

Project Deliverable E: Project Schedule and Cost

GNG 1103 - Engineering Design

Section #A03

Team #12

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Introduction

After the process of organizing the concepts and ideas dedicated to each respective subsystem, a group of discussions and modifications were held in order to compile a starting grand concept for the prototypes yet to be made.

The process of organization began with using the combined concepts for each subsystem and compiling all the features previously listed into a detailed visual which showcased the results of numerous periods of ideation.

Next, a period of brainstorming was conducted in order to narrow down possible software/apparatus potentially required to execute the creation of the soon to be engineered prototypes. The results of the brainstorming was documented in a chart which showcased the material name, quantity of material needed, the cost for each individual material and lastly the total cost for each material incorporating the quantity.

To further progress, a plan for the execution of each prototype's construction was conducted using an organized table showcasing the subtasks for each respective prototype, an estimation for the duration of completion of said task, a target date to aim for, dependencies for each task and finally, an assigned owner for each subtask. Each subsystem and the program it would be integrated onto was summarized using the information showcased in the plan chart.

To follow up, a detailed chart showcasing the entailments for each prototype test was formulated. The chart displayed all of the information concerning prototyping test plans. Specifically, the constructed chart projected information such as the number of tests, the reasoning for the performance of each test, the test plan's objective, the methodology and expected categorization of results and finally, an estimate for the duration of each testing period alongside the expected start date. A stopping criteria was included to indicate the point at which the testing would end and the desired results had been obtained.

Finally, a list of project risks and potential uncertainties were showcased in a multiple point format. The points displayed in detail what each risk may entail and were accompanied in the latter section with solutions and respective contingency plans relating to each risk and uncertainty.

Detailed Design Concept

After consultation and discussion of group members, we got a plan that integrates the design inspiration of the whole group. We will design our platform prototype based on this detailed design concept.

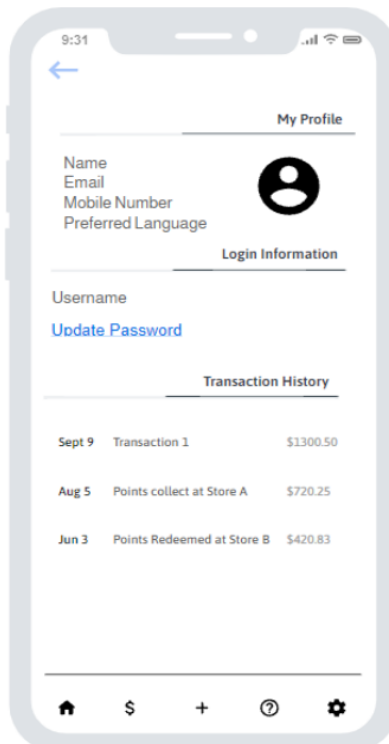
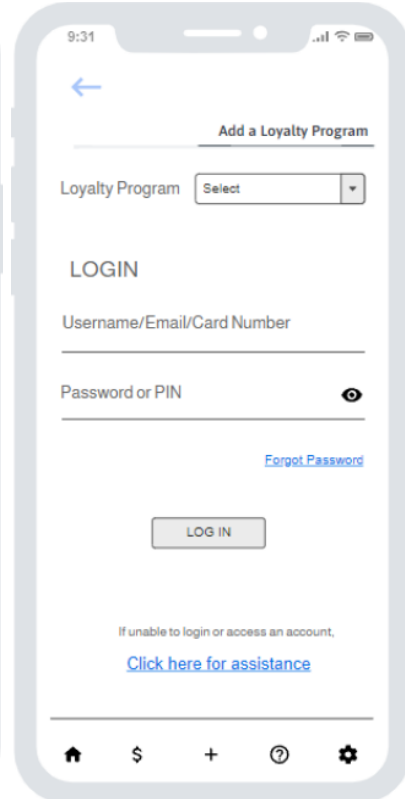
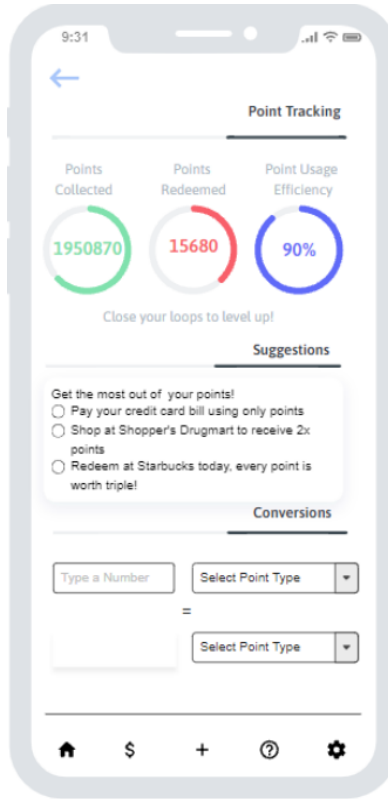
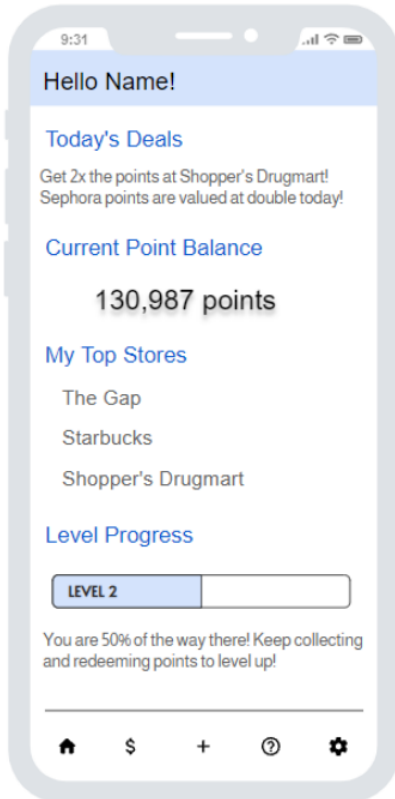
- **For the end-user Interface (application):**
 - Have a successful login page
 - A home page
 - A search engine at the top right corner
 - A help icon
 - A chat tab for customer to get information
 - the stores that the customer has selected as their favourites
 - the point balance of the customer
 - the deals available for the customer that day
 - the amount of points they have and need to complete a milestone
 - an account/setting icon
 - a dropdown menu in the left hand corner:

- ❖ a conversion calculator
- ❖ a contact us link
- ❖ adding a new loyalty program
- ❖ linking accounts and referrals
- ❖ a points tracker
- ❖ suggestions for effective spending
- ❖ a section for past transactions
- **For the Bank Data Analysis (website):**
 - Section for transacting points
 - A secured place to store transaction records
 - A place to set values for points
 - A place to add new loyalty programs or alter existing programs
 - Demographics show customers' information
 - A statistics tab that shows statistics per vendor and per customer
 - The vendors' statistics includes:
 - ❖ Demographics
 - ❖ Percentage of returning customers
 - ❖ A points overview
 - The customers statics includes:
 - ❖ Top vendors
 - ❖ The top way that points were received and redeemed
 - ❖ Amount of points collected and redeemed.
- **For the Vendor Interface (website):**
 - Have early access to upcoming deals involving their store(s)
 - Have access to their stores' sales statistics that involve points
 - Stores' sales statistics include:
 - ❖ Percentage of returning points shoppers
 - ❖ The amount of points collected through sales
 - ❖ The amount of points redeemed at their store
 - ❖ The number of users that are affiliated with the points program

Final Design Concept - Picture

Subsystem 1

End User Interface:



Subsystem 2

Bank Data Analysis:



Item 5

20%

Item 1

20%

Item 2

20%

Item 3

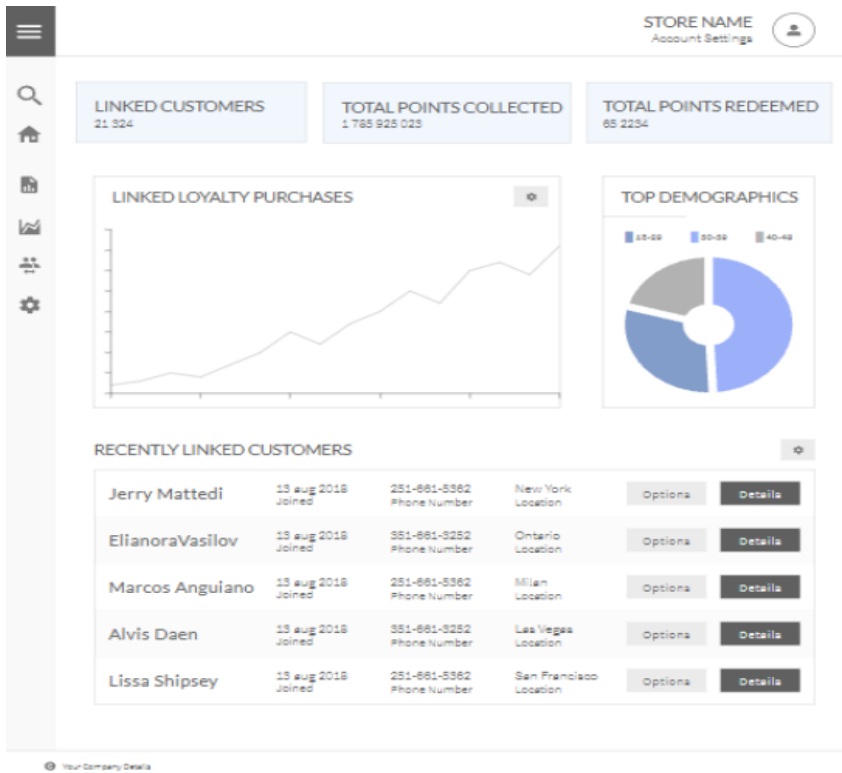
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Item 4

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Subsystem 3

Vendor Interface:



Cost Breakdown

Bill of Materials

Table 1: Bill of Materials

Item Number	Item Name and Description	Quantity	Unit Price	Amount
1	Powerapps:	1	\$0	\$0
2	Javafx:	1	\$0	\$0
3	Figma:	1	\$0	\$0
4	Moqups:	1	\$0	\$0

5	PC/Mac:	1 (per person)	\$0 (previously owned)	\$0
6	Excel:	1	\$0	\$0
7	Mouse	1 (per person)	\$0 (previously owned)	\$0

The BOM showcases all of the potentially usable apparatus our group plans to utilize to bring our project plans into reality (may be modified in the future). This list includes many software and hardware that will be of significant use in the engineering process of our prototypes. The resources and their uses include:

Powerapps is a microsoft software that allows you to use a large variety of business apps to construct an application tending to your needs. This can be used to add functionality to our prototypes as well as design user interfaces with the respective features our subsystems entail.

Javafx is a developer platform that can be utilized in order to create a software or application. This is done through the means of coding. Javafx can be used to code and add functionality to our features that adhere to our project plans. This application will be relied on in the creation of the second prototype.

Figma is a website which allows for many prototype configurations through the means of simple graphic design. This will be useful for the second and third prototype construction process due to the aesthetic and functional aid it can provide us with. Figma can be used to create an outline or a goal and potentially even a final product if it adheres to our wants and needs.

Moqups is a tool used to aid in collaborative efforts. This can be used to make diagrams or visuals crucial in helping the engineering process of our prototypes. Moqups may be used in the first prototype process due to the visual aid aspect that it can provide us with. This will allow the team members to have an easier to follow linear path in creating a finished product.

PC/Mac is a piece of hardware necessary for everything relating to this project. This is a requirement for each group member.

Excel is a microsoft software that allows you to create spreadsheets for storing data or formulating values. This can be used by the group to create displays for each data type whilst working on the subsystems adhering to banking and vendor interfaces. Data displays are crucial and a part of our design as of currently.

Mouse is a piece of hardware which is not necessary, however it may greatly aid in the creation of a proper prototype due to the advantages it may provide. This hardware is simply for the quality of life aspect for the group members to explore if they wish.

The links to each of the listed materials in the BOM include:

- ❖ Powerapps
 - <https://powerapps.microsoft.com/en-us> (Free Through University)
- ❖ Javafx
 - <https://openjfx.io> (Free of Charge)
- ❖ Figma
 - <https://www.figma.com> (Free of Charge)
- ❖ Moqups
 - <https://moqups.com> (Free of Charge)
- ❖ PC/Mac
 - (Previously Owned Product)
- ❖ Excel
 - <https://www.microsoft.com/en-us/microsoft-365/excel> (Free Through University)
- ❖ Mouse
 - (Previously Owned Product)

Project Plan

Tasks Breakdown

Table 2: Tasks Breakdown

Prototype	Tasks	Time Estimate	Target Date	Dependencies	Owner
Prototype I	Divide the concepts equally	1 hour	Oct 24	N/A	All
	Learn more about Powerapps and Javafx	2 days	Oct 27	N/A	All
	Integrate ideas for subsystem 1: End User Interface	1 week	Nov 4*	Learn more about Powerapps and Javafx	Anissa Feryza

	Integrate ideas for subsystem 2: Bank Data Analysis	1 week	Nov 4*	Learn more about Powerapps and Javafx	Kat Anissa
	Integrate ideas for subsystem 3: Vendor Interface	1 week	Nov 4*	Learn more about Powerapps and Javafx	Paul Dawood
	Customer Feedback and questions for Prototype I	3 hours	Nov 5*	Integrate ideas for subsystem 1, 2, and 3 : User Interfaces	All
Prototype II	Use Feedback to update Prototype I	2-3 hours	Nov 11	Customer Feedback and questions for Prototype I	All*
	Adding Functionality to Prototype I	3 days	Nov 15	Use Feedback to update Prototype I	All*
	Update detailed design and BOM	5 minutes	Nov 15	Customer Feedback and questions for Prototype I	Dawood Paul
	Prototype II Finalization	1-2 hours	Nov 16	Adding Functionality to Prototype I	All*
	Gather Feedback and Comments on Prototype II	3 hours	Nov 20	Prototype II Finalization	All

Prototype III	Use Feedback to update Prototype II	2-3 hours	Nov 22	Gather Feedback and Comments on Prototype II	All*
	Refining the functionality for Prototype II	1 day	Nov 24	Use Feedback to update Prototype II	All*
	Getting users feedback on Prototype III	2 days	Nov 26	Refining the functionality for Prototype II	All
	Prototype III Finalization	1-2 hours	Nov 27	Getting users feedback on Prototype III	All*
	Improve the aesthetic of the design	1 day	Nov 28	Customer Feedback and questions for Prototype I	All*
	Integration of Prototypes into Presentation	1 hour	Nov 28	Prototype III Finalization	All*
	Presentation/ Visual Aid Design/Aesthetic	2 hours	Nov 28	N/A	Kat Anissa Feryza
	Design Day Presentation Rehearsals	1 day	Nov 29	Presentation/Visual Aid Design/Aesthetic	All

				Integration of Prototypes into Presentation	
Design Day - December 1st					

Prototype I (Low fidelity function test)

Prototype 1 will be the official starting point in the engineering process of bringing all of our ideation progress into reality. As showcased by the chart, the first step we plan to take in this process is to divide all of the concepts evenly. This will allow for organization and as a result, improve haste and quality. Secondly, the team must get familiar and learn the features associated with the software we've decided to use to go about this project. The software programs that have been mutually decided to be fit for this prototype include Figma, Microsoft Powerapps and Moqups. The next step introduces the beginning of building our first prototype. We have decided to jump into integrating our ideas from the three subsystems by taking all of our concepts and transferring them over to either Figma, Powerapps or Moqups. We'll use either software as we see fit in the near future. After the integration is complete, we will present our prototype and analyze the provided feedback from our clients to better our product in the next prototype.

Prototype II (Medium to High Fidelity test)

Prototype 2 will focus on adding functionality to our previously engineered design in prototype 1, however, this step will take place after the analyzing and editing based on our client feedback is complete. With the respective changes and growth made in our project so far, it's now time to make our prototype bloom. Using the feedback we will add functions to each predetermined feature using some helpful software such as Javafx and Microsoft Powerapps. Based on the changes we've made, there will be an update to the BOM list as well as the detailed design plan and drawing relative to the recently obtained feedback. After all of the functionality has been completed, the prototype will be finalized and prepared for another evaluation from our clients.

Prototype III (High fidelity fully functioning prototype)

Finally, for prototype 3, using the newly obtained feedback, we will analyze the comments we have received and yet again add or modify some features in our program in respect to our clients' wants and needs. A series of updates will be performed on our prototype to make sure it is fit to be our final product. After the modifications, a process of refinement will be conducted in order to ensure that the functionality previously integrated in prototype 2's construction is working and is easy to use for the entirety of our target audience. Next, the refined prototype will be used to interview and obtain feedback from sources other than our clients. This feedback will then serve as another source of ideas for further refinement and finalization. Once the product's functionality and criteria has been met, the aesthetic aspect of the prototype will be addressed and modified for viewing pleasure and to act as a sort of hook for the target audiences. All of the prototypes' features are compiled into this final product, so to present this as our grand final outcome, this prototype will be accompanied by a presentation slide show allowing

us to explain our product in a fluid and proper fashion. Once that has been done and rehearsed the final prototype is ready for presentation at design day.

Prototyping Test Plan

A set of plans for testing our prototypes have been outlined and showcased in the chart below. It includes the number of tests conducted for each model, the reasoning for each testing process, a descriptive summary of what the testing methodology entails, how the results will be recorded and how the tests will be conducted and finally the estimated time accompanied by the starting date for each test. The tests will be put to a stop once the feedback we obtain is deemed is agreed to be sufficient. The stopping criteria will be discussed by the group during the tests individually. This will help us regulate the time spent on each test and allow us to provide modifications towards our prototypes without any sacrifice in quality.

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	User friendly interface (ease of use) for end user interface communicating and getting feedback for ideas	Low fidelity, figma, check if users can understand the flow of the interface	Give user tasks and time how long it takes them to figure it out/ease of use, used to generate feedback and increase usability	1-2 hrs October 31
2	User friendly interface (ease of use) for vendor interface communicating and getting feedback for ideas	Low fidelity, figma, check if users can understand the flow of the interface	Give user tasks and time how long it takes them to figure it out/ease of use, used to generate feedback and increase usability	1-2 hrs October 31

3	<p>User friendly interface (ease of use) for bank interface</p> <p>communicating and getting feedback for ideas</p>	Low fidelity, figma, check if users can understand the flow of the interface	<p>Give user tasks and time how long it takes them to figure it out/ease of use, used to generate feedback and increase usability</p>	<p>1-2 hrs</p> <p>October 31</p>
4	<p>Add functionality for end user interface (point tracking inventory)</p> <p>Verifying feasibility</p>	Medium high fidelity, test with entering false data to see if code is accurate	<p>Check if results are accurate and how efficient the code is (run time)</p> <p>Used to verify functionality of code and increase code efficiency (decrease wait times)</p>	<p>2-3 days</p> <p>November 7</p>
5	<p>Add functionality for bank interface (point transaction tracking, point democratization)</p> <p>Verifying feasibility</p>	Medium high fidelity, test with entering false data to see if code is accurate	<p>Check if results are accurate and how efficient the code is (run time)</p> <p>Used to verify functionality of code and increase code efficiency (decrease wait times)</p>	<p>2-3 days</p> <p>November 7</p>
6	<p>Add functionality for vendor interface (point spending tracking/returning customers)</p> <p>Verifying feasibility</p>	Medium high fidelity, test with entering false data to see if code is accurate	<p>Check if results are accurate and how efficient the code is (run time)</p> <p>Used to verify functionality of code and increase code efficiency (decrease wait times)</p>	<p>2-3 days</p> <p>November 7</p>
7	<p>Integrate functionality into end user interface</p> <p>Analyzing system integration</p>	High fidelity, check if users can navigate the interface with false data	<p>Check if results are accurate and everything is displayed correctly/buttons work</p> <p>Used to verify functionality and ease</p>	<p>2 days</p> <p>November 17</p>

			of use/receive feedback	
8	Integrate functionality into vendor user interface Analyzing system integration	High fidelity, check if users can navigate the interface with false data	Check if results are accurate and everything is displayed correctly/buttons work Used to verify functionality and ease of use/receive feedback	2 days November 17
9	Integrate functionality into vendor user interface Analyzing system integration	High fidelity, check if users can navigate the interface with false data	Check if results are accurate and everything is displayed correctly/buttons work Used to verify functionality and ease of use/receive feedback	2 days November 17

Project Risks and Uncertainties

The procedure of this prototype development plan will be inevitably halted at certain points due to uncertainties and risks. We formulated a list of possible risks and uncertainties that may cause a hindrance in the future.

- ❖ (1) Inequitable workload distribution (due to different work schedules)
- ❖ (2) Inability to use the previously listed software/material properly
- ❖ (3) Computer issues (hinderance to completing tasks on time)
- ❖ (4) Internet problems (hinderance to completing tasks on time)
- ❖ (5) Non functional feature in the prototype
- ❖ (6) Software's inability to perform a desired function (Software we use doesn't allow for us to add a feature we want)

Respective Contingency Plans

With each project risk and uncertainty, efficient means of planning comes equipped with contingency plans in the cases of potentially likely problems. For each of the possible risks that we may encounter in the engineering process of our prototypes, respective contingency plans have been formulated.

- ❖ (1) Enforced communication to avoid said situation, in case of inevitability, each person will accommodate for each other equally
- ❖ (2) Explore new softwares with haste, or spend a group session learning the features of said program for elevated education
- ❖ (3) Access a public device or borrow one from a peer/family member
- ❖ (4) Visit a building on campus for ensured wifi connection
- ❖ (5) Troubleshoot the problem as a group in scheduled weekly meetings
- ❖ (6) Explore new software with haste in order to stick to the time goal without a sacrifice of quality

Conclusion

To conclude this deliverable, the information covered in summary includes a detailed design diagram which showcases the skeleton of our prototypes, a descriptive set of criteria relative to the project plans, along with associated project risks and uncertainties, a set of contingency plans for each risk and uncertainty, a set of plans for testing the functionality and obtaining feedback for each of our prototypes, and finally a BOM list including all of the potentially required apparatus.