Axolotl Industries

Team B03-2

Deliverable K - User Guide

Engineering Design - GNG1103

<u>**Team Members**</u>

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ABSTRACT

The purpose of this deliverable is to outline the user manual of the app AxolotlAR. This report is divided into describing all the features included in the app, as well as troubleshooting and details on the app was developed as a whole.

Table of Contents

List of Figures

1. Introduction

In this project, the client, EllisDon, suggested the use of an augmented reality application to view 3D models of their B.I.Ms in real-time. As such, Axolotl Industries developed AxolotlAR, the augmented reality application that will allow users to not only view their B.I.M, but also use key features such as commenting, dimensioning, and view selection. The purpose of this deliverable is to outline the user guide of the app, so that anyone may use, expand upon, or replicate the app.

The app is focused on the following needs expressed by the client: ability to view a BIM in 3D space, OS and Android compatibility, including tutorials on how to use the app, a user-friendly interface, ability to toggle between different engineering views, and using free software. As a whole, the app costs $12 and hundreds of hours to make.

2. Home Screen

2.1. Icon Labelling

The button labelled "AxolotlAR" is used to show the user all the possible buttons they might encounter when using the app. This is to give them a quick and easy way to help them use our application. Buttons with recognizable functions are not included such as the home button, music buttons, and video buttons. The icon labelling is accessed through the "AxolotlAR" button on the home screen. Clicking on the "next" arrow button in the bottom left will exit this screen, and return you to the home screen. An image of this is shown below.

Figure (1) Icon labeling

2.2. Main Buttons

From the home screen, the user will be able to go to the settings, icon, editing, and collaboration screens using their associated icons.

3. Main Screen (AR mode)

3.1 Commenting (Gaze Interaction)

The commenting feature, accessible through to the main screen, allows the user to comment on any issues, or features, anywhere in the B.I.M. Its purpose is to help communication between different users and allow easy analysis of the model. The feature works by gaze interaction, where the user must point his camera at the exclamation point, for the comment to appear. The text box also always faces the user, for easy maneuvering.

To access the commenting feature of the app, on the main screen's dropdown menu, click on the commenting icon. A blue text box should appear in the bottom right corner. Type any comment, and when finished, press the checkmark on the right to post the comment. The newly made comment should now appear to the right and slightly above the user. Writing new comments would not disturb the previous comments, this enables the user to place as many comments on the model anywhere. The figure below portrays this feature.
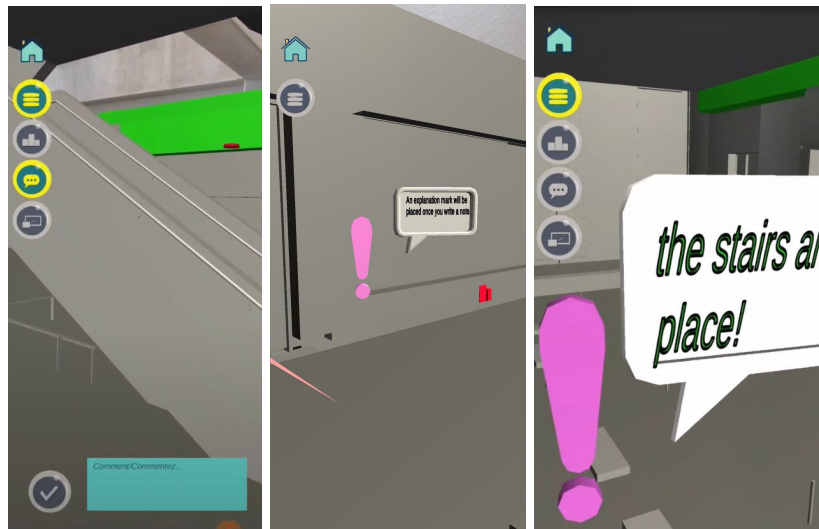
Figure (2). Gaze Interaction

3.2. Dimensioning

The dimensioning feature allows the user to measure the dimensions of the model when it is at a 1:1 scale. The function uses two flagpoles that will appear with a click of a button, and the user can drag them around to measure distances. Essentially, it works like a tape measure, where the script applied measures the distance between the two prefabs in a 3-D space.

To access this feature, click on the dimensioning icon, and then click on the screen. Two flagpole prefabs should appear, and with one finger, drag one of the prefabs along with any preferred distance. The distance should appear in the bottom left corner and will be updated as the prefabs are moved. To close the dimensioning feature, click on the "done" button in the bottom right corner. The feature is shown in figure 3 below.

Figure(3). Dimensioning

3.3. View Selection

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. To only see one view, the user must deselect three of the

views that they do not wish to see. This works by reducing the alpha value of the material to 0.01. By selecting the view toggle, the alpha value goes back 1, and in turn, the view appears on the screen.

To access the view selection function, from the main screen, click on the view selection button. From there, a toggle feature should appear, where you can select and unselect any of the 4 views. The figure below demonstrates this feature.
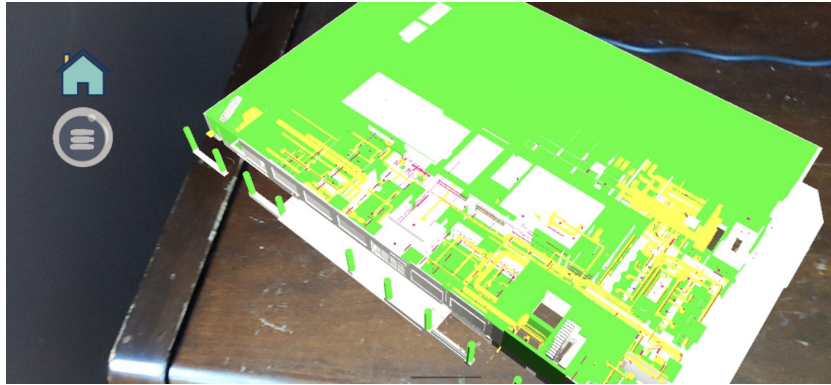

Figure (4). View Selection

4. Editing Screen (Share Mode)

4.1. Scaling

The scaling feature, present in the app's share mode, allows the user to scale down the model by pinching the screen. It works using a "leantouch" script that was implemented on the B.I.M. The feature is shown below.

Figure(5) Scaling in the editing screen (Share Mode)

4.2. Other features

The other features that appear in the editing are the same that appear on the main screen: commenting, dimensioning, and view selection. These features work fine in editing screens, even though the screen is in the landscape.

5. Other Screens

5.1. Tutorial Screen

The tutorial video is implemented using a 'video player' element in the hierarchy that can be played, paused, and stopped by a script associated with each button when it is clicked. The user can also return to the home screen using the home button that is assigned to a script that switches screens.

5.2. Settings Screen

In the settings screen, the user can choose their language and music preference. When the language button is clicked, a 'game object' in the hierarchy (which is attached to a script) makes the french and English options appear on the screen. The music can be turned on and off by clicking on the music button which uses a game object similar to the one associated with the language option UI. The figure below illustrates the settings.
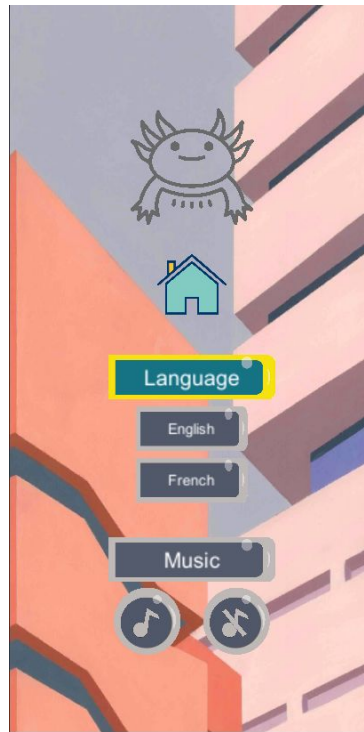
Figure (6). Settings Screen

5.3. Warning Screen

The text in the background of the warning screen is simply an image placed on the main canvas in the scene. The yellow and black background is an image on the ''canvas.background" object used as a background. After reading the warning, the user is brought to the home screen after clicking the 'AxolotlAR' (to which we added the 'switching screen' script in the inspector window).
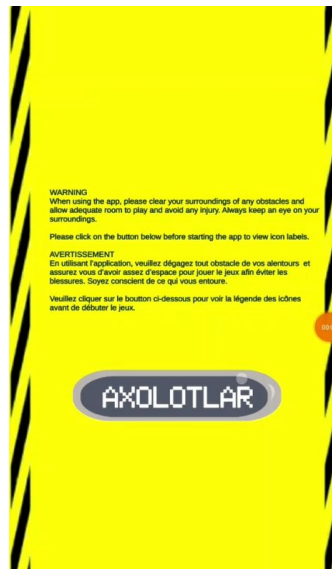
Figure (7). Warning Screen

6. Troubleshooting

Common Questions and Issues:

- **What do I do if the app suddenly crashes?**
  - As B.I.Ms are large files, they can often overwhelm the device and the app. This can cause the app to suddenly close down or crash. To fix this, simply restart the application completely, so that you are greeted by the warning screen.
- **What can I do if the BIM is not properly aligned with my surroundings, or is glitching?**
  - The app works best when used in an open space, or in an area with a similar structure to the B.I.M.
- **Why are there multiple transparent planes on the BIM and how can I change this?**
  - The planes originate from the app using Raycasts to identify surfaces in the real world. The reason why multiple planes appear is that the camera can make the furniture inside the room into planes. To reduce the number of planes, the user will need to be in a big room that has no obstructions.

**Please note that most issues can be solved by simply restarting the application on the mobile device.

7. Conclusion

Overall, Axolotl Industries' solution was well received by experts, as well as the client. In regards to the features that could be added in future developments, this app is definitely open for improvement for it to be ready for commercial use.

Possible improvements were as such:
- Making sure all the glitches were smoothed out
- Add cloud sharing, find/use more efficient codes if possible
- Making it so that any BIM model can be uploaded and used
- Have the user change floors of BIM with a click of a button
- Make it so that multiple users can use the app and be connected via the app

Appendix:

And that's all folks! Go on our little Axolotls and make us proud!