Semester I 2025/2026
Technology and Information Systems (SECP 1513)

Section : 04

Task: Design Thinking Report

Group: 6

<u>UTM SMART PARKING AVAILABILITY AND RESERVATION PLATFORM</u>
Project Video ([Link](#))

Group members:

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1.0 Introduction

Universiti Teknologi Malaysia (UTM) is a large and dynamic campus that accommodates thousands of students, academic staff, non-academic staff, and visitors every day. With the increasing number of vehicles on campus, parking has become one of the most common challenges faced by campus users. Many users experience difficulty in locating available parking spaces, especially during peak hours, which often results in wasted time, traffic congestion, frustration, and delays in attending classes, meetings, or appointments.

In line with the vision of a future digital campus, our group proposes the UTM Smart Parking Availability and Reservation Platform. This system is designed as a non-functional, interface-based solution that allows users to view real-time parking availability and reserve parking spaces in advance. The platform focuses on improving campus mobility, user experience, and decision-making through a user-friendly interface. By applying the design thinking approach, this project aims to develop a solution that is empathetic, practical, and aligned with the needs of different campus users.

2.0 Design Thinking Process Overview

Design thinking is a user-centered problem-solving approach that emphasizes understanding user needs, generating creative ideas, and developing effective solutions through continuous improvement. In this project, our group applied the five main phases of design thinking, namely Empathy, Define, Ideate, Prototype, and Test.

Each phase played an important role in shaping the proposed solution. The empathy phase helped us understand the real challenges faced by campus users regarding parking. The define phase allowed us to clearly identify and reframe the core problems. During the ideate phase, multiple solution ideas were generated and evaluated. The prototype phase focused on designing the interface flow of the system, while the test phase involved gathering feedback to improve usability. This structured approach ensured that the final proposal was both user-focused and relevant to the future digital campus theme.

3.0 Problem, Solution, and Teamwork

3.1 Problem Description

Parking availability is a persistent issue at Universiti Teknologi Malaysia, particularly during peak hours such as morning classes, examination periods, and special campus events. Students often spend a significant amount of time driving around campus searching for vacant parking spaces, which can lead to late arrivals to lectures and increased stress levels. Academic and non-academic staff also face similar challenges, as limited parking availability affects their daily work routines and productivity.

3.2 Proposed Solution

To address the identified problems, our group proposes the UTM Smart Parking Availability and Reservation Platform, a digital system designed to improve parking efficiency and user experience on campus. The platform allows users to view real-time parking availability through a visual map interface, enabling them to identify vacant parking areas before arriving at their destination.

3.3 Teamwork and Collaboration

Teamwork played a crucial role in the successful development of this project. Our group worked collaboratively throughout all phases of the design thinking process by conducting group discussions, brainstorming sessions, and feedback sharing. Each team member was assigned specific tasks based on their strengths to ensure efficiency and balanced contributions.

4.0 Empathy Phase

The empathy phase focuses on understanding the real experiences, challenges, and emotions of campus users regarding parking availability at Universiti Teknologi Malaysia. To gain meaningful insights, our group conducted informal interviews with students on campus and observed their daily parking behavior. This process allowed us to identify common frustrations, expectations, and unmet needs related to parking facilities.

The interviews revealed that many students experience stress and time pressure due to the difficulty of finding available parking spaces, especially during peak hours. Participants expressed frustration over driving around campus multiple times without clear information about available parking areas. These findings helped the team develop a deeper understanding of user needs and ensured that the proposed solution was grounded in real user experiences rather than assumptions.

4.1 Target Users

The UTM Smart Parking Availability and Reservation Platform is designed to serve a diverse group of campus users, including students, academic staff, non-academic staff, and visitors. Each user group has different parking needs and challenges, which were considered during the empathy phase to ensure inclusivity and usability.

4.2 Sample Interview Questions and Responses

Questions	Summary of User Responses
How does parking difficulty affect your daily activities?	Causes stress, lateness to classes, and frustration.
How much time do you usually spend searching for parking?	Users mentioned spending between 10 to 30 minutes.
Would you reserve a parking space if given the option?	Yes, especially during busy periods or important schedules.

5.0 DESIGN THINKING EVIDENCE

5.1 THE SAMPLE WORK

Figure 5.1 Interview in the Empathy stage

Figure 5.2 Interview in the Empathy stage

Figure 5.3 Discussion for Define and Ideate stages
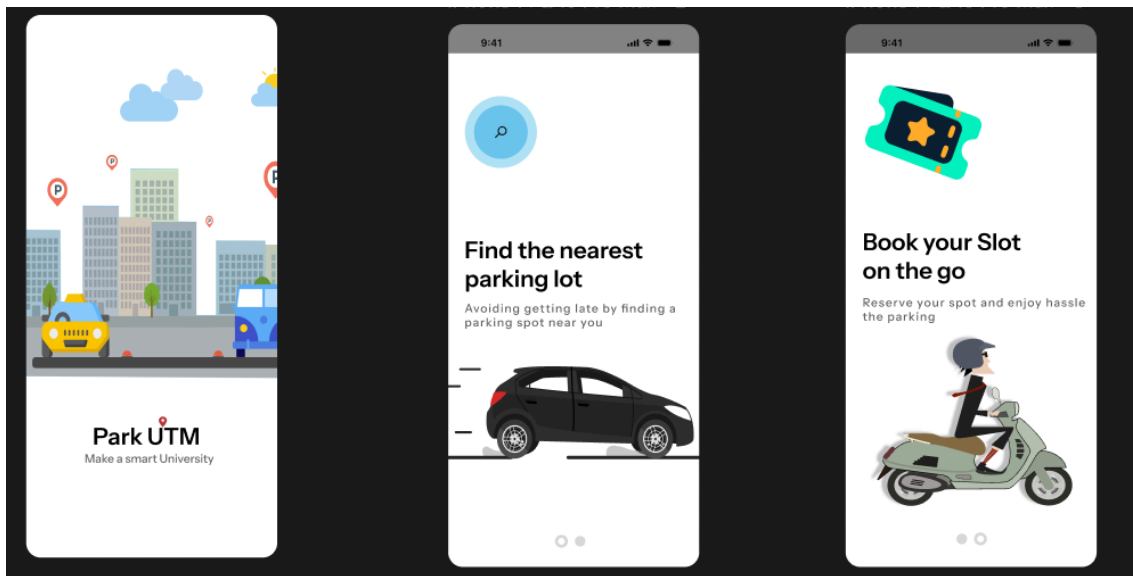
5.2 User interface
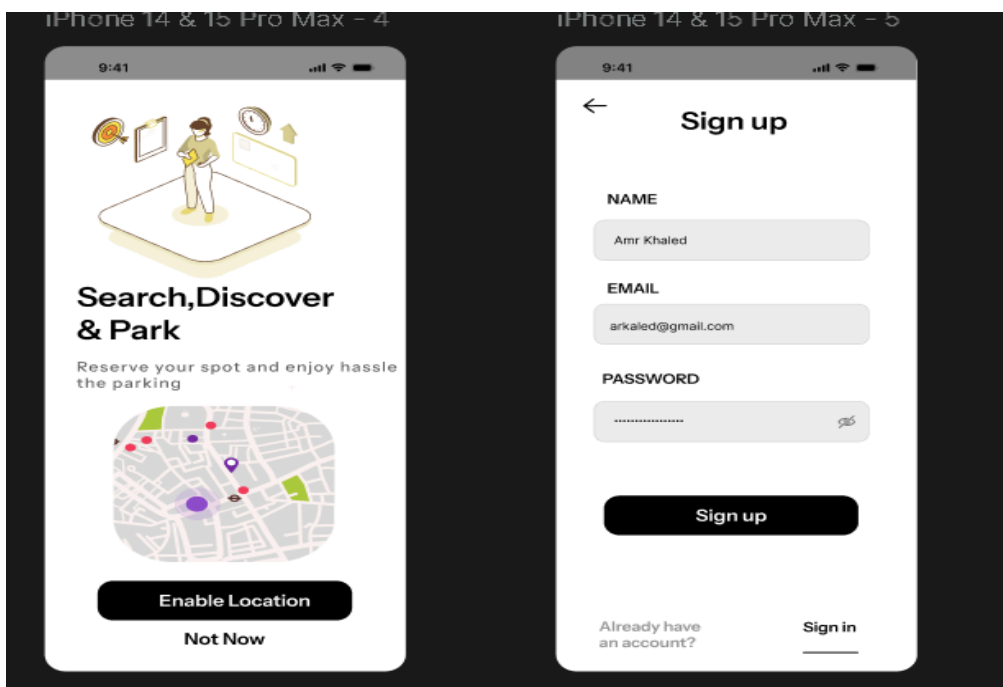

Figure 5.2.1 user interface app

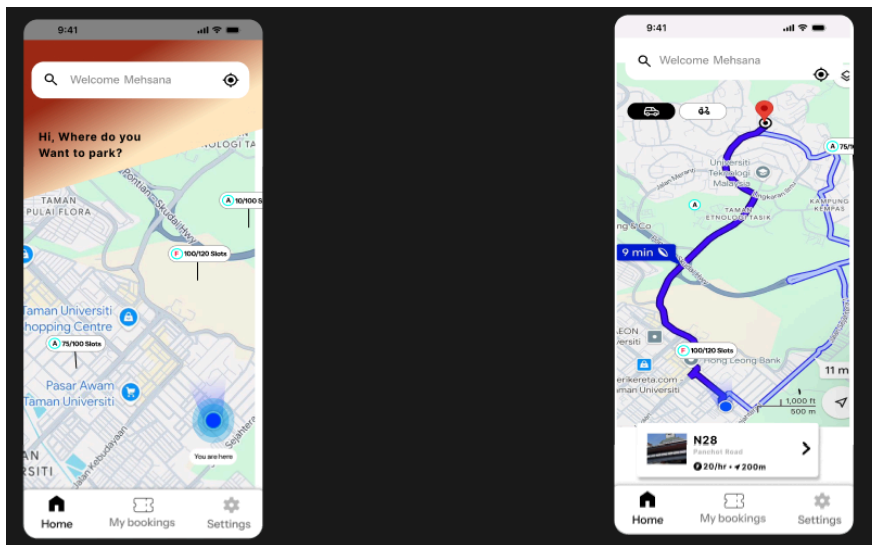Figure 5.2.2 user interface registration and sign up
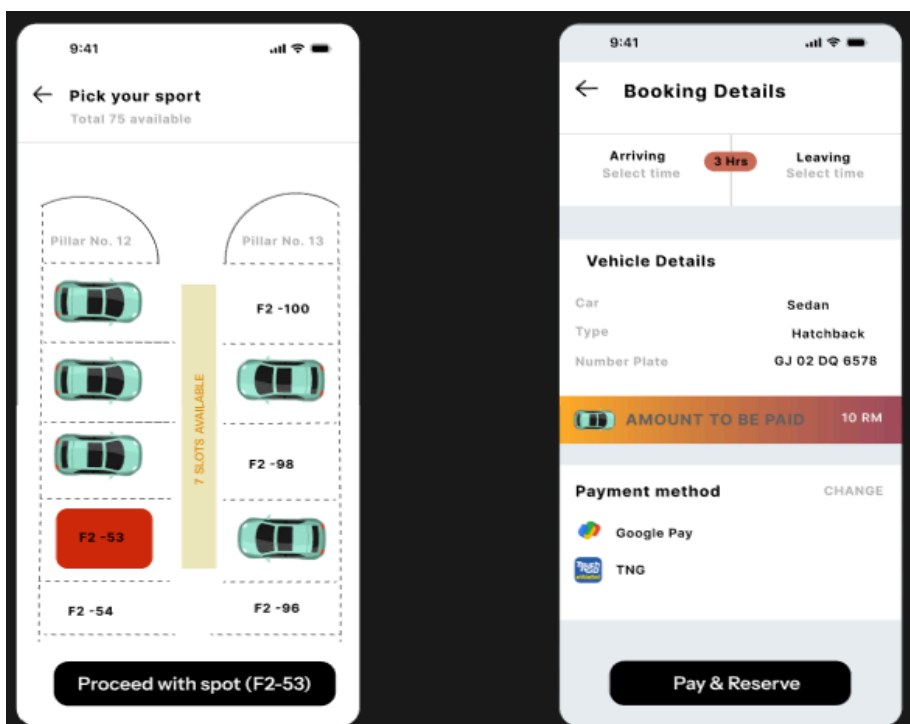
Figure 5.2.3 user interface parking location

Figure 5.2.4 user interface parking booking

5.3 Test

- Tested the prototype with students and staff
- Collected feedback on usability and clarity
- Made small improvements based on feedback

6.0 CONCLUSION

The design thinking approach was used in this project to address the parking problem at Universiti Teknologi Malaysia by developing a user-centric, interface-based Smart Parking Availability and Reservation Platform. The empathy, define, ideate, prototype, and test stages helped identify real user requirements and reflected them in a practical design that aims to save time on parking, reduce user stress, and enhance campus mobility. Although it focuses mainly on interface design, the system demonstrates how digital solutions can improve user experience and decision-making, highlighting the importance of user-centred design and collaboration in creating effective information systems.

7.0 REFLECTIONS

a. What is your goal/dream with regard to your course/program?

 b. How does this design thinking impact on your goal/dream with regard to your program?

c. What is the action/improvement/plan necessary for you to improve your potential in the industry?

Group member answers:

ESED NADI EYYUBIOGLU:

a. In this course, I aim to become a competent, industry-ready graduate capable of designing effective information systems as problem-solving tools for real-world issues. I want to deepen my technical knowledge, enhance problem-solving skills, and develop collaboration abilities to create solutions that prioritize user needs and practical implementation in a digital environment.

b. This design thinking project made me realize that it is essential to view problems from the user's perspective rather than focusing solely on technical solutions. By using empathy, defining, ideating, prototyping, and testing, I learned how to identify actual user issues and transform them into useful system designs, which directly supports my goal of becoming a more efficient and user-focused system designer.

c. To improve my prospects in the industry, I will continue practicing design thinking, strengthen my communication and teamwork skills, and gain additional experience with system design and prototyping tools. I also plan to incorporate the concept of user-centered design into my future academic and real-world projects to better prepare myself for the challenges of the professional technology field.

Mohammed Mudather:

a. My goal in taking the Bachelor of Computer Science (Network and Security) program is to become a skilled IT professional in the field of networking and cybersecurity. I aim to develop strong technical and problem-solving skills so that I can work in securing systems and networks in the future.

b. This design thinking project helped me understand that designing a system is not only about technology, but also about understanding user needs. This experience is important for my future career because secure systems must also be practical and user-friendly..

c.To improve my potential in the industry, I plan to strengthen my technical skills in networking and security, while also improving my communication and teamwork skills. I also aim to participate in workshops, projects, and internships to gain real industry experience.

AMR KHALED:

a.My goal in this program is to become a skilled graduate who can design useful and practical systems that solve real-world problems. I want to improve my ability to think logically, work in a team, and design systems that focus on user needs

b.This design thinking project helped me understand how to approach problems from the user's perspective instead of jumping directly to solutions. It improved my problem solving skills and showed me how to design systems based on real user needs, which supports my goal of becoming a better system designer.

c.To improve my potential in the industry, I plan to continue practicing design thinking, improve my communication skills, and learn more design and prototyping tools. I also aim to gain more experience working in trams and applying user centered design to future projects

Abdulrahman Sheikh:

a. My goal is to graduate with strong practical IT skills, not just theory, and become a competent professional in the tech industry, especially in areas like networking, systems, and problem-solving. I want to be industry-ready, confident with real tools, and capable of contributing value from day one—not just holding a certificate.

b. Design thinking helps me think like the industry, not like an exam paper. It pushes me to focus on real user problems, test ideas, accept failure, and improve continuously. This mindset improves how I approach projects, labs, and assignments—turning them into real-world solutions, not academic exercises. It aligns my learning with how tech problems are actually solved in the workplace.

c. My plan is to:

Strengthen hands-on skills (labs, Packet Tracer, databases, real configs)

Practice problem-solving, not memorization

Work on real projects and mini case studies

Improve communication and teamwork skills

Stay updated with industry tools and trends

Build consistency and discipline—daily progress, no excuses

7.0 Task Distribution

Name	Task
Mohammed Mudather	The main task in this project was report writing and documentation. I organized the content, explained the design thinking process, and ensured that the report followed the required format and rubric.
Amr Khaled	Responsible for the Empathy and Define stages of the project. He helped prepare user interview questions, collected user feedback, summarized the findings, and contributed to defining the main problem statement based on user needs.
Esed Nadi Eyyubioglu	Responsible for the Ideate stage and brainstorming process, helped with the report writing, and the interface design. He participated in generating solution ideas, comparing alternatives, and helping the team decide on the Smart Parking System as the final solution.
Abdulrahman Sheikh	Responsible for the Prototype and Testing stages. He designed the interface-only prototype, prepared the parking system screens, and participated in testing the prototype with users and improving the interface based on feedback.