Project Deliverable G

-Prototype II and Customer Feedback-

Group B4

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Introduction

In this deliverable we are outlining the second testing plan that takes place to determine the viability of our second prototype. At this point our second prototype is complete and testing will take place to determine what aspects of our product must change for the final version of our product. Our test plan includes the reasons for testing, the objectives of the testing, a description of our prototype, expected results, desired results and a measuring system for these results. The timeframe of this testing is also outlined to help ensure that the project is staying on track and satisfying the customers needs.

Why are we doing this test?

This test is being done to continue to monitor the progress we have made following the completion of our second prototype. At this point we have fully implemented firebase and must ensure that we have done so correctly. We are also continuing to understand Unity and its various features. We have added new functions to our application since the first prototype and testing is vital to ensure that we are successfully implementing our features. The risk of our lack of background in coding remains, however, that risk is diminished with the more work and research that is done. This testing allows us to evaluate the performance and functionality of our prototype to ensure that our client is receiving a high-quality product.

Test Objective Description

The specific objective of this testing period is to be able to open a building information model within Unity and our application. During our previous testing period we confirmed that a user can login and reach the file selection page, we will also be verifying that this continues to function.

This prototype serves the purpose of the beginnings of implementing files and AR into our application. We have used our previous knowledge of Unity along with our new research findings to create a login forum and landing page. We are now attempting to open files with Unity and eventually have a functional AR component. This testing period will inform us if our efforts with importing files to Unity are successful. It will also test the beginning of our knowledge with AR functionality.

The potential results are more varied than the previous testing phase. A successful outcome would be that the building information model will open successfully in Unity and the user will still be able to login and navigate in the app to the files page, as well as the user tutorial page. The building information model could also fail to open, or may open in an incomplete manner that is not sufficient for our prototype.

If the building information model opens successfully then we will be able to continue as planned and continue working on the AR implementation. If the file is unable to open we will have to reevaluate our approach to be able to find a solution where the file will open. Our prototype would need to be closely analysed to find any potential errors and more research on Unity would need to be done to comprehend how the file may be opened. A potential solution, if our

AR cannot be implemented properly, would be to create a desktop application that would allow for the user to view the BIM without the mobile AR component.

This testing period is considered a complete success if the prototype allows a user to login, reach the file selection page (as well as the tutorial page), and open a BIM file within the application. Any outcome less than this would be considered a failure for the prototype and suggests that there are errors to be fixed for our next prototype, in addition to new features.

What is going on and how is it being done?

Our prototype II is the continuation of our first prototype. Therefore, this prototype is a focused analytical one just like the previous one. Indeed, the prototype contains a few new attributes of our final product. This prototype is also a focused one because it is not the last one. In fact, there will be a third prototype. Our second prototype answers specific questions such as security, aesthetics, user interface, framework but also the different possible views of the building we will design. This is also an analytical one because it is cheaper than a physical prototype (it did not cost anything yet) and we can make modifications more easily since the prototype is done through Unity which means we have had more freedom with it. As said in the previous deliverable, we have chosen this type of prototype because it is easier for us to make many prototypes where we will add features every single time which will allow us to obtain our final product. Therefore, this prototype has new features the previous one did not have and the third one will have other ones we haven't added yet and will soon be working on.

In order to proceed on our project, we need to test our prototype. The testing process for the first prototype was a success since we were able to login into Unity and be redirected into where the files' company will be stored. By testing our prototype we will be able to detect any possible flaws it may have or even if there might be a way to simplify the use of the app. Our main aim is to make the prototype as simple as possible so that the users can figure out how to make it work.

The testing process of this prototype is a little more complex than the previous one. The first step is to login into the registration page where we will be redirected into the files on Unity. This step is to make sure that those features from the prototype I still work. After that, the aim is to be able to open the building information model file on Unity. Hence, in order to continue the testing process of the prototype, we will have to make sure that after opening the file, a building appears. If that's the case it will mean that we will have uploaded successfully the file onto Unity. We added a little question mark icon which will lead to a potential tutorial if the users find any issues or have trouble finding something. We also have added a plane cutting through the building where the floor would be. We managed as well to add a camera feature where we can enter the building and go around it. With this prototype, we measure and record the level of safety with the registration page, the aesthetics because we want to make sure that the login page, the files storage and Unity main page are welcoming and easy to understand to all users. We also measure and record the different views so that we are able to see the building from the top, bottom, right or left so that the users can see their buildings from any angle they want and

finally thanks to the camera we are now able to see the inside of the building and go around all the rooms.

The goal here is to make sure we can safely open the building information model file on Unity, that we can see the building with the plane we have added from different angles easily and finally that we can see the inside of the building. We will, as said before, measure and record all those attributes in order to see if we will need to work on them with a different approach on the next prototype. And so, the work that needs to be done is to evaluate the app and see if it won't crash when opening the file or editing it for example.

When is it happening?

The testing process will not take long. It will happen before the due date of the deliverable which is November the 20th. In fact, all that needs to be done is to login in order to make sure the registration page works and to open the BIM file on the files storage to see if we can open it. However, before that we need to make sure that the code for the login page works and that the BIM file has been successfully uploaded onto the storage file room. Indeed, if the file has not been successfully uploaded, we will not be able to open the file on Unity and if the code ends up having an issue we will not even be able to login and try to open the file.

The results should be required immediately after the testing process. However, the results will be given right after the testing process since we will be able to figure out if it is possible to open the file on Unity. As said above for this test, we mainly depend on the BIM file because if we cannot open it, we won't be able to proceed and verify that we can see a building from different angles for instance.

Prototype II

The objective of this prototype is to open BIM files within Unity and access a user tutorial page. Our previous prototype allowed a user to login to the application and access a landing project selection page, it also included an application logo. The previous prototype included the connection of Firebase to our application which authenticated users and gave us access to the application analytics. In working on the current prototype, there were many issues trying to open the BIM file. After much trial and error, we were able to get the file open on one of the group members computers and will be working to improve the rest of the application from here. It can be seen below. Additionally, the AR functionality was worked on separately with a smaller object and issues were encountered here as well. We were able to code everything properly, but were not able to get unity to build our application onto our iphones. The project manager and TA have been notified and we are working towards a solution that will allow us to present our final work. The current prototype also improved the user experience by adding a language selection option to the homepage and a tutorial page once logged into the application.

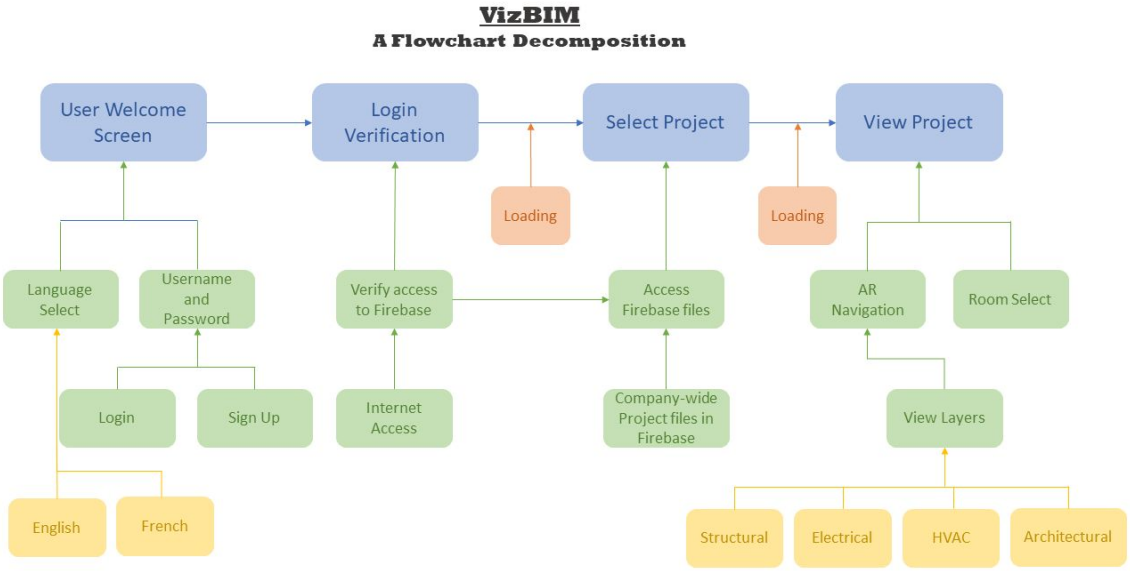

Figure 1: VizBIM Flowchart Decomposition

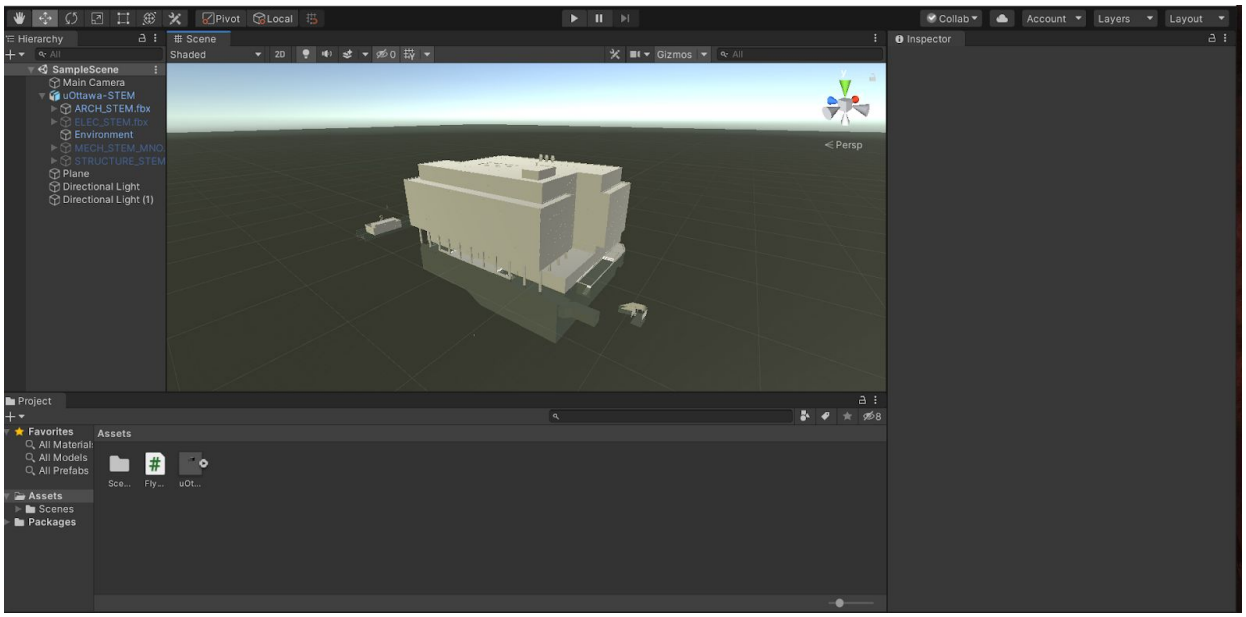

Figure 2: STEM Building in Unity

Conclusion

In conclusion, we have tested our second prototype and followed every step given above. We have written down our results. We are able to login and to successfully open the BIM file. This means that we can see a building from different angles with the added plane but also the inside

of it thanks to the camera. We are now ready to proceed to the next step of the project which is the making of our prototype III. However, no purchase for this prototype was required, so our budget is still intact for the rest of the project. Regarding prototype III, our group has set up a few goals. It will be ideal to reach all of them for this prototype as it is the last one. Therefore, for the third and last prototype, we thought of implementing a tutorial video or walkthrough, finalize the room selection tool implement AR overlays and ability to pin sticky notes in the AR software, get the app on iOS devices, automate Unity AR scene construction so any file can be uploaded and viewed and automatically detect and separate rooms for the room selection tool. We are aware that we have a lot of goals but our aims have all been successful so far and we will divide the tasks following everyone's skills in order to move faster and stay efficient.