SECP1513-02 TECHNOLOGY AND INFORMATION SYSTEM

Design Thinking Project Report

Project Title: Study Space Utilization Among UTM Students

Group: 9

Prepare for: Dr Aryati Binti Bakri

Group members:

 Name: Nurul Izzati Liyana binti Hashim Matric No.: A25CS0336	 Name: Muhammad Fairuz bin Herman Matric No. : A25CS0267	 Name: Chia Yu Henn Matric No.: A25CS0052

TABLE OF CONTENT

INTRODUCTION

What is Design Thinking?

Design Thinking is a way for problem-solving by focusing around the users' needs. It aims on serving, emphasizing, understanding their needs and redefining the problems instead of making assumptions to develop practical solutions.

The design thinking process consists of five stages:

1. **Empathize:**

   The first stage focuses on understanding the users' experiences and their needs. It involves observing users, listening their opinions and identifying their needs. This stage helps us gain insight into real problems through the users' perspective.

2. **Define:**

   In the define stage, you will analyse the observations and identify the main problem from the information collected during the Empathy stage. A problem statement is defined to ensure that the team is focusing on the right issues.

3. **Ideate:**

   The ideate stage encourages the generation of ideas. A wide range of ideas are going to be produced before selecting the most suitable one.

4. **Prototype:**

   This stage involves creating a simple version of the selected idea. Prototypes allow ideas to be visualised and explored; it can be tested within the team to have a better idea of the problems that it faces.

5. **Test:**

   You will start evaluating the prototype through users' feedback. The feedback is used to refine the solutions and make it better, which helps identify areas for improvement.

DETAIL STEPS

Our group was given a task based on the theme Smart Campus Data Solution: Improving Student Experience through Data. Through the discussion and brainstorming sessions, we explored a lot of ideas related to this particular field. After having the discussion session, we found that most of the study areas are aften overcrowded during peak hours. Hence, we aim to develop a solution that helps the students to find available study spaces easier and improves the usage of the study spaces around UTM.

Empathize

Firstly, we created a Google Form and also conducted an interview session to gather the users' opinions and experiences they have faced when they were finding a study space. It includes some questions about the awareness of study spaces of the students, study preferences and traffic-related behaviour. This is to understand what the users really need and their preferences.

Define

From the Google form, we found that the challenges users usually face with when finding a study space are the struggles for getting a seat, especially during peak hours. Besides, they usually leave a study space early because of it becoming too crowded and makes the area become noisier, and sometimes they are feeling uncomfortable with the study space. Using these findings, a we came up a clearer problem statement to continue with the next stage of the project.

Ideate

After having a clearer problem statement, we came up with a brainstorming session where all members shared ideas based on the issues related to study space utilization. We decided to make a feature that displays a list of available study spaces across campus and shows the occupancy of the study spaces. We also added a booking feature.

Prototype

After selecting a solution, we created a low-fidelity prototype by sketching the interface to show how the solution would work for enhancing study space utilization. The prototype focused on matching the users' desire.

Test

We completed the design of our prototype and started testing it to ensure that it can work smoothly. We invited some students to try the prototype and give some opinions and feedback on its effectiveness. The feedback helped us to identify which parts worked well and parts that needs to be improved. We have refined our prototype to make sure it completely meets the users' needs.

DETAILS DESCRIPTION

Problem :

Students want to know whether the study area is full or not, but they need to check physically by driving or walking. If they check the study area and it appears to be full, it will not worth anything for the students and students will complain about coming so far to study area just to found out it was full.

Solution :

Our team decided to build a software, not a new application, but a new feature for UTM Smart Application. We will add a feature where studentss can check or book online. Why use UTM Smart ? Why not create new application ? Some students will not install the application since it will just increase their storage devices. So , all UTM students have UTM Smart. If they want to check in their seat, they need to scan the QR that is on the seat, after that the system will automatically show that the seat is occupied. They can also pick any study area they want, and also room that they want to use. We also allow booking method to avoid overlapping between students. By using booking method, students will not choose the same seat, since only 1 people can book the seat online. After student done using the seats , they can either scan the QR again or just manual update, which is sign out without scanning the QR. Students will also gain points after using the application. They can exchange the points with an amazing rewards.

DESIGN THINKING ASSESMENT POINT

The primary goal of this project is to enhance the utilization of study spaces at UTM by solving the issue that prevented the students from fully utilizing it.

This project started off by going through the Empathize page, whereas data and responses were collected from several students by getting their feedback from Google Form and interviewing them. Several related questions were asked to get a better idea of the issue that the students were facing.

From these data, Define phase can be conducted next, and it was discovered that most students have issues in finding available seats at their desired study spaces during peak hours. Navigating through several other study spaces before finding one that has available spaces are tedious and impractical in terms of energy, cost and time. These issues were then highlighted to move ahead into creating a perfect solution.

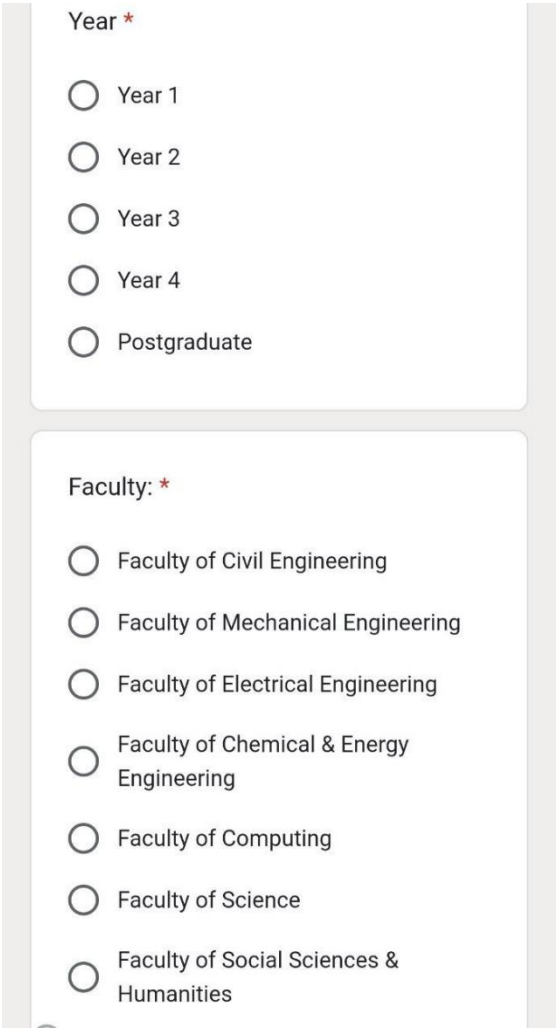
Once the problem statement is clear, several ideas and solutions were brainstormed and discussed together during the Ideate phase. After careful analyzation of each idea, solution that are most suitable were chosen, which is to develop a new feature specifically for this issue.

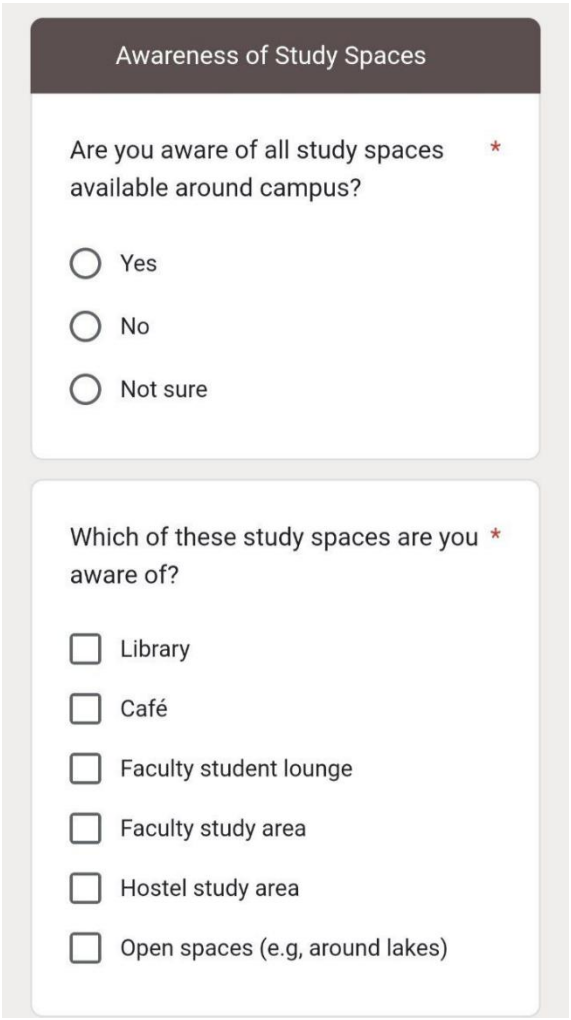
The prototype can then be created to give a clearer image of the purpose of this project. This prototype takes every study space available at UTM into consideration to ensure that everyone can be included. From each of these study space, students can check the availability of seats and plan their way up ahead properly before making their way there. They can also do a prior booking so that the available seat wouldn't be gone by the time they get there. It is found that this design meets the user-criteria and can solve the main issue from the problem statement.

DESIGN THINKING EVIDENCE

Empathy Phase

We have created a Google Form to conduct a survey to get more opinions and information from a huge range of people.





Which of these study spaces do you prefer to use? *

- [ ] Library
- [ ] Café
- [ ] Faculty sudent lounge
- [ ] Faculty study area
- [ ] Hostel study area
- [ ] Open spaces (e.g, around lakes)

Which study spaces do you think are underused (not many students)? *

- [ ] Library
- [ ] Café
- [ ] Faculty student lounge
- [ ] Faculty study area
- [ ] Hostel study area
- [ ] Open space (e.g, around lake)

Study Preference

When do you prefer to study? *

- ( ) Morning
- ( ) Afternoon
- ( ) Evening
- (•) Night

How often do you use campus study space? *

- ( ) Daily
- ( ) Sometimes
- ( ) Rarely
- ( ) Never

How long do you usually stay per study session? *

- Less than 1 hour
- 1-2 hours
- 2-4 hours
- More than 4 hours
- Never

Which study environment do you prefer? *

- Quiet zone
- Moderately quiet
- Collaborative/group discussion areas
- Outdoor/relaxed areas

Do you study mostly alone or in groups *

- Alone
- In small groups (2-3 people)
- Large group (>= 4 people

Where do you prefer to seat/be in? *

- Carrel room
- Individual desk
- Long shared table
- Sofa lounge seating
- Group rooms
- Standing desk

Back Next Clear form

Traffic-related behavior

When do you usually go to study spaces? *

- ◯ Weekday
- ◯ Weekend
- ◯ Public holiday
- ◯ Semester break

Do you avoid study spaces during peak hours ? *

- ◯ Yes
- ◯ No
- ◯ Sometimes

If a study space is around 80% full, will you still enter ? *

- ◯ Yes
- ◯ No
- ◯ Depends on urgency
- ◯ Depends on noise level

How far are you willing to walk for a less crowded study area? *

- ◯ 1-2 minutes
- ◯ 3-5 minutes
- ◯ More than 5 minutes
- ◯ I prefer to stay at the same area regardless

Would you prefer a space that is slightly further but less crowded ? *

- ○ Yes
- ○ No
- ○ Depends

What is your biggest frustration with crowded study spaces ? *

- ☐ Hard to find a seat
- ☐ Too noisy
- ☐ No available power sockets
- ☐ Uncomfortable seating
- ☐ Slow Wi-Fi
- ☐ Hard to focus
- ☐ People occupying seats not studying
- ☐ Other:

What usually causes you to leave a study space early ? *

- ☐ It becomes too crowded
- ☐ Too noisy
- ☐ No available power sockets
- ☐ Feeling uncomfortable
- ☐ Poor air-conditioning
- ☐ Need to move for class
- ☐ Other:

Back Next Clear form

Final Input

Would you use a system that shows real-time seat and study space availability? *

- ○ Yes
- ○ No

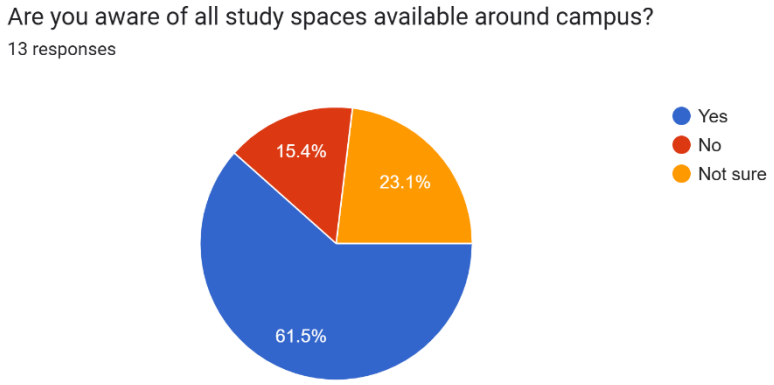
Any suggestions for the improvement on study space usage or traffic flow? Your answers are highly appreciated! *

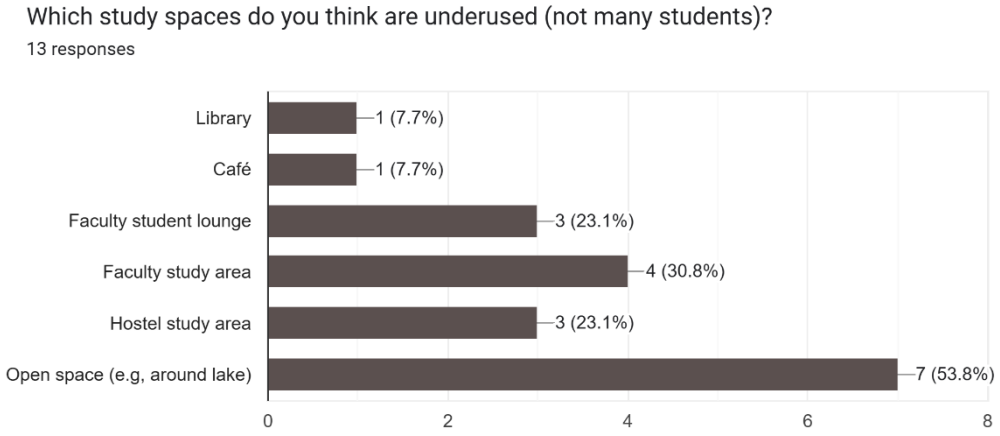
Your answer

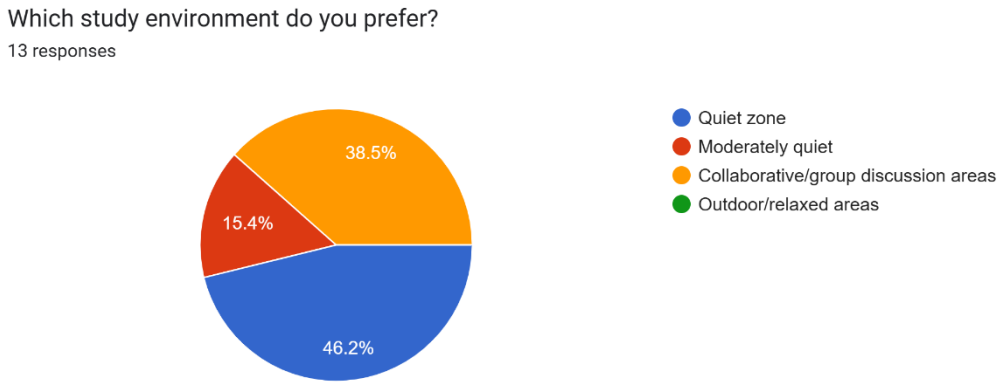
Back Submit Clear form

Define Phase

During this phase, we collected the data from the interview session and Google Form survey. This helped us to understand the problems they faced, and make us to have a better idea to design the solutions based on their needs.

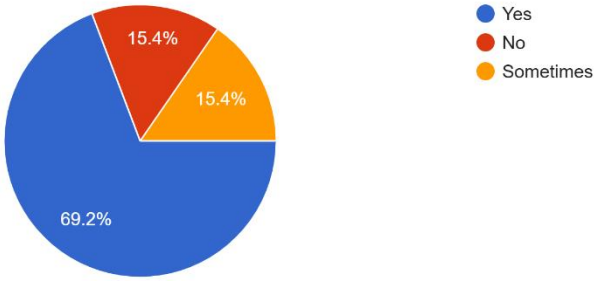






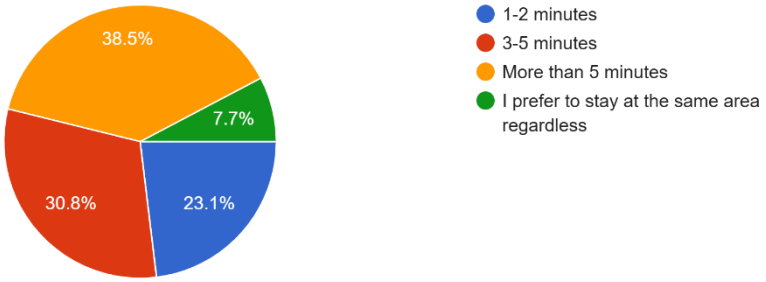
Do you avoid study spaces during peak hours ?

13 responses



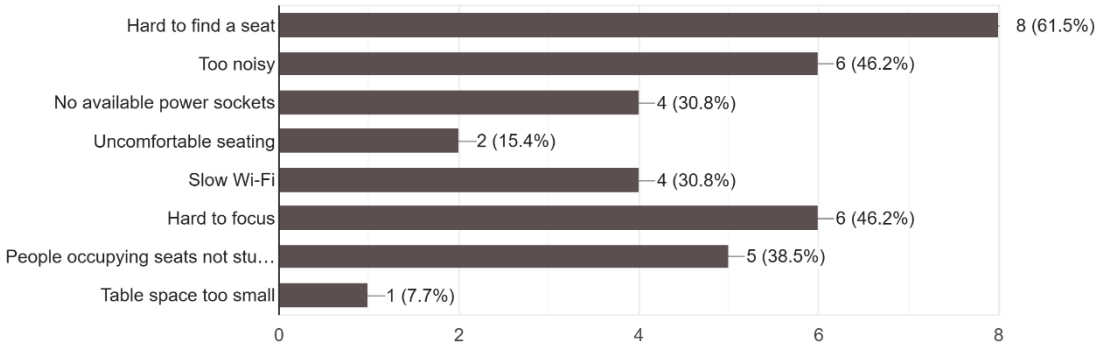
How far are you willing to walk for a less crowded study area?

13 responses



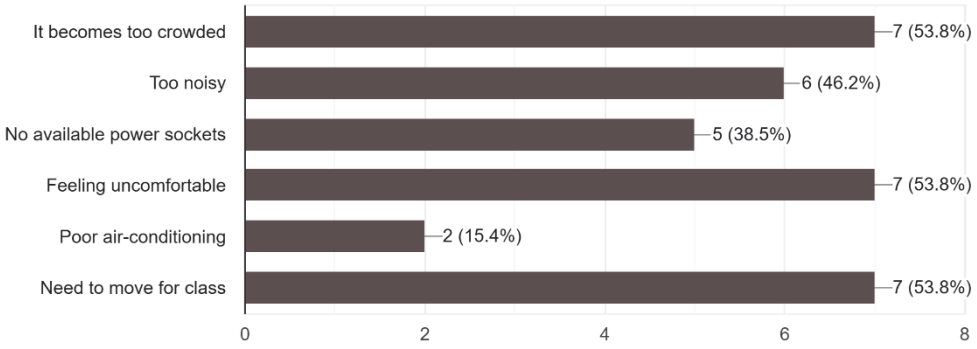
What is your biggest frustration with crowded study spaces ?

13 responses



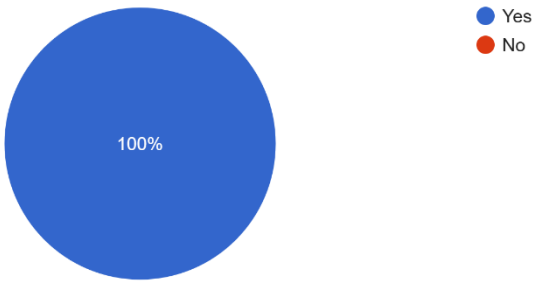
What usually causes you to leave a study space early ?

13 responses



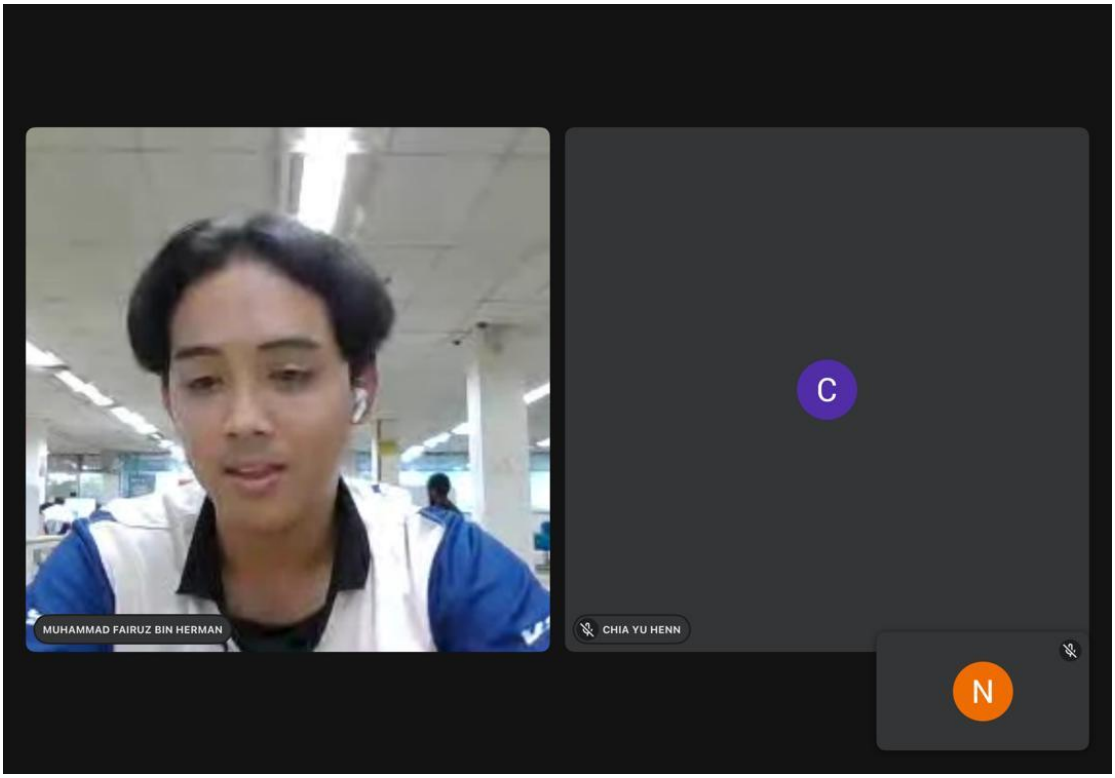
Would you use a system that shows real-time seat and study space availability?

13 responses



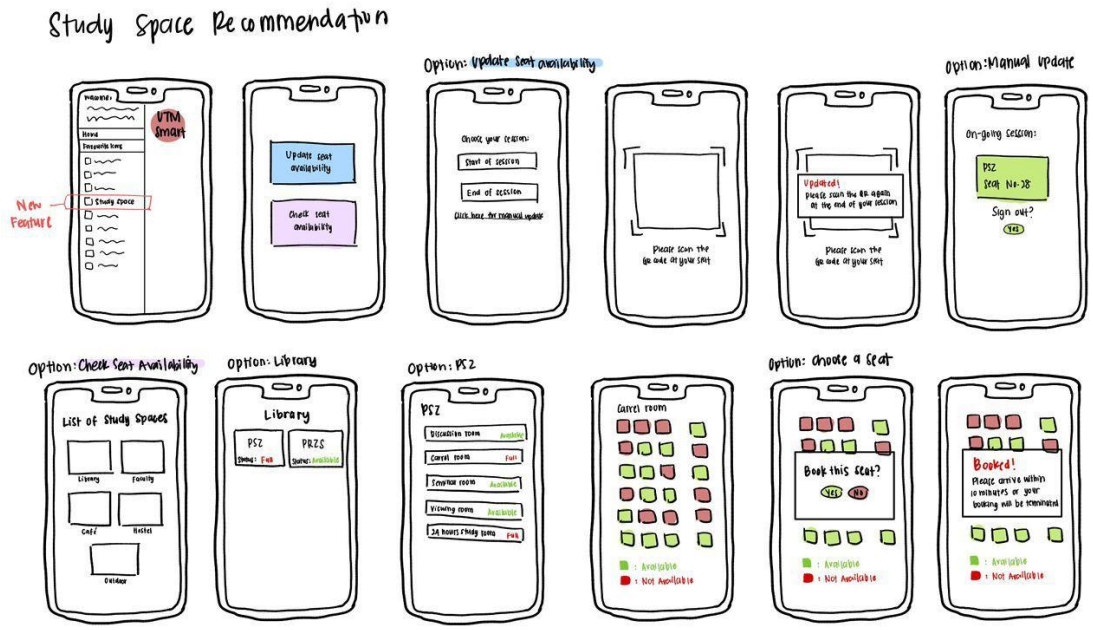
Ideate Phase

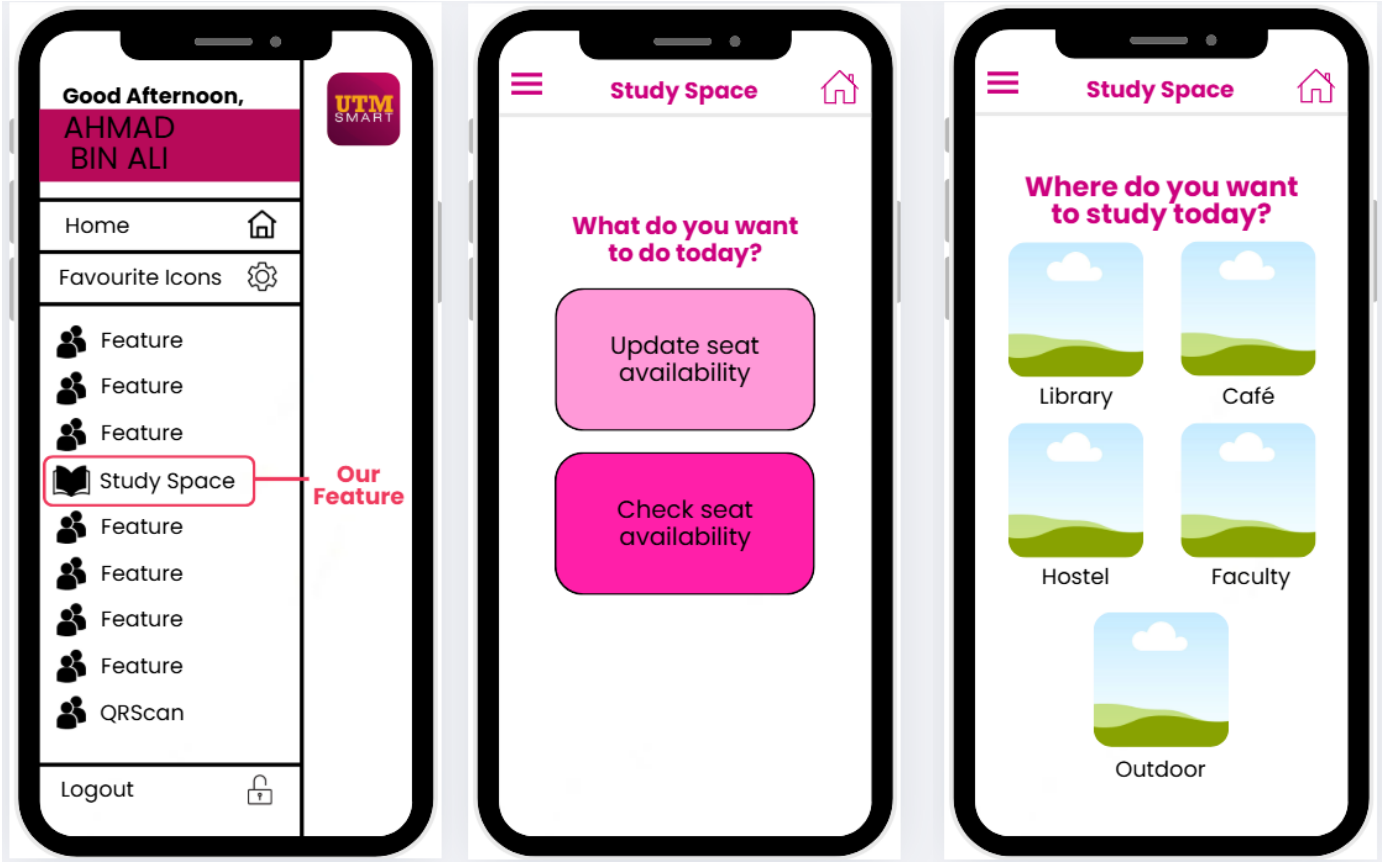
During the ideate phase, we discussed to decided the most effective solution. After the brainstorming session, we decided to add a feature which can help students to find a study space based on their preferences easier.

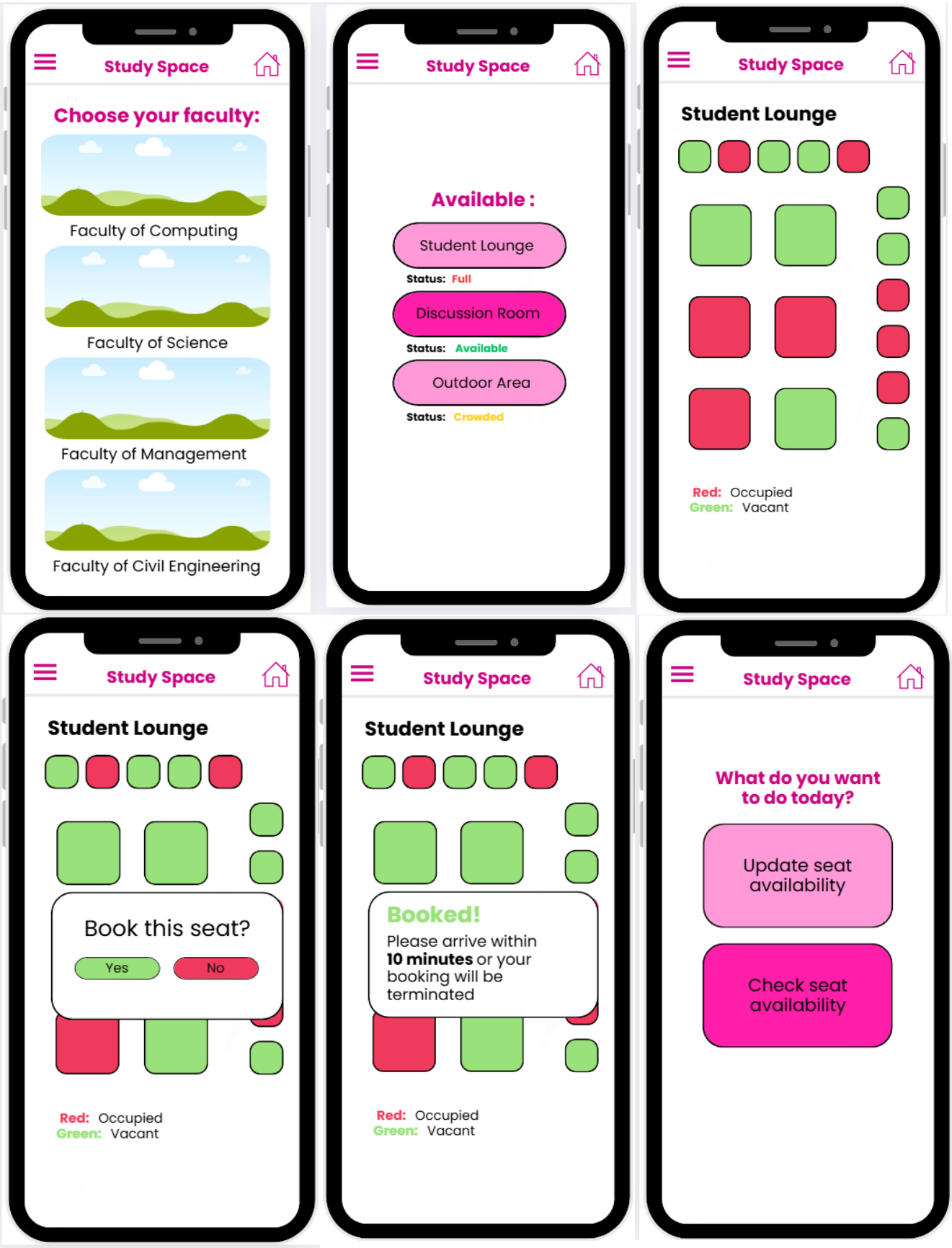


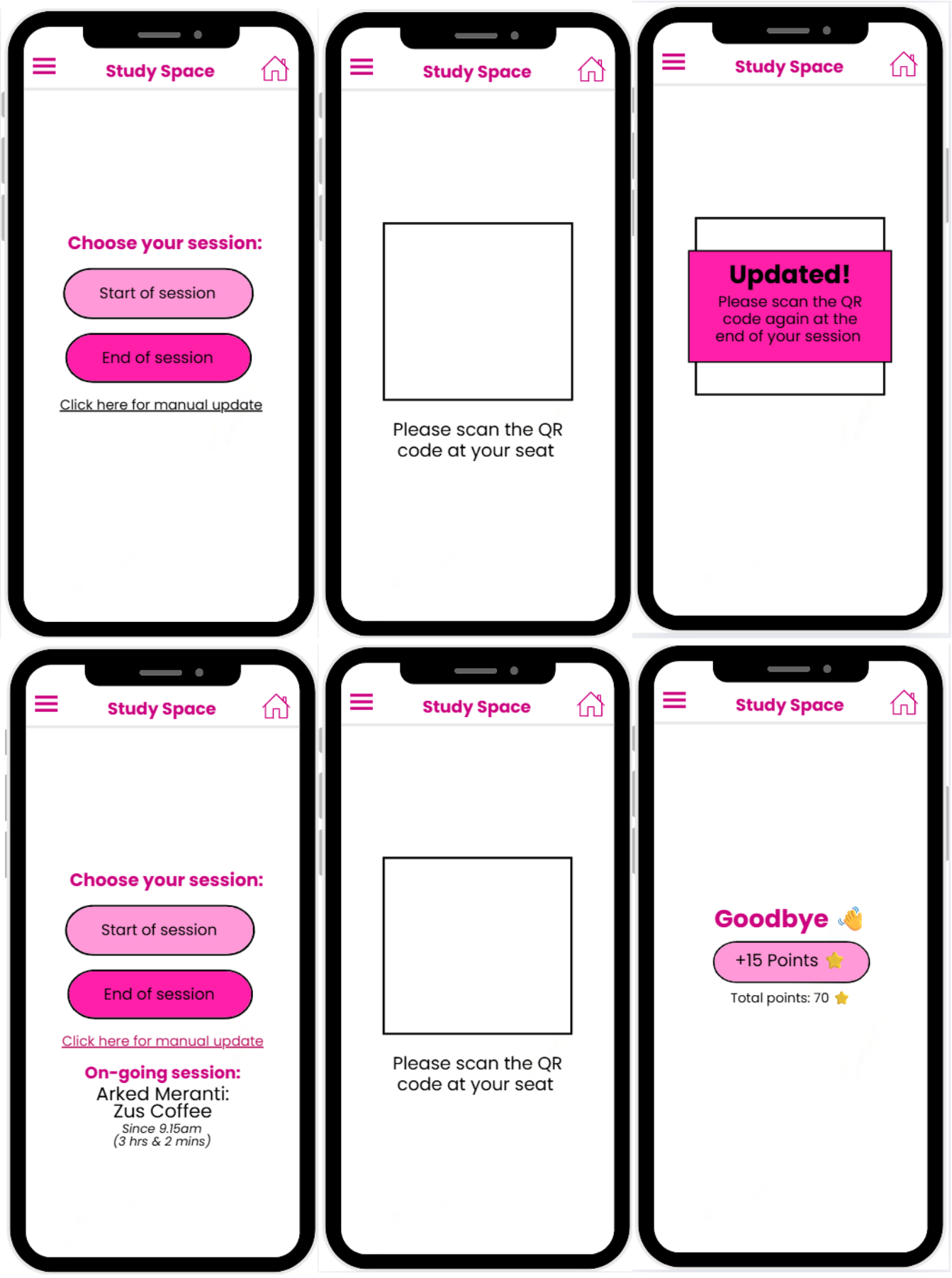
Prototype Phase

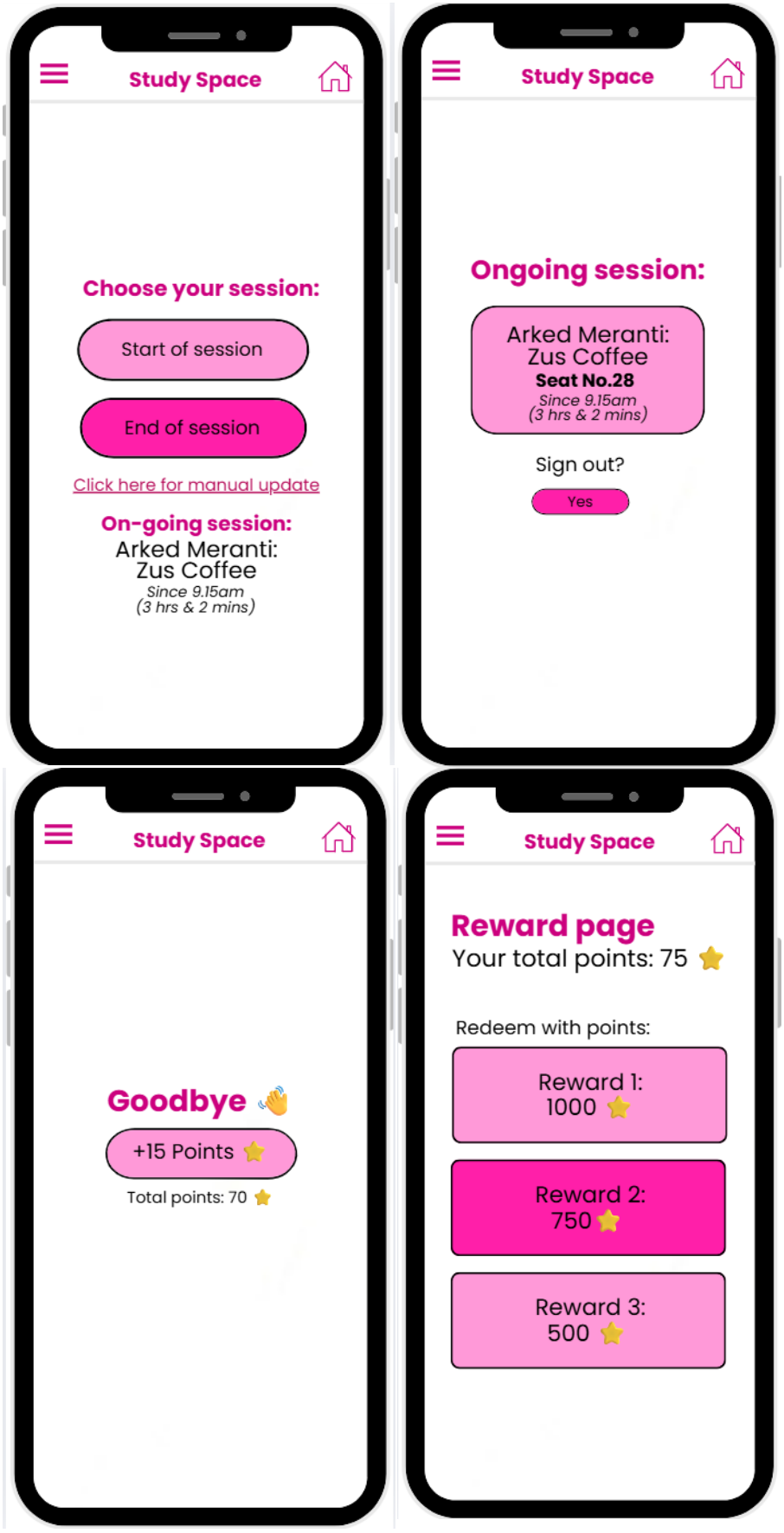
During this phase, we created a prototype based on the solution we discussed during the ideate phase.





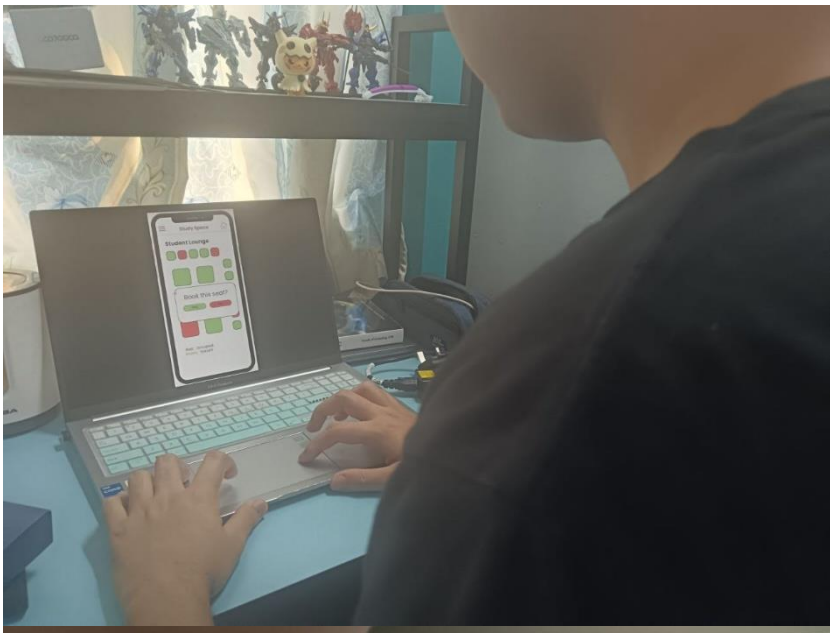

Study Space
Choose your faculty:
Faculty of Computing
Faculty of Science
Faculty of Management
Faculty of Civil Engineering
Study Space
Available :
Student Lounge
Status: Full
Discussion Room
Status: Available
Outdoor Area
Status: Crowded
Study Space
Student Lounge
Red: Occupied
Green: Vacant
Study Space
Student Lounge
Book this seat?
Yes
No
Red: Occupied
Green: Vacant
Study Space
Student Lounge
Booked!
Please arrive within 10 minutes or your booking will be terminated
Red: Occupied
Green: Vacant
Study Space
What do you want to do today?
Update seat availability
Check seat availability

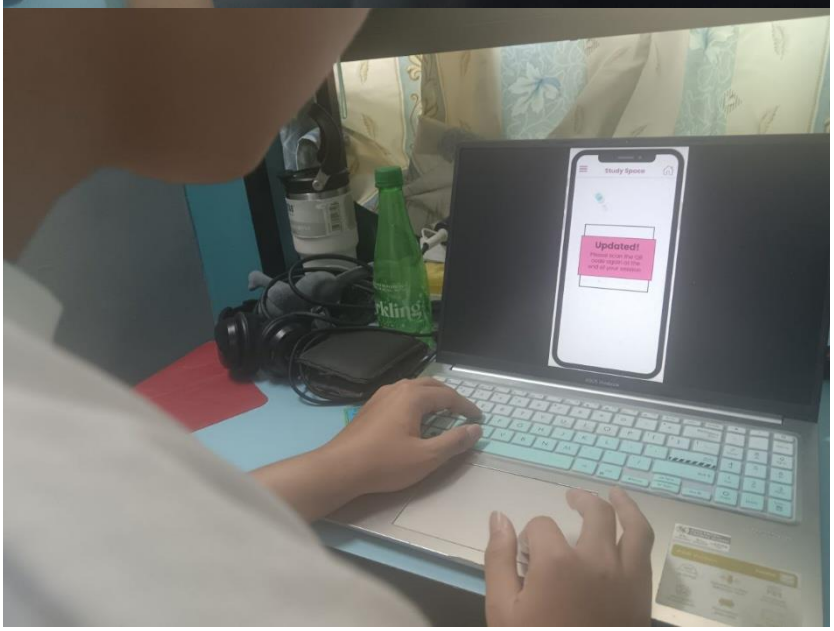

Study Space
Choose your session:
Start of session
End of session
Click here for manual update
Study Space
Please scan the QR code at your seat
Study Space
Updated!
Please scan the QR code again at the end of your session
Study Space
Choose your session:
Start of session
End of session
Click here for manual update
On-going session:
Arked Meranti: Zus Coffee
Since 9.15am
(3 hrs & 2 mins)
Study Space
Please scan the QR code at your seat
Study Space
Goodbye 👋
+15 Points ⭐
Total points: 70 ⭐


Study Space
Choose your session:
Start of session
End of session
Click here for manual update
On-going session:
Arked Meranti:
Zus Coffee
Since 9.15am
(3 hrs & 2 mins)
Study Space
Ongoing session:
Arked Meranti:
Zus Coffee
Seat No.28
Since 9.15am
(3 hrs & 2 mins)
Sign out?
Yes
Study Space
Goodbye
+15 Points
Total points: 70
Study Space
Reward page
Your total points: 75
Redeem with points:
Reward 1:
1000
Reward 2:
750
Reward 3:
500

Prototype Testing Phase

During the testing phase, we invited some users to try the prototype and share their opinions. They gave positive feedback for the prototype and it showed that the prototype has met their requirements completely.





REFLECTIONS

NURUL IZZATI LIYANA BINTI HASHIM (A25CS0336)

My goal as I stepped in into the digital industry is to become a person that can resonates well with the society and contributes to them by making their life easier. This design thinking project has opened up the ways on achieving my goals, as I can work with real-world problems and went through several different phases to fully understand and be able to design a solution for the issue. It challenged my critical-thinking, problem solving and teamworking skills that are surely essential to enter the career world. However, there are still a lot of room for growth and for the future few years, I plan to strengthen my soft skills by actively engaging in classroom and out-of-classroom activity. Not only that, I also want to deepen and expand my knowledge by mastering technical skills such as Phyton, SQL and C++ and take professional certificates to make myself stand out in the industry.

CHIA YU HENN (A25CS0052)

My goal with regard to my course is to improve my problem-solving skill that can prepare me for my future career. This design thinking project has helped me in understanding how important a user-centred thinking is in problem solving. A good solution is not only by having technical knowledges, but also about understanding users' needs. It supports my goal by improving my skills to approach problems. To improve my potential in the industry, I will keep improving my problem-solving and communication skills. I will also keep hard-working in doing the works given from the lectures to better prepare myself for my future.

MUHAMMAD FAIRUZ BIN HERMAN (A25CS0267)

My goal is to become a person that master every skills needed for industry and a person that can work together as a team. I aspire to become a great data engineer in the future. This design thinking does impact on my goal since this project require great

teamwork and also succeeded in doing a project which makes me a step closer to becoming a great data engineer. My plan to improve my potential in industry is improving my skills such as technical skills, soft skills, and other skills that I need for industry.

CONCLUSION

This design thinking project helped us to identify and solve the problems that related to study space utilization across UTM. By following its process, a user-centred solution was developed to enhance the students' experiences in finding suitable seats for themselves.

By doing this project, we have learnt that how empathy, clear problem statement and user feedback is important in developing a solution. Last, we have improved our problem-solving, teamwork and critical thinking skills from this project.

TASK DISTRIBUTION

No	Member	Task
1.	**Muhammad Fairuz bin Herman (A25CS0267)**	• Report writing (Details Description) • Creating video • Creating Google Form • Preparing slide • Conducting interview session • Data collection
2.	**Nurul Izzati Liyana binti Hashim (A25CS0336)**	• Report writing (Assessment Point) • Creating Google Form • Prototype Design • Preparing slide • Conducting interview session • Data collection
3.	**Chia Yu Henn (A25CS0052)**	• Report writing (Introduction) • Report writing (Detail Step) • Report writing (Design Thinking Evidence) • Report writing (Conclusion) • Creating Google Form • Data collection

YouTube video link: https://youtu.be/Dbd0u3IIMYM