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**Introduction:**

This document outlines our team’s third prototype for the EllisDon VR in Construction project as well as the test plan for ensuring we have met the criteria set by the client. This prototype is almost fully functional and will have all of the important features required in the project. The main additions and refinements since the second prototype are things like the ability to navigate to different floors, an upgraded User Interface with lots of user control, and a complete user guide that gives instructions on how to use the software.

# Main Body:

## Test Objectives:

The specific test objectives of the third prototype are:

* The user instructions are clear and comprehensive
* The user interface is complete and allows users to navigate floors and view the different systems of the building like electrical and architectural as they wish
* The user is able to navigate around the building model using camera movement and floor movement
* The main menu is complete with user instructions and allows them to enter the pre-uploaded 3D model viewing when they want

The third prototype is the last one before the project is finished so it will showcase how much progress has been made and all of the features the team was able to implement. The prototype should demonstrate all the goals set by the client EllisDon and only need small refinements before it is complete. The tests outlined in this document will help us determine whether this is true or not.

Through testing, the team can determine:

* If the main menu is easily navigable
* If the user instructions give enough information that anyone could use the product
* If the main menu is functional and does the tasks it should
* If the user interface is easily understood and useful to the user while in VR
* If the buttons on the user interface do what they should
* If the user can navigate the 3D model effectively and easily
* There are no major bugs that affect the user experience

Whether our prototype meets these criteria or not will help the team understand where to commit time and effort to finish the project off. As it was for testing Prototype I and II, the testing process will be repetitive and qualitative to assess each feature for functionality and ease of use. If the team finds a problem, they will focus their attention on it until it’s resolved. Overall, the tests will give the team an idea of what needs to be done to put final touches on the project.

As it was for Prototypes I and II, there isn’t a hard line between success and failure for the tests. The prototype is tested qualitatively and the team will gauge the results based on functionality and ease of use.

## Prototype III Overview and Updates:

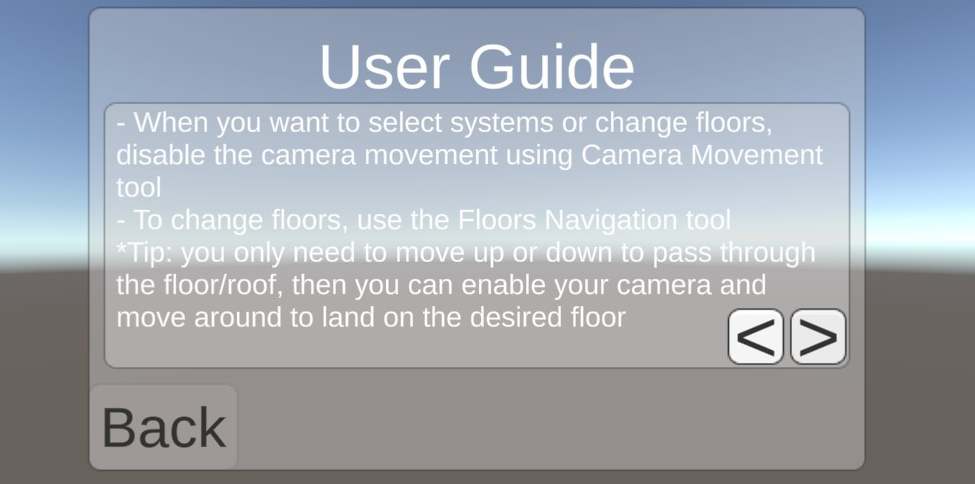
Prototype III is a comprehensive prototype that our team is working on collaboratively in Unity. At this stage in development, it’s important to have a comprehensive prototype because we need to ensure that all the different components are working together effectively as the deadline for completion is fast approaching. Having a comprehensive prototype allows the team to do complete product tests and make changes to any part of the prototype.

For the third prototype, the team is doing repetitive, comprehensive testing to ensure that important features are working properly and cohesively. When working with the prototype, the team focuses on one aspect at a time. The specific updates in the third prototype compared to the second are discussed below. There are three main changes from the second prototype and the rest of our efforts were put towards refining features already present.

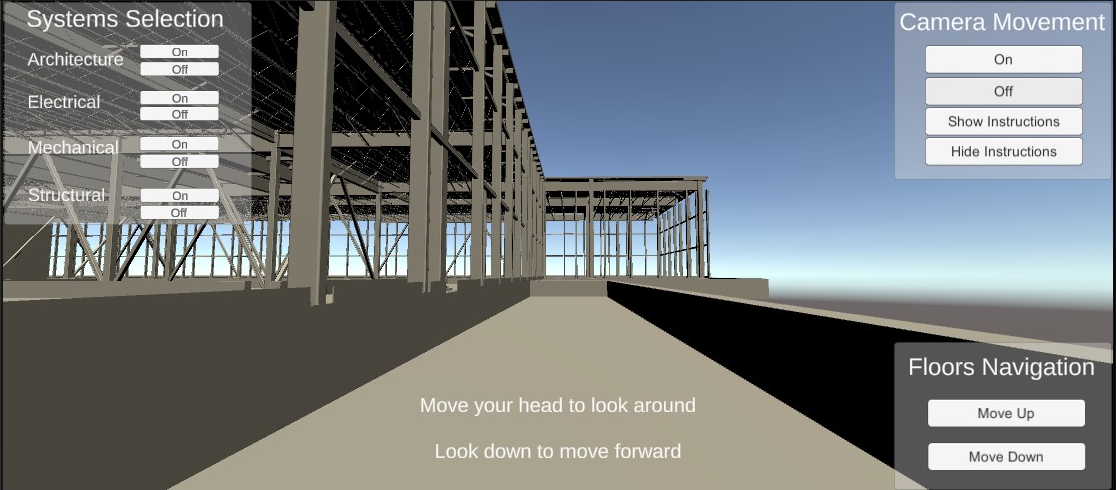
1. First Update:

As requested by the client, an important part of the project is how easily a new user can pick up and use the software. To meet this requirement we have created a user guide section within the main menu that explains how someone can use the project. Within this section you can find an extension set of instructions about how the user can move around, navigate floors, view different subsystems, etc.





1. Second Update:

The second major change made since Prototype II is the refinement of the permanent User Interface (UI) screen when viewing the BIM of the pre-uploaded model. In the refined UI screen, namely in the Camera Movement box, the user also has the option to show or hide instructions for movement in case they forget what was mentioned in the User Guide.   
  


1. Third Update:

The last noteworthy change made for this prototype was the speed at which floors are changed when the user selects a different one. After conducting multiple tests of the second prototype’s user interface buttons and navigating between floors, the team decided it would be more convenient to make the speed of transition from one floor to another much faster, such that the user can switch floors in as little as one click.

## Project Cost, Methods, and Next Steps:

Though the tests outlined here don’t produce measurable results, they allow the tester to assess how user-friendly and comfortable the prototype is, allowing the team to decide where they need to focus attention to finish the project.

While the team performs tests of the prototype, we are checking the user’s view and how they would experience the product. The various objects of interest for the tests are recorded as screenshots shown in this document. The screenshots help the team to verify which goals they have met and what they have yet to do. It also helps to show whether the prototype has passed the tests outlined here.

The team hasn’t needed to make any purchases for the project yet and we won’t need to. The only material necessary for testing the final prototype will be a cardboard VR headset. The instructions for making a VR headset from scrap cardboard was provided in one of the labs for this course so there is no cost for the prototype.

The next step for our team in producing our final product is making some final touch-ups and building the software into a mobile app for iOS and Android. The main features required for this project are already implemented into our prototype but the final thing that would make it complete is moving it to a phone and actually using the software in VR. The team hopes to have this ready for Design Day.

In contrast to the previous prototypes and other kinds of projects, each feature of interest in Prototype III can be tested simultaneously because we almost have a finished product at this point. The only test that has to wait is attempting to use the software in VR. The team is currently working on building the software into an app using a Google VR asset, which was downloaded and imported into Unity for free.

The results of testing Prototype III are necessary before making the mobile application because we need to make sure each feature works properly on the computer before introducing the complications of working in VR. Once we verify the features, we can make a mobile app and have it ready to present on Design Day.

# Concluding Remarks:

In this deliverable we outlined the features added since our second prototype as well as how we plan to test them for quality. The main improvements of the third prototype are finalization of the main menu, a complete set of instructions for guiding users, easier navigation between the floors of the 3D model, and an overall refined UI screen for viewing BIM with the additional feature of on-screen instructions as friendly reminders for users. Each feature stated here will be tested repeatedly in a comprehensive prototype that the team will continually modify until it meets the requirements set by the client. These tests will bring the project very close to completion.