University of Ottawa

GNG 1103: Engineering Design

Project Deliverable H: Prototype III and Customer Feedback

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1. Introduction

In this deliverable, we will be looking at our last prototype. The third product we have made needs to be fully functional and the most complete version of all our trials. Once again, we are creating a product based off of our two first tries. Therefore, this prototype will include all of the features we had incorporated into prototype I and II as well as extra features to form a well organised and functional application. In this deliverable we will look at our results from the second prototype, which have guided us in our advancement for the final version, our updated and final prototype, its test plan outline along with its corresponding analysis, feedback and results.

2. Results from prototype II

Unlike our first prototype, the second one was not presented to our client. Our feedback is solely based on what our TA's and volunteer users have recommended. Similarly to the first prototype, our second one was very satisfactory in terms of functionality and aesthetics. Every new added feature in the prototype was fully functional and easy to use. Considering that was the main goal for prototype 2, this means that we successfully met our expectations for this version of our product. Although we encountered trouble with certain things such as having to use a different 3D model, our application still worked and proved its effectiveness in terms of functionality.

3. Prototype III

Since this is our final prototype, we do not have many more features to add. This version only has 4 new features: the FAQ, the menu, the select option and the tutorial.

3.1. FAQ

As mentioned in our initial conceptual designs, as well as based off of client needs, we have now included our FAQ page. This would obviously improve our user experience since it helps guide any confused users to better understand how to use the application. Our FAQ is a simple page with available answered questions as shown in the images below.
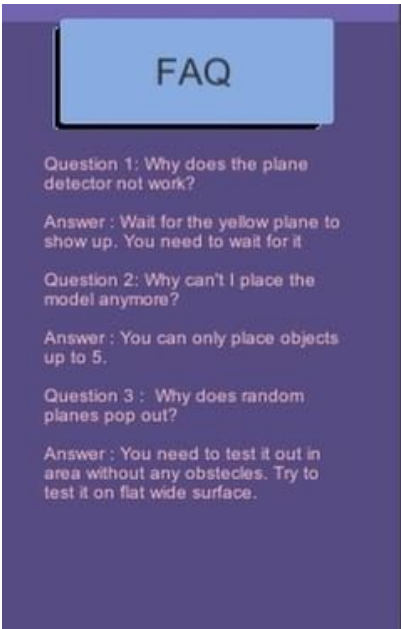
Figure 1: FAQ in game view on Unity

3.2.   Tutorial

After being led to the FAQ page, it is possible for the user to come across a quick tutorial that swiftly explains basic functionalities of the application. This feature can be revisited at any point during the use of the application. However, it is mandatory to go through it initially. The user may choose to go through a video tutorial in English or follow a step by step tutorial offered in multiple languages. The tutorial would appear as follows:

Figure 2: Tutorial pop-up in game view on Unity

3.3.   Menu Pop-Up

As planned in our conceptual design, we have incorporated our menu pop-up, an essential feature to our prototype. As shown below, this step involved creating a toggle menu using assets from

Unity. When the toggle menu is opened, we find two buttons: return to the main menu and help. Both act as functional buttons programmed through Unity. The first one brings the user back to the first scene, where they may either start a new project or open a pre-existing one (as shown in deliverable G). Meanwhile, the second button let's the user go back to the FAQ where they encounter the FAQ questions or can also even go through the tutorial once more. These features are shown in the following figure:

Figure 3: Menu pop-up in game view on Unity

3.4.   Select Pop-Up

Our final new addition to our prototype is the select pop-up. Our select menu consists of a toggle type menu including two buttons for measuring and dimensions. Keeping the same configuration as the other pop up menus, this one includes two new features that are essential to making construction decisions. The buttons are each respectively in charge of measuring specific details such as length of a beam while dimensions give specifications about certain parts (ex: volume).

Figure 4: Select menu in game view on Unity

3.5. New Modifications

Aside from what we already had created and added, for our final prototype, we have included the use of a UI pack to finalize the visual aspect of our application. Differences in appearance may appear as shown below:

Figure 5: English annotate page in game view on Unity

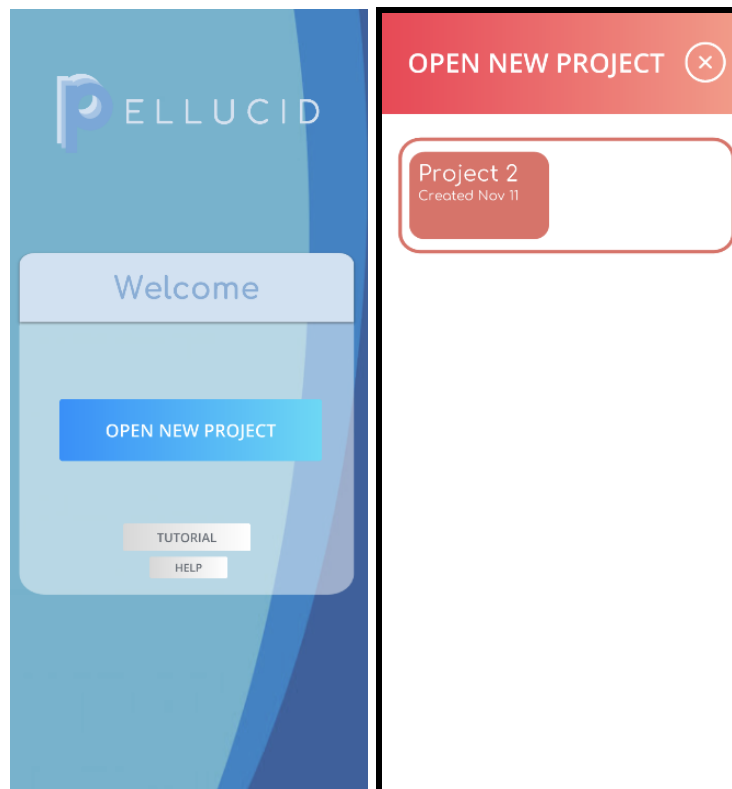Figure 6: French annotate page in game view on Unity

Figure 7: English welcome page on game view in Unity

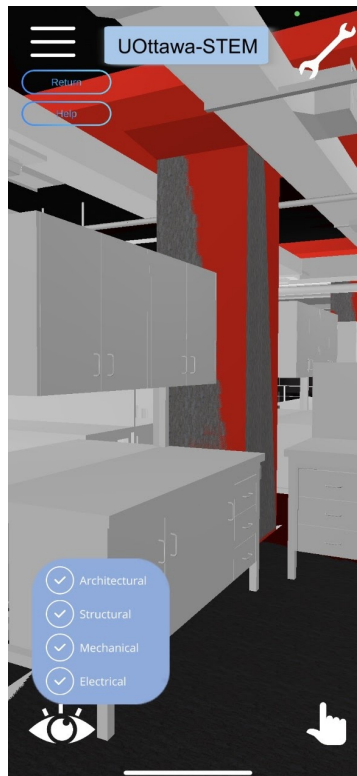Figure 8: French welcome page on game view in Unity

Figure 9: Main interface with new appearance on game view in Unity

With everything listed above, we have our final product, ready for design day. The following flow chart shows our final product and all its components:
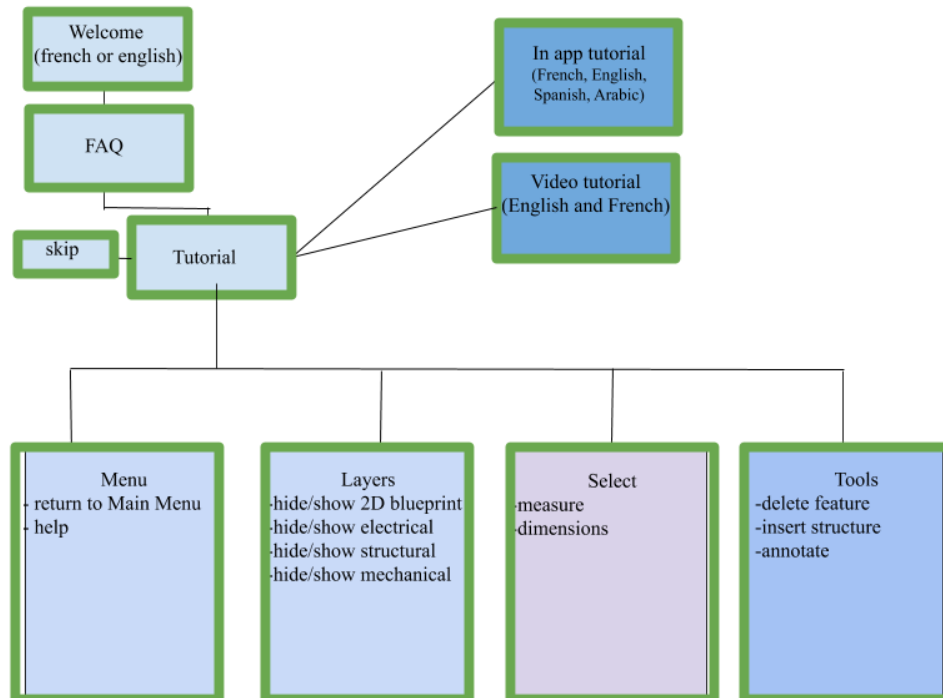

Figure 10: Design Flowchart with updated tasks

4. Test plan outline

With Design Day arriving increasingly fast, our group has had to produce our final product along with the preparation for our presentation. With an increased workload in such a short period of time, we needed to efficiently plan how we were going to create and test our product. This prototype really molded our first two together while adding new features and improvements. Prototype three incorporates the rudimentary ideas of prototype one without forgoing the functionality of prototype two. In fact, in this final version, we have not only added new things on top of what we had initially made, by using new assets available on Unity, we were even able to improve what already existed. This majorly affected the aesthetics of our application. Identically to our past prototypes, our work was heavily influenced by advice and help from the TAs. Once again, our work for this prototype involves putting together what we already had as well as the scenes each team member was tasked with building. As shown in the images for prototype III, this version of our application goes into detail for every functional aspect we have created. Since the test plan for the two first prototypes was successful in building them, we have once again decided to go through with it for our final prototype.Therefore, we followed the following plan: create, build, assemble, test and then modify. During the process to

build our final prototype, we had the typical issues regarding having to work through unity bugs as well as coding errors. The 3D model once again became an issue we had to work with again since an updated version of it was supposed to be available for us to use. However, the model did not arrive at the time we expected it to and we had to plan accordingly. Despite the multiple issues, we compiled our scenes which created our final prototype. Once this was done, our same volunteer users were asked to go through the application so we could collect different opinions and modify our work accordingly. Our improvements on our prototype will be when we will stop working for this second part of our application version.

5.   Analysis

This final deliverable and prototype seemed to be the one that required the most attention and organisation. In fact, the final prototype, our deliverable and a final presentation as well as the plan for said presentation were all due at the same time to be completed in a period of only a week. Therefore, our group needed exemplary organisation as well as communication throughout this period of time. Aside from this work, this period of time, approaching multiple exams created a culmination of work and stress which our group needed to manage quickly and efficiently. Although this seemed like a heavy burden to carry during an entire week, we managed to organise ourtime, giving ourselves deadlines to be able to divide the week for Unity work and final presentation preparation work. In theory, this seems like an easy task, but we needed to work together to advance fast all while avoiding needing to restart if one aspect of our work did not advance properly. This prototype really fully utilized our Unity store asset, a UI pack that would help us create shortcuts for buttons without creating unnecessary clutter on screen and preserving an attractive aesthetic front for our application. This prototype was our conclusion to our Unity work and the final necessary tool for our presentations.

6.   Feedback and Results

After letting our same volunteer users take a final look at our work, we were able to take into consideration their opinions to then accordingly modify what we had initially presented them with. Similarly to our second prototype, users did not have much to tell us. Once again, what stuck out the most was our display choice, in other words, how our buttons are placed, the text position… This was particularly important considering for our previous prototypes, aesthetics was something that had required work initially. Another issue one of our users had with prototype II was that although buttons were functional, fundamentally, there was not much to do. However, with this finalised and complete version of our application, this issue was resolved as users can do more than just open an AR camera. Another element that was recurrent for our third prototype was the language options we had available. All five users particularly enjoyed that feature.

Overall, our users seemed to have thoroughly enjoyed the final product we have created, because of this, we were then able to start focusing on our presentation work as the Unity portion has come to an end.

7.   Future Plans

Although our final product is complete and ready for presentation, we cannot ignore the many other features we eventually would plan on having incorporated into our product. These features are mentioned in our previous deliverable with our conceptual designs as well as our product diagram. We would like to add the following features:

- Library: This feature would be included inside the tools pop-up menu. This feature would allow users to go through a list of different pre-existing elements they can import into their project. This would facilitate the task of incorporating specific structures into a project. An example of this would be inserting a door that would be available inside the library(different versions of a door would exist so the user may use whichever one they prefer). The library would also preferably have prices displayed for different structures so the user can see if their modifications stay under their budget.

- Material detail: This feature would be found in the select pop-up menu. This feature allows users to display their materials on surfaces. This would work as a colour code system, so that each material is associated to a colour. Doing so avoids creating clutter on surfaces by displaying names of different materials. It also facilitates understanding projects since it is more visually appealing.

- Price Breakdown and Changes Pop-Up: These two features go hand in hand and would be found in the notepad menu. Price Breakdown would create a sort of total receipt so the user may see how much his total project costs. Unlike the library which only displays the price of individual items, this feature gives the total price breakdown of the project. The changes pop-up let's users see the "history" of what modifications were made on the project.

- Login and logout: In our future endeavours, we would like to add a login/logout feature that allows users to go in and out of their respective accounts. This would allow users to maintain their own personal accounts versus their commercial/job accounts. Having an account system also assures that there is a minimum amount of security surrounding peoples' work. For our login, we would like to not limit users to having to login on an account they make for the application, but let them link their Pellucid accounts to Google or Facebook. This allows users to have a faster sign-in experience but also makes it easier for their work to be saved onto a cloud system.

8. Conclusion

In conclusion, for this final prototype and deliverable, we have successfully built the application we will present on Design Day. Following a strict prototype test plan and keeping organisation as a priority, we created a third prototype that not only fully functions but is aesthetically pleasing to the users eye. This final prototype really tested our abilities as we needed to rush to complete good work in a small amount of time. As Design Day approaches, we can now focus on our pitch to the judges.