

الجامعة الإسلامية العالمية ماليزيا
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
يُونِيْسْكُو إِسْلَامِ إِنْتَرَأَ بِعُثْنَى مِلِيُّسْكِيَا

Garden of Knowledge and Virtue



INFO 3307 HUMAN COMPUTER INTERACTION

SEMESTER 2 2021/2022

PROJECT PHASE 1&2

“Community SOS Welfare System”

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1.0 EMPATHY

1.1 Project Introduction

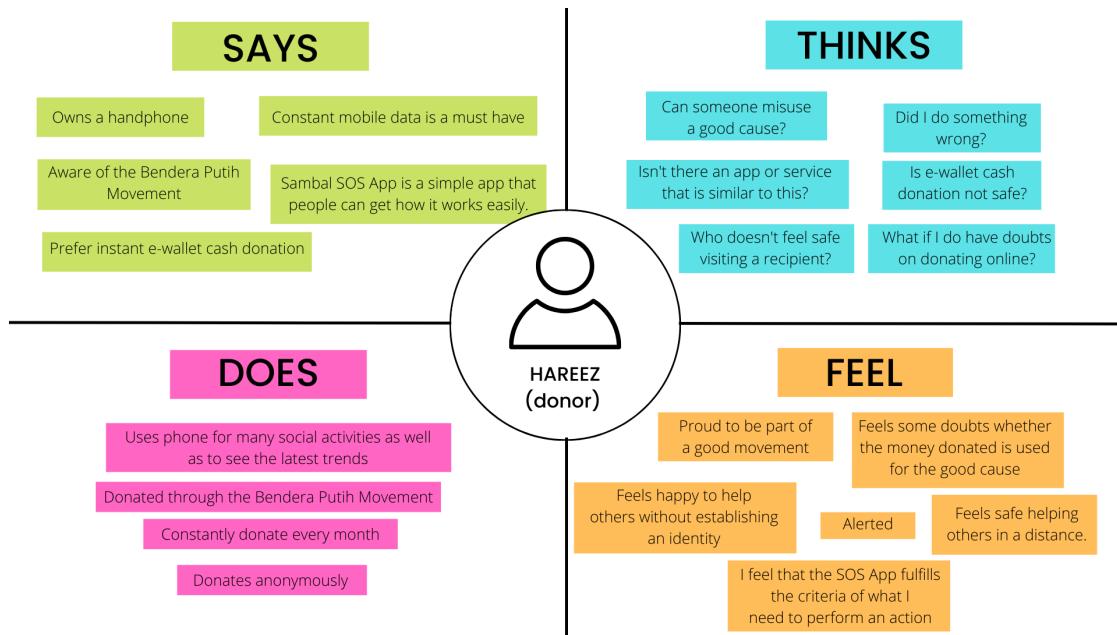
Topic of our project represents the solutions for a handful of persisting issues concerning humanity and the environment. We aimed to offer HCI ideas related to the SDG 1 (No Poverty) of our choice. We also hope our development of user-friendly apps can contribute to help people in need. In shaa Allah.

In order to help IIUM students in need, our team came up with the concept of a Community SOS Welfare System. We can observe that many Malaysians were struggling financially and emotionally during the pandemic. The development of welfare apps was done in order to support persons in need. In IIUM, it's common to see people requesting assistance via whatsapp or other social media, yet these requests rarely receive the attention or assistance they deserve. That's why our team decided to develop this app to help individuals in need.

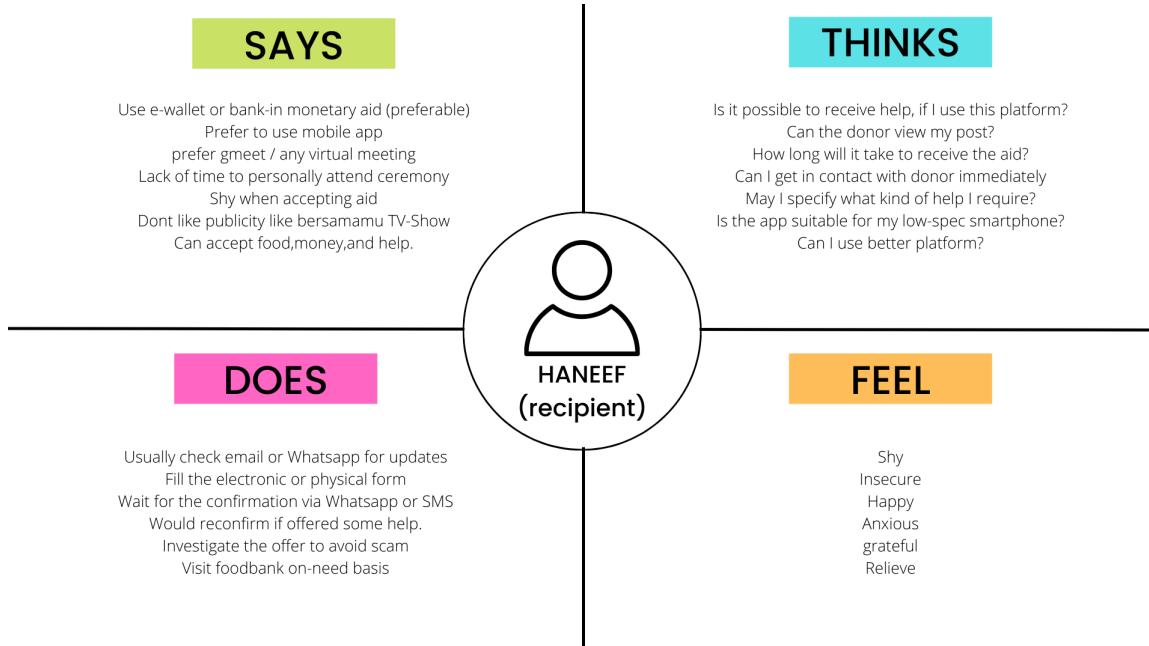
Much like a user persona, an empathy map can represent a group of users, such as a customer segment. We have used empathy map for deeper insight into our customers. There are two roles: Donor and Recipient. The four quadrants reflect four key traits, which the user demonstrated/possessed during the observation/research stage. The four quadrants refer to what the user: Said, Did, Thought, and Felt. Each user's experience helped us to discover insight in order to further improve our project.

1.2 Empathy Map

Module: Donor



Module: Recipient



2.0 DEFINE

2.1 Challenges

The recent covid-19 outbreak has put a particular strain on the community, especially on the economy. This is because many stores and working places got closed, leading to a high rate of job loss and people were having trouble keeping up with their savings and goods price fluctuations. This problem hits harder on those who are from low-income families, which the majority of the income is earned enough for per day or a week basis. When the situation keeps getting worse, the only option to escape the problem is to ask for emergency help from other people by launching a white flag which represents a symbol of surrender or truce.

Besides aiding the people struggling to cope with the pandemic, the white flag campaign also helps encourage people to help others in distress. Thus, the development of an application of such a campaign will bring a positive impact to other people. However, there are a few challenges that need to be faced to encourage people to use the application.

The first challenge is to overcome people's hesitation in asking others for help despite them being seriously in need of that. According to lawmaker Maria Chin Abdullah, she said that the reason people refuse to ask others for help is perhaps because they want to avoid telling everyone that they cannot manage the situation. In some people's perception, begging others for something is considered lazy because they should work for it if they really want something. However, it can be taken positively as it is impossible to cover everybody's needs, and if people raise for help, the other people will be more alert and able to come to aid. It is not considered a selfish act because it also indirectly helps other people to give help more efficiently.

The next challenge for the people to use the application is because they still lack experience in using similar kinds of applications which focus on donating and requesting items. However, this issue could be solved by giving proper guidance on how to use it and adjusting the application to be able to be used by any level of knowledge.

The other challenge that restrains people from using the application is because they still are not aware of the benefits of the application, especially what its purpose and for who it is intended. People should be able to use and will use it more often once they are exposed to how the application could be a number one thing they will need in case they are struggling to cope with difficult situations like lockdown and disaster. This problem could be solved by exposing the people about the benefits they can gain using the app so that they will have ideas on when and where to use it.

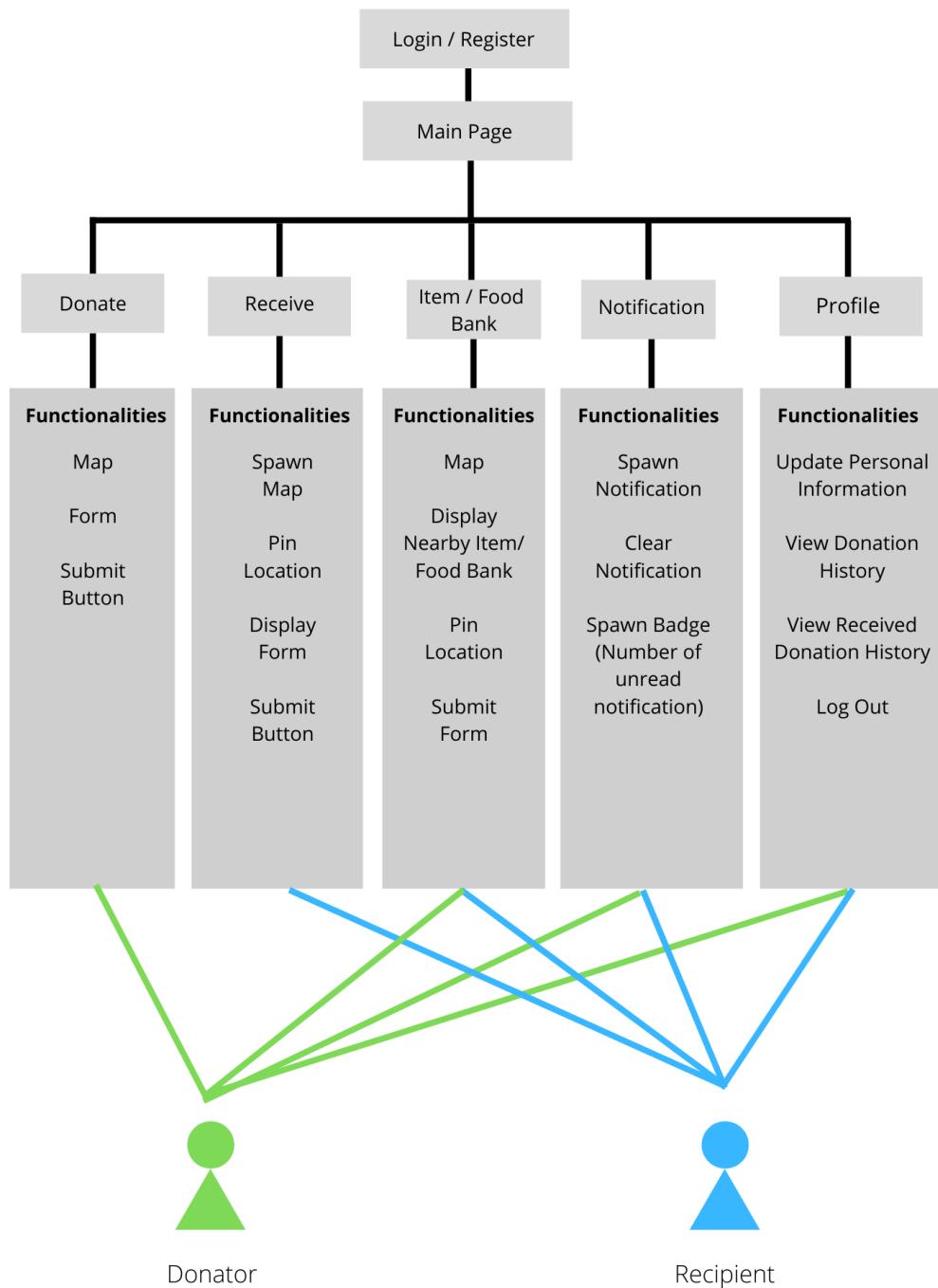
2.2 Persona

 <p>Aiman Age: 22 Occupation: Student Level: University</p>	<p>Description</p> <p>Aiman is a 2nd Year Student taking Bachelor of Information Technology at IIUM. He is currently looking for ways to help students in need around the campus.</p>	<p>Personal Characteristics</p> <p>Helpful Independent Resourceful Outgoing Studioous</p>	<p>Hobbies and Interests</p> <p>Reading Board games Cooking Online gaming Playing guitar</p>
	<p>Needs</p> <ul style="list-style-type: none"> - A safer approach to help those in need - A simple way to transfer money via Instant E-wallet funds - Alerted of students in need - Anonymous Donation Feature 	<p>Goals</p> <ul style="list-style-type: none"> - To help students in need - To be a part of a good movement - To build a better community 	<p>Experiences</p> <ul style="list-style-type: none"> - Donates to charity organizations every month - Used the Bendera Putih App - Donate to IIUM Students via Whatsapp

 <p>Izzati Age: 23 Occupation: Mahallah Cafe Worker Level: Diploma</p>	<p>Description</p> <p>Izzati is an ambitious woman who aims to further her education. However, coming from a B40 family, her financial situation discouraged her from continuing her education. To help her family and to sustain her livelihood, she works at Cafe as general worker. As a contract worker, she is often overlooked by university welfare system.</p>	<p>Personal Characteristics</p> <p>Shy Ambitious Hardworking Introvert Low-Esteem</p>	<p>Hobbies and Interests</p> <ul style="list-style-type: none"> - cooking - reading - playing puzzles - jogging
	<p>Needs</p> <ul style="list-style-type: none"> - Need some financial aid to sustain her family livelihood. - Prefer android smartphone apps as she does not have a laptop or an iphone. - Want to find nearest food bank. - Willing to provide basic personal information. - avoid scam. 	<p>Goals</p> <ul style="list-style-type: none"> - put up SOS to get help. - Enable her to receive the donation in the efficient manner. - Find food bank faster and easier. - System that can be installed in smartphone especially low cost ones. 	<p>Experiences</p> <ul style="list-style-type: none"> - Has experiences working at fast food restaurant. - Adept smartphone user. - Has social media accounts

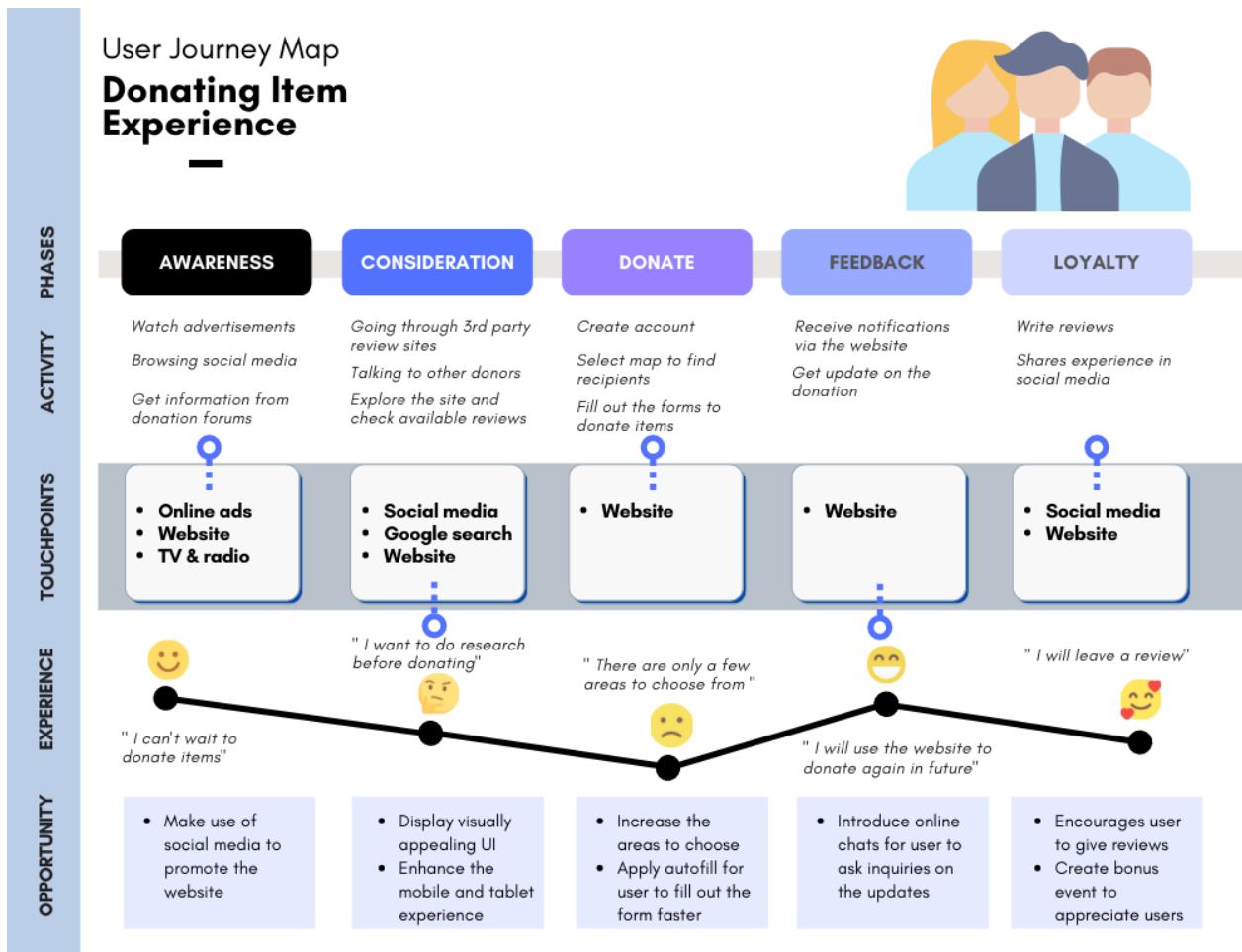
3.0 IDEATION

3.1 System Functional Architecture

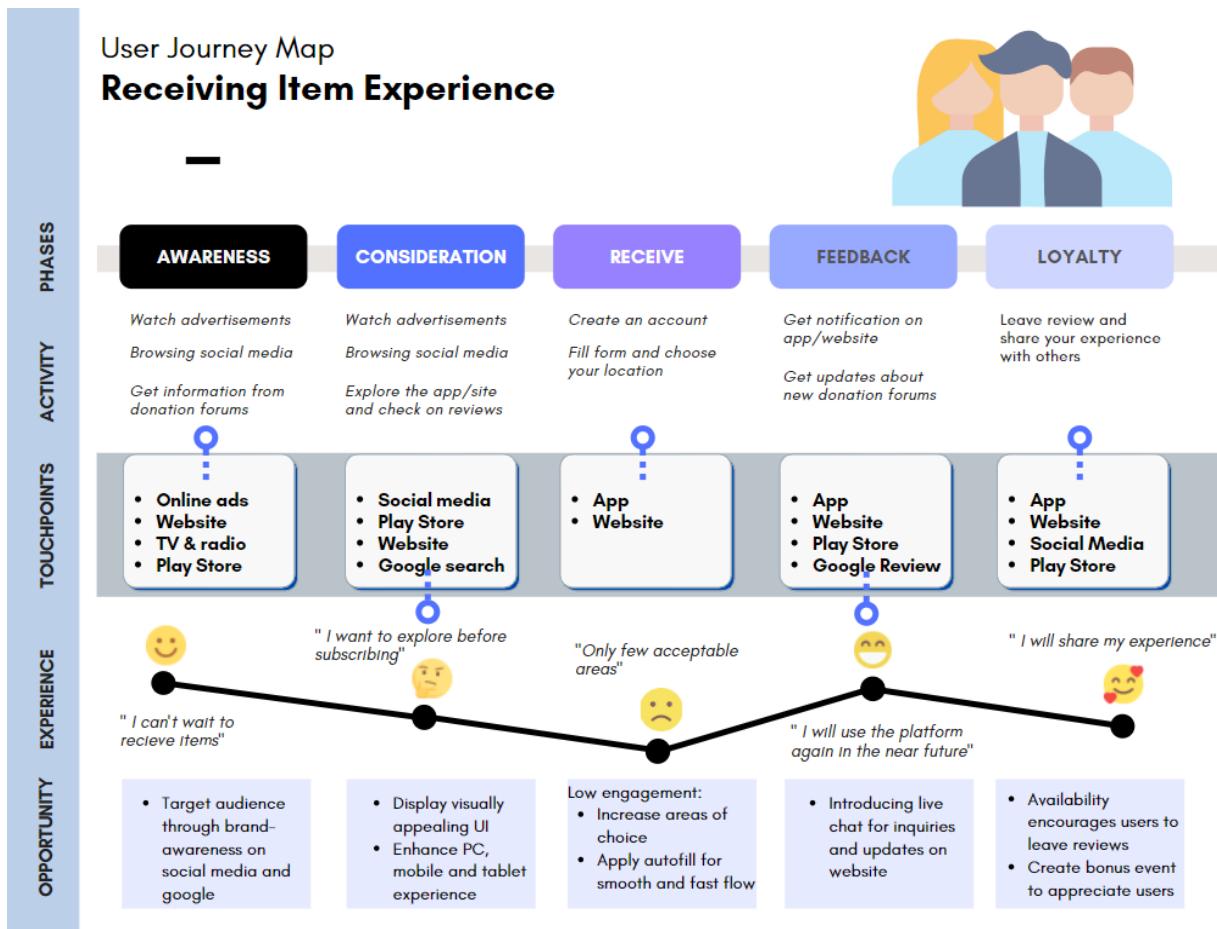


3.2 User Journey Map

Module : Donation



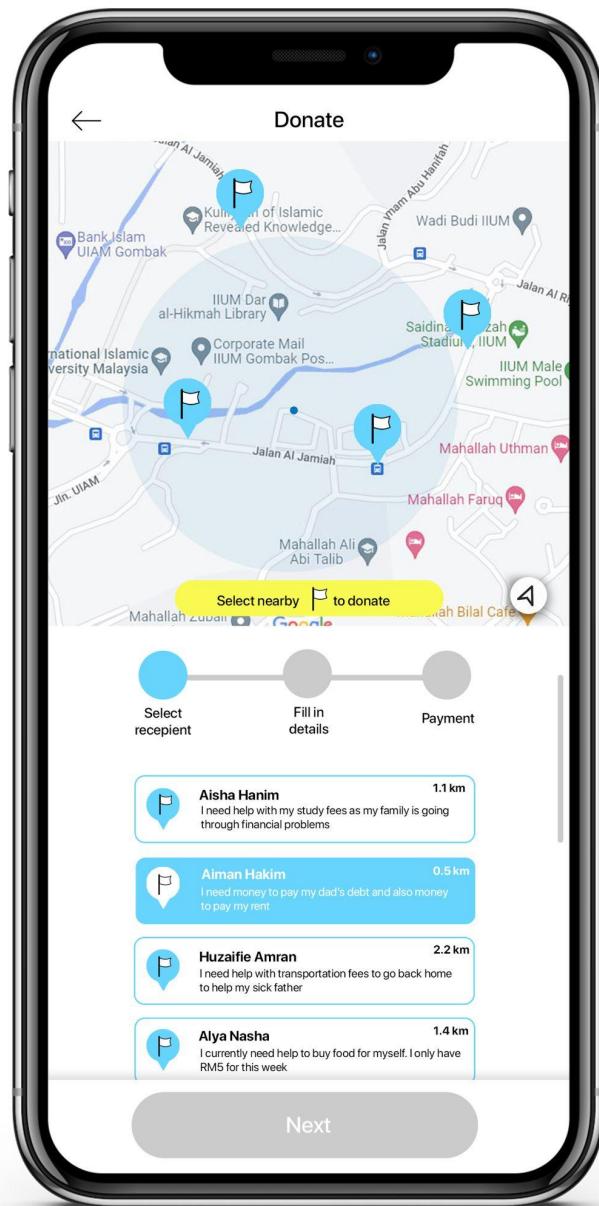
Module : Receive



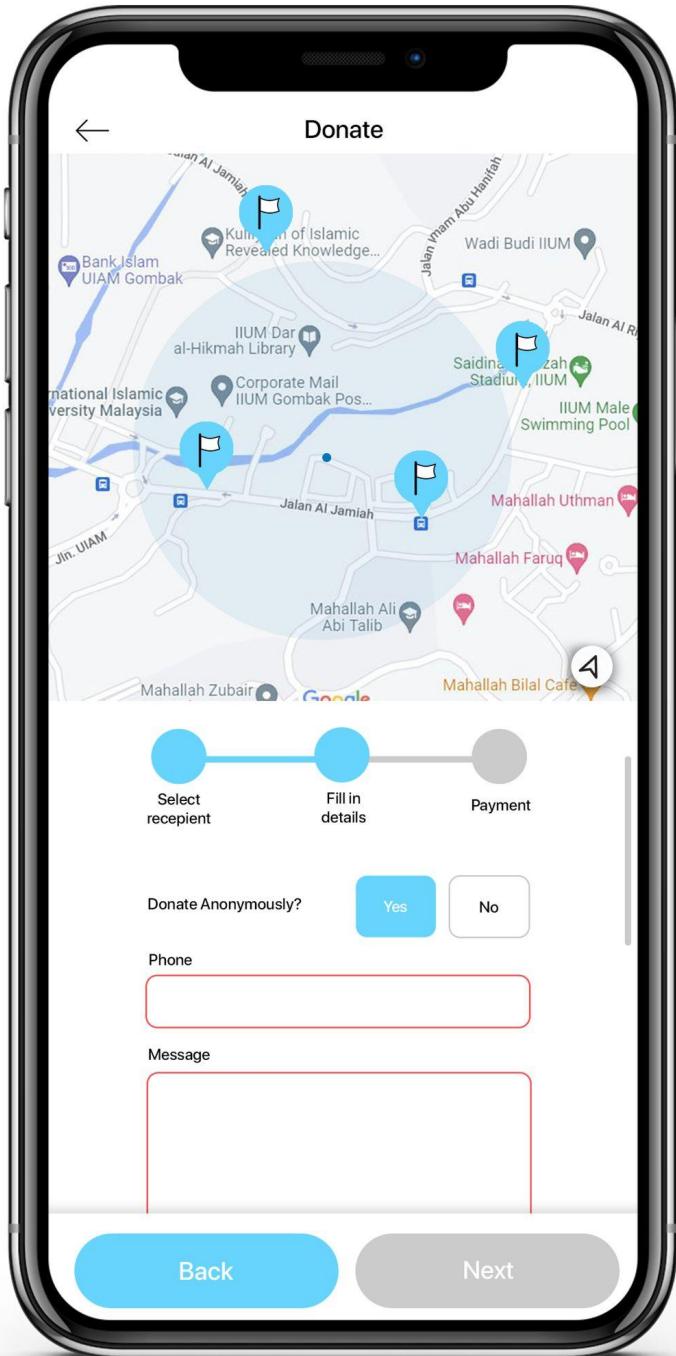
3.3 UI Alternative Designs

3.3.1 UI Design 1

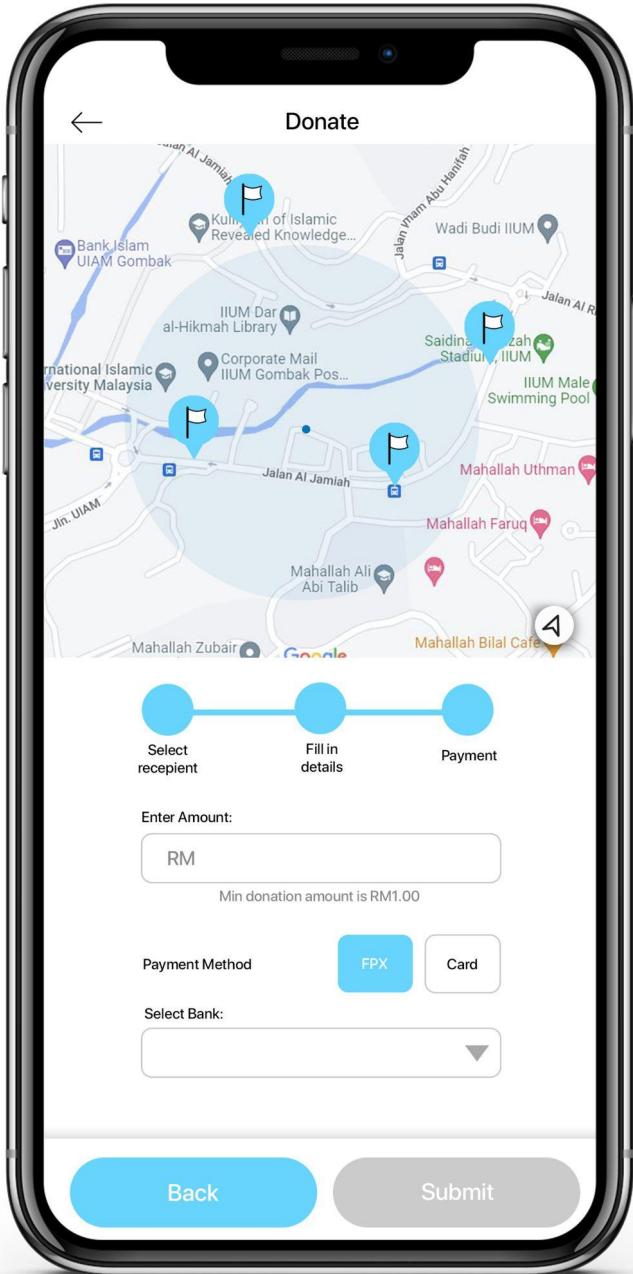
Step 1:



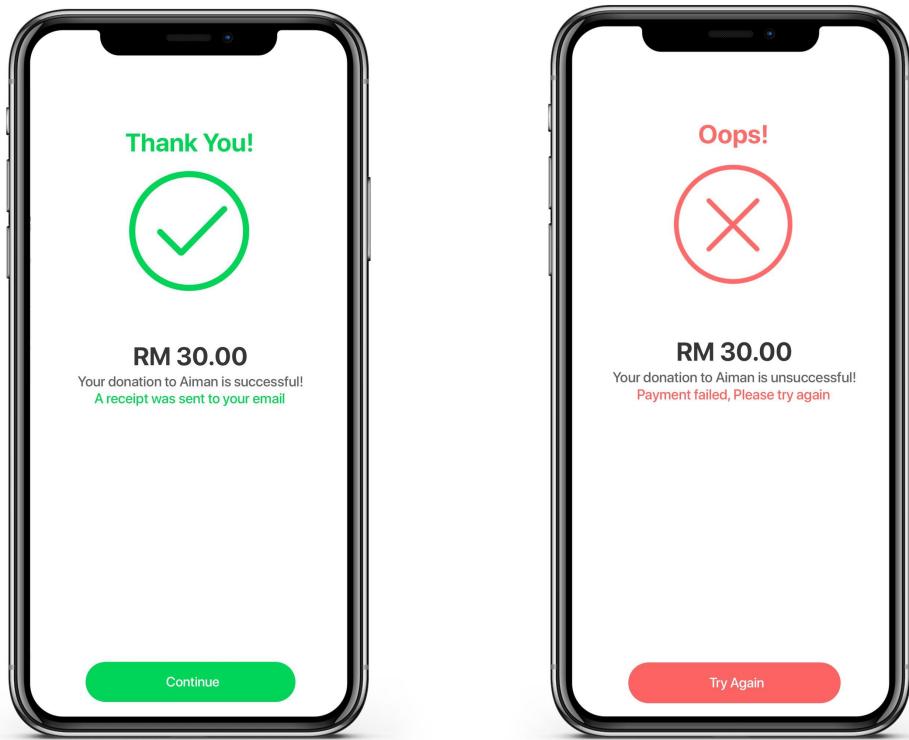
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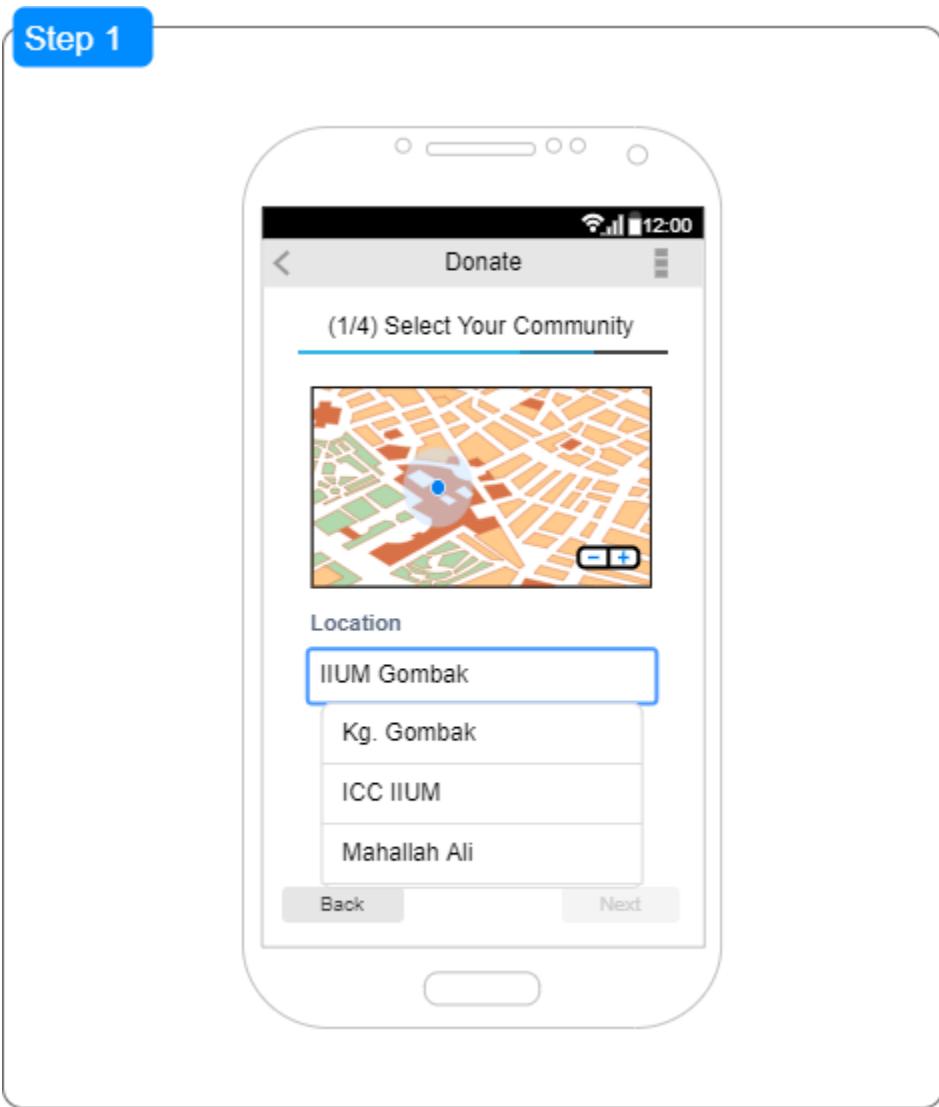
Step 3:



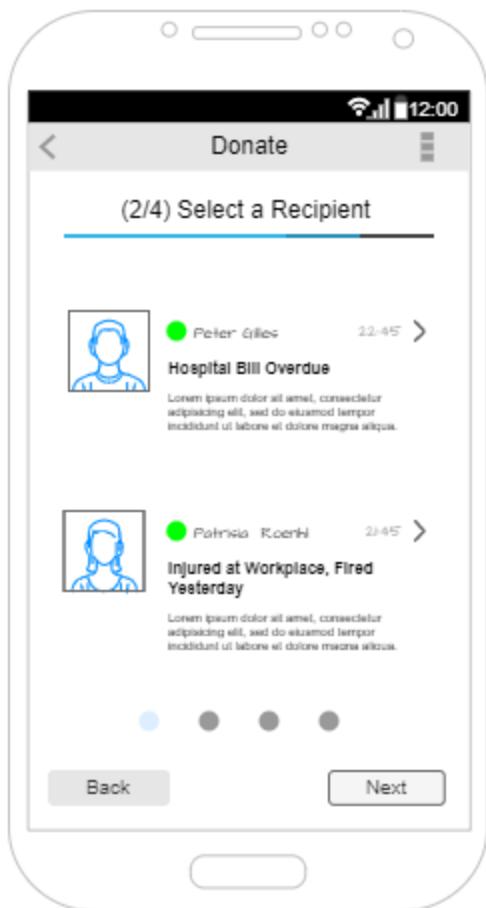
Step 4:



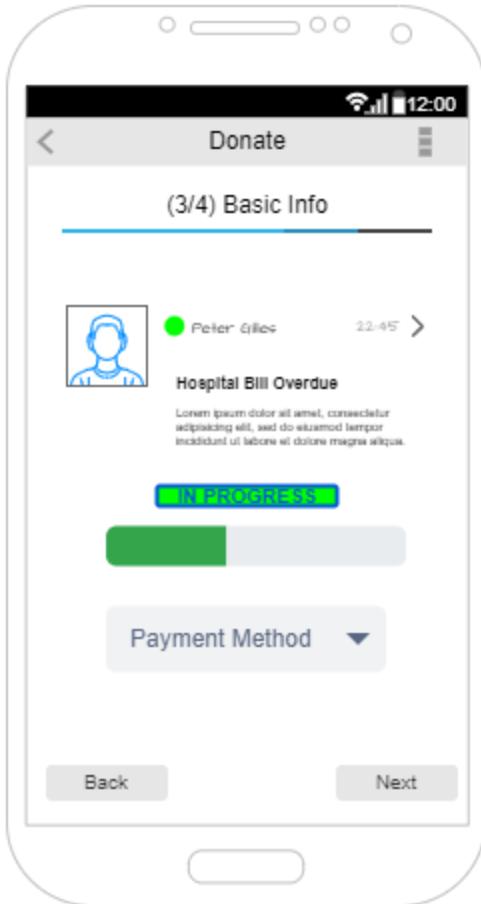
3.3.2 UI Design 2



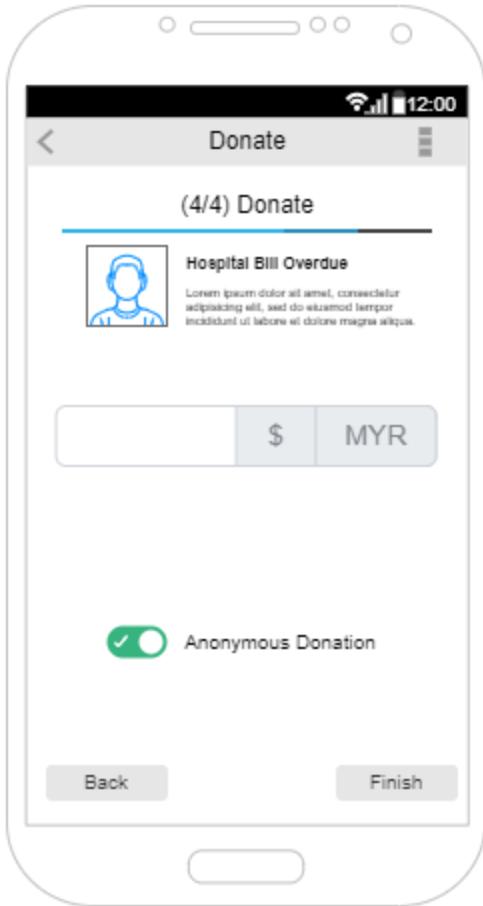
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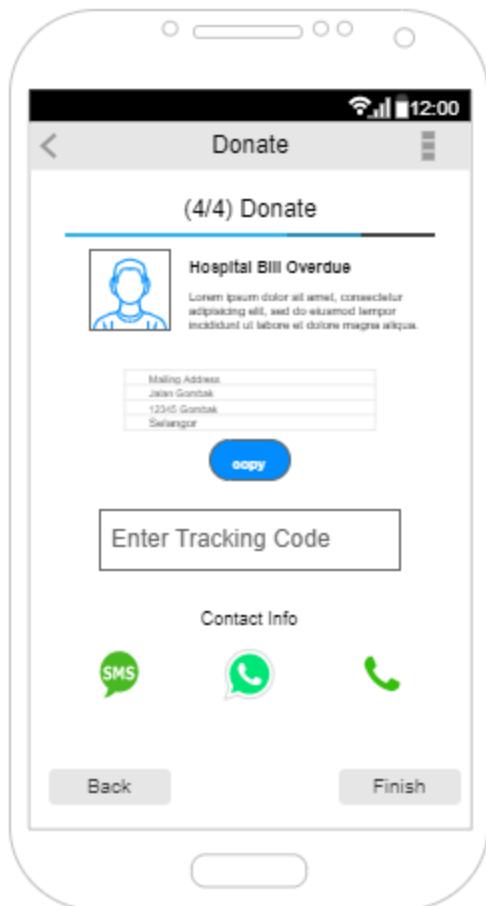
Step 3



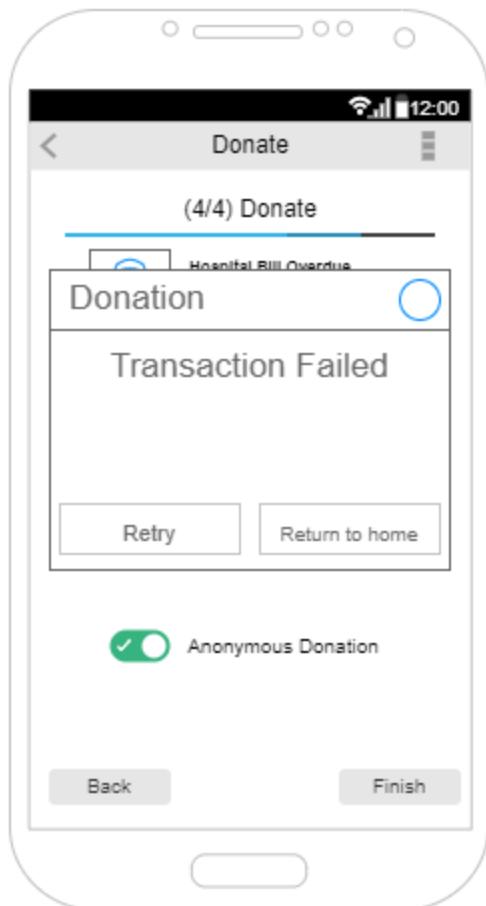
Step 4



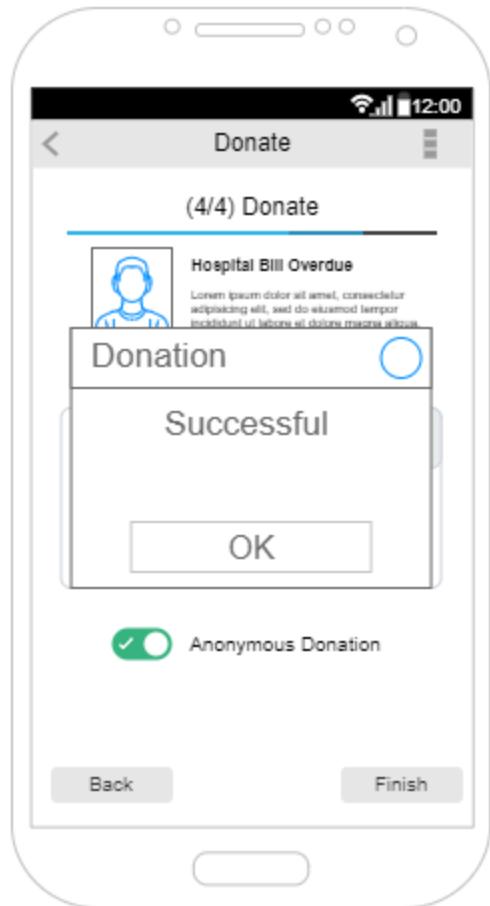
Step 4



Step 5



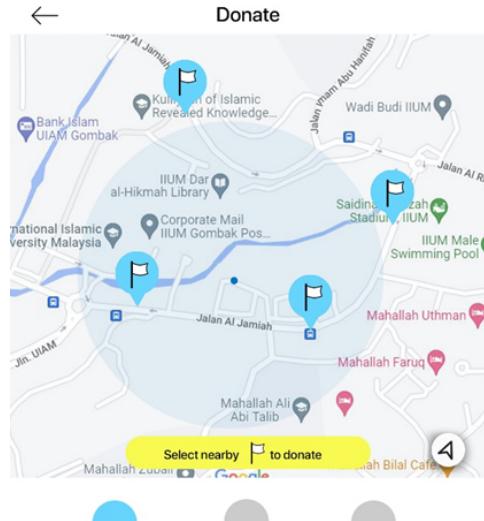
Step 5



3.4 Description of each UI Design

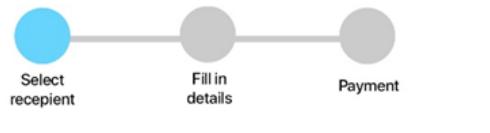
3.4.1 UI Design 1

For Map,



It shows the users their own location with surrounding white flags nearby which indicates nearby recipients' location. Users can move and swipe around the map to look at the white flags around them. There is also a button that lets users center the map on themselves.

For the Progress bar,



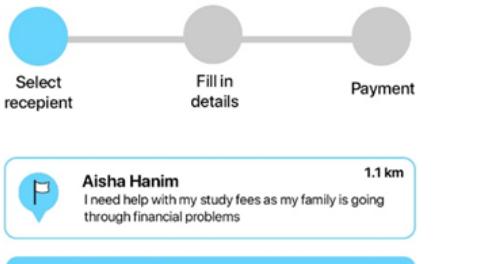
This indicates to the user which stage they are at during the donation process where in the donation process there are 3 stages to complete before donating successfully.

For moving between pages,



Users are given the ability to navigate backwards or forwards through the donation process using this button. If they have not finished filling out all of the form, the button will be disabled or made inaccessible to them during that donation stage.

For scrolling down the page,



During the donation process, the user is informed by a scroll bar that they are allowed to scroll down the form in order to provide further information. They will be unable to scroll through the page only in the event that there is not a scroll bar present.

For Step 1,

Aisha Hanim 1.1 km
I need help with my study fees as my family is going through financial problems

Aliman Hakim 0.5 km
I need money to pay my dad's debt and also money to pay my rent

Huzailie Amran 2.2 km
I need help with transportation fees to go back home to help my sick father

Alya Nasha 1.4 km
I currently need help to buy food for myself. I only have RM5 for this week

Next

Users can scroll through names, descriptions, and distances of nearby white flags. Once a user chooses a white flag, it will be highlighted blue. After selecting, the next button will be accessible.

For step 2,

The form consists of several input fields and buttons. At the top, there is a question "Donate Anonymously?" with two options: "Yes" (blue button) and "No" (white button). Below this are two text input fields: "Phone" and "Message", both outlined in red. At the bottom are two large buttons: "Back" (blue) and "Next" (grey).

Donors can choose whether or not to remain anonymous when filling out the form. No matter if consumers select yes or no, the form will change. The next button can only be accessed if all of the relevant fields have been filled out by the user.

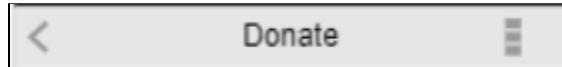
For step 3,

The payment process interface includes fields for "Enter Amount:" (with "RM" selected), "Payment Method" (with "FPX" and "Card" options), and "Select Bank:" (with a dropdown menu). To the right, there are two outcome scenarios: "Thank You!" with a green checkmark icon and "Oops!" with a red X icon. Both scenarios show a donation amount of "RM 30.00". The "Thank You!" scenario also includes text: "Your donation to Aiman is successful! A receipt was sent to your email". The "Oops!" scenario includes text: "Your donation to Aiman is unsuccessful! Payment failed, Please try again". At the bottom are "Back" (blue) and "Submit" (grey) buttons.

The final step in the donation process is for donors to specify how much money they wish to donate to the chosen recipient. FPX or card payments are available, and customers can then select their preferred banks or enter their credit card information. Once the user is done with the whole payment process, the system will check whether the payment is successful or not.

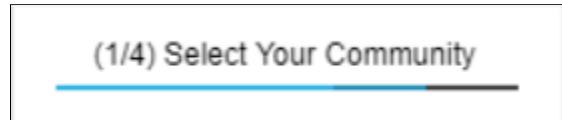
3.4.2 UI Design 2

For the Basic Navigation Bar,



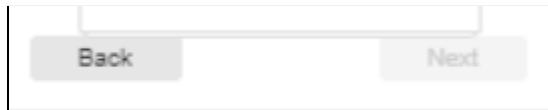
The Left Arrow indicates to cancel the operation and return to main, upon clicking the left arrow '<', the user will be prompted to confirm leaving the “Donate” page and cancel the operation. With “Confirm” the data is discarded and the user returned to the Home page. The “Burger” icon allows the user to: 1) Change Language (BM, EN) 2) Adjust font Size 3) Set High Contrast Mode 4) Help. The title Donate lets the user know that they are in the donation page.

For Progress Bar,



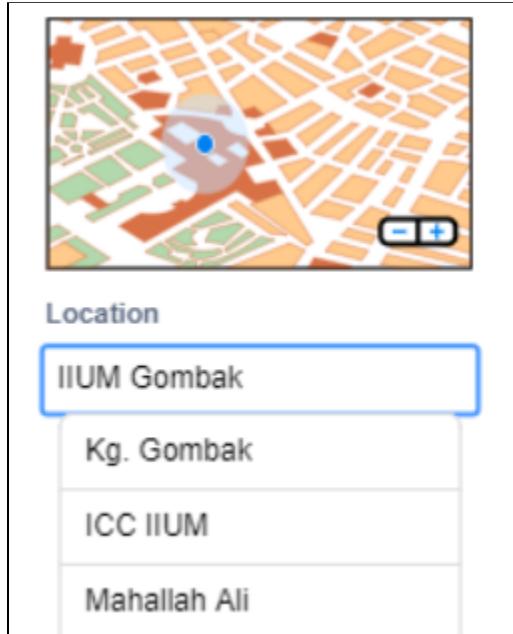
This acts as a wizard to guide users throughout the donation process, The fraction $\frac{1}{4}$ shows that user in the first step out of 4 steps. The Instruction helps the user to understand the purpose of that page.

For moving between pages,



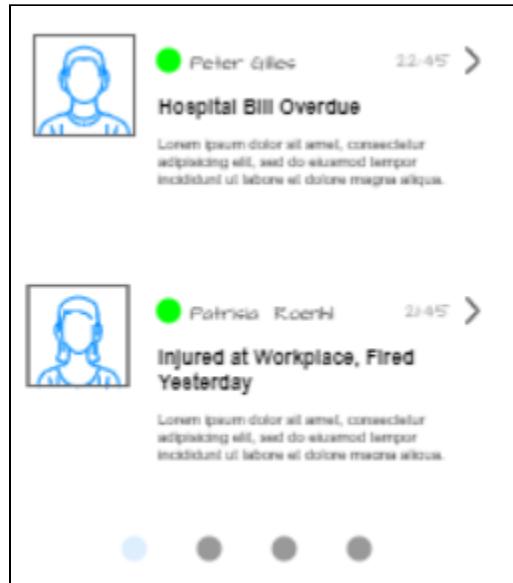
This allows the user to progress between pages, Next button is grayed out and disable until user input mandatory field. Back button brings user to previous pages. The data is saved unless the user escapes to the Home Page using the left arrow '<' at the navigation bar.

For Step 1,



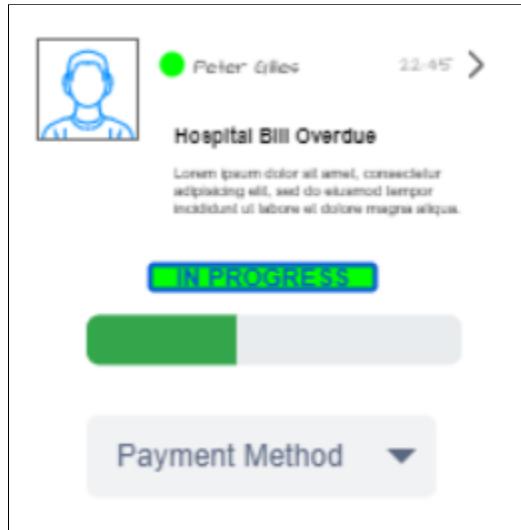
Users can type in the area name or select from the map. Auto suggestion is turned on to assist the user. User can zoom in or zoom out using '+' or '-' respectively.

For Step 2,



User profiles and their request description is written with Different font size and bold style. Green Circle indicates that the user is online. Timestamps are shown near the right arrow ‘>’. Right Arrow lets us read more info and donate to the recipient. Circle at the bottom let us know there are more requests and pages. Light circle indicates the current page.

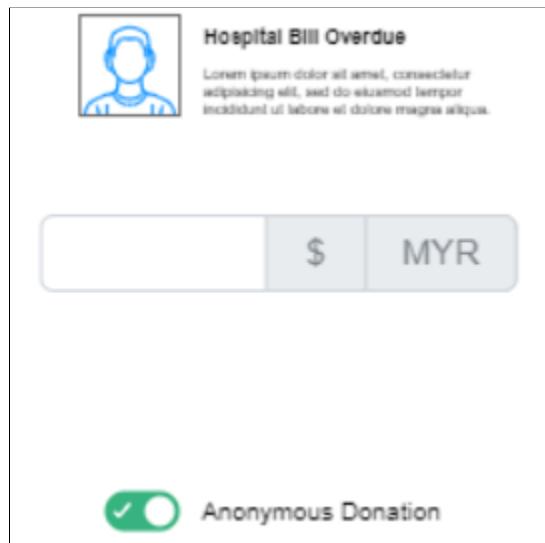
For Step 3,



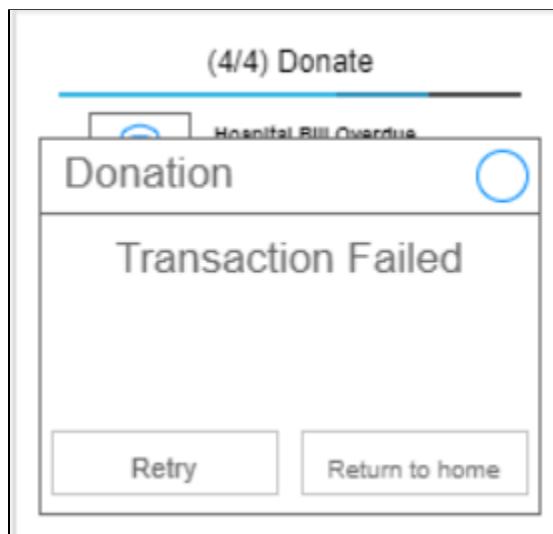
After the user clicks the right arrow, they can read more information. The green “In progress” shows that the user is still accepting donations. The green progress bar shows how many

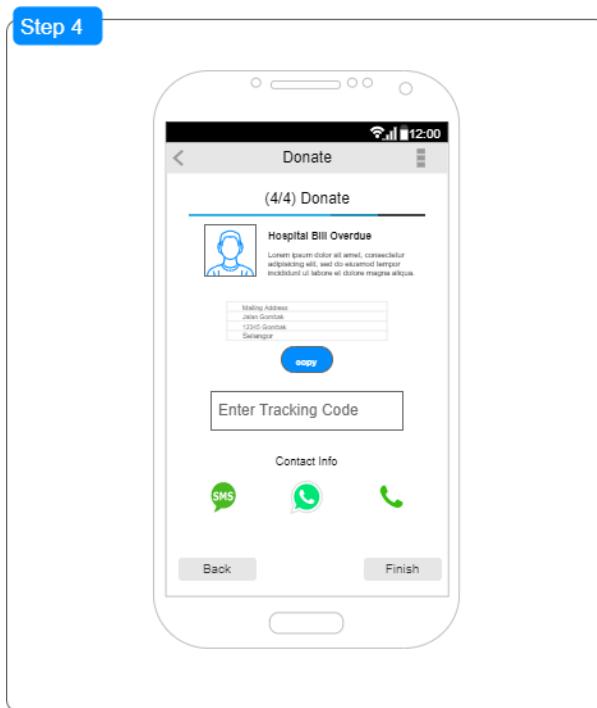
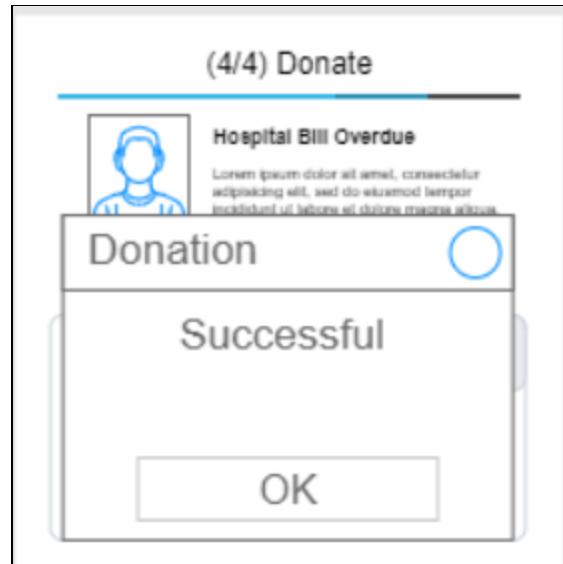
donations the user needs and how many he has obtained so far. Payment method lets the donor choose how he wants to pay : credit card,debit card, FPX, or item donation

For Step 4,



The final step, let the user enter an amount of money. Donors can opt to remain anonymous by selecting the “Anonymous Donation” radio button. Another click will disable the anonymous donation feature. If an item donation is selected, the mailing address of the recipient is shown with a copy button and a text box for tracking code is shown instead of the money amount textbox. Donors are shown contact information (Whatsapp, Telegram) that is provided by the recipient for further inquiries and setting up meeting points. After the donor clicks the “Finish” button, a pop-up box is displayed to inform successful or failed transactions. The donor returned to the home page.





3.5 Usability Evaluation

3.5.1 UI Design 1

System Usability Scale
UID Design 1

		Strongly Disagree	1	2	3	4	Strongly Agree
1.	I think that I would like to use this system frequently						/
2.	I found the system unnecessarily complex	/					
3.	I thought the system was easy to use						/
4.	I think that I would need the support of a technical person to be able to use this system	/					
5.	I found the various functions in this system were well integrated						/
6.	I thought there was too much inconsistency in this system	/					
7.	I would imagine that most people would learn to use this system very quickly						/
8.	I found the system very cumbersome to use	/					
9.	I felt very confident using the system						/
10.	I needed to learn a lot of things before I could get going with this system	/					

3.5.2 UI Design 2

System Usability Scale
UID Design 2

		Strongly Disagree	1	2	3	4	Strongly Agree
1.	I think that I would like to use this system frequently					/	
2.	I found the system unnecessarily complex	/					
3.	I thought the system was easy to use						/
4.	I think that I would need the support of a technical person to be able to use this system	/					
5.	I found the various functions in this system were well integrated					/	
6.	I thought there was too much inconsistency in this system	/					
7.	I would imagine that most people would learn to use this system very quickly						/
8.	I found the system very cumbersome to use	/					
9.	I felt very confident using the system					/	
10.	I needed to learn a lot of things before I could get going with this system	/					

Score Table:

Each item's score contribution will range from 0 to 4. For items 1, 3, 5, 7 and 9 the score contribution is the scale position minus 1. For items 2, 4, 6, 8 and 10, the contribution is 5 minus the scale position. Multiply the sum of the scores by 2.5 to obtain the overall value of SU.

	1	2	3	4	5	6	7	8	9	10	Score*2.5
UID 1	4	4	4	4	4	4	4	4	4	4	100
UID 2	3	4	4	4	3	4	4	4	3	4	92.5

3.6 Designated UI Design and Justification

Both of the UI Designs of our app are based on Simplicity, Clarity and Transparency principles. User friendliness makes the UI usage flow on time and gives users safe search by making them secure through its transparency as well.

In comparison UI Design 1 is on top while the second design lacks in transparency not enough being interactive. Firstly, design no 1 meets all the requirements of project goal scope, making it perfectly suitable for the target audience. Secondly, it shows up-to-date interactive and adaptive interface while second is a more older version and non suitable for new softwares.

In summary, the user experience and scope of research clearly serves as evidence of UI design support and adaptability. This is the most important core value that customers need to pay attention to in their projects. Mostly, Design 1 is the best, and Design 2 is not very compatible and gives the user the best impression of simplicity.

3.7 Task Analysis

In order to better understand the interaction between the user and the application, a model called **the seven stages of action**, or Norman's action cycle will be used.

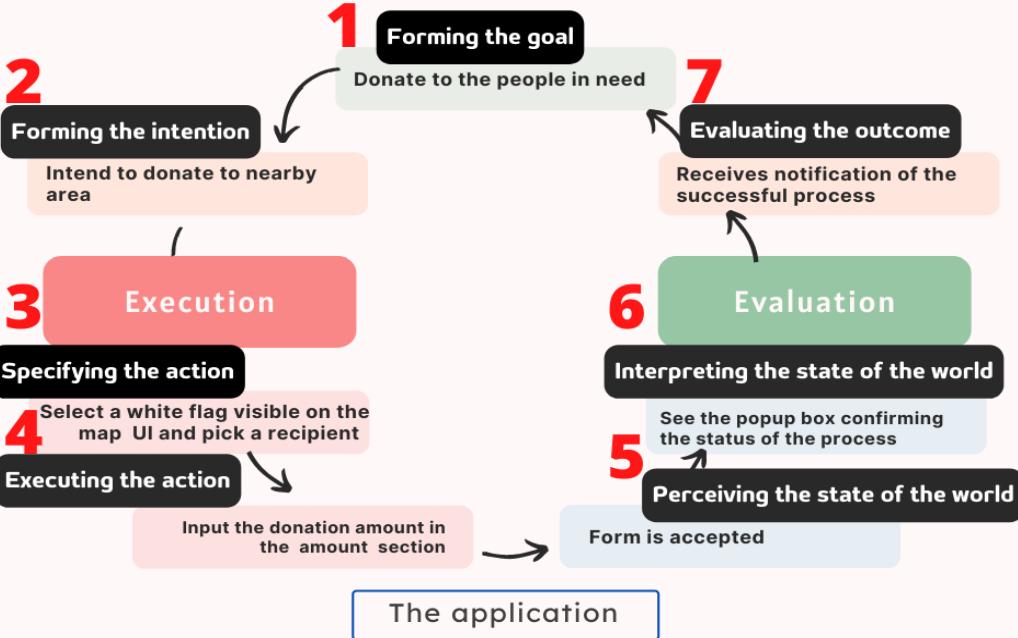
The action cycle is divided into two parts. The first part is **execution** in which the users form a goal they want to accomplish and execute an action in order to achieve the goal.

The second part is **evaluation** in which the users evaluate the effects of the action and know whether the goal was achieved or not.

The action cycles are illustrated as below:

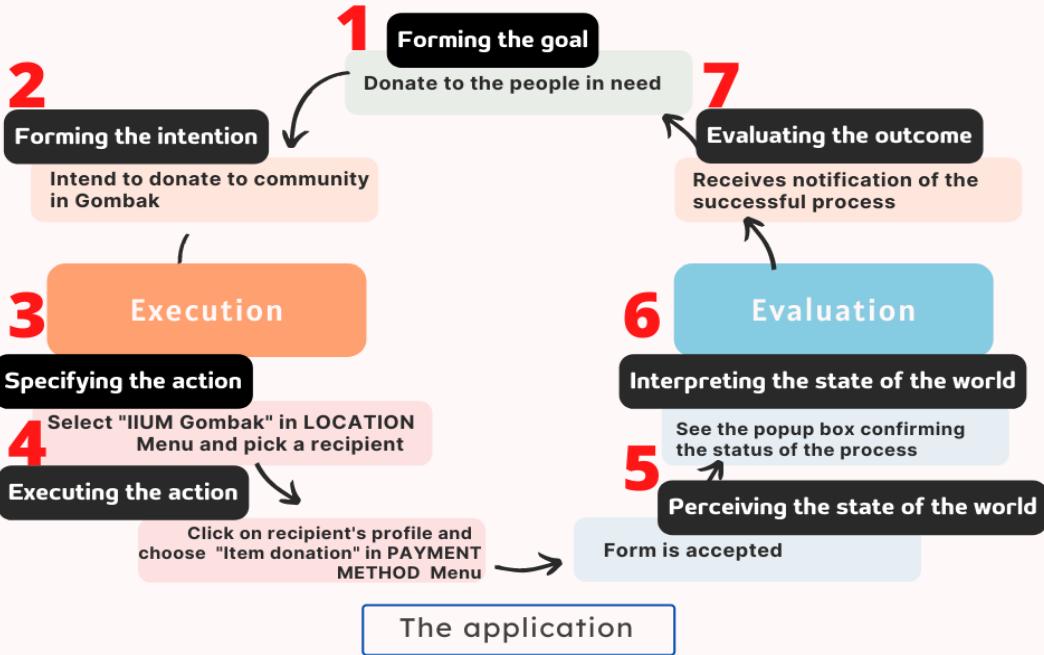
UI DESIGN 1

Donating on the app



UI DESIGN 2

Donating on the app



4.0 Prototyping and Evaluation

4.1 Interview Questions

We are using participant-based evaluation, namely cooperative evaluation in this project. Cooperative evaluation developed by Andrew Monk and his colleagues at University of York in the United Kingdom around 1993. This technique is a means to maximize the data gathered from a simple testing session. Here, participants are actively co-evaluating the design and are not passive subjects. This technique is popular because it is reliable and economical with diverse applications.

During the evaluation:

- What do you want to do?
- What were you expecting to happen?
- What is the system telling you?
- Why has the system done that?
- What are you doing now?

After the session:

- What was the best/worst thing about the prototype?
- What needs changing most?
- How easy were the tasks?
- How realistic were the tasks?
- Did giving a commentary distract you?

4.2 Tasks Performed

There are guidelines that we follow throughout the interview. First, we created a list of tasks. The task must be realistic and doable with software. Secondly, we try out the task and estimate the time taken for the participant to complete the task around 10 minutes. With extra 50%, we allocated 15 minutes for each session. Thirdly, we review the task and improvise it to remove ambiguity and make it easier to be understood. We were using a vertical prototype with emphasis on the “Donate” functional module. The subsequent tasks in the list reflected our decision.

Next, we invited the participant to a comfortable area and prepared the prototype. To record the session we use primarily laptop and notebook. Before the interview takes place, we remind them that it is the design we are testing instead of their intelligence. Afterwards, we show and explain to them the tasks that we prepared beforehand. They are asked to provide a commentary related to the task. Any difficulties and uncertainties should be mentioned as soon

as possible. Areas with problems are noted and marked in the notebook. If the participants are stuck, the interviewers are required to help them. In order to encourage the participant to keep talking, we asked them a few questions during the interview. After the participant finished with the tasks, we asked them 5 questions to probe about the usability of the prototype design. In order to extract more data, we use System Usability Scale as a questionnaire. With a Likert Scale of 5 points, we calculate the score.

Task :

1. Open up the Community SOS App from Smartphone Homepage.
2. Sign up new Account
3. Login using new Account credentials
4. Click “Donate” button
5. Select Area
6. Select recipient available at that area
7. Select option “Anonymous” .
8. Enter the amount of donation .
9. Use FPX as payment method
10. Choose a bank
11. Confirm details of transaction.
12. Finish

4.3 Evaluation Findings

Asyraf

System Usability Scale
UID Design

		Strongly Disagree	1	2	3	4	5 Strongly Agree
1.	I think that I would like to use this system frequently						/
2.	I found the system unnecessarily complex			/			/
3.	I thought the system was easy to use						/
4.	I think that I would need the support of a technical person to be able to use this system				/		
5.	I found the various functions in this system were well integrated						/
6.	I thought there was too much inconsistency in this system			/			/
7.	I would imagine that most people would learn to use this system very quickly					/	
8.	I found the system very cumbersome to use				/		
9.	I felt very confident using the system						/
10.	I needed to learn a lot of things before I could get going with this system		/				

Figure 1. SUS Form by Mr.Asyraf

System Usability Scale

	1	2	3	4	5	6	7	8	9	10	Score*2.5
1	4	3	4	2	4	3	4	2	4	3	82.5

Our first participant was Mr.Asyraf. He is a final year student at KICT and is planning to major in Computer Networking and Security. Thankfully, he learnt about the Human-Computer Interaction subject during his diploma. Therefore, we were able to extract a lot of valuable input during the interview. Firstly, he likes the familiarity around the user interface design. The good aesthetic designs help to influence users in using the app. Moreover, the familiar design also helps him to recognize the control elements like textbox, button, scroll bar to navigate around faster. For him, our paper prototype is realistics and can be implemented using the available tools in the market. Additionally, he also mentioned that the design is quite “standard” like other apps in the market. This consistent and standard design is a plus point as it helps the user to learn using the app faster and simultaneously more predictable than unconventional or novel design.

The downside turned out to be our first page after the login page. Here, Mr.Asyraf was confused due to the presence of a Map with markers. Instead of clicking the “Donate” button, he clicked the marker. He wished there would be more instructions to aid him. There are few solutions for this issue. For example, as shown by Grab application in Android Playstore, using the dashboard as the first page after the login page would help to mediate the problem. Instead of a map, we can display related information in the dashboard such as the user's last donation, current hot donation campaign list and the user's statistics data such as donation frequency. Alternatively, we can implement an interactive help button which provides interactive help for new users to help them or an interactive tutorial for new users. He also advised us to use buttons with movement animation to attract the user's attention.

System Usability Scale
UID Design

		Strongly Disagree	1	2	3	4	Strongly Agree
1.	I think that I would like to use this system frequently					/	
2.	I found the system unnecessarily complex					/	
3.	I thought the system was easy to use						/
4.	I think that I would need the support of a technical person to be able to use this system		/				
5.	I found the various functions in this system were well integrated				/		
6.	I thought there was too much inconsistency in this system		/				
7.	I would imagine that most people would learn to use this system very quickly					/	
8.	I found the system very cumbersome to use				/		
9.	I felt very confident using the system					/	
10.	I needed to learn a lot of things before I could get going with this system		/				

Figure 2. SUS Form by Mr.Syazani

System Usability Scale

	1	2	3	4	5	6	7	8	9	10	Score*2.5
1	3	1	4	3	2	3	3	2	3	3	67.5

The participant involved in this second interview is Mr. Syazani Sazali. He is a 3rd year student majoring in Information Technology in IIUM. The participant is knowledgeable about how the lofi interview is conducted, thus this helps to ease the process of interview. Moreover, the participant also already took the Human-Computer Interaction course last semester and was also involved in the same kind of group project. After conducting a quick demo in front of the participant, he shows a sign of understanding and the readiness to start the walkthrough.

At the beginning, the participant got confused with the UI of the login page where he could not detect the sign up button and straight away heading to fill out the login form. This shortcoming should be improvised where we could increase the size of the fonts or change the appearance of the button so that the user could notice and remember to sign up before they can login into the system. Next, the participant could clearly see the map and the markers because of the appearances of the UI where red color is used on the marker which is able to attract the user's attention on the intended target. The pointer icon is used as the marker and the participant seems familiar with the symbol and knows right away what the pointer is indicated for. This helps to fulfill one of the essential user interface design principles which is the user familiarity.

However, the UI still lacks encouragement to guide the participant in completing the tasks as he becomes clueless on what to do next on the map page. Thankfully, the consistency in the layouts of the buttons help the participants to get back on the right track to complete the next task. In order to avoid such difficulty for future users, help or guidance should be implemented to guide the user in completing the tasks inside the system.

Another good point is the feedback added on the buttons that helps the participant to confirm the completion of the task as they can see the buttons become visible and clickable for the user to proceed further. The simplicity and familiarity implemented for the app greatly becomes a boon for the user to stay exploring the app. The participant has provided a valuable suggestion which is to add a recovery system where mistakes such as putting the wrong amount of donation could be corrected.

System Usability Scale
UID Design

		Strongly Disagree	1	2	3	4	Strongly Agree
1.	I think that I would like to use this system frequently				/		
2.	I found the system unnecessarily complex	/					
3.	I thought the system was easy to use					/	
4.	I think that I would need the support of a technical person to be able to use this system					/	
5.	I found the various functions in this system were well integrated					/	
6.	I thought there was too much inconsistency in this system		/				
7.	I would imagine that most people would learn to use this system very quickly					/	
8.	I found the system very cumbersome to use		/				
9.	I felt very confident using the system					/	
10.	I needed to learn a lot of things before I could get going with this system				/		

Figure 3. SUS Form by Sr.Deqqa

System Usability Scale

	1	2	3	4	5	6	7	8	9	10	Score*2.5
1	2	4	3	1	3	3	3	3	3	2	67.5

Our last participant was Sr.Deqqa. She is a final year student at IRKHS and showed high interest in learning app development. Thus she was highly helpful on feedbacks and advices regarding prototype. Firstly, she liked the user-friendliness of the user interface design. The good aesthetic designs help to influence users in using the app. Moreover, the familiar design related to apps such as Grab was helpful for her to recognize the control elements like payment, available recipients, next button to navigate around faster. She find out our paper prototype is realistic and can be implemented using the available tools in the market. Additionally, she also mentioned that the design is near to be “simple to understand” like other relatable apps in the market. This consistent and standard design is a plus point as it helps the user to learn using the app faster and simultaneously more predictable than unconventional or novel design.

The downside turned out to be our first page after the login page. Here, Sr.Deqqa was confused due to the presence of a sliding with markers. Instead of screen sliding to the right, she started to turn from . She wished there would be more instructions to aid him. There are few solutions for this issue. Alternatively, we can implement an interactive help button which provides interactive help for new users to help them or an interactive tutorial. She also advised us to use buttons with movement animation to attract the user's attention.

4.4 Evaluation Video Links

Youtube Presentation Link

Interview 1 : https://youtu.be/B_E6gytsETQ

Interview 2 : <https://youtu.be/0CgNvkIZFVU>

Interview 3 : <https://youtu.be/towFqWIfEdw>

REFERENCES

1. Benyon, D. (2019). *Designing user experience : a guide to HCI, UX and interaction design* (4th ed.). Pearson Education Limited.
2. *Sambal SOS*. (n.d.). [Www.sambalsos.com](http://www.sambalsos.com). Retrieved May 20, 2022, from <https://www.sambalsos.com/home>
3. *HCI Lecture 8*. (n.d.). [Www.psy.gla.ac.uk](http://www.psy.gla.ac.uk/~steve/HCI/cscln/trail1/Lecture8.html#:~:text=In%20Human%20Computer%20Interaction%2C%20task).
<https://www.psy.gla.ac.uk/~steve/HCI/cscln/trail1/Lecture8.html#:~:text=In%20Human%20Computer%20Interaction%2C%20task>
4. *Functional Architecture - MRSD Project 2013-14 Team I - Zaphod*. (n.d.). [Sites.google.com](http://sites.google.com). Retrieved May 20, 2022, from <https://sites.google.com/site/mrsdproject201314teami/design-concepts/functional-architecture>
5. *Task Analysis | CS4760 & CS5760: Human-Computer Interactions & Usability*. (n.d.). Retrieved May 20, 2022, from <http://cs4760.csl.mtu.edu/2017/lectures/task-analysis/>
6. Experience, W. L. in R.-B. U. (n.d.). *Journey Mapping 101*. Nielsen Norman Group. <https://www.nngroup.com/articles/journey-mapping-101/#:~:text=Definition%3A%20A%20journey%20map%20is>