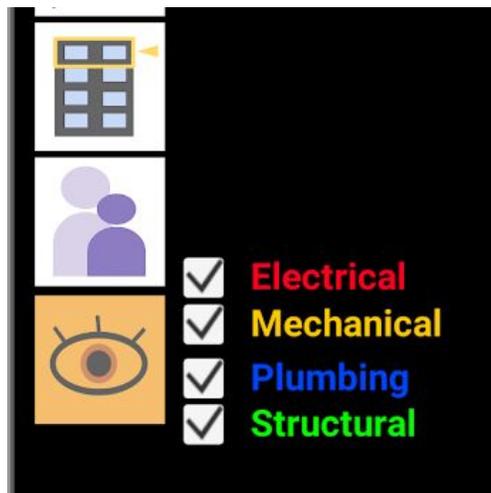


Figure 4. View Icon Layout

## 2.1 Testing

The testing phase is one of the fundamentals of prototyping. The two main tests that were used to determine the functionality of the prototype were if it works on Unity PC, and if it works on the mobile device both on iOS and Android. The stopping criteria for the unity platform were whether the buttons functioned as scripted and if their screen placement was okay. The mobile device test had more stopping criteria and consisted of if the AR background functioned correctly, the buttons functioned on the device, if the application layout worked with the device screen size, and if it worked on both devices.

In regards to the test results, prototype I passed the Unity PC tests and most of the mobile device tests. The buttons and AR camera-input functioned properly on all devices and operating systems. However, on the mobile device test, the button layout did fail, as some buttons were too small or close together, and as such were resized, and tested again until success. Figure 5 below portrays how the application looked on an android device.

As prototype, I was a focused prototype, the tests described above are not comprehensive and were instead to test basic functions and prepare for the first client meet. For future prototypes, more rigorous testing methods will be used, including functionality across platforms and devices, but as well as aesthetics, model resolution, functionality and accuracy of all application features, and overall user interface.

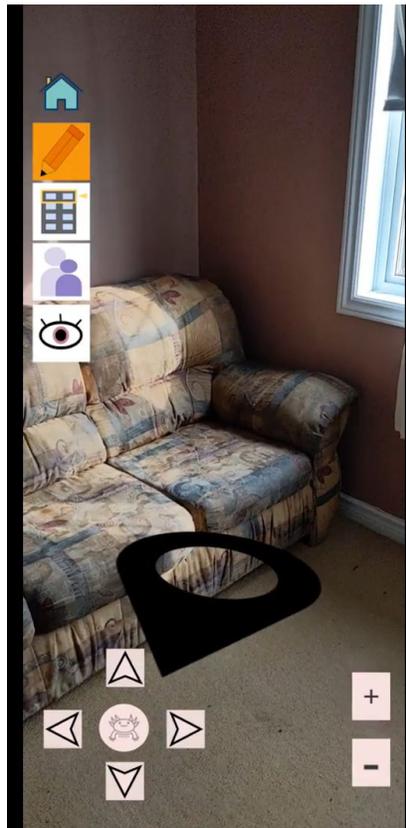


Figure 5. Application Functionality on Mobile Device

### 3. Feedback

The third client meeting was very insightful and fruitful. We had the chance to present our prototype to the client and get useful feedback. We also had the chance to compare our prototype and design with other teams and have an understanding of how ahead we were compared to most teams. We wrote down multiple points that were suggested to other teams that we thought would help us improve our design.

#### 3.1 Client Feedback for Prototype I

The overall feedback from the client was overwhelmingly positive. The client liked ours over app design and menu screen. Even though, most of our home menu screen icons and design were place holders for more clean and professional designs. The client noted that the current icons are dull and lack creativity; we will address this issue by purchasing an icon bundle from the asset store that fits our overall design and aesthetic of the app.

Buying an icon bundle gives us more time to work on our code and app. Instead of wasting time trying to design icons. The current and projected icon designs are illustrated below in figures 6 and 7.

The client finally added that the design plan was “ambitious”. Being called an ambitious can affect a team’s morale and hinder overall progress. Instead, we are optimistic and glad to hear that our idea and design seem too ambitious for other team ideas. This means our design stands out among others and gives us more motivation to perfect our design.

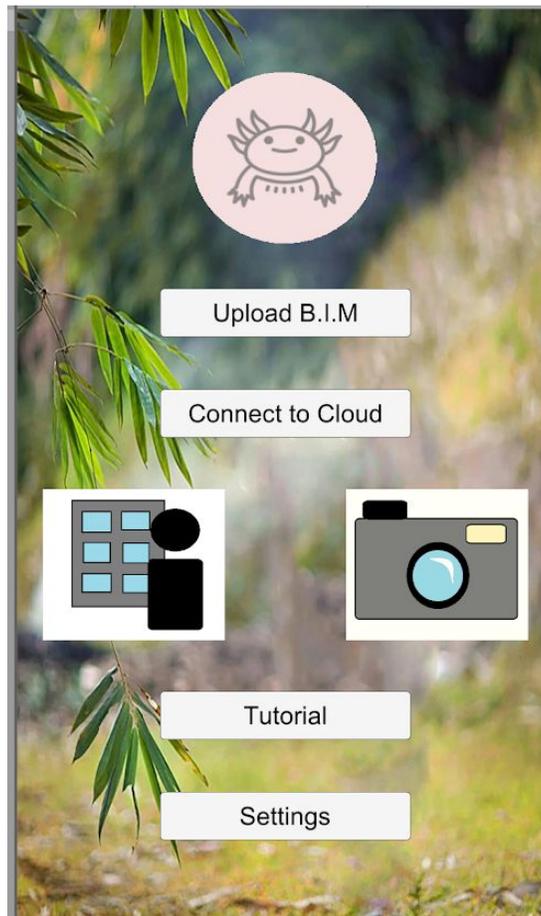


Figure 6. Current icon design



Figure 7. Projected UI icons From Bundle

### 3.2 Feedback about other teams prototypes

Multiple teams had safety or a warning screen that popped out before opening the VR aspect. We believe that we should add this feature to ensure the user's safety. Another important feature that we noticed a lot of teams had incorporated was the ability to choose between English and French. The client in the end explained that the ability to choose between languages is really useful especially here in Ottawa. After hearing this explanation, we had to incorporate the ability to choose a language into our final design. The feedback that was directed to other groups was as important as feedback directed to our design and insightful of the client's expectations

### 3.3 Future Feedback Methods

As mentioned previously, feedback for prototype I consisted mainly of direct client feedback. For future prototypes, more comprehensive feedback methods will be used. This will consist of gathering feedback from people other than the client and will range from knowledgeable users to general. This will not only help gather valuable feedback in regards to how the app works and looks but also if the app design is compatible with the construction market.

## **4. Conclusion**

From the client's feedback, we can conclude that prototype I was a success. The client seemed pleased with our prototype and was interested in seeing the future of our product. For prototype II, we are planning on adding new screens to improve the user experience and implement the scripts for the empty buttons shown in prototype I. We will also change out the button icons with more professional looking icons.