

GNG 1103

Deliverable E: Project plan and Cost Estimate

Group 13

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February 28th, 2021

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Introduction:

This deliverable introduces the final design concept based on our previous deliverable, our future project schedule, the risk and contingency planning, and the cost estimate for the project.

Our client, Mitch Bouchard, was satisfied with the concepts presented in the 2nd client meeting on February 22nd 2021. Based on his feedback, our group came up with a final design concept that finalizes the features and subsystems intended for the final project.

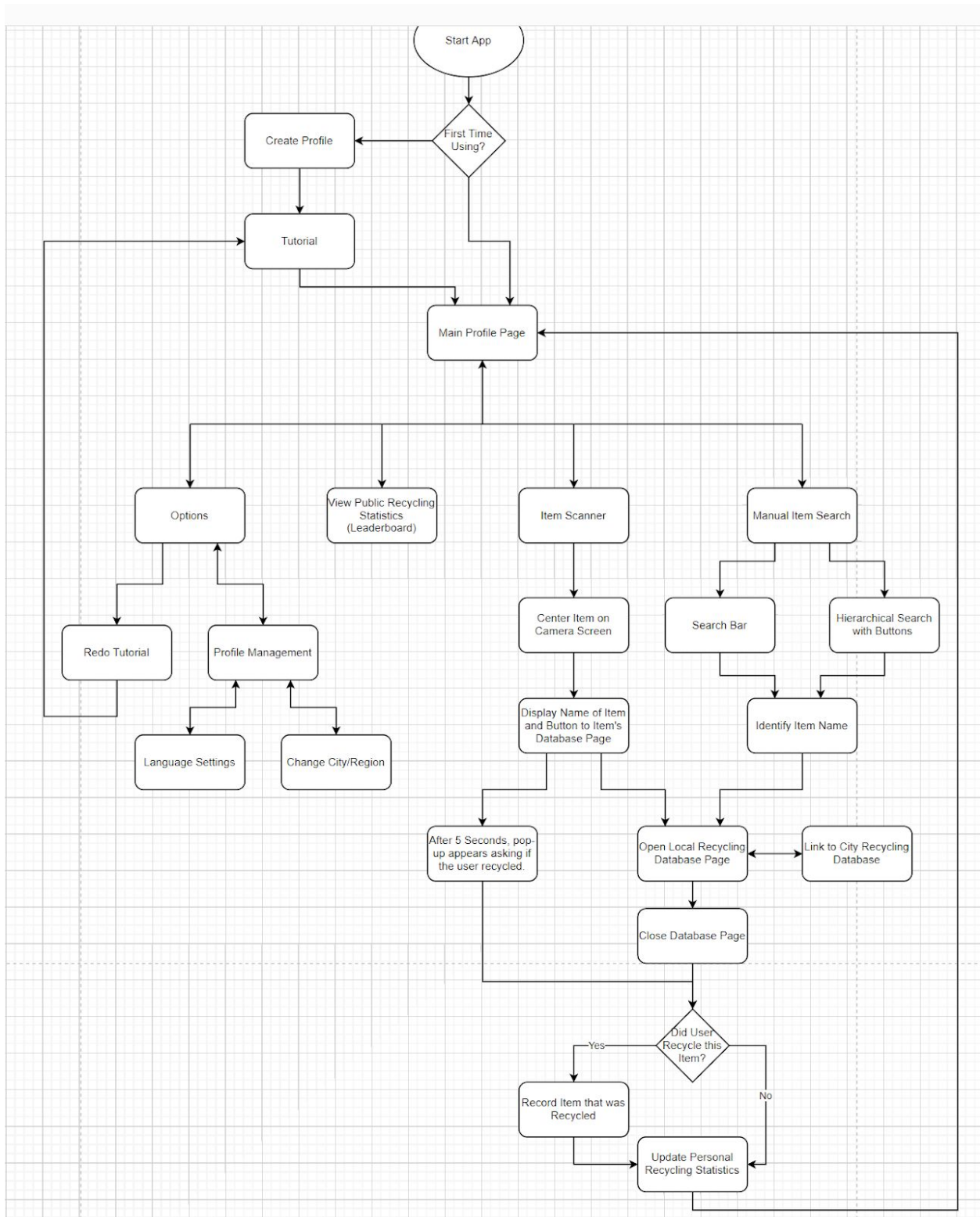
Our group used methods from lecture 9 to assign tasks appropriately and estimate their duration. Moving forward, our group will attempt to strictly adhere to the project schedule as it outlines critical tasks and deadlines necessary for the project's success within a reasonable timeframe. Additionally, our group assessed how likely we are to deviate from the initial project plan and tried to come up with contingency measures to ensure smooth deliverable progress. Once these components were finalized, our group predicted future expenses and estimated their cost in a bill of materials.

Design Drawings:

Navigation:

The app will be built around 5 central scenes, the profile page, public leaderboard, manual item search, item scanner and the options page. Switching between these scenes will be done with an icon bar located at the bottom of the screen.

Figure 1: App Navigation Flowchart



Profile page:

In order to keep track of user recycling activity, it is necessary for each user to possess a profile. The profile page displays the user's name and allows the user to view information about their own personal recycling activity in the form of graphs and a calendar.

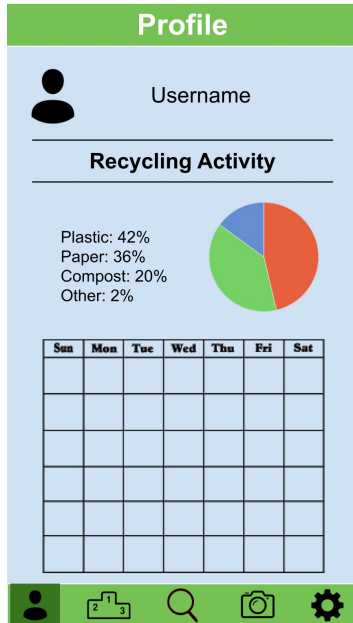


Figure 2: Profile page

Leaderboard:

The leaderboard page ranks users against one another based on their monthly recycling activity. Each user's rank, name and amount of items recycled are visible.

Rank	User	# of Items Recycled
1	user1	143
2	user2	136
3	user3	131
4	user4	124
5	user5	118
6	user6	111
7	user7	105

Figure 3: Leaderboard page

Manual Item Search:

This feature is intended to serve as an alternative method of identifying an item if the AR scanner fails to identify an item. The user will have the option to input text into a search bar or press the material buttons lower on the screen to perform a hierarchical search to identify an item. If an item that the user is searching for is not in the local item database. The search bar will return no results found.

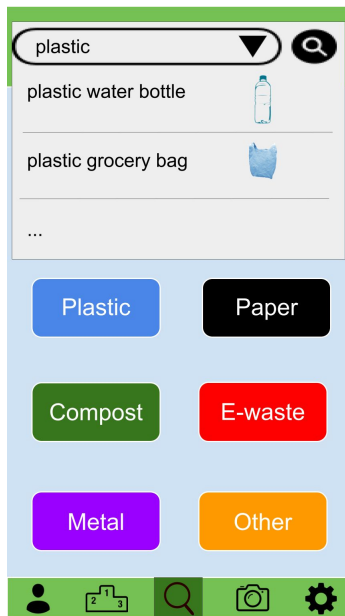


Figure 4: Manual search page

AR Item Scanner:

The AR scanner will evaluate what is displayed on the phone camera against a database of image targets to determine what is being viewed by the camera. The name of the item will be displayed at the top of the screen. If there is no matching image target for the item the camera is pointed at, the text at the top of the screen will display no results found. A pop-up with the bin to place the item in along with a button to open the database page will be at the bottom of the screen. 5 seconds after having identified an item, an additional pop up will appear asking the user if they have recycled that item.



Figure 5: Scanner page

Options:

The options scene will allow the user to adjust information relating to their language preferences, recycling region and whether or not they want to display their recycling on the leaderboard. The user also has the option to retake the tutorial.



Figure 6: Options page

Database Page:

These pages are accessible through both the manual item search and the scanner scenes. The name of the inputted manual search item or the matching image target name from the scanner will be used to open a database page with recycling information relating to the item with that name. This page will have the name of the item, an image of the item, the bin to place the item in along with any additional actions that need to be taken to dispose of the item. A link to the user's recycling municipality's database will be present at the bottom of the database page. To return to the main 5 scenes, the user will press the red X at the top of the database page. This action will prompt the user to answer whether or not they recycled the item that they were just looking at. Responding to the prompt will update the user's recycling activity and return the user to their profile page.



Figure 7: Database page

Gantt Chart:

In order to track the team's progress for the project deliverables, a Gantt was created using Wrike. The Gantt chart provided shows the due dates and assigned tasks that must be completed to ensure the development and finalization of the application. The Gantt chart may receive updates for future deliverables as time passes to make sure that the team remains organized.

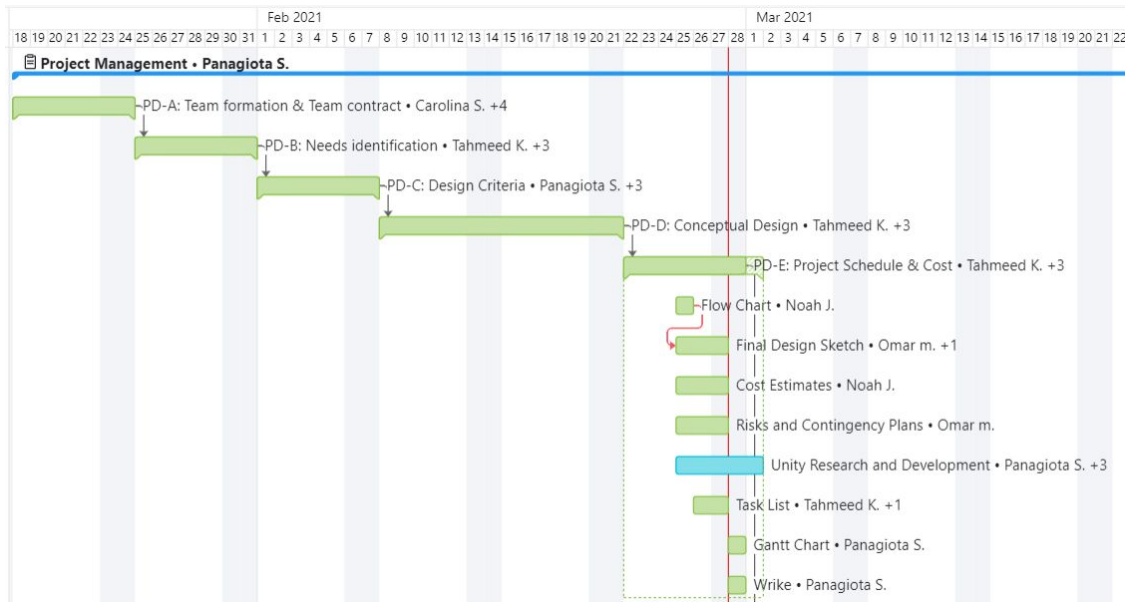


Figure 8: Gantt Chart

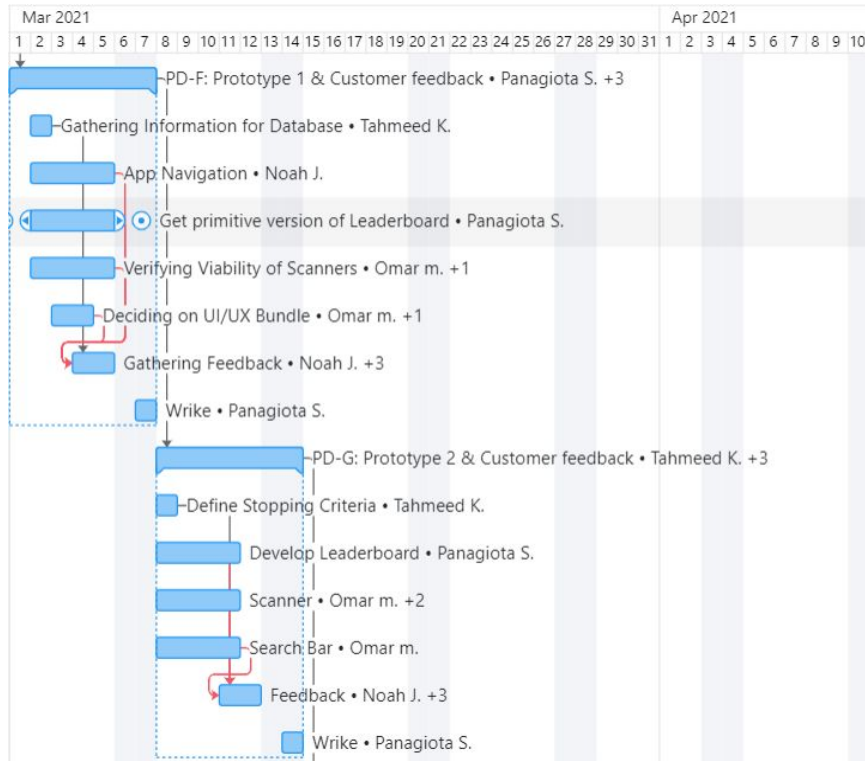


Figure 9: Gantt chart

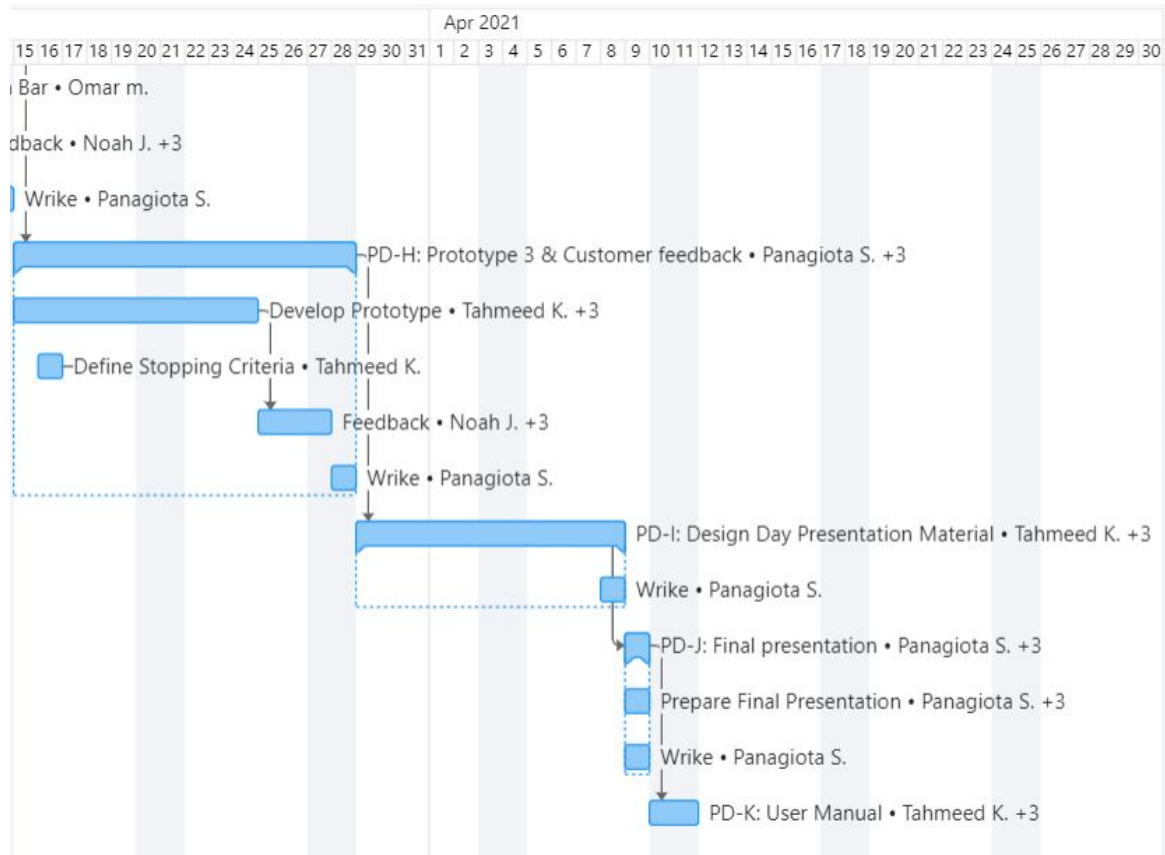


Figure 10: Gantt chart

Project Schedule

The following table outlines a detailed timeline of future deliverables and their associated sub-tasks. It is important to note that the further away the deadline is, the harder it is to accurately assess the tasks associated with its respective deliverable and even harder to assess its deadline. Thus, the closest deliverables have the most detailed plans.

Table 1: Defined Subsystems for Final Product

Major Task or Milestone Name	Sub Tasks	Dependencies	Estimated Duration (Days)	Owner	Due Date
Deliverable A: Team Contract and Project Management		None	7	All	Jan 24
Client Meeting 1		None	0	All	Jan 26
Deliverable B: Need Identification and Problem Statement		Previous Deliverable	7	All	Jan 31
Deliverable C: Design Criteria and Target Specifications		Previous Deliverable(s)	7	All	Feb 7
Deliverable D: Conceptual Design		Previous Deliverable(s)	14	All	Feb 21
Client Meeting 2	Meet with 2nd client		0		Feb 22
Deliverable E: Project Schedule and Cost		Previous Deliverable(s)	7		Feb 28
	Task List		2	Tahmeed Panagiota	Feb 27
	Gantt Chart		1	Panagiota	Feb 28
	Flow Chart		1	Noah	Feb 25
	Final Design Sketch	Flow Chart	3	Omar Noah	Feb 27

	Risks and Contingency Plans		3	Omar	Feb 27
	Cost Estimates		3	Noah	Feb 27
	Wrike		1	Panagiota	Feb 28
	Unity Research and Development		5	All	Mar 1
Deliverable F: Prototype I and Customer Feedback		Previous Deliverable(s)			Mar 7
	Gathering Information for Database		1	Tahmeed	Mar 2
	Verifying Viability of Scanners		2-4	Omar Tahmeed	Mar 5
	Get primitive version of Leaderboard		3-4	Panagiota	Mar 5
	Deciding on UI/UX Bundle		1-2	Omar Tahmeed (Everyone's decision at end)	Mar 4
	App Navigation		3-4	Noah	Mar 5
	Gathering Feedback	Every subtask on deliverable F before this one	2	Everyone	Mar 5
	Wrike		1	Panagiota	Mar 7
Client Meeting 3	Get Feedback		0		Mar 12
Deliverable G: Prototype II and Customer Feedback		Previous Deliverable(s)			Mar 14
	Define Stopping Criteria		1	Tahmeed	TBD

	Scanner		3-4	Omar Noah Tahmeed	TBD
	Develop Leaderboard		3-4	Panagiota	TBD
	Search Bar		3-4	Omar	TBD
	Feedback	Every subtask on deliverable G before this one	2	All	Mar 12
	Wrike		1	Panagiota	Mar 14
Deliverable H: Prototype III and Customer Feedback		Previous Deliverable(s)			Mar 28
	Define Stopping Criteria		1	Tahmeed	Mar 16
	Develop Prototype		10	All	Mar 24
	Feedback	Every subtask on deliverable H before this one	3	All	Mar 25
	Wrike		1	Panagiota	Mar 28
Deliverable I: Design Showcase Presentation		Previous Deliverable(s)		All	Apr 8
	Wrike		1	Panagiota	Apr 8
Deliverable J: Final Presentation		Previous Deliverable(s)			TBD
	Prepare Final Presentation			All	TBD
Deliverable K: User Guide		Previous Deliverable(s)		All	Apr 11

The table provided shows both previously completed project deliverables or milestones and ones to be completed in the future. It also includes the tasks for each deliverable with the assigned team member(s) and their approximate durations. It may occur that some of the tasks may have dependencies, meaning that a task will rely on the task before it. Therefore, the previous task has to be completed in order to move on to the next task.

Risk and Contingency Plan:

This segment would concentrate on outlining the risks involved with this undertaking and, if it were to happen, on drawing up contingency plans. The categories of potential risks vary from member-related risks to software risks. In our preparation, possible risks are important to include. In reality, these factors can cause not only a delay in project development, but also a shift in team dynamics, which has a direct effect on how the group operates and progresses. Creating contingency plans to help provide a safety net around such problems and allows us to be ready for any potential scenario.. All risks and contingency plans are discussed in the table below. Like previous deliverables, the rating for both the likelihood and impact are out of 5.

Table 2: Risk and Contingency Plan

Risk	Likelihood	Impact	Contingency plan
Unfamiliarity with Unity	5	5	Setup meetings as a team to work together Ask for help from the TA
Unity not being Sharable	5	3	Since Unity does not allow multiple users to edit at once like google docs, an external software such as github is necessary.
Lacking Coding skills	4	5	Ask for help from TA Look for other methods such as crash courses and Youtube tutorials to develop that skill
Unity crashing	4	4	Externally saving our work on separate harddrives. Search for many troubleshooting options
Specific Feature Not working	4	4	In the case that a specific feature is not working or is taking longer than expected, a team meeting must be conducted to discuss a more feasible solution.

Pressure overload	4	3	Team meeting to be commenced, discussing what elements of the app should be removed to reduce the stress.
Communication Barrier	2	4	Expand current methods of communication Assign individual tasks to reduce the need to communicate.
Covid-19	2	4	Due to the global pandemic, a chance of one member getting covid likely. In that case the team must work together to finish that members tasks
Members not completing assigned task	2	3	As a team work collectively on the missing part and finish it as soon as possible.
More time Needed	1	4	Commence more meetings per week and work hard to get it done.
Group Conflicts	1	3	Due to the high pressure situations conflicts may occur and to cope with them the team must work together to solve them

Cost Estimate and Bill of Materials:

To assist us with this project, the university has allocated our team a budget of \$100 to spend on any necessary materials or software. The project development is to be done in unity, a free open-source software that facilitates app development. Our team intends to only make use of free assets and plug-ins for the prototyping deliverables. However, some of the budget may be spent if there are no free options available for a necessary asset or plug-in. The following table lists all foreseen components and associated costs necessary for the prototyping deliverables.

Table 3: Cost Estimate and Bill of materials

Component	Description	Cost (\$ CAD)
Unity Software	Free software to be used for developing the app.	0
Vuforia Engine	Unity plugin that assists in augmented reality app development.	0
CloudOnce Plug-in	Unity plugin that provides unified game services support for mobile apps.	0

Unity UI Package	Prebuilt assets to improve the look of the app.	0 - 50
Additional Unity Assets and Plug-ins	Any unforeseen tools that will aid in developing the product.	0 - 50
Total		About \$100 CAD

Conclusion:

In this deliverable, we were able to get a greater understanding of how to complete our tasks. In reality, by planning out every potential deliverable as well as future milestones, we can better imagine what we'll need to do to finish the job more efficiently and successfully. In the case that certain difficulties and delays arise, risk reduction and contingency preparation is carried out. A bill of materials was also generated to approximate a gross cost of sub \$100 CAD, which was under the project's budget. Overall, the proposal is well-planned, and given that everything goes according to plan, the project will be finished in time for Design Day.

References:

- Unity. *Unity Asset Store - The Best Assets for Game Making*, 2021, assetstore.unity.com/.