

Project Deliverable F: Prototype I and Customer Feedback

GNG 1103 - Engineering Design

Section #A03

Team #12

Feryza Damji, Katrine Labonte, Anissa Millington, Zhehao Xu, Dawood Kalair

November 4, 2021

Faculty of Engineering

University of Ottawa

## **Introduction (Anissa and Kat)**

The most crucial aspect of any design endeavour is prototyping. It allows you to incorporate ideas that you think will work, figure out what won't, and determine what the customer needs for the project to succeed. This deliverable would provide a deeper understanding of our prototype by discussing why it was created and what we changed in our design to meet the client's demands utilizing less expensive and faster resources to develop a preliminary model.

We created a plan and estimated the costs of our project's components during the final deliverable. As a result, we developed our initial prototype, which has undergone minor changes from our sketch, which was annexed in deliverable D.

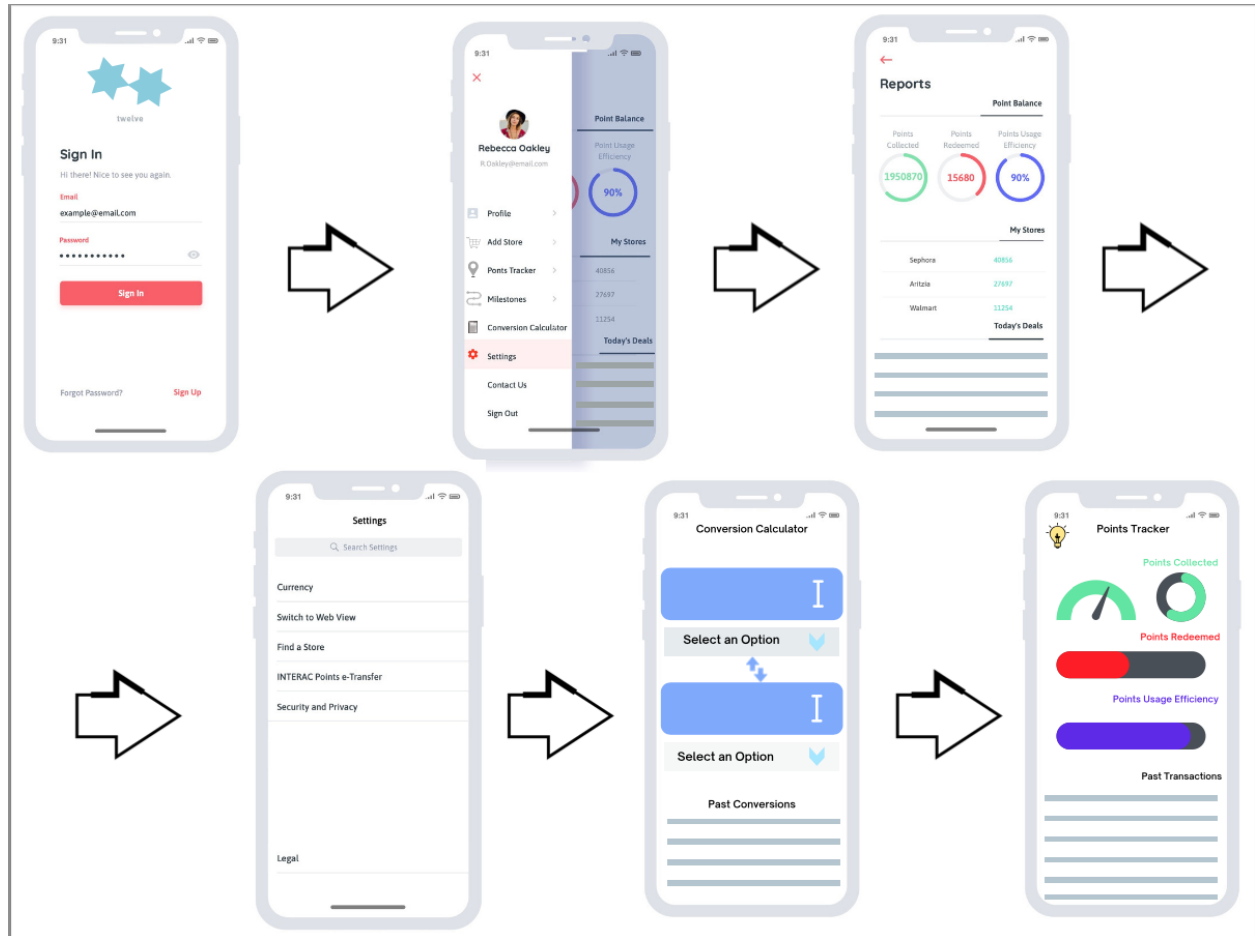
Our new subsystems consist of the User Interface, Point Democratization, and Point Use Efficiency. The user interface is composed of the bank, end user and the vendor interface. Point democratization includes predetermined factors that allow you to assign point values. Lastly, point use efficiency consists of the amount of perceived value of goods redeemed versus total amount that could have been redeemed, amount of points gained against the amount spent (in terms of point hoarding which would be equivalent to low efficiency), and suggesting ways to spend points based on favourite stores and end user's demographics as well as the deals offered.

## **Prototypes**

Below are the three parts of Prototype 1, which are referred to as 1a, 1b, and 1c. Each of these parts is representative of our modified subsystems.

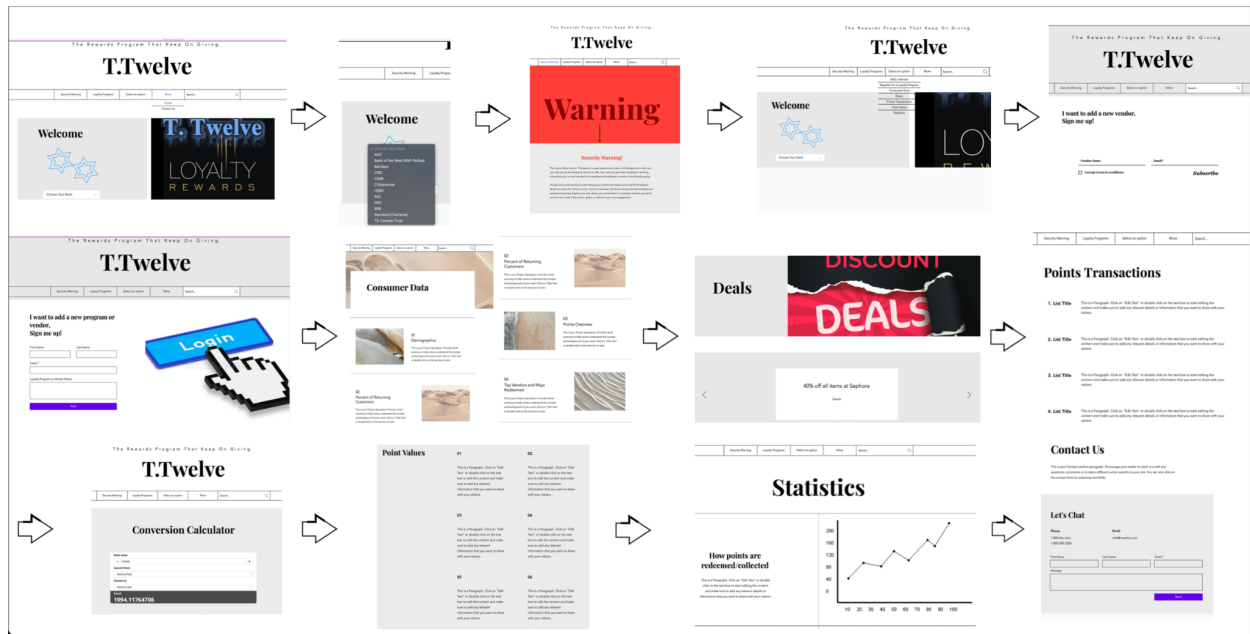
### **Prototype 1a**

Prototype 1a consists of two parts, an app designed for the end user, and a website designed for the banks' internal use.



As seen above, this app has been designed with every feature that was discussed in the Conceptual Design Deliverable D. We decided to focus on creating an app that is easy to use, and easy to understand, by having visual representations of the user's statistics and efficiency.

The app features a sign in page that greets the user, and allows for them to troubleshoot if they have forgotten their password. Once signed in, the user can see the Reports page which has the points they've received, redeemed, and their efficiency, as well as their top three stores and today's deals. They can then click the sidebar to see their profile, add a store to their list, points tracker, milestones reached and upcoming, and the conversion calculator. They also have access to their settings, and can contact us if they need to troubleshoot or have any questions.

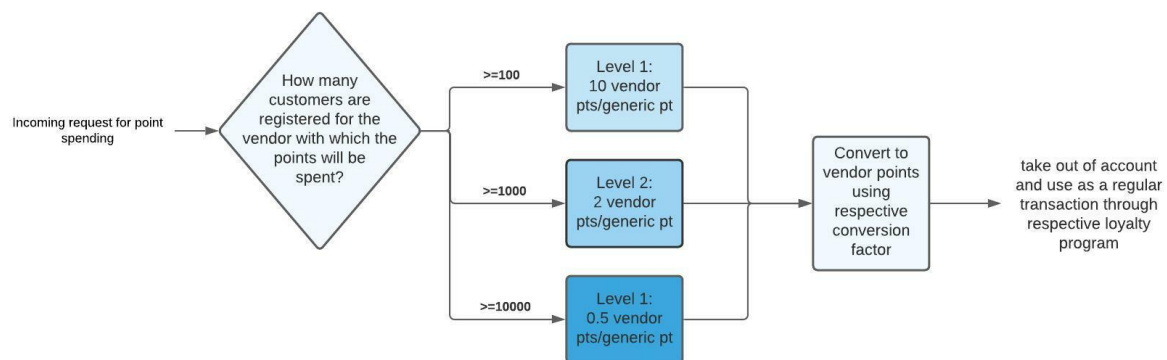
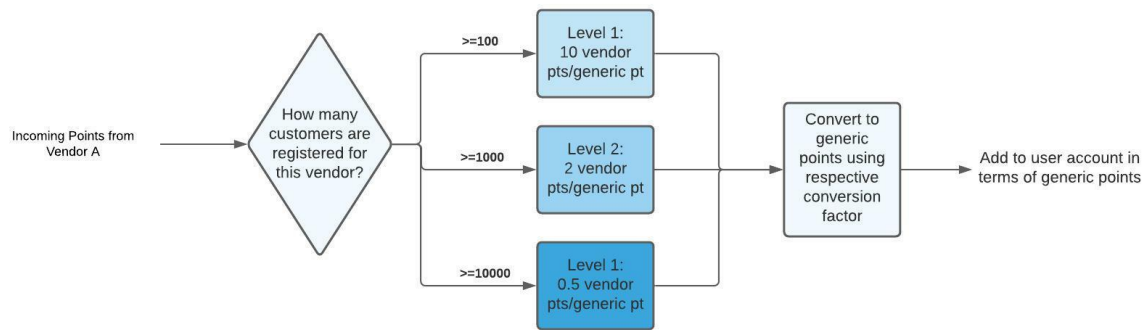


As seen above, this website has been designed for the banks to use internally. It has even more features than what was discussed in Deliverable D.

The website features an option to choose which bank the user is a part of, which ideally will lead to a login that is verified by that bank. Once signed in, there are tabs to add a new vendor to be affiliated with the bank, register a new loyalty reward program, consumer data, current and upcoming deals, points transactions, point values, and statistics. The purpose of this website is to give the bank a bird's eye view on how the points are being used by their clientele. There is also a security warning tab, which provides current fraud warnings, gives a summary of past fraud warnings and security breaches, and also gives tips to increase security.

### Prototype 1b

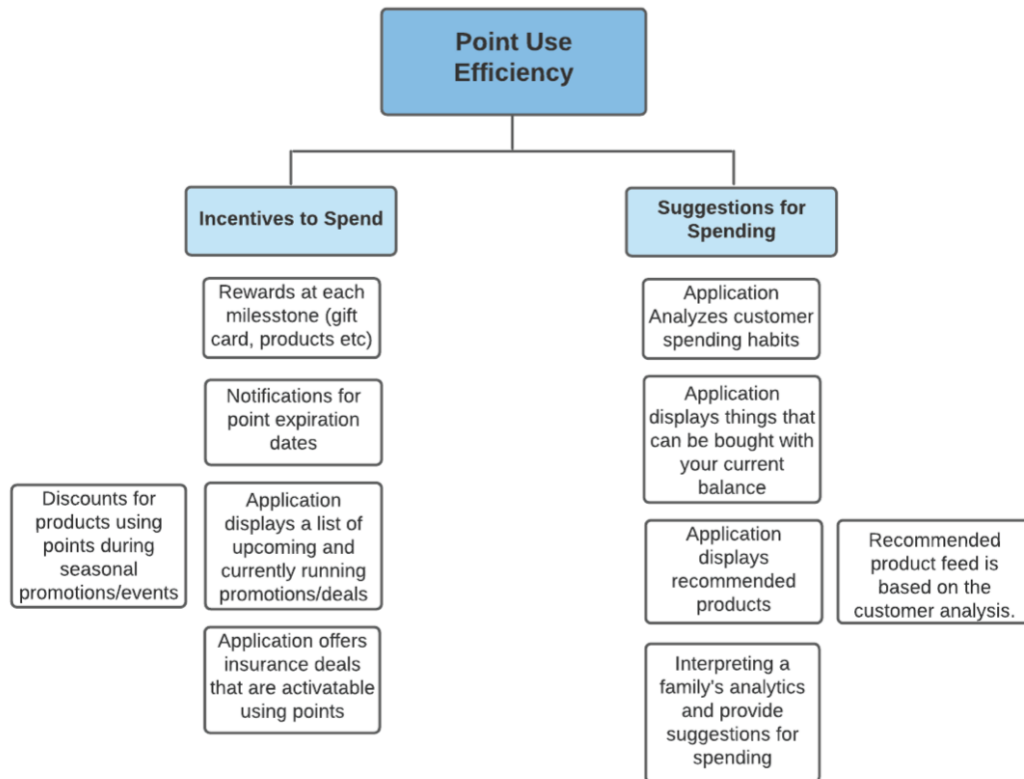
Prototype 1b consists of a flowchart that depicts how exactly points will be democratized. The software that is created from this flowchart will be able to convert all store points into a standard point currency, and assign point value based on predetermined factors.



As seen above, when collecting points from the end user, the software will obtain vendor information and point value that corresponds to that specific vendor. Based on this value, the points will be converted to the corresponding amount of magic beans, which is the name denoted to the generic points. Then, the software will add this amount of magic beans to the end user's balance. When the end user is spending points, they will enter the type of points they want their magic beans to be converted to. The software will then convert the magic beans into that specific point type based on vendor point value, and take it out of their account, and it can then be used in a transaction. Both of these processes rely on the point value being calculated properly. This will be done based on predetermined vendor criteria 100 (in this example, how many customers are registered with the vendor was used to demonstrate this concept), and their own point evaluation.

### Prototype 1c

Prototype 1c consists of a flowchart which depicts the efficiency of point use. Efficiency will be used as a methodology to create the prototypes for the other subsystems, and it will be a piece of software that is incorporated into the end user interface as well.



As seen above, efficiency will be broken down into two main subcategories. One is the variety of ways that a customer can be incentivised to spend money or buy new things. The other will aid the customer in spending based on recommendations curated from analyzing their current spending habits. By analyzing point spending efficiency and curating personalized suggestions for maximizing point spending, loyalty and point spending is reinvented for the consumer and allows for the vendors and banks to attract more consumers with this approach to efficient loyalty programming.

### Testing Analysis of Prototype

The goal of our specific test was to obtain an essential proof of concept for our approach. This will enable us to visualize our concept and identify any issues that we had overlooked previously. It will also serve as a foundation for us to create our upgraded prototypes.

The reason for this prototype test is to communicate the feasibility of designing an app and website and creating a frictionless experience for the customers. During the composition of the prototype, we made sure that each interface was easy to use and had everything that the client asked for as well as what the user would need.

This prototype helps the customer and us learn about potential flaws with the concept to address them. This prototype also enables us to explain our concept to the consumer, allowing for more precise and relevant input.

Our prototypes should provide three categories of results: "Good," "To Be Improved," and "Bad." The best outcomes are exemplary, function as planned, and can be kept the same. The "To be Improved" results are those that can be improved with our knowledge and abilities in order for them to operate as intended. The adverse outcomes are those that cannot be amended or improved and must be discarded and recreated to function correctly.

These findings will help us determine which components of the prototype need to be improved in order for it to be functional and which aspects need to be entirely reworked since improvement is impossible. Overall, we'll be able to ensure that our final prototype is as practical and as feasible due to these.

#### Summary of Prototype 1 Testing

Prototype ID	Test Objective (Why?)	Description of Prototype used and of Basic Test Method (What)	Test duration and planned start date (When)
1a	Communicating and getting feedback for ideas	User friendly interface (ease of use) for end user interface  Low fidelity mockup, design to check if users can understand the flow of the interface	1-2 hrs  November 2
1b	Proof of concept	Point Democratization  Low fidelity proof of concept, designed to check feasibility	1-2 hrs  October 31
1c	Proof of concept	Point Use Efficiency  Low fidelity proof of concept, designed to check feasibility	1-2 hrs  October 31

#### Customer/User Feedback And Testing Analysis Results

We gathered feedback from someone who designs websites, engineering managers, a quality engineer manager and from people who are not proficient in the use of technology. We were able to show them our app flowchart and the website prototype to ask for their opinions and feedback. Some of the feedback we received from the person who designs websites is that we should include a blurb about what our platform is, our mission and goals statement, adding a page to input customer information since the points transaction and consumer data are reliant upon having customer information. To solve this issue, we will add a customer sign in page that needs to be filled out before anyone can access those necessary pages. Another concern that we received was from people who are not proficient in the use of technology. Their concern was in regards to the app the interactive point e-transfer should allow you to transfer points to another person in addition to transferring your points to another point system. A solution to this would be to create a dropdown menu and add the choices; transfer points between accounts and transfer points to another person. The other feedback that we got was that it was easy to follow and use, well detailed, and looked very appealing. After we procure the clients feedback we will have the sufficient details to allow us to create a second prototype for the next client meeting. In terms of the proof of concepts parts of this deliverable, design concepts were easy to understand and feasibility was considered

### **Detailed Design**

After tests and feedback was received from uninvolved individuals, the resultant data recordings were listed as follows.

- **Subsystem 1: 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



- **Subsystem 1: 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.

- **Subsystem 1: 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

- **Subsystem 2: Point Democratization**

- Assign respective values to each organization's loyalty points
- Convert all organization's points to a neutral point system
- Ability to assign point value based on predetermined factors
  - ❖ Organization size
  - ❖ Customer demographic
  - ❖ Bank demographic
- Convert points from one loyalty program to another
- Convert points into a value for real life currency respective to each country

- **Subsystem 3: Point Use Efficiency**

- Provide user with efficient spending advice
- Display a variety of recommended products/services to spend points on
- Ability to analyze customer data and advertise products accordingly
- Invent incentives to avoid point hoarding
  - ❖ Point expiry dates
  - ❖ Promotional events
  - ❖ Discounts
  - ❖ Persuasion through product/service advertising
- Deals offering

- Offer rewards as listed in the previously illustration of point use efficiency
- Point promotions (seasonal x2 earning events)
- Product/service advertising relative to current customer point balance

### Target Specifications

Zafin is an international financial technology company. Their primary focus is providing software to banks that improves the banks' customer relations, and increases revenue. Zafin has enlisted us to create a new platform whose main goal is to democratize loyalty rewards points.

### 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
8	Wix:	1	\$0	\$0
9	Canva:	1	\$0	\$0
10	Lucid:	1	\$0	\$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.

**Wix** is a tool used to create websites. It helps the group to create the prototypes of websites for the banks to use internally. It has several functions which are useful to create an ideal website.

**Canva** is a graphic design platform, used to create social media graphics, presentations, posters, documents and other visual content. It helps the group to create the prototype's interface and presentations.

**Lucid** is an online software that allows the user to create descriptive and detailed flow charts displaying a numerous variety of different information. Lucid will be used to create one of the flowcharts that will display the efficiency aspect of the program and user spending for the submission of the first prototype.

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)
- ❖ Wix
  - <https://www.wix.com> (Free of Charge)
- ❖ Canva
  - <https://www.canva.com> (Free of Charge)
- ❖ Lucid
  - <https://lucidchart.com> (Free Signup)

## 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: User Interface	1 week	Nov 3	Learn more about Powerapps and Javafx	Anissa Feryza

	Integrate ideas for subsystem 2: Point Democratization	1 week	Nov 3	Learn more about Powerapps and Javafx	Kat
	Integrate ideas for subsystem 3: Point Use Efficiency	1 week	Nov 3	Learn more about Powerapps and Javafx	Paul Dawood
	<b>Customer Feedback and questions for Prototype I</b>	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 8	Customer Feedback and questions for Prototype I	All
	Adding Functionality to Prototype I	3 days	Nov 11	Use Feedback to update Prototype I	All*
	Update detailed design and BOM	5 minutes	Nov 11	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  Integration of Prototypes into Presentation	All
<b>Design Day - December 1st</b>					

### **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.

### **Conclusion**

A prototype is a provisional model used to grasp the essence of a project before moving forward with the design. In other terms, prototyping is a test run for a project. It is a critical component that will ensure our client's success at the end of the project. The quality of the specified requirements provided to clients is improved through experimentation. The primary goal of this project is to make our customers happy and content; we will accomplish this by involving the client in all of the project's delicate intricacies. Our client will be able to see and engage with a working model of the project through the prototype, providing comments, requesting project adjustments, and changing model specifications. It was instrumental in removing misunderstandings and miscommunications. Finally, the prototype assisted us in determining early on what the client requires and what we need to change in our design using more efficient and less expensive resources.