DESIGN THINKING PROJECT REPORT

Building Maintenance Management System (BMMS)

Subject: Technology and Information Systems (SECP 1513)

Section: 06

Group Members

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1.0 Introduction

In Universiti Teknologi Malaysia (UTM), many students live in hostels (Kolej). However, maintaining the facilities is a big challenge. Currently, the process of reporting a broken fan or leaking pipe is done manually using paper forms. This leads to lost reports and slow repair times.

Our group decided to use **Design Thinking** to solve this problem. Design thinking is a process used to develop solutions through collaboration and innovation. Our goal is to create a "Building Maintenance Management System (BMMS)" to make the reporting process easier and faster for students and management. This report documents our journey through the five phases: Empathy, Define, Ideate, Prototype, and Test.

2.0 Design Thinking Process & Evidence

2.1 Phase 1: Empathy

To understand the problem deeply, we adopted the **"Observation and Immersion"** method. As residents of the UTM hostels ourselves, we have experienced the maintenance issues firsthand. We also observed the daily workflow of the maintenance office to identify bottlenecks.

Evidence: Observation Log (Current Pain Points) Instead of relying on assumptions, we documented the current manual process and identified three critical failures:

The "Paper Chase": We observed that students must physically walk to the office to get a form. If the office is closed (e.g., lunch hour or weekend), no report can be made.

Lack of Updates: We noticed that once a form is submitted into the "drop box," there is no way to know if it has been read. Students often report the same issue multiple times, causing duplication.

Data Loss: We observed stacks of paper forms on the maintenance desk, which can easily be misplaced or damaged by water/coffee spills.

Evidence: User Persona (Constructed from Observation) Based on our observations of the maintenance staff's workload, we created a composite persona:

Name: Ali (Maintenance Staff)

Role: Technician at Kolej

Pain Point: He spends 30% of his time just organizing paper forms and deciphering bad handwriting instead of fixing things. He needs a digital list to prioritize urgent tasks.

2.2 Phase 2: Define

Based on our **observations and personal experiences**, we defined the core problem , we defined the core problem. We used the information to make a problem statement.

Evidence: List of Define

Problem Statement: The residents of UTM hostels need a faster way to report damages because the manual paper system causes long delays and frustration.

User Need: Students need to track the status of their report (e.g., "Pending" or "Completed").

Insight: The current system lacks transparency. Users feel ignored when they don't get updates.

2.3 Phase 3: Ideate

In this phase, we brainstormed many ideas to solve the problem. We gathered as a team and discussed different solutions.

Evidence: Brainstorm Process

Idea 1: Create a WhatsApp group for complaints. (Rejected: Too messy).

Idea 2: Use a Google Form. (Rejected: Hard to track status).

Idea 3: Develop a Mobile App (BMMS). (Selected: Best for tracking and user experience).

2.4 Phase 4: Prototype

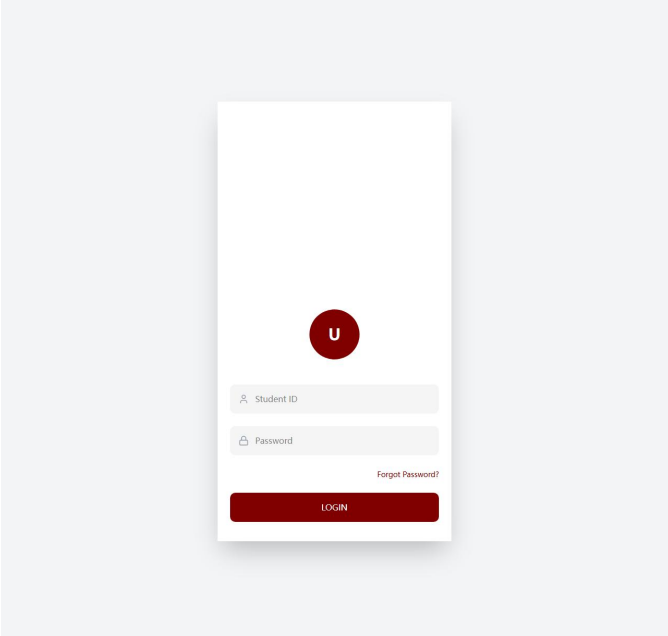
We decided to build a prototype of the Mobile App. We used simple sketches first and then designed the interface using software.

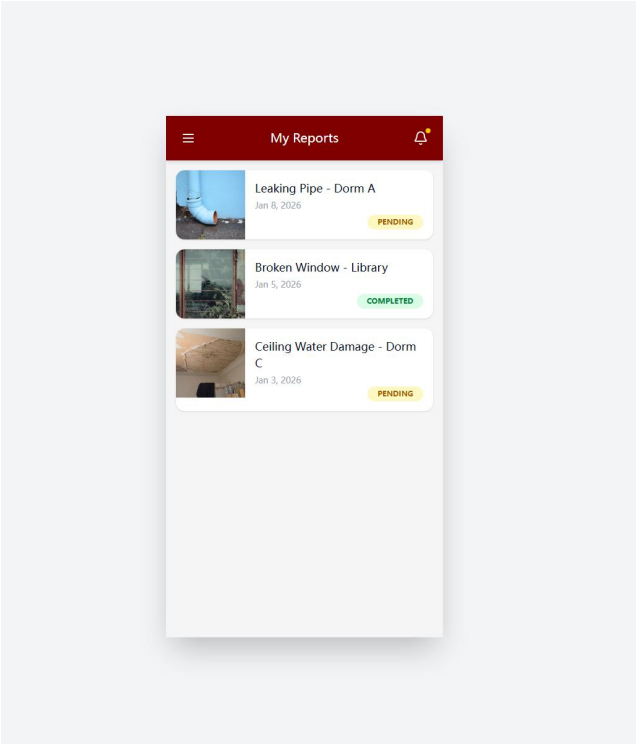
Evidence: Prototype Development Our prototype has three main features:

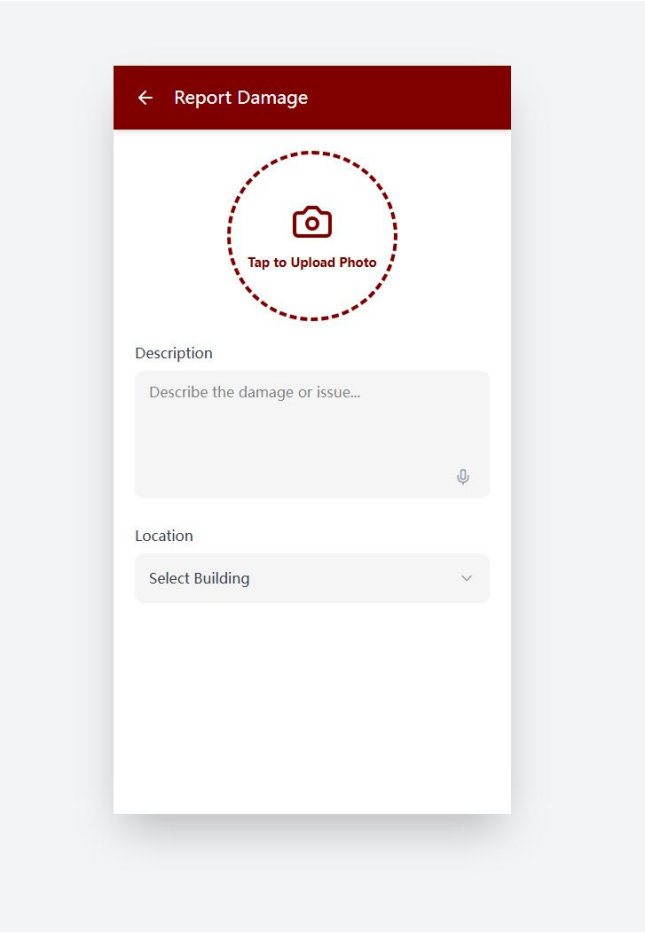
Login Page: Secure access for students and staff.

Report Page: Students can take a photo of the damage and upload it.

Status Page: Shows if the repair is "In Progress" or "Done".







2.5 Phase 5: Test

We showed our prototype to 2 students to get their feedback.

Evidence: Testing Result

Feedback 1: The interface is clean and easy to use.

Feedback 2: The user suggested adding a "Notification" feature so they get an email when the job is done.

Improvement: Based on this feedback, we plan to add email notifications in the next version.

3.0 Detailed Descriptions

The Problem: The main problem is the inefficiency of manual work. Paper forms are physical, so they can be lost, damaged, or piled up. This makes the maintenance team slow to react. For students, this is frustrating because they live with broken facilities for weeks.

The Solution: Our solution, BMMS, addresses this by digitizing the workflow.

Speed: Reports are sent instantly to the management.

Tracking: Nothing gets lost. Every report is recorded in the database.

Communication: It bridges the gap between students and workers.

Team Working: Our team consisted of 4 members. At first, we had different ideas about the features. Some wanted a web system, and some wanted an app. We used the **Ideate** phase to discuss and vote. Finally, we agreed on the app. We divided tasks based on our skills; for example, one member was good at design, so he did the prototype.

4.0 Design Thinking Assessment Points

We assessed our project at two key moments:

During the Transition: Between the *Define* and *Ideate* phases, we checked if our problem statement really matched the **real-world situation we observed**. We wanted to make sure we were solving the right problem.

End of Project: After the *Test* phase, we evaluated if our prototype met the requirements. We realized that while the app works, it needs more features like multi-language support to be perfect.

5.0 Individual Reflections

XU HAOJIE

Goal/Dream: My goal is to become a successful system analyst in the future.

Impact: This design thinking project taught me that technical skills are not enough. Understanding the user (Empathy) is very important to build a good system.

Action Plan: I will improve my communication skills and learn more about User Experience (UX) design to help my career.

LI HONGYU

Goal/Dream: I dream of being a project manager in a tech company.

Impact: The project helped me understand how to manage team conflicts and how to move from an idea to a product using structured steps.

Action Plan: I plan to participate in more hackathons to practice my teamwork and leadership skills.

LI WENBO

Goal/Dream: I want to be a software developer.

Impact: Design thinking showed me that coding is just one part. The "Test" phase is crucial to find bugs and improve the software.

Action Plan: I will study more programming languages like C++ and Java to build better prototypes.

Mohamed Brahim Khairy

Goal/Dream: My ambition is to work in data science.

Impact: The "Define" phase helped me learn how to analyze **complex problems based on user behavior and real-world observations** to find patterns and insights. to find patterns and insights.

Action Plan: I need to improve my analytical thinking and learn how to present data clearly using tables and charts.

6.0 Task Distribution

Name	Role	Task Description
XU HAOJEI	Leader	coordinated the team, wrote Introduction and Conclusion.
LI HONGYU	Designer	Created the User Persona and the Prototype (UI Design).
LI WENBO	Researcher	Conducted interviews (Empathy) and wrote the Define section.
Mohamed Brahim Khairy	Editor	Compiled the report, checked formatting, and wrote the Ideate section.