



SECP1513 TECHNOLOGY AND INFORMATION SYSTEM

SECTION 02

Design Thinking Report

Topic: Big Data and Artificial Intelligent New Innovation

Product Name: FashionMorph

Lecturer: Dr. Aryati binti Bakri

Name: Damia Zafira Binti Nawawi Matric No: A24CS0241	Name: Irdina Hannah Binti Misnun Matric No: A24CS0086	Name: Mirza As-Siddiq Bin Tohari Matric No: A24CS0112
Name: Teoh Xin Yee Matric No: A24CS0307	Name: Toh Shee Thong Matric No: A24CS0309	

TABLE OF CONTENTS

1.	INTRODUCTION.....	3
2.	DETAIL STEP.....	4
2.1.	Empathy.....	4
2.2.	Define.....	4
2.3.	Ideate.....	4
2.4.	Prototype.....	4
2.5.	Test.....	4
3.	DETAILED DESCRIPTIONS.....	5
3.1.	Problem.....	5
3.2.	Solution.....	6
3.3.	Team Working.....	7
4.	DESIGN THINKING ASSESSMENT.....	8
4.1.	During the end of the project demonstration	
4.2.	During the transition between design thinking phases	
5.	DESIGN THINKING EVIDENCE.....	9
5.1.	The sample work by students working to solve the design challenge	
5.2.	Record for each phase	
6.	REFLECTIONS.....	18
7.	TASK DISTRIBUTION.....	22
8.	REFERENCES.....	23

1.0 INTRODUCTION

Design Thinking is all about understanding people's needs and finding creative ways to solve their problems. It's a process that helps us step into someone else's shoes, figure out what they're struggling with, and come up with solutions that make their lives better. The five phases of Design Thinking: Empathize, Define, Ideate, Prototype and Test guide us through this journey of problem-solving.

In the Empathy phase, we collected data through interviews and questionnaires to understand the user's challenges. In the Define phase, we identified key problems based on the insights gathered. During the Ideate phase, we brainstormed and selected creative solutions to address those problems. In the Prototype phase, we developed a basic version of the app focused on solving user needs. Finally, in the Test phase, we had users interact with the prototype and provided feedback to refine it further.

2.0 DETAIL STEP

In October 2024, our group was assigned the task of creating a prototype centered around Big Data and Artificial Intelligence. After discussing the topic, we identified our colleagues as the sole client, representing the challenges faced in the fashion industry. Our client, as a consumer, encounters difficulties when trying to figure out which items complement each other and often buying unnecessary pieces of clothes which leads to waste. Additionally, online shopping exacerbates this issue with inaccurate sizing and poor product images contributing to high return rates. Consumers usually despise wasting their time to go through the process of returning items. They would want a way to try clothes in an efficient and convenient manner.

2.1 Empathise

First, we hold an interview with two of our colleagues to gain better insight on the problems faced as a client while choosing clothes. The interview was held with Azdayana Batrisyia binti Azahari and Niveethita A/P Pandia Rajan. Through these interviews, we managed to ask our questions and uncover the problems faced by the client. The information we gathered has significantly guided us in the next phase.

2.2 Define

In this stage, we discussed the information obtained from the interview session. During the discussion, we managed to come up with 4 problems with the current method of choosing clothes from the wardrobe and buying clothes online. The problems are people are unable to try on clothes virtually without visiting a physical store, stress and uncertainty of shopping clothes online, unable to create cohesive outfits during mix and match, and unable to decide what to wear for special occasions or everyday situations.

2.3 Ideate

After establishing a clear problem statement by listing and categorizing the issues in the previous stage, we can now collaborate and brainstorm various ideas to develop new solutions. We were able to identify several potential solutions for the problems.

2.4 Prototype

After the ideate stage, we design and create our prototype. After determining the features and functions, we divided up the work and created the prototype. The ideate stage served as the basis for the prototype.

2.5 Test

In this stage, it is time to test our completed prototype. We tested some of the features of the prototype such as the inventory, so that we can examine its functions and features. We were also able to get the feedback of our prototype from our clients.

3.0 DETAILED DESCRIPTION

3.1 Problem

The fashion industry continues to grow rapidly and many individuals enjoy keeping up with the most recent trends. However, this has resulted in issues such as excessive waste, returns, and difficulty organizing clothing. When purchasing new clothing, consumers frequently need to mix and match to discover if outfits work well together. However, without the necessary tools, it might be difficult to make effective decisions.

The Ellen MacArthur Foundation estimates that the fashion industry generates 40 million tons of textile waste per year. This happens when people struggle to organize their clothes, plan outfits, and identify their particular style. These challenges lead to people buying clothes they don't need, which creates more waste.

Online purchasing adds to the problem. Sometimes clothes purchased online do not look or fit as planned. According to studies, 26% of returns are due to incorrect size or style. This occurs because online sellers frequently lack clear photos, accurate sizing instructions, and live chat to assist clients. Plus, the lack of virtual try-on features makes people more likely to make mistakes when buying clothes online because they cannot try them on without visiting a physical store.

3.2 Solution

After analyzing the issues and brainstorming potential solutions, we came up with five worthwhile concepts. Based on these concepts, we developed Fashion Morph, an app that makes online clothing buying more efficient and entertaining for everyone. This app is user-friendly, with features such as detailed sizing guidance, fit reviews, and AI-powered personalized recommendations to assist users in making better decisions.

One of Fashion Morph's unique characteristics is the virtual try-on option. Users can utilize a 3D model to preview how outfits will look on them before purchasing. The app allows users to customize the 3D model's height, weight, body shape, and features to closely resemble their own. This increases users' confidence in their choices and minimizes the likelihood of purchasing clothing that does not fit or suit them.

Fashion Morph also comes with an AI outfit maker. By combining items from the user's shopping cart or wardrobe, this tool makes outfit suggestions. This is particularly helpful for shy or introverted people who may find it difficult to style their clothes.

The customized dress calendar is yet another brilliant feature. The app has the ability to generate a schedule with clothing recommendations for each day and event. The user will always have something appropriate to wear as a result of these recommendations, which are customized based on their tastes, wardrobe and even the weather.

3.3 Team working

To make team communication easier, Damia set up a WhatsApp group as soon as we were given the project's topic. We discussed various kinds of project ideas, and following an in-depth research, decided on AI fashion. Fashion Morph is the name we gave our project. To tackle the current challenges faced by people who love fashion, we applied a five-phase process which includes empathize, define, ideate, prototype and test. This approach helped us deeply understand the problems, develop innovative ideas , and create a solution that effectively addresses these issues.

After that, we gathered the problems and solutions through interviews. Damia, Irdina, Xin Yee, and Shee Thong interviewed two students from UTM. Additionally, we created a Google Form to understand the challenges they face when styling and how people feel about AI fashion. Through this method, we were able to gather useful and more accurate information.

Finally, we began working on the prototype where Irdina, Mirza, Shee Thong and Xin Yee were in charge of the website design, Damia was responsible for creating the 3D model, and all of us were in charge of testing the prototype. Through these collaborative efforts, everything went smoothly, and we were able to complete the project successfully. Our teamwork allowed us to refine the prototype and ensure it met the needs of our target users, bringing us one step closer to solving the challenges faced by fashion lovers.

4.0 DESIGN THINKING ASSESSMENT

A thoughtful approach must be followed when developing a design thinking evaluation to ensure that it accurately assesses the essential elements of design thinking. For this reason, we start by outlining the assessment's primary goal which is applying big data and artificial intelligence to the fashion industry.

In the beginning of the project, our team members discussed how we can develop a project that would be impactful to a wide number of people rather than just a select few. We also set up an appointment with our TIS lecturer to get her opinion on the project we decided which is AI fashion. After that, we proceed to hold interview sessions with our fellow coursemates to gain more insight and identify the problem they are facing.

Next, we proceed with the define phase where we analyse the problem statements identified by the client during the empathise stage. After conducting some research, we categorized the issues and listed them down.

Moving on to ideate phase, we collaborate and brainstorm various ideas to develop solutions for the problem listed in the define phase. At this phase, the assessment point became essential by eliminating any unreasonable or irrelevant concepts or solutions. At the end of this phase, we were able to come into agreement for the best solution.

Lastly, we proceed to the prototype phase by using the solution created during the ideate phase. We designed a prototype of our app, which includes a 3D model feature. This will allow the clients to visualise the clothes they want to try on according to their weight, height and also body shape. Plus, clients will have a better experience to make decisions during mix and match as our prototype provides access to a virtual wardrobe. This technology enables clients to have various combinations of clothes to choose from without having to try every piece of clothes physically. It will make it easier for them to make decisions which will save a lot of time and energy for the clients.

5.0 DESIGN THINKING EVIDENCE

Empathy Phase

A few team members conducted interviews with our colleagues to understand their needs and opinions regarding outfit planning. Additionally, we distributed a Google Form survey to collect data from a broader audience beyond our colleagues, ensuring a more diverse range of inputs.



Figure 1.1 and 1.2: Interview with Azdayana Batrisyia Binti Azahari



Figure 2: Interview with Niveethita a/p Pandia Rajan

I am interested in trying on clothes virtually using an AI application *

- yes
- maybe
- no

I will use an AI Fashion app if it provides realistic clothing simulations *

- yes
- maybe
- no

I find it challenging to mix and match my outfits *

- yes
- sometimes
- no

Do you share or seek opinions about your outfits on social media? *

- yes
- maybe
- no

I feel more confident in purchasing clothing if I can see a 3D simulation of the items *

- yes
- maybe
- no

The AI Fashion app needs to be user-friendly for me to consider using it *

- yes
- maybe
- no

How often do you think you would use this app? *

rarely

sometimes

often

An attractive app interface design will influence my decision to try the app *

yes

maybe

no

Using this technology will reduce the stress of shopping for clothes online *

yes

maybe

no

In which area do you think AI can be most beneficial? *

Personalized styling and recommendations

Virtual try-ons and fitting (3D model)

Fashion trend prediction

Customer service and shopping experience

Automated manufacturing and production

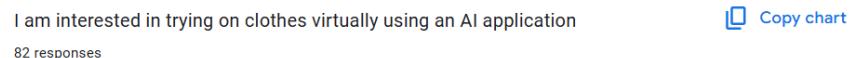
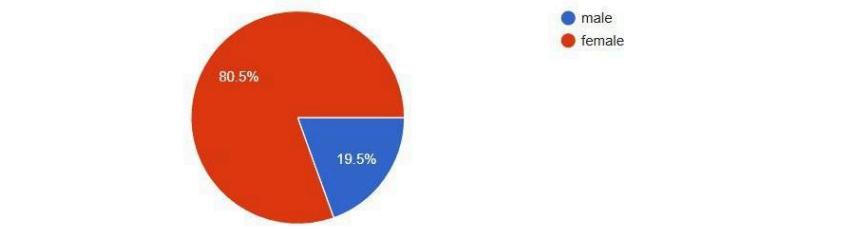
Customized outfit calendar

Other...

Figure 3: List of Question from Google Form

Define Phase

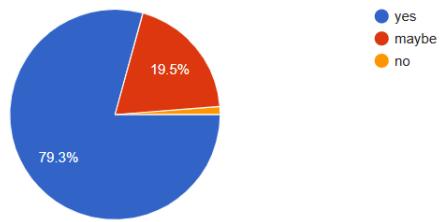
In this phase, we gather a wide range of data from various sources, like interviews and Google Form responses. This helps us better understand the challenges people face and allows us to come up with effective solutions to address their needs. Below are the results from Google Form:



I will use an AI Fashion app if it provides realistic clothing simulations

82 responses

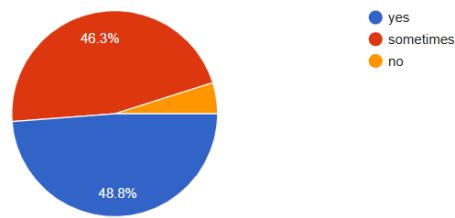
 Copy chart



I find it challenging to mix and match my outfits

82 responses

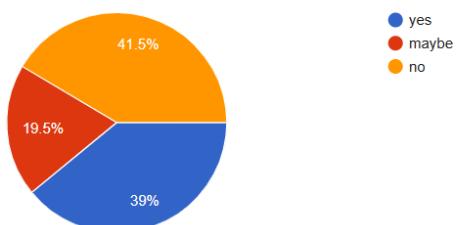
 Copy chart



Do you share or seek opinions about your outfits on social media?

82 responses

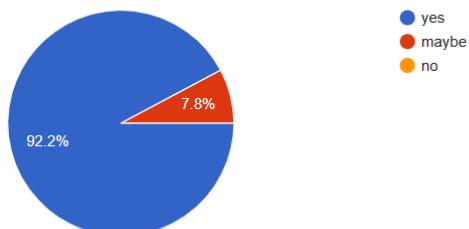
 Copy chart



The AI Fashion app needs to be user-friendly for me to consider using it

77 responses

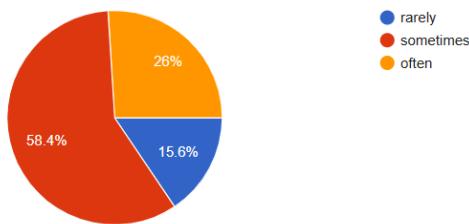
 Copy chart



How often do you think you would use this app?

 Copy chart

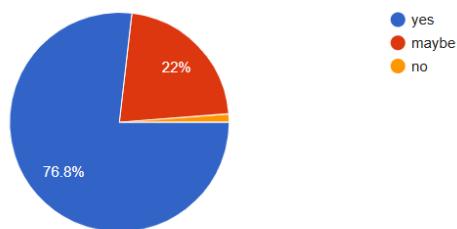
77 responses



An attractive app interface design will influence my decision to try the app

 Copy chart

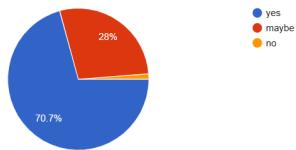
82 responses



Using this technology will reduce the stress of shopping for clothes online

 Copy chart

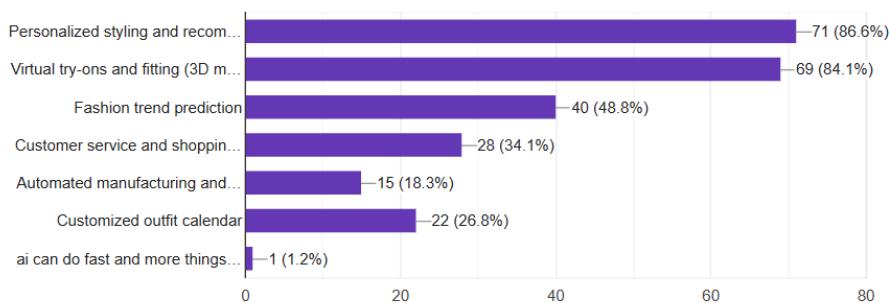
82 responses



In which area do you think AI can be most beneficial?

 Copy chart

82 responses



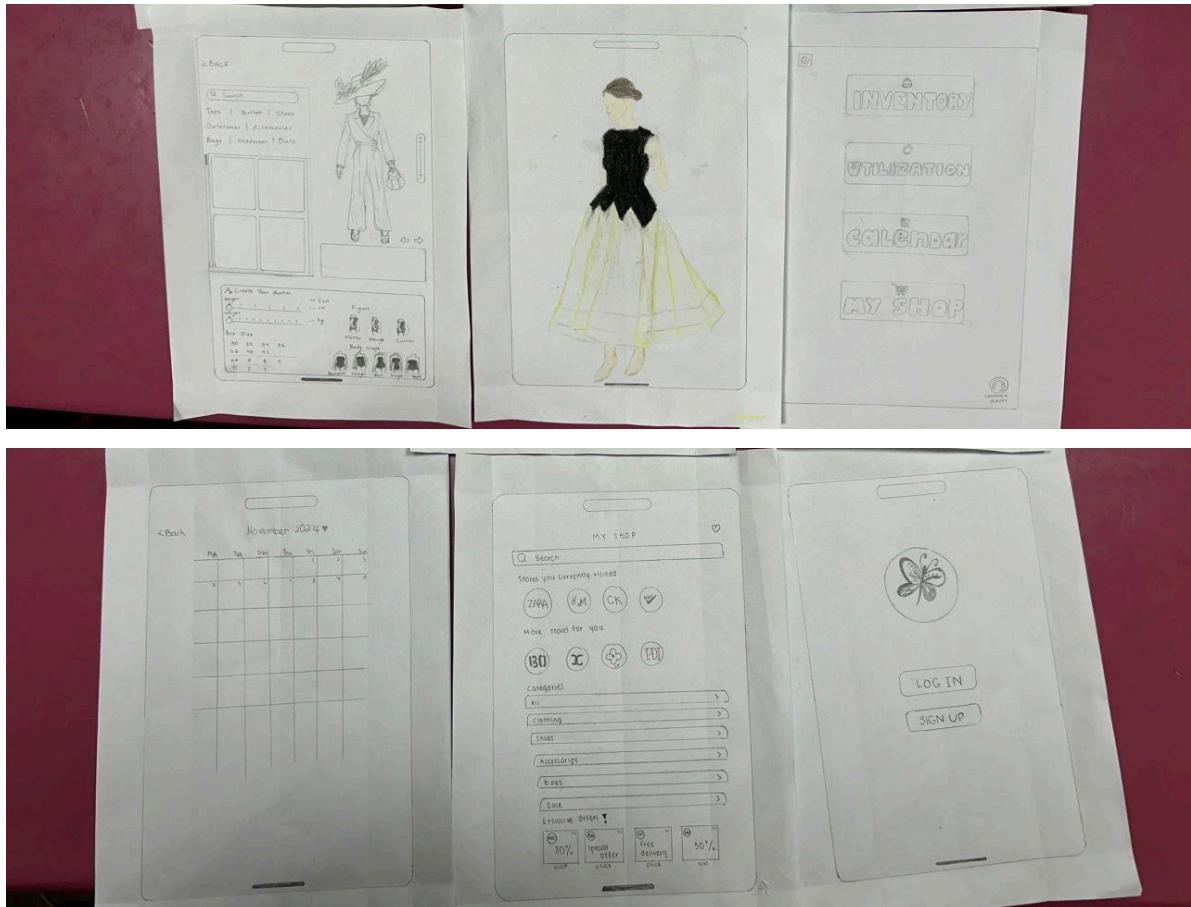
Ideate Phase

In this phase, we worked together as a team to share ideas and discuss the best ways to solve the problems we found. After exploring different options, we chose the ones that felt the most practical and helpful for the users.



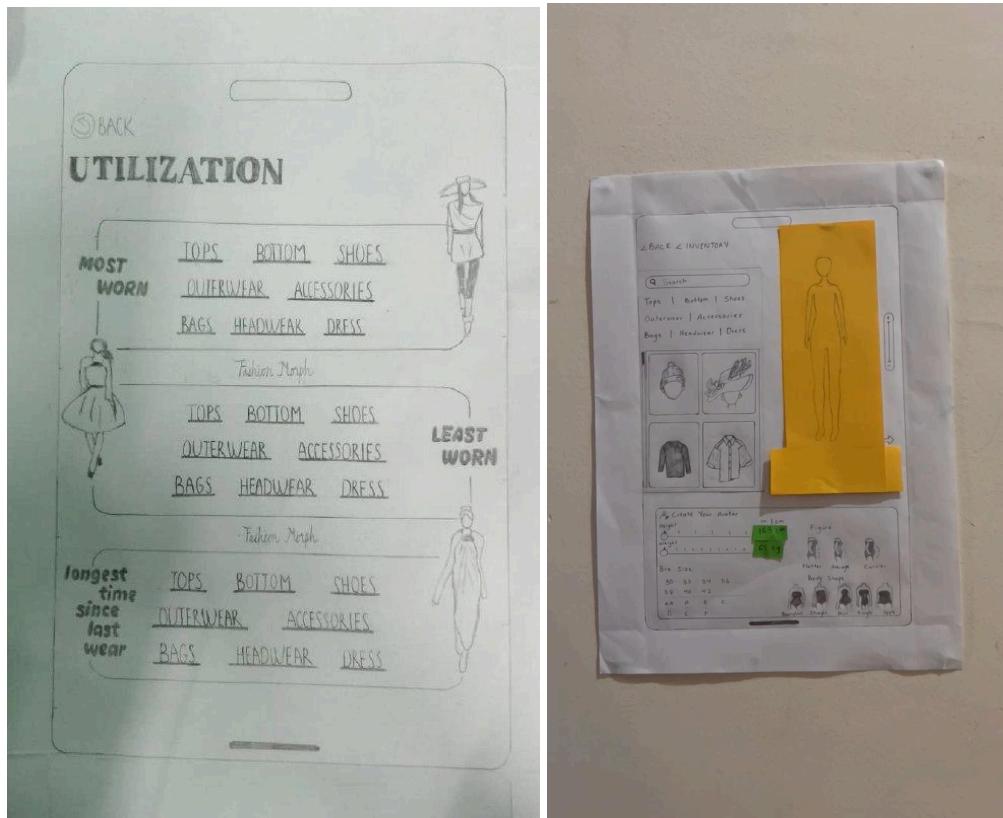
Prototype Phase

In this phase, we took our ideas and turned them into basic models of the app. We focused on the main features that would solve the problems users faced.



Prototype Testing Phase

During this phase, we had several colleagues to try out our prototype. Most of them thought it was an awesome idea and found it really helpful for planning their outfits. Their feedback gave us valuable insights into what worked well and what could be improved.



6.0 REFLECTION

QUESTION 1: What is your goal/dream with regard to your course/program?

NAME	CONCLUSION
DAMIA ZARIFA BINTI NAWAWI	<p>My creative abilities in design have always been a key part of how I approach problems. In Data Engineering, I see an opportunity to blend my creativity with technology. By developing user-friendly data systems, visualizations and interfaces, I aim to create solutions that not only solve complex problems but also provide an engaging and meaningful experience for users. I believe this creative mindset will allow me to think outside the box and contribute to the field in unique ways.</p>
IRDINA HANNAH BINTI MISNUN	<p>My goals as a Bachelor of Computer Science in Data Engineering student are mastering the art of designing, building, and maintaining data that enable organizations to unlock the full potential of their data. I aim to become proficient in handling complex data systems, ensuring their scalability, reliability, and efficiency. Also, to contribute to innovative projects where data engineering plays a pivotal role in driving insights and creating solutions that not only solve real-world problems but also have a positive impact on industries and communities.</p>
MIRZA AS-SIDDIQ BIN TOHARI	<p>My goal with regard to my course is to build a strong foundation in data engineering and gain a deep understanding of data systems, architecture and analytics. Through this, I can always stay relevant even when technologies develop continuously.</p>
TEOH XIN YEE	<p>As a Bachelor of Computer Science in Data Engineering student, my goal is to gain expertise in handling large datasets efficiently, analyze raw data to find useful patterns, and transform raw data into valuable insights that support data-driven decision-making. I hope to become a skilled data engineer who can use data to solve real-world problems.</p>
TOH SHEE THONG	<p>My primary goal is to manage efficient data systems that can support data-driven decision-making. I aim to gain a deep understanding of big data technologies, and analytical tools, enabling me to process and analyze massive datasets effectively.</p>

QUESTION 2:

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

NAME	CONCLUSION
DAMIA ZARIFA BINTI NAWAWI	The Design Thinking approach in the Fashion Morph project helped me combine creativity with technology, which aligns with my goal in Data Engineering. It taught me how to empathize with users, define their challenges, and create innovative solutions, which are valuable skills in developing data-driven applications.
IRDINA HANNAH BINTI MISNUN	Design thinking impacts my goals by fostering a user-centered, innovative mindset. It helps me empathize with users, define problems clearly, and create efficient, user-friendly solutions. By embracing ideation, prototyping, and collaboration, I can build impactful data systems that align with real-world needs and drive meaningful insights.
MIRZA AS-SIDDIQ BIN TOHARI	Design thinking allowed me to experience how to handle a project in a systematic and efficient manner. It emphasizes a deep understanding of the problem while ensuring that the solutions we developed are not only effective but also user-centered. Furthermore, it encourages me to work together in a group to find the best solution.
TEOH XIN YEE	Design thinking helps me break down my goal into smaller, manageable steps by focusing on ideas and prototypes rather than building a full solution right away. It allows me to explore creative approaches to solving data problems, such as designing a system for analyzing raw datasets.
TOH SHEE THONG	Design thinking plays a crucial role in helping me achieve my goal of understanding the practical applications of AI as a tool. It enhances my familiarity with AI and equips me to manage raw data more effectively using Artificial Intelligence.

QUESTION 3

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

NAME	CONCLUSION
DAMIA ZARIFA BINTI NAWAWI	I plan to continually enhance my technical skills in data engineering by learning programming languages such as Python and SQL. I also aim to join programs like competitive programming to sharpen my coding skills and stay updated on industry trends such as advancements in AI and machine learning. To further improve, I will focus on enhancing my communications skills and aim to take leadership roles in group projects to develop my ability to manage teams and drive projects forward.
IRDINA HANNAH BINTI MISNUN	As a student, I plan to improve my potential in data engineering by mastering technical skills like programming languages (c++ , SQL, Python...) and advanced tools like Apache . I'll focus on deepening my understanding of data design and staying updated on industry trends in AI and big data. Gaining hands-on experience through projects and internships, along with earning relevant certifications, will be key to building my expertise. Additionally, I'll work on improving my soft skills like communication and teamwork skills to build connections and widen my knowledge in the industry. This will help me become a competitive and capable data engineer.
MIRZA AS-SIDDIQ BIN TOHARI	I plan to learn languages used in back-end development like SQL and Python. Plus, having a strong foundation in programming is needed because each industry uses different frameworks which means I need to quickly adapt to the frameworks they use. Next, I will work on some small projects to improve my skills and portfolio. Plus, I will take part in competitions like Hackathon to gain more experience of working in a team to solve real-world problems. Last but not least, I will improve my soft skills because soft skills are very important in the industry.
TEOH XIN YEE	To improve my potential in the industry, I plan to work on building both my technical skills and real-world experience. I'll focus on learning tools like Python, SQL, and data

	<p>engineering platforms as well as exploring cloud technologies like AWS. At the same time, I want to take on small projects or internships where I can apply what I've learned to real problems. I'll also push myself to participate in hackathons or data challenges to improve my problem-solving skills and learn to think quickly under pressure. Finally, I want to improve my teamwork and communication skills so I can work better with others and explain my ideas clearly. These steps will help me grow into a confident and capable data engineer.</p>
TOH SHEE THONG	<p>I will actively participate in workshops, conferences, webinars, and hackathons to enhance my knowledge and stay competitive. Other than that, personal development is equally important. I will work on strengthening my communication, teamwork, and problem-solving skills to excel in collaborative and fast-paced environments.</p>

7.0 TASK DISTRIBUTION

Name		DAMIA ZARIFA BINTI NAAWAI	IRDINA HANNAH BINTI MISNUN	MIRZA AS-SIDDIQ BIN TOHARI	TEOH XIN YEE	TOH SHEE THONG
Task	Interview, Discussion, Prototype and Test Sections	Interview Azdayana Batisyia Binti Azahari			Interview Niveethita a/p Pandia Rajan	
				Producing Prototype and test		
				Discussion for Define and Ideate Stages		
	Documentation and Presentation		Editing Video			Editing Video
		Slide Presentation				
Report	Detail Description About Problems, Solution and Team Working,			Detail Description for Each Phase, Outline Creation, Assessment Point	Introductio n, Design Thinking Evidence, Task Division, Table Content	
		Reflection, Reference				

8.0 REFERENCE

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