SECP1513 TECHNOLOGY AND INFORMATION SYSTEM

SEMESTER 1, 2024

FACULTY OF COMPUTING, UNIVERSITI TEKNOLOGI MALAYSIA

DESIGN THINKING PROJECT REPORT

PRODUCT NAME: AI SHOPPING BUDDY

GROUP NAME: GROCERY BUDDY

NO.	NAME	MATRICS NO.
1.	SYAZMIN NADIA BINTI AHMAD LUTHFI	A24CS0300
2.	NUR FATIN NABILA BINTI ZAINUDIN	A24CS0163
3.	WAN AMNI ZAHIRAH BINTI WAN AHMAD NAZARUDDIN	A24CS0208
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Prepare for: Dr Pang Yee Yong

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1.0 INTRODUCTION

WHAT IS DESIGN THINKING?

Design thinking is a solution-focused methodology for tackling complex, unclear challenges. It emphasizes understanding human needs, reframing problems with a human-centric approach, brainstorming ideas, and prototyping with hands-on testing. The process follows the five-stage design thinking model:

Design Stage	Definition
Empathize	You want to gain an empathic understanding of the problem by consulting experts or certain individuals with interviews and surveys to conduct observations.
Define	Organize the information you have gathered during the Empathize stage and analyze your observations to define the core problems that have been identified up to this point.
Ideate	In this stage, you are ready to generate ideas. You can start to look at the problem from different perspectives and ideate innovative solutions to your problem statement.
Prototype	The aim for the prototype is to identify the best possible solution for each of the problems identified during the first three stages.
Test	In the final stage of the design thinking process is to get as deep an understanding of the product and its users as possible by conducting a feedback form for the users to put their opinions in.

2.0 DETAILED STEPS

In January 2025, our team created a prototype named Grocery Buddy, an AI Shopping Buddy, focusing on the theme "Big Data and Artificial Intelligence New Innovation." Grocery Buddy caters to two primary users. The grocery store proprietors, looking to increase sales and improve customer experience, and shoppers, desiring convenience, time efficiency, and streamlined shopping. Its goal is to simplify and enhance the grocery shopping experience for everyone.

2.1 EMPATHIZE

First, we conduct an interview with one of the public that we met randomly, so we have better observation on the problems that have been faced by people in this country. The interview was held with Miss Ainur Mardhiah Binti Sanip by face-to-face interview. We managed to ask several questions and successfully analyzed the problems faced by people. The information that we gained in the interview has helped us a lot to identify the problem and proceed to the next step.

2.2 DEFINE

Following the empathy phase, we collectively went over the information we had learned during the interview. Three main problems with the conventional grocery shopping procedure were noted during our conversation. These include the considerable amount of time spent navigating shops and standing in long checkout lines, the regular difficulty of wanted items, and the difficulties faced by senior citizens and busy people. These issues show how much a more effective, convenient and user-friendly purchasing solution is needed.

2.3 IDEATE

With a well-defined problem statement established from organizing and categorizing the issues in the prior stage, we can now work together to generate and investigate different ideas for possible solutions. We have found various solutions to tackle the recognized issues.

2.4 PROTOTYPE

We now start designing and creating our prototype. We divided up the work after determining the features and functions and the prototype was built using the ideas that came from the ideation stage.

2.5 TEST

At this point, we successfully finished designing our prototype and started evaluating its functionality. We made sure that the barcode scanning system and other important features worked as intended. To further develop the final product, we also asked user feedback on the prototype in order to spot any possible defects or areas that needed work.

3.0 DETAILED DESCRIPTION

3.1 PROBLEM

In Malaysia, shopping for groceries is a daily requirement for Malaysians, yet it poses various difficulties including time consumption, availability of products and accessibility especially for busy or elderly people. Tackling these concerns is essential as customer demands change.

Conventional shopping can be quite time-consuming for most individuals, requiring individuals to navigate aisles, wait in lines, and spend nearly an hour on the process. This is exhausting for those with hectic schedules, as many prefer to minimize shopping time. On top of that, finding specific products can also frustrate the customers, especially when stores lack certain items. When this issue occurs, individuals may need to go to multiple shops or choose an alternative, wasting time and creating frustration. This is particularly challenging for elderly individuals who face mobility issues, travel difficulties, and anxiety in crowded shops. Research indicates that numerous older Malaysians favour small local stores due to their convenience, yet these stores do not always fulfil all of their needs. Individuals with busy schedules encounter comparable challenges, as locating time for in-person shopping proves difficult, thus complicating the process further.

These problems highlight the need to address time, product accessibility, and availability to simplify grocery shopping for everyone.

3.2 SOLUTION

After all the consideration about the problems and we have discussed all potential solutions through the discussion process, we have discovered a solution that could solve these problems. Artificial Intelligence (AI) offers innovative solutions to transform grocery shopping into a flawless, personalized and systematic experience.

We have created a mobile application to overcome these problems. Our app, 'Grocery Buddy' uses Artificial Intelligence (AI) technology to help the user scan the barcode of the products and simply add the products into their cart. These apps will show you the price of the products and you can change the quantity of the products you take in the apps. When you arrive at the counter, you just need to show your account barcode then the cashier will scan it or you can pay it by online banking. So, you just need to pay for the goods and you are done. This will save you a lot of time since you don't need to queue up for payment.

Another frustrating aspect of grocery shopping is navigating through crowded places and spending time searching for specific products. AI-powered tools, which are our apps 'Grocery Buddy' have indoor navigating systems. It will guide the shoppers directly to the items they need by tracking the store layout and real-time inventory data. This feature will help the elderly to find the products. Also, our apps can detect the product availability. The shoppers can know if the items they want are out of stock or not. This will save a lot of shoppers time since they don't need to walk around and search the products.

3.3 TEAM WORKING

Our team began the project by discussing roles and responsibilities and generally selecting Nadia as our leader due to her strong leadership skills. We chose to create an AI Shopping Buddy after conducting research and brainstorming sessions in order to tackle issues that Malaysians frequently encounter including accessibility, product availability and time consumption. To approach the problem methodically, we follow the five stages of Design Thinking which are empathy, define, ideate, prototype and test.

In order to gain a deeper understanding of the issue, we interviewed Miss Ainur Mardhiah Binti Sanip as a local shopper, who shared her frustrations with time-consuming shopping trips, difficulties in finding products and accessibility issues. These insights were documented by Nadia in our group Whatsapp to keep the team aligned.

Finally, we worked collaboratively to brainstorm and develop our solution, ‘Grocery Buddy’. Each team member contributed to a specific feature of the app such as the navigation, cart system and inventory tracking. We collaborated to review the input and make the required changes to improve our prototype. Through smooth collaboration, efficient communication and clear responsibility distribution, we were able to finish our project and provide a workable solution.

4.0 DESIGN THINKING ASSESSMENT POINT

Conducting a design thinking assessment requires a comprehensive approach to evaluate the essential components effectively. We began by defining the goal,which is exploring the use of Artificial Intelligence (AI) in daily grocery shopping.

In the empathize phase, our team discussed developing a project that benefits other people. We interviewed a local shopper to understand their challenges and gain deeper insights into the problem.

Next, in the define phase, we analyzed the issues shared by the local shopper during the empathize phase. After additional research, we organized and categorized the problems systematically.

In the ideate phase, we brainstormed all the potential solutions and eliminated unrelated ideas through assessment. By the end, we had chosen the most feasible solution.

Finally, in the prototype phase, we developed an application with an AI feature that allows shoppers to explore groceries virtually, find products efficiently, and make payments via online banking by scanning product barcodes. This technology enhances decision-making and saves time.

5.0 DESIGN THINKING EVIDENCE

5.1 EMPATHY PHASE

To learn more about the difficulties grocery shoppers have, our team interviewed Miss Ainur Mardhiah Binti Sanip as a local shopper. In order to collect data from a larger audience, we also published a survey via Google Forms. By understanding customer challenges like time limitations, product unavailability, and accessibility issues, these efforts helped us shape our solution.

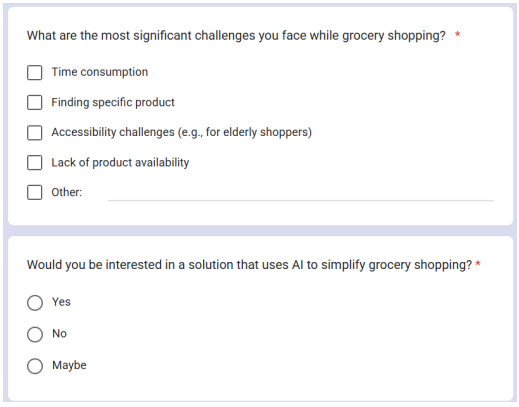


Figure 1.0 Google Forms

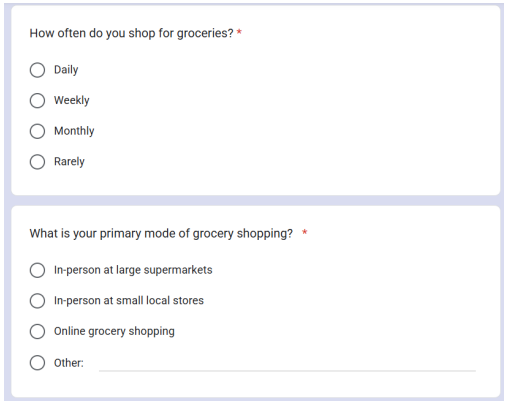


Figure 1.1 Google Forms

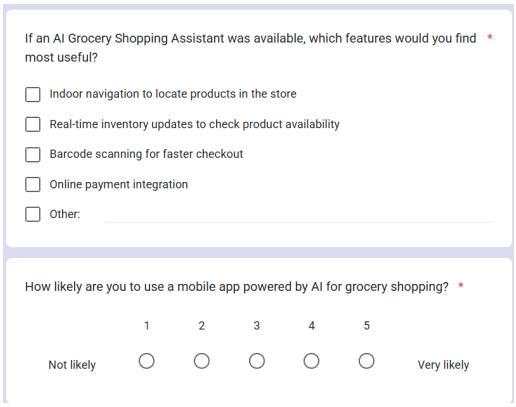


Figure 1.2 Google Forms

Figure 1.3 Interview with Miss Ainur

5.2 DEFINE PHASE

We combined all of the data acquired from the google form replies and the interview sessions during this step. We were better able to figure out users' needs due to this procedure. With this information, we customized our solution to more successfully handle their particular problems. Below are the result from the google form:

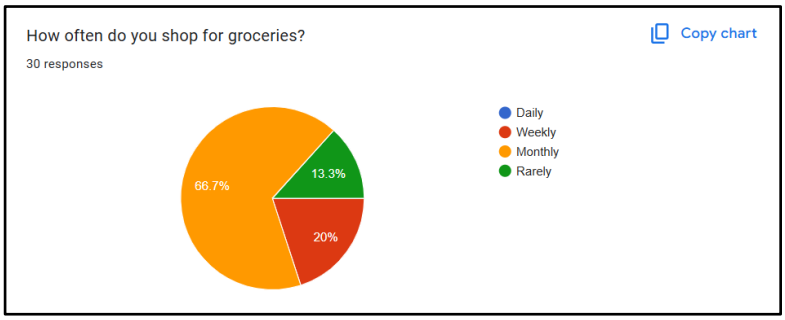


Figure 2.0

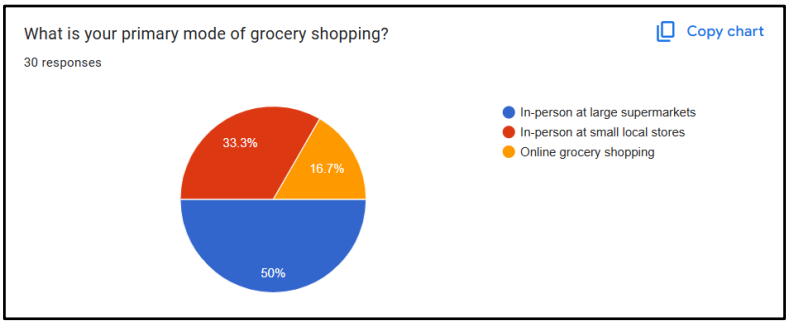
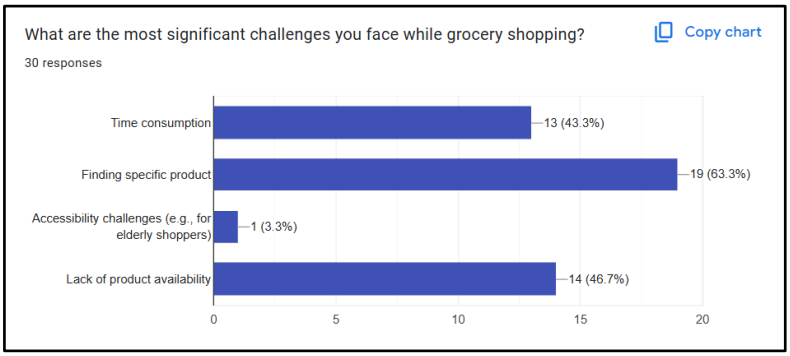


Figure 2.1



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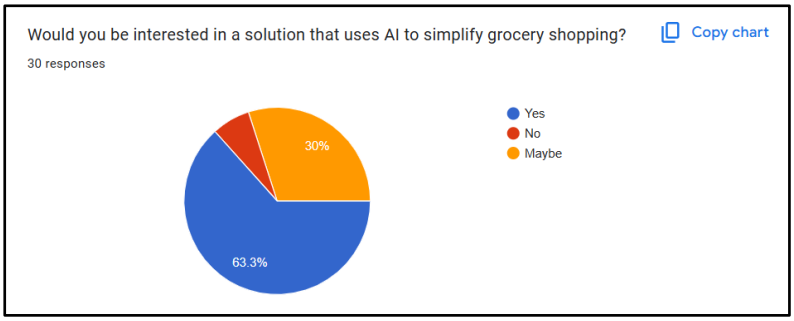

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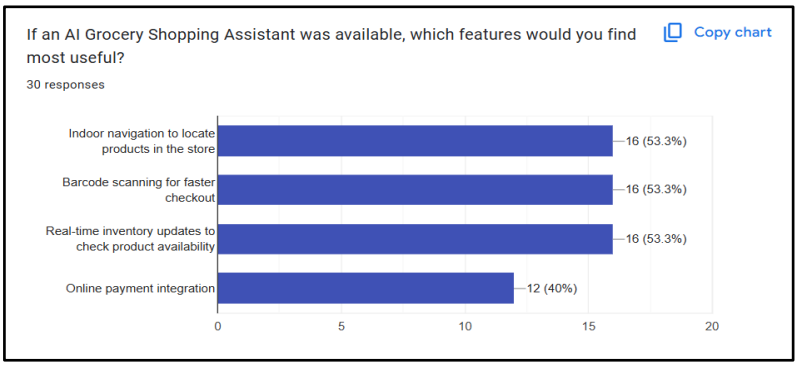

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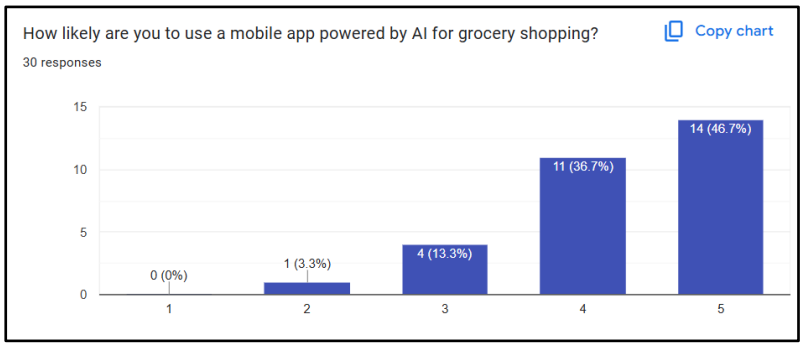

Figure 2.6

5.3 IDEATE PHASE

We collaborated as a team to identify the best way to address the problems we had gathered throughout this phase. We thoroughly evaluated the possibility of each solution during brainstorming sessions. At last, we decided to implement the idea of utilizing artificial intelligence (AI) via a mobile application to transform the grocery shopping process.

Figure 3.0 Brainstorming sessions

Figure 3.1 Improvise sessions

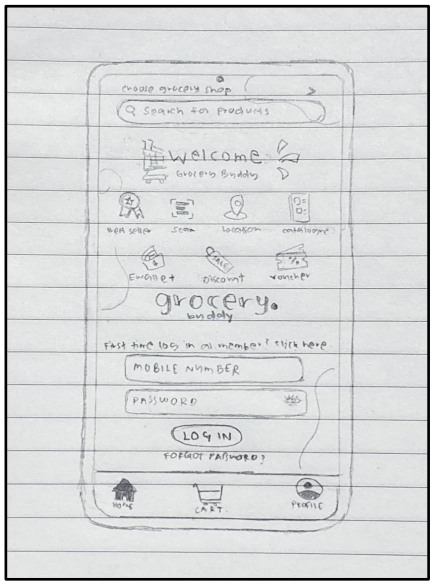

Figure 3.2

5.4 PROTOTYPE PHASE

We led the creation of our prototype in this phase by using the concepts, knowledge, and information we had collected in the earlier stages. By using this method, we make sure that our design successfully satisfied user needs and fixed the issues that were identified.

Figure 4.0

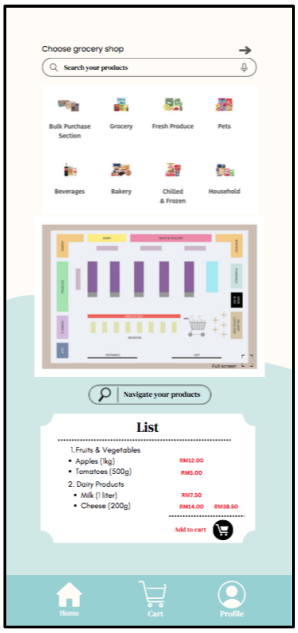

Figure 4.1

Figure 4.2

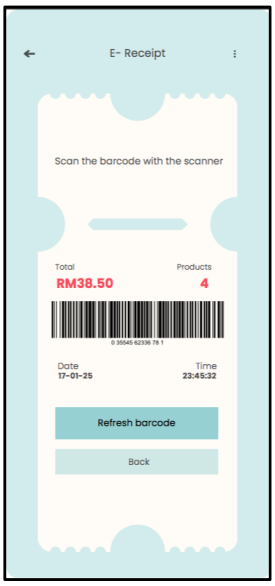

Figure 4.3

Figure 4.4

5.5 TESTING PHASE

We asked a few users to test our prototype during the testing process. Most people gave it positive feedback and said they liked how well it worked and looked. One user in particular said that the prototype would be a useful application for shoppers, focusing on potential customers as a first step in the process of buying needs.

Figure 5.0

Figure 5.1

Figure 5.3

6.0 REFLECTION

1. Syazmin Nadia Binti Ahmad Luthfi

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

My goal is to become a creative designer and work on innovative projects.

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

Design thinking helps me generate unique ideas and improve my creative problem-solving.

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

I need to explore design tools, build a strong portfolio and keep learning about design trends.

2. Nur Fatin Nabila Binti Zainudin

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

My goal is to develop my own application.

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

This project helps me to think more thoroughly to solve a problem and it blows my mind.

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

I will learn more and more from the expert to become a good programmer and achieve my goal.

3. Wan Amni Zahirah Binti Wan Ahmad Nazaruddin

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

My goal is to become a good software developer.

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

Design thinking helps in brainstorming solutions and testing concepts through prototypes.

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

I need to attend workshops and participate in design challenges to refine my skills.

4. Ayza Naseha Binti Ali Rahmat

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

My goal is to gain the knowledge and skills to work in the tech industry.

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

Design thinking helps me focus on understanding user needs and solving problems creatively.

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

I plan to improve my skills, gain experience and stay updated on tech trends.

7.0 TASK DISTRIBUTION

NO.	NAME	TASK
1.	**SYAZMIN NADIA BINTI AHMAD LUTHFI (A24CS0300)**	- Report Writing (Introductions, Detail Step, Detailed Descriptions, Evidence) - Slide presentation - Prototype
2.	**NUR FATIN NABILA BINTI ZAINUDIN (A24CS0163)**	- Report Writing (Detail Step, Detailed Descriptions, Design Thinking, Evidence) - Prototype
3.	**WAN AMNI ZAHIRAH BINTI WAN AHMAD NAZARUDDIN (A24CS0208)**	- Report Writing (Detail Step, Evidence) - Slide Presentation
4.	**AYZA NASEHA BINTI ALI RAHMAT (A24CS0229)**	- Report Writing (Detail Step, Detailed Descriptions, Evidence) - Video - Slide Presentation