



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

## Faculty of Computing

### SECP 1513-06 (TECHNOLOGY AND INFORMATION SYSTEM)

#### Design Thinking Project:

#### Smart Files Assistant

#### Chapter 3 - Software (System Software and Application Software)

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## **Introduction**

Design thinking is an innovative and iterative approach to problem solving that places a strong emphasis on cooperation, empathy and experimentation. Design thinking, in contrast to conventional problem-solving techniques, places a high value on comprehending users.

This report explores the application of design thinking principles to address the pervasive issue of lost files and disorganization on computers and even on several devices like smartphones and tablets. By incorporating empathy, collaboration, and iterative problem-solving, design thinking offers a human centric approach to develop a solution for a friendly user experience and simplifies one's file management.

## **Detailed Steps**

### Empathize

This part is about understanding the user by engaging with them, observing their behaviors, and conducting a survey or interview to obtain their opinions on computer file management. In the empathize stage, we concentrate on comprehending the everyday obstacles users encounter when managing their own files. Typical problems might include the inability to locate particular files, worrying about data loss during file cleansing and optimization, and the need for a more intuitive and organizational structure.

- Do you have a problem in managing your files?
- What kind of challenges do you face when searching for specific files on your devices?
- Is it hard to find unwanted files that consume your device's memory?

### Define

Integrate the knowledge acquired during the empathize phase to identify the main issues and difficulties that users are facing. The problem statement should be stated clearly to direct the design processes. With several insights gathered during the empathize stage, the next step is to define the main problems users encounter in the computer file management. This includes synthesizing data to identify recurring patterns, such as duplicates of files or folders with less to no purpose for a computer user.

Many users face difficulties in finding and managing their documents, photos, and other files, especially to those who have less experience with organizing digital files. In the context of personal file management, people might find it difficult to put their collection of files into a methodical and understandable organizational framework. When a file organization plan is not clear enough, users might find themselves spending too much time looking for certain files only to find them hidden away in an unrecognized directory or misplaced folders. As a result, it makes the file management process messier for a user than it should have been.

## Ideate

Ideate is a mode that emphasizes coming up with ideas. Ideate's purpose is to investigate various ideas along with their solutions. Brainstorming sessions with several groups in our section allow us to foster a dynamic exchange of ideas. Potential solutions may includes:

- Give a family-friendly daily suggestions/reminders to users on how to maximize optimizations inside the app itself, which means it is independent of other softwares.
- Allows users to manually/automatically optimize files in a folder.
- Gradually remove any unwanted cache files inside the files.
- Create a separate backup file.
- Intuitive search and filter options.

## Prototype

Based on the proposed ideas, we proceed to the next step which is the prototype stage. In this phase, we develop a low-fidelity prototype to easily visualize the potential solutions of our problems from our design thinking analysis into the physical world. We are using sketch to implement the visualization for our solutions to the problem. We designed an application prototype called ***Smart File Assistant*** where it tells the end user on how to optimize their files efficiently with a guidance tutorial not on a specific platform but on the spot. This assistant will run in the background and will use less memory. Besides, this assistant does not rely on other applications software to guide users specifically in file management, like YouTube. The app will have its own user interfaces for easier management of the user.

## Test

Testing is an opportunity to bring our proposed prototype to the real world for implementation and testing. During the test process, we are able to visualize the functionality of our ***Smart File Assistant*** for professional file management. Several steps are defined to ensure that users can handle our application software at ease as:

1. Firstly, users need to download our package software and install it on their computer.
2. Secondly, users need to activate the software as well as turning several functions of the software to make it work accordingly.

3. The software will always run in the background while using less memory. A bubble pop-up will appear on their monitor display. This pop-up will greet the user with friendly dialogues and a quick tutorial on how to manage their files and folders.
4. The powerful AI will have to access all of the files and folders of your computer to rearrange essential files and will give numerous suggestions to the users to classify and organize their information more efficiently via pop-up dialogue chat boxes specific to the person, meaning every suggestion will be different with other users. The assistant will have its own simple user interface to minimize memory allocation.
5. The procedure is manually operating under the user's consent in addition to several automatic features like creating a separate backup file, gradually removing unwanted files that eat up the computer's memory, preventing potential malwares and providing enhanced security measures to avoid risks of data loss, especially to the computer system software files.
6. The application will only stop running in the background if the user disables the assistant feature at the software's icon at the taskbar. The application will run automatically when users log in their computer after shutting down.

**Functionalities/Benefits:**

- ① Give daily reminders/random messages to the users
- ② Gradually optimize computer space and memory, creating backup files and scannings.
- ③ Friendly user interface specifically for end users
- ④ Free tutorial/guidance within the software itself (independent of other softwares)
- ⑤ Manual or automatic optimization and suggestions.
- ⑥ Uses less memory
- ⑦ Can also be turned off desirably.
- ⑧ Once the computer is switch on, the assistant will automatically run in the background.
- ⑨ Able to remove unwanted file caches, cookies, duplicates and potential malwares such as files downloaded from untrusted websites.
- ⑩ Wide range of optimization from user's common files to the system software.
- ⑪ Has A.I. like feature and supports text-to-voice feature
- ⑫ Specifically designed for a wide range of desktop computers, laptops, tablets and even smartphones.

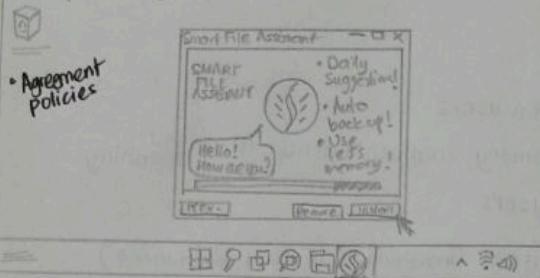
Want to have an assistant to help you optimize your PC like a pro? Try "Smart File Assistant" and you will sure to have your PC to be a pro!

Some of the functionalities/benefits of **Smart File Assistant**

## Low Fidelity Prototype (sketch)

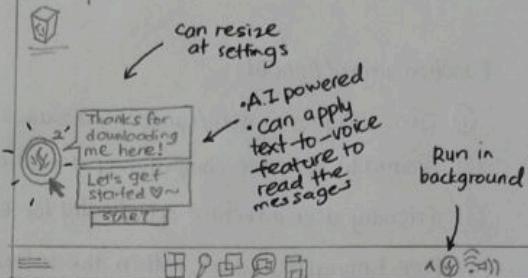
### SMART FILE ASSISTANT

Desktop (Thursday)



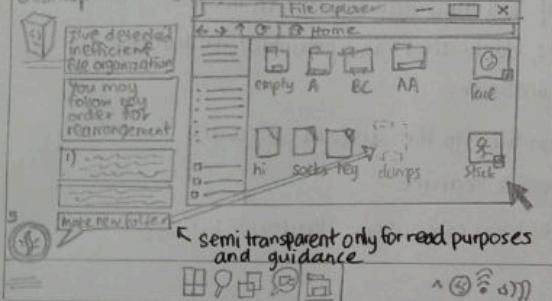
- 1) Download and Install our software "Smart File Assistant" into the computer.

Desktop (Thursday)



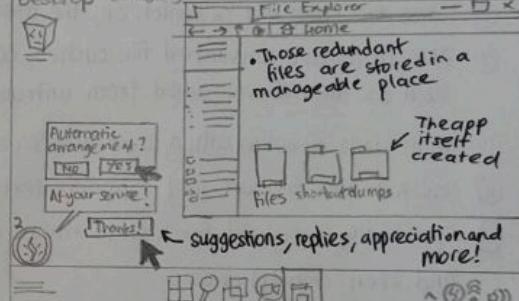
- 2) A simple pop-up will appear on the screen. Move the cursor to the pop-up and see messages from the assistant

Desktop (Thursday)



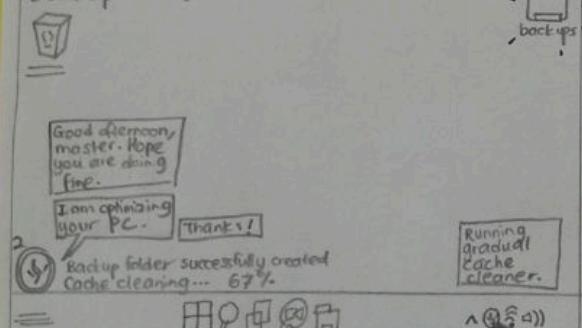
- 3) The Assistant will have access to the computer's files. A tutorial guidance by the app itself will be conducted on file management and optimization

Desktop (Thursday)



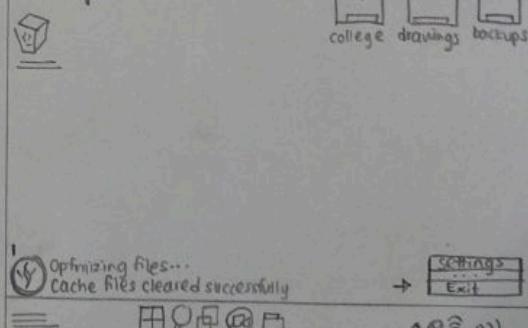
- 4) From manual to automatic optimization! Faster and easier! User friendly messages for easier user interface (UI). Only uses less memory.

Desktop (Friday)



- 5) Daily messages, suggestions from the assistant. Provide separate backup folder, scheduled file scanning to remove unnecessary cache files

Desktop (Friday)



- 6) The assistant's functionality can be turned off by the user.
  - Design for end users
  - Freeware

Simple sketch of our low-fidelity prototype of our *Smart File Assistant*

# **Detailed Description**

## **Problem: Inefficient File Management and Disorganization**

Many users find it difficult to efficiently manage and arrange their digital assets like folders, files, shortcuts, and application softwares. A disjointed and crowded digital environment is frequently caused by the sheer amount and diversity of information, which can include everything from documents and images to videos and applications. Users can find themselves spending too much time looking for particular files, having to deal with duplicates, and having trouble keeping their file structure organized. The lack of an intuitive streamlined file management system results in decreased productivity, poor time management and dissatisfaction of important files being misplaced or even lost.

## **Solutions:**

### **1. Family-Friendly Daily Suggestion/Reminders**

This feature provides a daily family-friendly suggestion and reminders to users on how to optimize their file management. It may include creating folders for certain files, arranging data according to specific file types, or routinely deleting unnecessary files. It is designed to provide users with random daily family-friendly messages and practical words are intended to inspire proactive maintenance of a well-organized digital environment. By this way, users will be able to arrange their data assets like a professional besides optimizing their computers.

### **2. Manual/Automated Folder Optimization**

With this feature allows users to pick an option to optimize files manually by drag and drop the received files for ease organizationally. On the other hand, introduce an automated optimization feature that analyzes file consumption trends and recommends ideal folder structures. With just one click the files will be dropped in the appropriate folder. By this way, users are able to identify files under several categories a lot easier as well as rearranging them every day either automatically or manually.

### **3. Remove unwanted cache files**

This feature includes a gradual removal function that locates and deletes unwanted cache files within the folder. The feature works seamlessly in the background, making sure that duplicates, and temporary files that consume a lot of storage and memory are routinely

removed to maximize the capacity of the computer storage and improve overall system performance of one's computer.

#### 4. Separate Backup File

This feature provides a reliable backup system that enables users to save important documents and data in distinct backup files. Users have an option to schedule automatic backups or initiate backup manually. The backup files are stored within a specific place in a computer or within a cloud storage in order to avoid data loss either by misplacement or deleting.

#### Teamworking

Our group has conducted a few online meetings to discuss the problems and solutions in regards to our situation. Besides, we have an interview with our friend who has problems in computer file management. Fortunately, we are able to give great ideas and recommendations.



One of our online meetings to discuss prototype makings

## **Design Thinking Assessment Point**

If the design thinking activity is carried out without any assessments or evaluation checkpoints, there could be risks of miscalculations, resulting in poor decision and choice making. When working as a team, various ideas can emerge for solving complex defined problems. Nevertheless, this collaborative approach may lead to a dysfunctional decision-making outcome that deviates from the original problem statement, owing to the wide range of ideas. Hence, an assessment point is crucial to address this issue. This evaluation can occur either at the end of the project demonstration or during the transition between design thinking phases. However, the assessment point took place in between the phases in our brainstorming discussion idea.

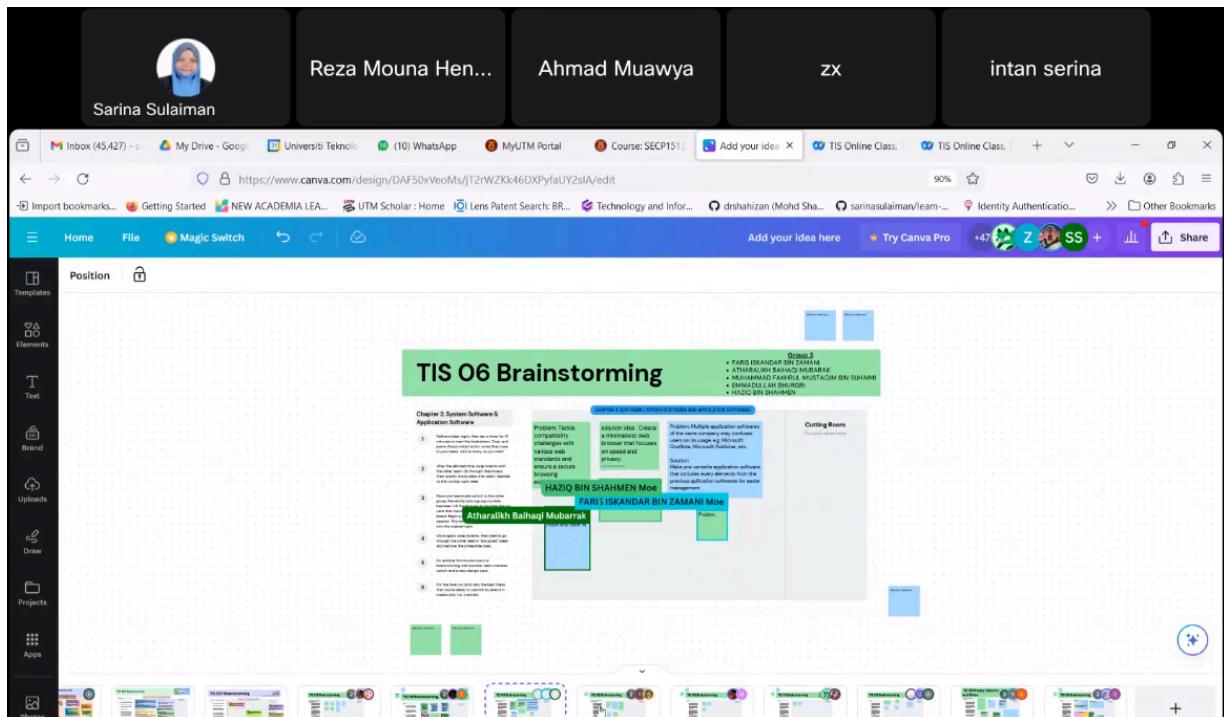
<b>Phases</b>	<b>Description</b>
Empathize	Our focus lies in gaining an understanding of the user by actively engaging with them, observing their behaviors, and conducting surveys and also interviews. During this stage, our primary goal is to comprehend the everyday challenges that users face when handling their files. Common issues may revolve around difficulties in locating specific files, concerns about potential data loss during file management, and the desire for a more intuitive organizational structure.
Define	In this phase, we examine and do research on the issue that we collected during the empathize phase. We found a lot of users, particularly those with limited experience in organizing digital files, encounter challenges when it comes to finding and managing their documents, photos, and other files. In the realm of personal file management, individuals may struggle to establish a systematic and comprehensible organizational framework for their diverse file collections. When the plan for file organization lacks clarity, users may end up investing too much time searching for specific files, only to discover them tucked away in an unfamiliar directory or misplaced folder.

Ideate	In one of our meetings, we got together to have a thorough discussion and share our different ideas during a brainstorming session. The goal was to find the best solutions to address our current issues.
Prototype	Following the empathize, define, and ideate phases, we began constructing our app as a prototype, we create low-fidelity prototypes to bring potential solutions to life. We use sketches to visually represent our solution to the problem. Our application prototype, named Smart File Assistant, provides guidance to end-users on optimizing their files efficiently through an on-the-spot tutorial. The app operates in the background, consumes minimal memory, and doesn't depend on external applications like YouTube for user guidance. It features its own user interfaces. We ensure that the product is aligned with our main ideas and it is functioned according to the outline.
Test	Testing allows us to see the potential future of our prototype in the real world. Several defined steps are given to ensure users are able to handle our application correctly.

As we wrap up the project, we carefully observe and assess to ensure that the achieved results match our initial goals and the problems we aimed to solve. The assessment checkpoints and continuous evaluations are pivotal in applying the design thinking methodology. They act as guides to keep us on the right path, validating our progress and ensuring that we're moving in the intended direction.

# Evidence

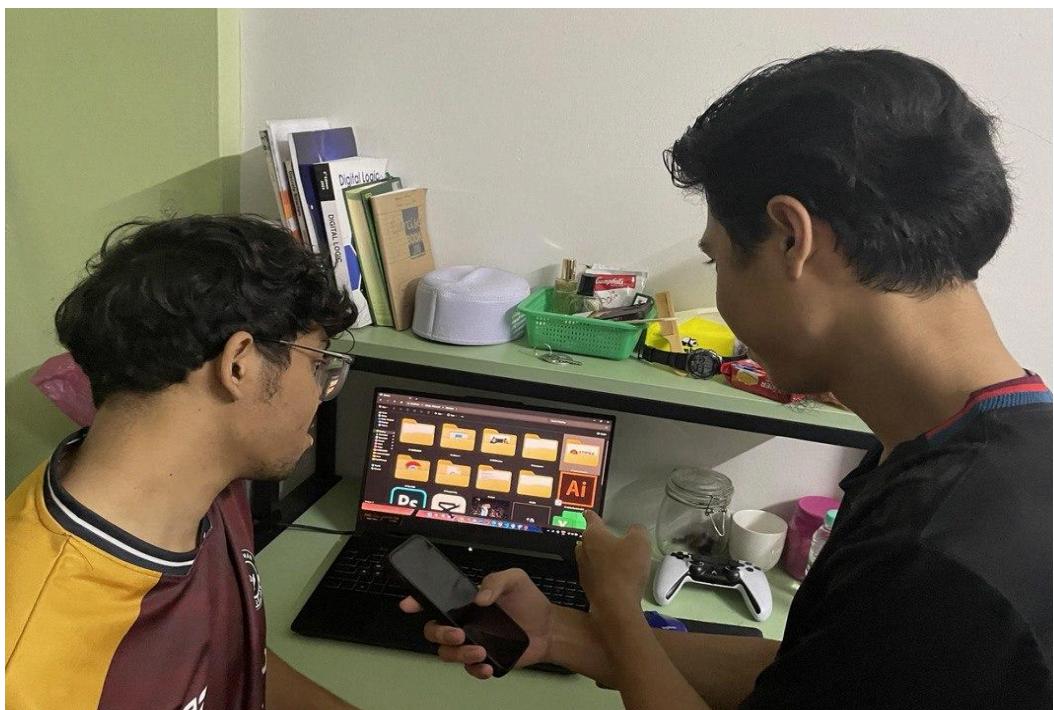
Evidence involves our progress in designing our prototype together as a team along with other groups in our section as well. Some interview sessions are conducted in order to obtain feedback on inefficiencies of file management.



Brainstorming Sessions with other groups

A screenshot of a TIS O6 Brainstorming slide. The title is 'TIS O6 Brainstorming' and the group is 'Group 3' with members: FARIS ISKANDAR BIN ZAMANI, ATHARALIKH BAIHAQI MUBARAK, MUHAMMAD FAHRUL MUSTAQIM BIN SUHAIMI, EMMADULLAH BHURGR, and HAZIQ BIN SHAHMIN. The slide contains a 'Chapter 3: System Software &amp; Application Software' section with 6 steps, a 'Problem Idea' section by Atharalikh Baihaqi Mubarak, a 'Problem' section by Faris Iskandar Bin Zamani, a 'Solution' section by Muhammad Fahrul Mustaqim Bin Suhami, a 'Cutting Room' section, and a 'Problem' section by Emmadullah Bhurgr. The 'Problem' section by Faris Iskandar Bin Zamani discusses multiple software suites from the same company causing confusion. The 'Solution' section suggests making one versatile application software that includes elements from previous ones. The 'Problem' section by Muhammad Fahrul Mustaqim Bin Suhami discusses software crashing and the 'Solution' section suggests optimizing code and improving algorithms. The 'Problem' section by Emmadullah Bhurgr discusses unnecessary software clutter and the 'Solution' section suggests a compact utility suite.

Brainstorming ideas of our group



Interview Session 1



Interview Session 2

## Reflections

- ATHARALIKH BAIHAQI MUBARAK

My goal in this course is to gain a thorough knowledge of the subject matter. To position myself for success in the field. I want to hone my practical skills, critical thinking ability, and creative mentality.

Design thinking impacted my goal in the course since it provides a distinctive and all-encompassing method of problem solving. By applying design thinking methodologies, it improves my capacity for innovation, and develops collaboration skills that are highly valued in the industry.

My plan to improve my skills in the industry is to:

1. Embrace continuous learning: Be proactive in seeking opportunities to gain new skills and keep up with changing best practices, emerging technology, and industry trends
2. Build a Network Create and cultivate contacts with other industry professionals.
3. Build a diverse skills set: Identify and acquire new abilities that enhance my key capabilities and increase my adaptability in the field.

- FARIS ISKANDAR BIN ZAMANI

One of my life goals is to perform well in my course to get a better understanding of my field as a computer student. I would like to enhance my analytical skills and critical thinking. As a student in a Graphics and Multimedia Software programme, I would love to improve the development of computer graphics to my nation as well as to the whole world for easier and family friendly interfaces.

Design thinking process is surely to make an impact on me in making decisions based on complex situations, especially when working in a team. I believe that in the work environment, I must be involved in decision making like brainstorming sessions to decide the best choice among the rest besides considering everybody's ideas into reality. By doing this, it helps me to do great as a team member or as a leader. In order for me to improve my potential in the industry, I should:

1. Consistent learning theoretical knowledge and practical knowledge as well in order for me to excel well in a work environment.

2. Improving my social skills like confidence and empathy and soft skills in an organization.
3. Provide numerous bright ideas for the development of computer graphics for the future.

- **MUHAMMAD FAKHRUL MUSTAQIM BIN SUHAIMI**

In this course, my objective is to acquire a comprehensive understanding of the subject matter and position myself for success in the field. I am determined to refine my practical skills, enhance critical thinking abilities, and cultivate a creative mindset.

The influence of design thinking on my course objectives is profound as it equips me with a toolkit for innovative problem-solving. It encourages me to explore unconventional solutions, the iteration of ideas, and the incorporation of feedback. This mindset shift leads me to the development of creating groundbreaking solutions, especially in industry challenges which are needed the most nowadays. To elevate my potential in the industry, I am committed to:

1. Consistently learning to stay updated with emerging technologies and industry trends through continuous training, including courses, certifications, and workshops.
2. Building a professional network by establishing and nurturing connections with other industry professionals.
3. Contributing numerous innovative ideas to open source projects or personal work to demonstrate my abilities aiming to gain practical experience and build a strong portfolio.

- **EMMADULLAH BHURGRI**

This course has been an eye opening time for me, As it enhanced my understanding of computers more for the field of Computing. That is something I deem a very important building block for a successful future. The course enabled me to know what I lacked in my insight and created a completely new mindset for me that will not only enhance the skills I possess but also enable me to acquire more. Additionally to get improve myself I'll be doing the following:

1. Keep track of the up-to-date developments in the field of computing including and not limited to new important software and hardware changes.
2. Get in contact or connect with people who are better equipped and skilled than me in this field and learn their ways of computers.
3. Partake in activities and events which include or involve computers, which will enhance my social space for the field allowing me to get more insight on how my peers are working on their courses.

- **HAZIQ BIN SHAHMEN**

In this course, my primary aim is to acquire an in-depth understanding of the subject matter while positioning myself for success in the field. My comprehensive objective is to refine not only my practical skills but also enhance my critical thinking abilities and foster a creative mindset. Design thinking is helping me by offering a unique problem-solving approach. It enhances my innovation and collaboration skills, which are highly valued in the industry. To get better in the field, I plan to:

1. Keep learning which is to stay proactive in learning new skills and staying updated on the latest industry trends.
2. Build connections which connect with other professionals in the industry for collaboration and staying informed.
3. Learn diverse skills which are to acquire new abilities to improve my core skills and be adaptable in the field.

By doing these things, I believe I not only can handle industry challenges but also contribute effectively to its growth.

## Task Distribution

Name	Tasks
ATHARALIKH BAIHAQI MUBARAK (A22EC9015)	<ul style="list-style-type: none"><li>● Report Writing:<ul style="list-style-type: none"><li>○ Introduction</li><li>○ Detailed Step</li><li>○ Detailed Description</li><li>○ Assessment Point</li></ul></li><li>● Prototype Making</li></ul>
FARIS ISKANDAR BIN ZAMANI (A23CS0078)	<ul style="list-style-type: none"><li>● Report Writing:<ul style="list-style-type: none"><li>○ Editings</li><li>○ Design Thinking Testing</li><li>○ Conclusion</li></ul></li><li>● Prototype Making</li></ul>
MUHAMMAD FAKHRUL MUSTAQIM BIN SUHAIMI (A23CS0127)	<ul style="list-style-type: none"><li>● Report Writing:<ul style="list-style-type: none"><li>○ Editings</li><li>○ Evidence</li></ul></li><li>● Interview Sessions</li><li>● Prototype Making</li></ul>
EMMADULLAH BHURGRI (A23CS0014)	<ul style="list-style-type: none"><li>● Report Writing:<ul style="list-style-type: none"><li>○ Editings</li><li>○ Evidence</li><li>○ Inserting Graphical Images</li></ul></li></ul>
HAZIQ BIN SHAHMEN (A23CS0082)	<ul style="list-style-type: none"><li>● Report Writing:<ul style="list-style-type: none"><li>○ Assessment Point</li><li>○ Evidence</li><li>○ Inserting Graphical Images</li></ul></li><li>● Interview Sessions</li></ul>