Deliverable E: Project Plan & Cost Estimate

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Introduction

The Ross Video Design Challenge is a project assigned to students by the client Ross Video, in collaboration with the Ottawa Sports and Entertainment Group (OSEG). The goal is to design an innovative interface that controls the various graphical and auditory elements used during sporting events. This system is expected to be produced using Ross Video's very own program, Dashboard, which is built specifically for the purpose of modelling interfaces to be used in live events.

The production team at the TD Place Arena are constantly seeking new ways to improve the fan experience. Fan engagement is extremely important during sporting events, as are functional aspects of the control panel. The project will explore ways to integrate viewer engagement features into the arena's display system.

In the last deliverable, the team formulated a series of conceptual designs for the various subsystems of the final solution. These designs were then categorized and combined into 3 new concepts and then benchmarked alongside one another. The various pros and cons of each new system were analyzed before the team decided on a final design solution for the project.

In this deliverable, the team will create the plan which will be followed during the product's development.

1. Design Drawing

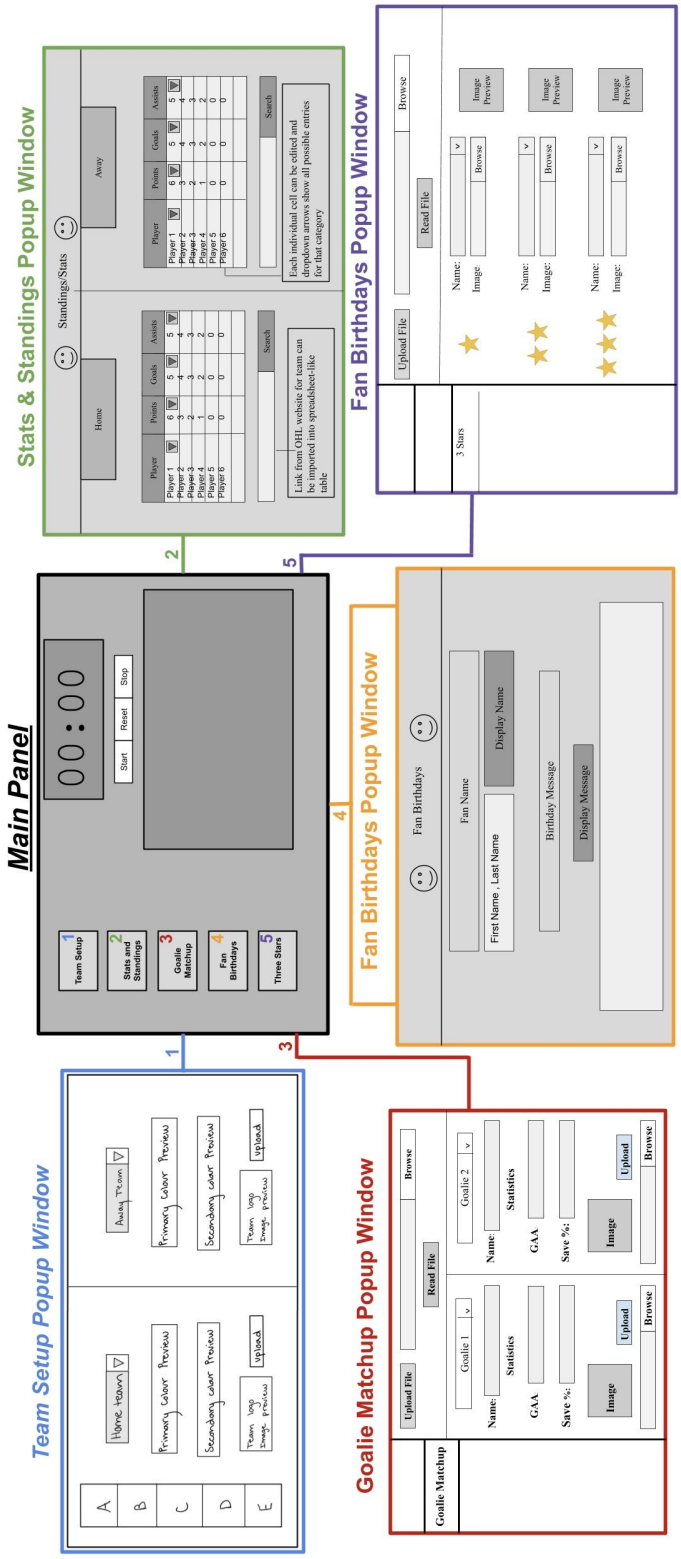


Figure 1. Design drawing of all subsystems as well as home screen.

2. Plan and Schedule (zhaoxin)

2.1. Task List

Table 1. Task list. (The gantt chart version of the project plan with more detailed tasks is provided in Appendix 1.)

Task #	Task	Duration (hours)	Owner
1	Create BOM	0.5	Sahibjot
2	Plan and schedule	1	Zhaoxin
3	Prototype plan	3	Sagnjeevie,Emma, Vivian
4	Build subsystem	8	All
5	Integrate subsystem (prototype 1)	8	Sahibjot,Emma, Vivian
6	Testing/debugging prototype I	4-5	Sagnjeevie,Zhaoxin
7	Updating prototype I	3	All
8	Building prototype II (deliverable G)	8	Sagnjeevie,Zhaoxin
9	Testing/debugging prototype II	8	Sahibjot,Emma, Vivian
10	Project presentation (Deliverable J)	3	All
11	Building Prototype III	8	All
12	Final Testing and integrating prototype III (Deliverable H)	8	All
13	Design day (Deliverable I)	3	All
14	User guide (Deliverable K)	4-5	All

2.2. Project Risks and Contingency Plans

Probability of happening: 1 = low probability, 5 = high probability
Priority: 1 = low priority, 5 = high priority
Impact: 1 = no damage, 5 = largest damage

Table 2. Project risks and details.

Specific Risk	Affected Activities	Probabi-lity	Priority	Impact	Contingency Plan	Owner
Subsystem is not functioning	6,9,12,13	4	5	4	Looking for the problem, and try to solve it before the due date. If the group cannot solve it, ask PM for help to solve the problem and see if the problem is solvable or we need to make a similar design	Zhaoxin
Failing to integrate subsystem	5,13	4	5	5	Try to solve the problem first by using Dashboard forum or related sources. Ask Pm if the problem is out of control or unsolvable	Emma
Subsystem function does not match target specifications	5,8,10,13	4	4	4	Minimizing the difference first. Document the variance between the prototype test and the target specification, and provide detailed analysis in the report.	Sagnjeevie
Team members cannot finish their part before due date	All	3	5	4	separate them into several pieces and let other team members finish the required task before the due date. After that the team member	Sahibjot

					who didn’t finish the task needed to finish more tasks.	
Dashboard file lost	All	2	3	2	After finishing a subsystem or updating a subsystem, a team member needs to upload the file into the google drive to prevent losses. If the file is already lost without uploading into the drive, the team member who is responsible for this part needs to redo the task.	All
Debugging failure and coding problem	6,9,12	4	4	3	Trying to find a solution online or Q&A with a PM/ Dashboard technician.	Zhaoxin
Dashboard compiling error due to computer problem	All	2	2	2	Using another team member's computer to compile the code, he/she needs to finish more documenting tasks.	All

3. Bill of Materials

For the project our total cost comes up to 0 dollars. To build the interface many different tools and materials will be used:

Table 3. Bill of Materials

Item	**Cost**
Laptop (5 personal item)	$0
OHL stats	$0
Ross Dashboard	$0
Images (Logos, players)	$0
Dashboard user manual	$0
Total	$0

The Laptops will be used to work on the interface since they can support the dashboard application. For any stats or statistics we will be using the OHL stats webpage and upload the stats from the website to the interface. The dashboard system is used to build the interface for this project. Any images used in the interface will be uploaded from google images. The user manual for dashboard is free of charge and will be used throughout the project.

4. Prototyping Test Plan

4.1. Prototype 1 Overview

The first thing to test will be whether the system's basic structure is actually feasible. The main screen (like a home page), has buttons on it which are meant to open up tabs corresponding to each subsystem, we need to make sure that each button can actually open the entire subsystem they correspond to, and users are able to properly interact with features on each tab. The goal is to make sure we can make many tabs, each with controls of their own. Additionally, based on our design concept, it should be possible to switch tabs without reverting to the home screen first.

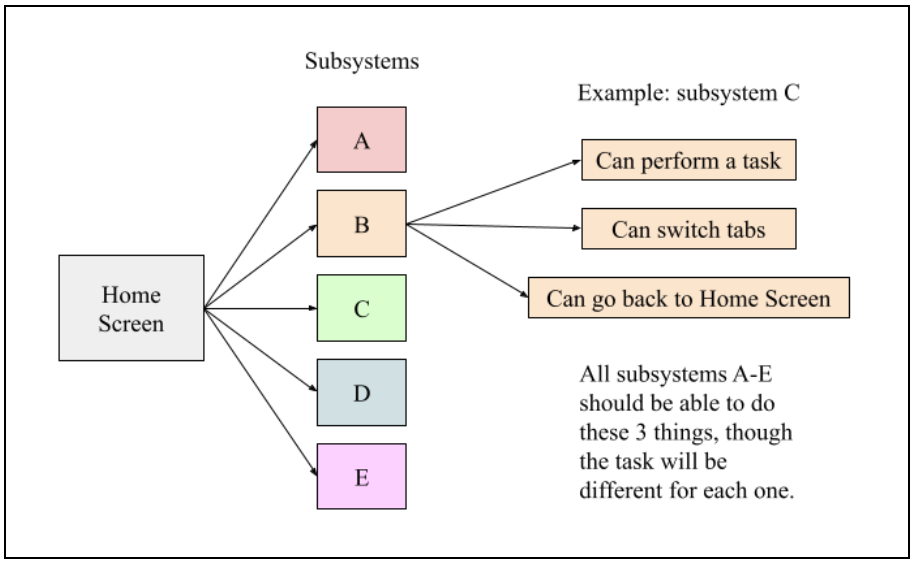


Figure 2. How prototype 1 should function if things run smoothly.

Next, if there is still time we will set up the code for reading JSON files. Ideally, we would set up the feature which reads JSON files/links from the OHL website and converts the information to a table in Dashboard. This is the basis of a few subsystems in our design and the sooner we figure out whether we are capable of it, the smoother the rest of the project will go.

Each team member will be assigned subsystems or parts of a subsystem to create in Dashboard for the prototype. For this stage each part will be on separate devices since each member will be using their own computer, so it won't be put together yet.

If there is no success on a subsystem after repeated attempts and significant time spent on it, the subsystem will need to be modified to be more feasible. This might happen with some of the more complicated parts such as coding the system to read files and autofill text fields, in which they may need to be simplified.

Once each member has set up their assigned parts, the team will test it. This will be done in advance of the client meeting to leave time to make quick adjustments or improvements If the team finds that a part does not work at all, or is difficult to use, everyone will provide feedback and suggestions, or change the design if needed.

To reduce the risk of a subsystem being unsuccessful, more complex ones may have more than one person assigned to make it. This way if one person gets stuck, there is still a chance that the other person will have more success.

Since there will still be a lot of things that need to be tested, the stopping criteria of prototype 1 will be reaching the time limit (the customer feedback date).

The overall prototyping test plan can be summarized in Table 4 below.

Table 4. Prototype 1 Test Plan. Test plans are based on the system as used by a fairly new user. Someone familiar with the topic of Dashboard but not necessarily with this design concept (for example, a group member aside from the person who designed the particular subsystem).

ID	*Test Objective (Why) and Description of Prototype used and of Basic Test Method (What)*	*Description of Results to be Recorded and how these results will be used (How)*	*Desired Results (What counts as success)*	*Estimated duration and planned start date (When)*
1	The basic outline of one or a few of the subsystems as well as the general home screen will be used for testing. A responsiveness test will also be conducted in order to gauge the speed at which the home page responds to user input. The goal is to check for any uncertainties associated with the function of the home page.	The rate of success in 10 uses of the different tab switch buttons will be recorded. Time in seconds for the system to respond to input will also be measured.	Users can find and open a subsystem's menu within 1-3 seconds from the home page.	Test Duration: 20 minutes considering multiple trials are to be conducted. Planned Start Date: October 29, 2021
2			Tab switch buttons function successfully ~100% of the time (10/10 times as long as the user does not make any obvious mistakes).	
3			Menus load within 1 second	
4	Verify feasibility by assessing the functions of the tab switching mechanism and measuring values related to its efficiency. The mechanism to save and switch from one tab to another can	The level of success as well as any anomalies of the tab switching mechanism will be observed and used to assess whether the capabilities of the system are practical for the client.	Subsystems should be saved at the top of the screen for easy access.	Test Duration: 10 minutes considering multiple trials are to be conducted. Planned Start Date:

5	be tested using basic tabs without any complicated elements on it. The speed at which the program is able to switch from one subsystem to another will be measured to ensure needs for efficiency can be met.	Time in seconds taken for a user to switch between multiple subsystems will be measured.	Capabilities for Switches from one subsystem tab to the next within a second.	October 29, 2021
6	Verify the feasibility by checking that each subsystem can successfully return to the home screen and assess the values related to its efficiency. Very few elements are required to test this function and a low fidelity prototype will work since it relates to base functionality rather than specific tasks. A blank popup window will be used to complete this test. Furthermore, the response time of the system to exit out of	Along with the basic test, average response time over 3 trials for the exit input will be measured as another means of gauging the efficiency of the function. The number of clicks it takes for a user to navigate from a random tab with an open pop up window will be measured.	Close out of a subsystem menu within 2 seconds with one button press.	
7			It takes no more than one click for a user to return back to the home screen and exit a subsystem tab.	Test Duration: 10 minutes considering multiple trials are to be conducted. Planned Start Date: October 29, 2021

	the subsystem menus in relation to the input provided by the user will be assessed.			
9	Only one subsystem such as standings/stats will need to be used to test this objective. A software test on Dashboard will be performed using a file uploader to determine the efficiency of the system as well as ease of use. The overall speed at which a user can perform this task and have the system read and display the information from the file will also be measured.	The results will be recorded by observing if the JSON file/ OHL link can be uploaded and converted into a spreadsheet or list. The results will be refined and applied to all subsystems that require this function. Quantitative measurements of the time in seconds required to perform the task and have the system read the file will be taken and used as a means of assessing whether the function is feasible. Number of mouse clicks needed to upload a file will be recorded.	Easily find the uploader and attach a file or link within 5 seconds from the home screen.	Test Duration: 20 minutes considering multiple trials are to be conducted. Planned Start Date: October 29, 2021
10			The file or link should be uploaded, and within 3-4 seconds of uploading, information should be loaded and displayed within the spreadsheet table 1-3 seconds after the upload has been completed.	
			The user needs to click no more than 3 times to finish uploading the file.	

4.2. Prototype 2

The goal of prototype 2 is to test all the subsystems individually to make sure all the important functions work, as well as implement any changes that are needed after receiving feedback from the client.

Subsystem A needs to allow a user to:

- ☐ Set and save the primary and secondary colors for all teams playing in the OHL, as well as the logos.

- ☐ Add, remove, or change a team as well as its colors without having to edit the way the control panel is programmed.
- ☐ See and select any team from a drop down list, and see the corresponding colors.
- ☐ Upload an image of the logo for each team.

It may also have features added due to a suggestion from the client after seeing prototype 1.

Subsystem B needs to allow a user to:

- ☐ Upload a JSON file or paste a link.
- ☐ Upon pressing the “Read File” button, access names of all players listed in the JSON file via a drop down menu and select one.
- ☐ Selecting a name needs to fill in the corresponding fields under the drop down menu.
- ☐ Upload a second JSON file without removing text from filled fields corresponding to the goalie on the other team.
- ☐ Upload an image of each goalie from the device.

Subsystem C needs to allow a user to:

- ☐ Upload link from OHL website.
- ☐ Organize the information for the statistics of each player into a table.
- ☐ Use the dropdown menu to access information from each category and edit it if necessary.

Subsystem D needs to allow a user to:

- ☐ Enter information regarding fan birthdays into a pop-up menu.
- ☐ Display each message for a set duration depending on total time allocated for all messages and the number of birthdays.
- ☐ Update the list by adding or removing birthdays very easily without having to alter the format or programming of the interface.

Subsystem E needs to allow a user to:

- ☐ Upload a JSON file or paste a link which is imported upon pressing the “Read File” button.
- ☐ Choose the required player by clicking on their name in the dropdown menu.
- ☐ Upload an image of each player from a file on the user’s device.

The testing of prototype 2 will focus on assessing various features of each of the subsystems. Many of the subsystems share common characteristics which will only need to be tested once to verify their feasibility and be carried throughout the system.

Table 5. Prototype 2 Test Plan

Test ID	Test Objective (Why)	Description of Prototype used and of Basic Test Method (What)	Description of Results to be Recorded and how these results will be used (How)	Estimated Test duration and planned start date (When)
1	Verify the speed and efficiency of the Standings/ Stats interface for the user.	A more comprehensive prototype will be used (a partial subsystem, missing some features which the team needs more time to build, but including everything we have ready). This will allow us to more accurately evaluate the performance of our product.	Average time in seconds needed to switch tabs (tabs with elements on them, unlike the first prototype). Results should not exceed 1 second, since in our previous prototype it was instant, this time we expect very small numbers.	Test duration: 15 minutes Planned start date: November 7th, 2021
2	Evaluate user friendliness of the Standings/ Stats interface. (Also testing speed).	A fairly comprehensive prototype will be used again (missing some features which the team needs more time to build, but including everything we have ready). This test doesn't necessarily need a comprehensive prototype since it does not measure performance, only the user's interactions with it.	Number of mouse clicks needed for a user to display desired information on the Standings/Stats subsystem *(Tab 1)*. At the same time, the process will be timed to get an idea of the minimum speed at which it can operate. This subsystem is currently fairly complex, so the goal is to take no more than 5 clicks on this screen in order to operate it.	Test duration: 15 minutes Planned start date: November 7th, 2021.

		However, we already have a comprehensive prototype intended to test performance in the previous step, which is why we will use the same prototype.		
3	Evaluate user friendliness of the Goalie Matchup interface.	This test will use the same prototype as the one used in Test 2, since this will save time and effort (resources) for the team.	Number of mouse clicks needed for a user to display desired information on *Tab 2*. Time taken will also be recorded once again, to get an idea of the speed at which it can be operated.	Test duration: 15 minutes Planned start date: November 7th, 2021.
4	Test the efficiency of the Fan Birthday subsystem	A more comprehensive prototype compared to prototype 1 will be used. It has multiple tabs and is capable of inserting different fan names so that they appear on a tab.	Average time in seconds required to parse 3 sets of data (name, age and message) into the system. Average time in seconds required to display parsed information.	Test duration: 10 minutes Planned start date: November 7th, 2021
5	Assess the speed and practicality of the three stars user interface in order to gauge its efficiency.	A focused prototype with greater capabilities for processing specific forms of information such as player names, team and jersey number. This will allow us to analyze the	The average time in seconds required for the user to enter the information into the interface as well as the amount of time required for the interface to respond to the user input, will be observed.	Test duration: 15 minutes Planned start date: November 7th, 2021

		efficiency of this subsystem for the user.	Desired results are ~1-2s for parsing information into the system and another ~1-2 seconds for the system to respond.	

Again, the stopping criteria for testing prototype 2 will be either once all the desired metrics have been met, or once time is up (client feedback date).

4.3. Prototype 3

Since most of the functional parts have been tested (ideally) on prototype 2, prototype 3 aims to refine the user experience. This is when the system is put together as smoothly as possible to provide the best user experience; this is also the stage where user perceptions of the product like the aesthetic aspect will be tested so the design can be refined.

Table 6. Prototype 3 Test Plan

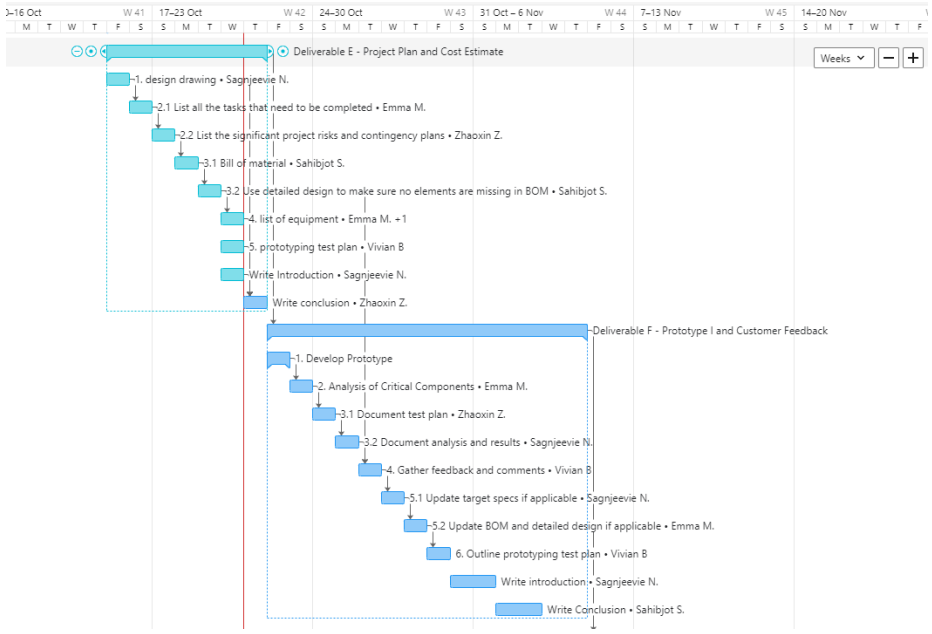
Test ID	***Test Objective (Why)***	***Description of Prototype used and of Basic Test Method (What)***	***Description of Results to be Recorded and how these results will be used (How)***	***Estimated Test duration and planned start date (When)***
1	Find out how easy to use users perceive the system to be at a glance and briefly after using it. This is important because a customer's first impression of a product can greatly impact how much they	Multiple people, ideally who are unfamiliar with the design but who have a general idea of the purpose of the product (people who watch hockey games but don't know programming for example), will be asked to briefly interact with the system. They will be asked to complete a simple task like "upload an image of a	Users will be timed (not necessarily with their knowledge), and then asked how simple/difficult they felt the system was to use on a scale from 1 to 10. Ideally, a user unfamiliar with the system should respond a number 6 or lower since the task they will be asked to perform will be a very simple one, so their perception of difficulty or simplicity will be based on how the user	Test duration: 20mins. Planning start date: November 13th, 2021

	want to use said product.	goalie that is in the Pictures folder of this computer onto the Dashboard.”	interface has been designed.	
2	Testing user perceptions of aesthetics	Various people (friends/family/ classmates)will be shown screenshots of different subsystems and asked if they would feel happy having to look at the control panel every day at work. They will be asked to give feedback on the visuals.	The result will be given by the user feedback. According to these results, our team will change certain features to satisfy the user's needs.	Test duration: 20mins. Planning start date: November, 13th, 2021

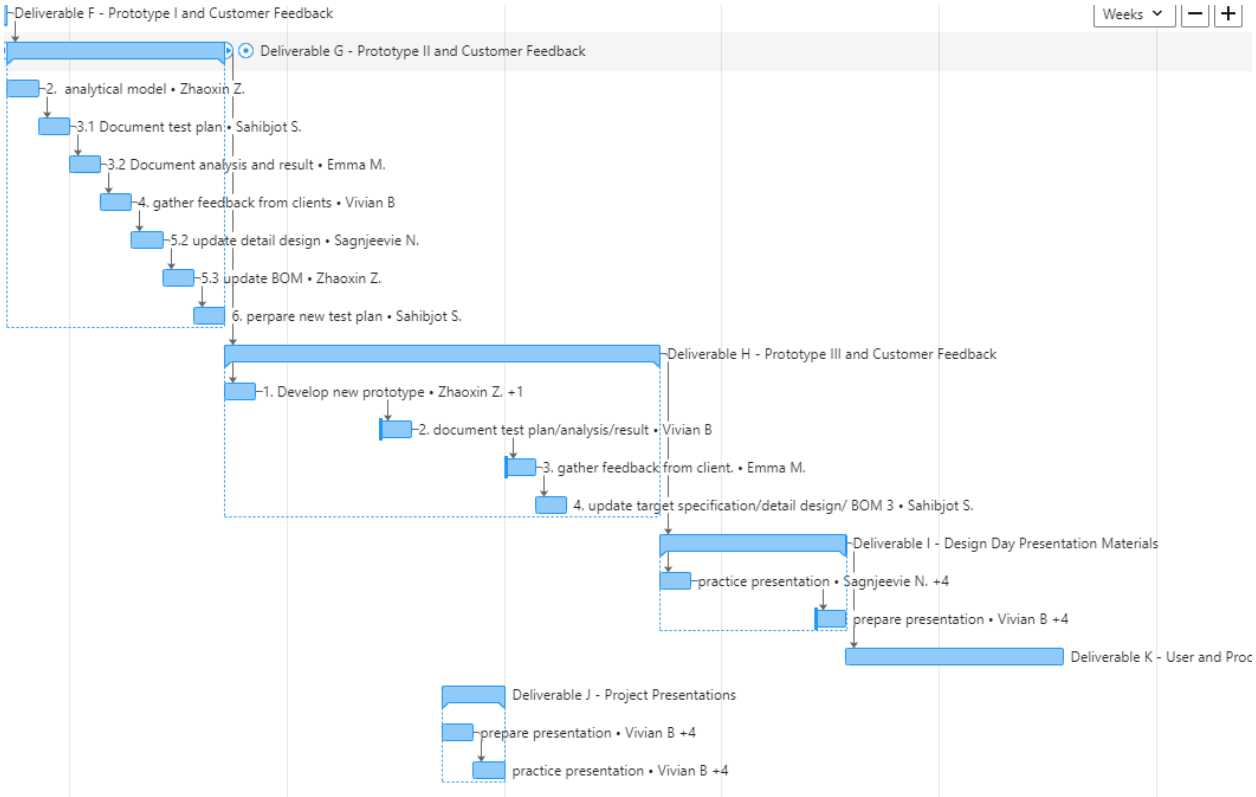
Conclusion

We developed a list and a Gantt chart of the tasks that need to be completed with approximate dates, and we distributed tasks to each team member. We also accounted for some risks and created some contingency plans so we are able to get the most important aspects done. We will mainly use Dashboard to program and design this project. Finally, we included an overview of planned prototype tests for this project.

Appendix 1



Gantt chart for deliverable E&F



Gantt chart for deliverable G,H,I,J,K