# Group C15

# Deliverable E – Project Plan and Cost Estimate

# Engineering Design – GNG 1103 – Section C

**Group Members:**

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# Abstract

This deliverable will lay out the project planning for accomplishing 3 prototypes of the previously chosen concept (Public Web API). Required tasks are identified and divided between team members based on personal preference as well as skillset, to best achieve success and efficiency in making each iteration on the concept. The tasks are laid out in both table and Gantt Chart form, followed by a bill of materials giving the required software tools and an estimated cost of development using these tools.

# 1. Introduction

In the previous deliverable (Deliverable D), all team members sketched and described ideas for each of the four subsystems of the prototype: User interface, Identification, Scalability, and Documentation. This led to the production of three global designs: Public web API with UI, Mobile Application, and Open-Source Library. After benchmarking these three, it was concluded that the best fully functional solution was the Public web API with UI.

Then our team had the second client meeting, with Mitch Bouchard, in which the final solution was presented. The client was impressed and had no negative comments. They also agreed with everything that was presented and they are looking forward to the prototype. Therefore, our team is continuing with the same idea: Public web API with UI.

This deliverable includes design mockups of the chosen global concept as well as a project plan and a schedule (Gantt chart) that will focus and organize the prototyping stages, which will be completed in further deliverables. Possible risks are recognized and the corresponding contingency plans to minimize those risks, as well as cost estimates and the bill of materials for these prototyping deliverables.

# 2.Prototype Mockups

Below will be mockups of the UI elements, showcasing the general feature-set of the API and web interface.

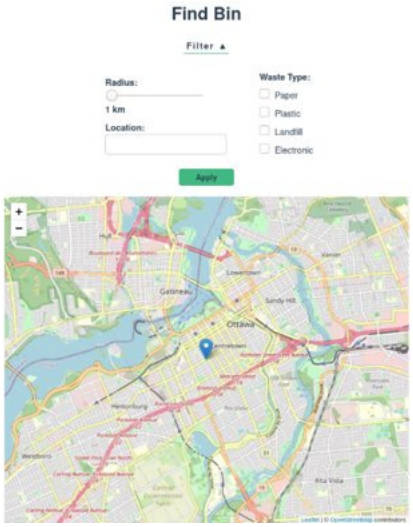


*Figure 1 Protype Mockup - Map Screen*

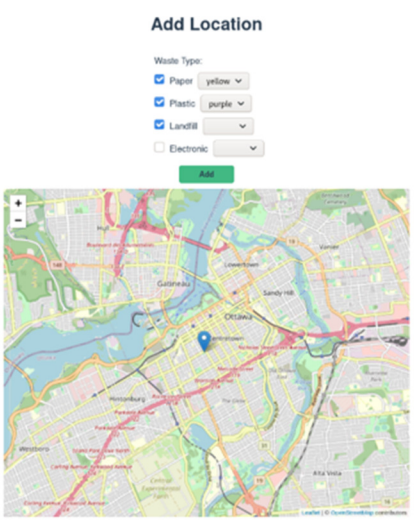


*Figure 2 Protype Mockup - Map Screen 1*

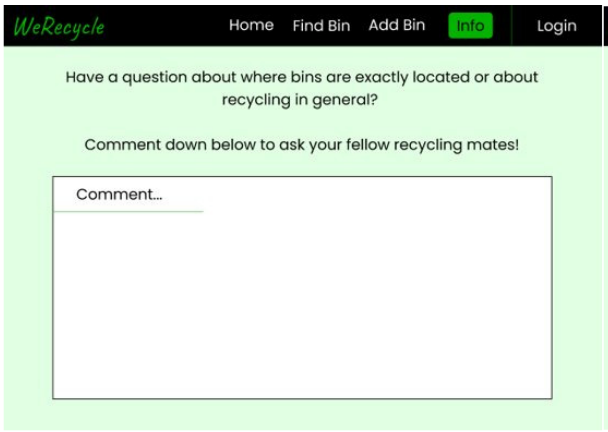


*Figure 3 Protype Mockup - UI Page 1*

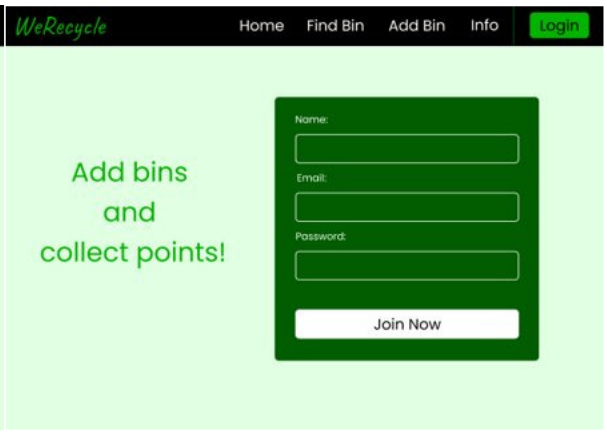


*Figure 4 Protype Mockup - UI Page 2*

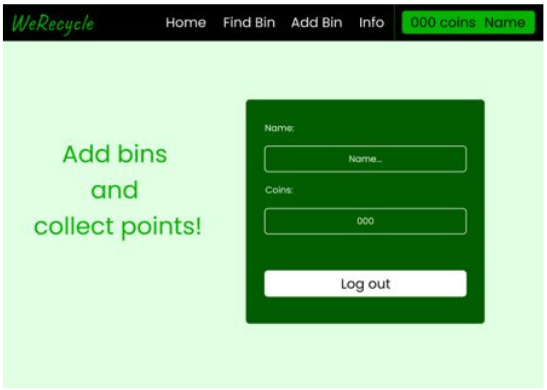


*Figure 5 Protype Mockup - UI Page 3*

## 3. Project Plan

After planning of prototyping process, it was decided to take agile approach in development with a 1-week iteration cycle. Team will be spited by the functional roles, namely: UI, development, and QA. UI role includes prototyping of the User interface and creating mock-ups. Development team will take on back-end and front-end development. In addition, one person will be responsible for QA (unit testing). Following list of tasks was developed:

The following table clearly shows the list of tasks that will be completed by each team member during the rest of the project. More specifically, each task has been assigned to at least one team member and the duration and due date of the tasks are also included. It is important to note that some tasks depend on each other, so to start, for example, task #…, task #… must be completed first.

*Table 1: Project Plan*

| Number | Task | Dependencies | Task Owner | Estimated Duration | Due Date |
|---|---|---|---|---|---|
| **#1** | Prototype desktop UI | None | Boyu Zhao and Rui Pang | 3 days | 1 Mar 2021 — 3 Mar 2021 |
| **#2** | Prototype mobile UI | None | Boyu Zhao and Rui Pang | 3 days | 1 Mar 2021 — 3 Mar 2021 |
| **#3** | Develop desktop UI | #1 | Illia Negovora | 3 days | 4 Mar 2021 — 6 Mar 2021 |
| **#4** | Develop mobile UI | #2 | Illia Negovora | 3 days | 4 Mar 2021 — 6 Mar 2021 |
| **#5** | Implement basic back-end | None | Adrian Perras and Illia Negovora | 7 days | 1 Mar 2021 — 7 Mar 2021 |
| **#6** | Plan testing strategies | None | Eleftheria Sarsaroudi and Illia Negovora | 7 days | 1 Mar 2021 — 7 Mar 2021 |
| **#7** | Prototype I | #1, #2, #3, #4, #5 | Adrian Perras, Boyu Zhao, Eleftheria Sarsaroudi, Illia Negovora, and Rui Pang | Milestone | 7 Mar 2021 |
| **#8** | Implement basic security (bot-prevention, authentication and authorization) | #7 | Illia Negovora | 3 days | 8 Mar 2021 — 10 Mar 2021 |
| **#9** | Update: UI prototype | #7 | Boyu Zhao and Rui Pang | 3 days | 8 Mar 2021 — 10 Mar 2021 |

| | | | | | |
|---|---|---|---|---|---|
| **#10** | Develop basic tests | #5 | Eleftheria Sarsaroudi | 6 days | 8 Mar 2021 — 13 Mar 2021 |
| **#11** | Implement basic organization features (back-end) | #7, #8, #9 | Adrian Perras and Illia Negovora | 3 days | 11 Mar 2021 — 13 Mar 2021 |
| **#12** | Update: UI implementation | #7 | Illia Negovora | 3 days | 11 Mar 2021 — 13 Mar 2021 |
| **#13** | Prototype II | #8, #9, #10, #11, #12, | Adrian Perras, Boyu Zhao, Eleftheria Sarsaroudi, Illia Negovora, and Rui Pang | Milestone | 14 Mar 2021 |
| **#14** | QA and testing | #10 | Eleftheria Sarsaroudi | 7 days | 14 Mar 2021 — 20 Mar 2021 |
| **#15** | Update and refine security features | #13 | Illia Negovora | 6 days | 15 Mar 2021 — 20 Mar 2021 |
| **#16** | Update: Final UI prototype | #13 | Boyu Zhao and Rui Pang | 6 days | 15 Mar 2021 — 20 Mar 2021 |
| **#17** | Update: Final UI implementation | #13, #16 | Illia Negovora | 6 days | 21 Mar 2021 — 26 Mar 2021 |
| **#18** | Final features implementation | #17 | Adrian Perras and Illia Negovora | 7 days | 21 Mar 2021 — 27 Mar 2021 |
| **#19** | Prototype III | #15, #14 #16, #17, #18 | Adrian Perras, Boyu Zhao, Eleftheria | Milestone | 28 Mar 2021 |

| | | | | | |
|---|---|---|---|---|---|
| | | | Sarsaroudi, Illia Negovora, and Rui Pang | | |

## 4. Gantt Chart

After assigning all dependencies and milestones, following Gantt Chart was developed:

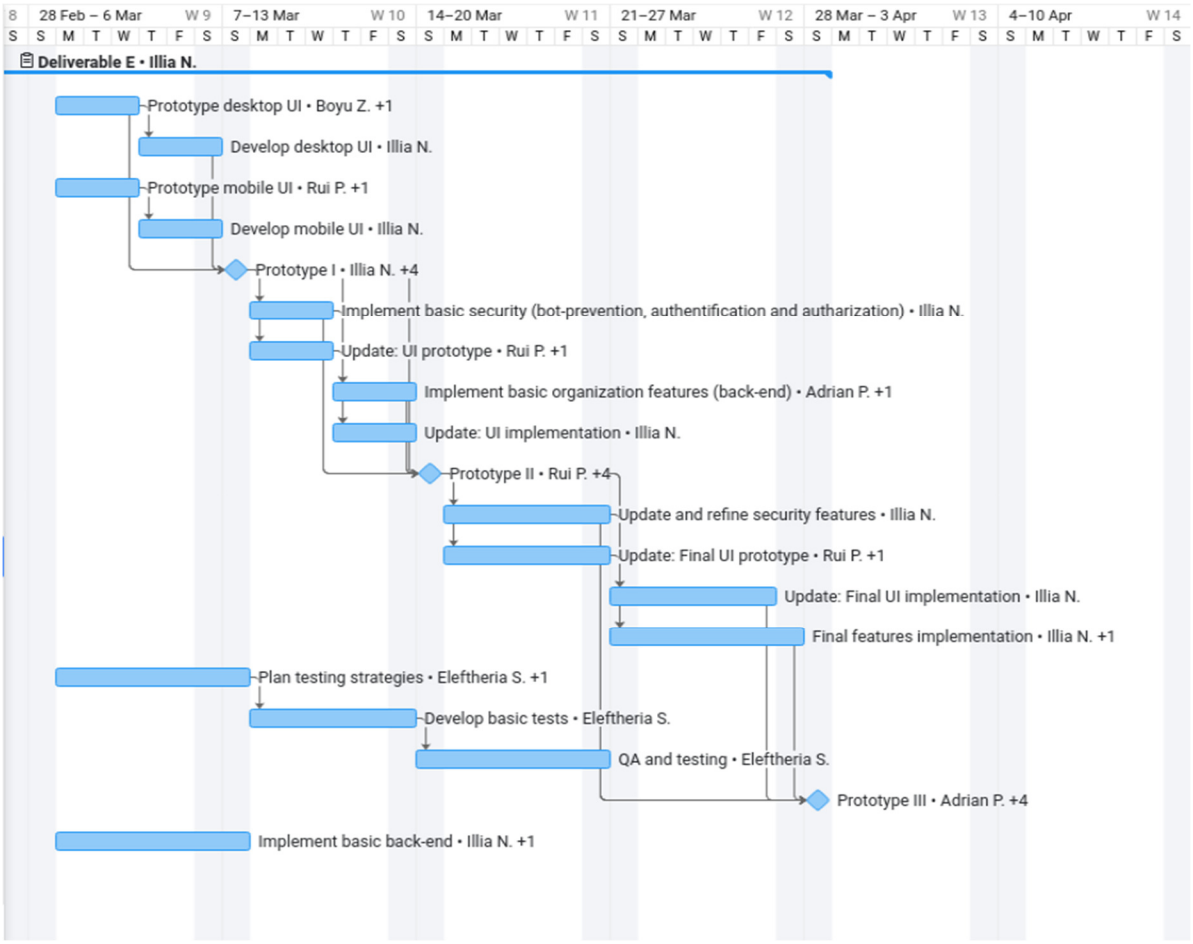


*Figure 6 Gantt Chart Sample for Prototyping Stages*

By following this task list and task assignment it is expected to deliver updated and refined product, every week, but ship first working version by March 4.

# 5. Risk Analysis and Contingency Management

Risk Analysis and Contingency Management are to identify and analyze project risks and the adoption of countermeasures, which including to maximize the impact of positive factors and minimize the impact of negative factors two aspects Content mainly includes: (1) Risk identification, there are risks that might affect the project progress is confirmed, and record each risk has the characteristics. (2) The risk quantification, risk assessment and risk of the interaction between, to assess the scope of the project may produce results. (3) Risk countermeasures study, namely, to determine the opportunity to choose and to respond to a dangerous step. (4) Implementation control of risk countermeasures, that is, to respond to the changes of risks in the process of the project.

From product design to product delivery is a long and complex process, so we need to do a good job of forecasting risks and figuring out ways to solve problems. The significant risks facing our team are the delayed communication caused by the online communication and the time difference, the slow logistics caused by the epidemic, and the immature web design, etc. We will present in the form of a table the risks that our team may face when promoting the project, probability of risk, the impact of the risks on our project, and our solutions when faced with the risks.

| **Risks** | **Probability of risks** | **Impact** | **Solution** |
|---|---|---|---|
| The delayed communication caused by the online communication and the time difference. | 70% | Lack of timely communication will affect the progress of the project, so this has had a serious impact on our project. | Regular group meetings are necessary, and checking messaging apps(WhatsApp) regularly can help minimize the impact of missing messages. |
| The slow logistics caused by the epidemic. | 50% | The slow logistics during the outbreak may cause us to be unable to complete the finished product of our project in time, so this has had a serious impact on our project. | We should make the purchase list in advance and start shopping online from now to allow enough time for logistics. |
| The immature web designs. | 60% | Immature web design can affect the user experience, which can | Plan and learn your web design ahead of |

| | | | |
|---|---|---|---|
| | | have a big impact on the product. | time and keep it simple and beautiful. |
| Spend over budget. | 30% | Overrunning the budget will put a financial burden on the whole team, and overrunning the budget is a sign of poor planning so this has had a serious impact on our project. | Use every penny wisely and choose affordable goods. |
| Disagreement among the group members. | 90% | In group discussion, it is quite normal for team members to have different problems, but if not solved in time, the relationship between team members and the progress of the project will be affected. | We will adopt the method of voting by all the members and the principle of the minority subordinate to the majority to decide the choice of the plan when there are differences among the group members. |
| Files have been corrupted or deleted by mistake. | 30% | Our group relies on file sharing, which can improve the efficiency of our cooperation, but everyone can see the files and delete the files, which also increases the probability of the files being deleted by mistake, which will lead to the deletion of part of our achievements. | Our group should be fully aware of the importance of group files, timely backup files, to prevent files from being deleted by mistake. |

## 6. Bill of Materials and Cost Estimates

The nature of a web API is that costs sit mainly in development hours. The benefits of a student-based project are that students are more or less free labour, and the remaining technologies involved are free and open-source software. Everything used is free (though some require publishing of the created source-code if used in a commercial environment), Including webhosting for testing our application. For a rough overview of our Bill of Materials, the following table is included.

*Table 2: Bill of Materials and Cost Estimates*

| Part # | Part Name | Description | Quantity | Unit Cost | Cost (CAD) |
|---|---|---|---|---|---|
| 1 | MongoDB | general purpose, document-based, distributed database | n/a | Free | Free |
| 2 | Mongoose ODM | Object Data Modeling (ODM) library for MongoDB | n/a | Free | Free |
| 3 | Vue3 | JavaScript Framework | n/a | Free | Free |
| 4 | Leaflet | Open-source JavaScript library for mobile-friendly interactive maps | n/a | Free | Free |
| 5 | AWS EC2 | Amazon Elastic Compute Cloud (web hosting) | 750 Hours Max (Free Tier) | Free | Free |
| | | | | Total | Free |

## 7. Conclusion

In conclusion, our team focuses on the Public Web API, the previously chosen concept in the last deliverable, to assign tasks to each team member based on personal preference and capacity. To maximize the contribution to the team's work with high efficiency, we lay out the previous Project Table and Gantt Chart to present the dependencies and milestones. Moreover, uncertainties, risks, and their corresponding contingency solutions were mentioned in this deliverable, to address unexpected situations throughout development. Finally the bill of materials highlighted the expected costs of development (No cost) for these prototyping deliverables.