UTM UNIVERSITI TEKNOLOGI MALAYSIA
FACULTY OF COMPUTING
UTM Johor Bahru

Report on Design Thinking Project

Subject : **Technology and Information Systems (SECP 1513)**

Section : **01**

Name of Lecturer : **Dr Azurah binti Abu Samah**

Date : **30/11/2023**

Title of Design Thinking Product: PurrFeast Dispenser

Video Link (youtube): https://youtu.be/8eoFfFD9gTI

Group Profile

Name: Amelia Adlina binti Azrul
Matric Number: A23CS0043
E-mail: ameliaadlina@graduate.utm.my
Phone number: 0185740060
Course: 1/SECBH
https://github.com/ameliaadlina

Name: Angela Lee Su Ing
Matric Number: A23CS0043
E-mail: angelaleesu@graduate.utm.my
Phone number: 0168681491
Course: 1/SECBH
https://github.com/angelaleesuing

Name: Tan Zhao Hong
Matric Number: A23CS0188
E-mail: tanzhaohong@graduate.utm.my
Phone number:01126910125
Course: 1/SECBH
https://github.com/TANZHAOHONG

Name: Muhammad Amirun Irfan bin Samsul Shah
Matric Number: A23CS0121
E-mail:muhammadamirunirfan@graduate.utm.my
Phone number: 01110272836
Course: 1/SECBH
https://github.com/MuhammadAmirunIrfan
https://muhammadamirunirfan.github.io

Name: Nurul Athirah Syafiqah binti Mohd Razali
Matric Number: A23CS0163
E-mail: nurulathirahsyafiqah@graduate.utm.my
Phone number: 01137550408
Course: 1/SECBH
https://github.com/nurulathirahsyafiqah

Comments by Grader:

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1.0 INTRODUCTION

Design thinking is an innovative problem-solving process by creating sundry new technology and products. Design thinking is almost certainly the best for "thinking outside the box" so that it is freedom to generate ground-breaking solutions. It helps to approach problems creatively in order to meet the users' needs. Nowadays, design thinking is widely applied to give a hand in many fields. There are five key stages in the framework of design thinking which is empathize, define, ideate, prototype and test.

Empathize 	The first stage of design thinking. This stage is to observe and engage with targeted audiences to figure out the users involved, users' needs and expectations that must be achieved.
Define 	State the users' needs and problems. Find out the difficulties needed to be overcome. Then, define a problem statement. This will guide the entire design process.
Ideate 	The part to brainstorm ideas. Be open-minded to look for alternative solutions to view the problem statement in order to produce creative products for the sake of users. At the end of this process, a few ideas will come up then move forward to the next step.
Prototype 	Prototype is an experimental phase. This phase is to identify the best way for the problem discovered. Create a costless, scaled-down version of the product to look into the idea generated. It can be displayed as an app or model.

Test 	Testing phase is to collect feedback to ensure whether the prototype functions well and make some improvements on the weakness of the prototype. Use the result to redefine further problems by returning to the previous stages.

(Table 1: 5 stages of design thinking)

2.0 DETAIL STEP AND DESCRIPTIONS IN DESIGN THINKING AND EVIDENCE FOR EACH PHASE

DATE	ACTIVITIES
23/10/2023	Briefing of the Design Thinking project was given by Dr. Azurah.
30/10/2023	Discussion with group members on what product should be designed for the project.
6/11/2023	Discussion with Dr.Azurah to determine whether our idea is accepted or not.
10/11/2023	Data collection was done via in-persons interview and Google form for the empathy phase.
16/11/2023	Discussion with group members via Google meet to define the problem based on the interview and determine the problem statement.
18/11/2023	Discussion with the group members via Google meet to brainstorming ideas to find the best solution for the problem statement for the ideate phase.
20/11/2023	Submission of initial report of our Design Thinking project.
23/11/2023	Prototype model was created and the application was drawn by using Canva application for the prototype phase.
24/11/2023	The prototype model and application is tested to determine their effectiveness.
25/11/2023	Discussion with group members via Google meet about the tasks distribution on writing report and editing video for the Design Thinking Project.
30/11/2023	Submission of the complete report and video for the Design Thinking project in e-learning platform.

Empathize

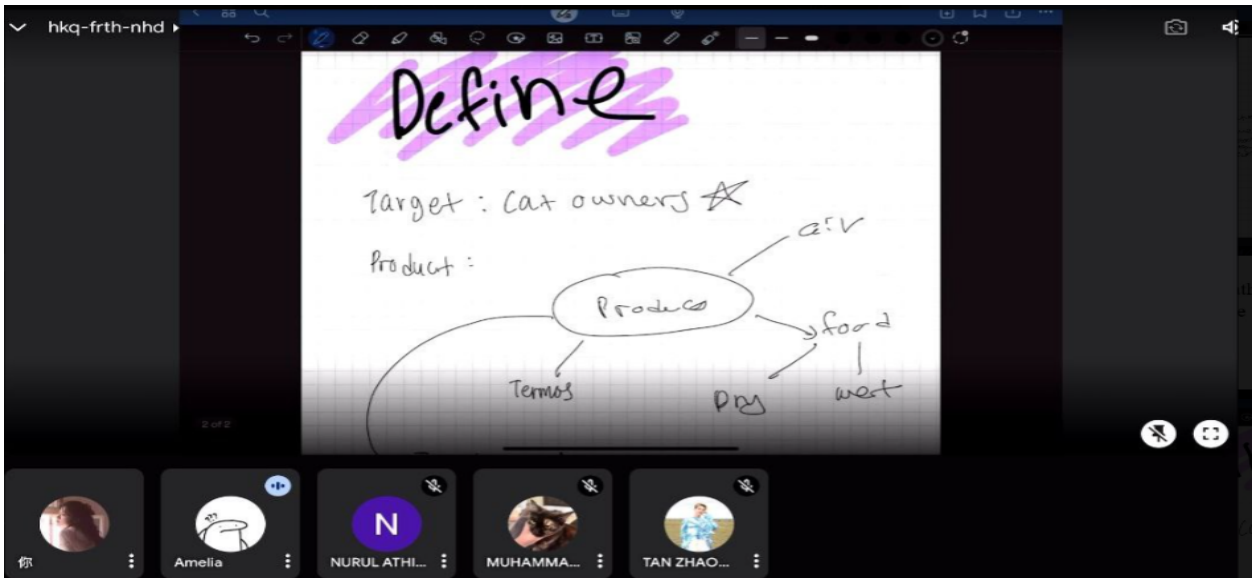
Our group target, cat owners, experienced a long list of problems so we began by brainstorming about them all. We tried to gather information about the particular problems and worries that cat owners have when worrying about their cats' well being during long absences, other than the costly solution of bringing them to a hotel for pets. We could have even conducted interviews and open discussions to achieve this goal. Our brainstorming approach was influenced by this sympathetic understanding, leading us to develop features that aim to provide owners comfort and assurance in addition to fulfilling the functional demands of cats. Based on the product, we each offer an achievable answer to the lists of problems we were given. This includes designing an application that connects to the prototype via Bluetooth and implementing more functionality into the prototype.

(Diagram : First discussion to determine the main idea for the project)

(Diagram : Interview to collect data for the first phase)

Define

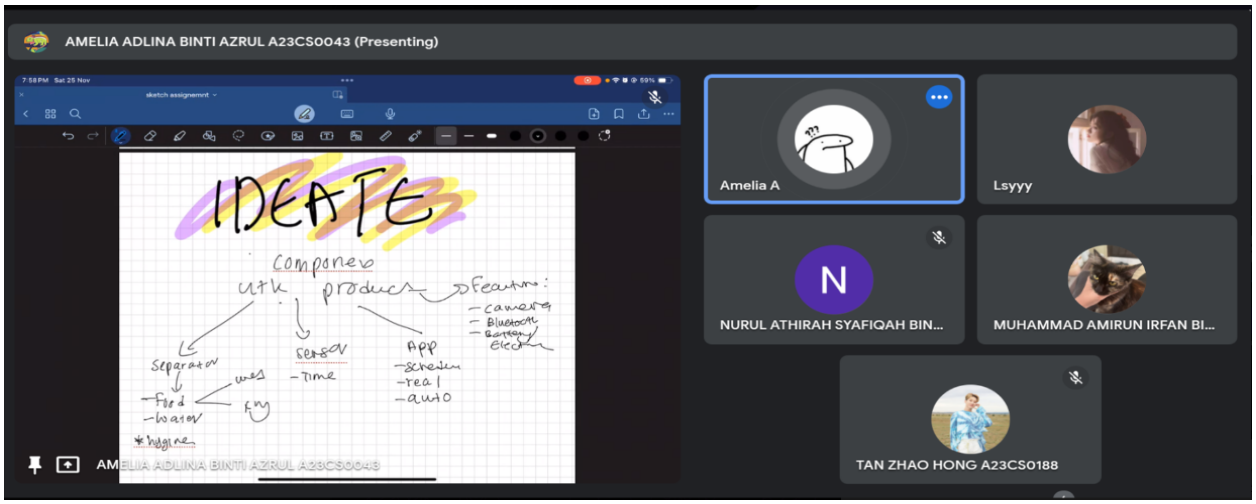
After the empathize process, we discuss through google meet with the data collected. Then, we list out our target users and problems faced in rearing cats. Problem faced by cat owners is that cats are unable to take care of themselves on their own. Therefore, most of the cat owners will send their cats to the cat hostel to take good care of their cats. However, the cat hostel requires a high cost. Besides,there are also limited options for wet cat food dispensers in the market and difficulty in preserving wet cat food for an extended period in room temperature.



(Diagram : Discussion via Google meet to define the problems for the second phase)

Ideate

After the problem statement is stated, we begin to brainstorm ideas to solve the problem. Everyone provides their own opinions and we screen out some valuable and creative opinions. Then, we list out the ideas used to give a rough draft for our prototype. The functions of our cat food dispenser include cooling technology to store wet cat food, barriers to avoid cat knocking the food over, WiFi connectivity to app for timing function and monitoring the cat, kibble function and cameras to record the condition of the cats.

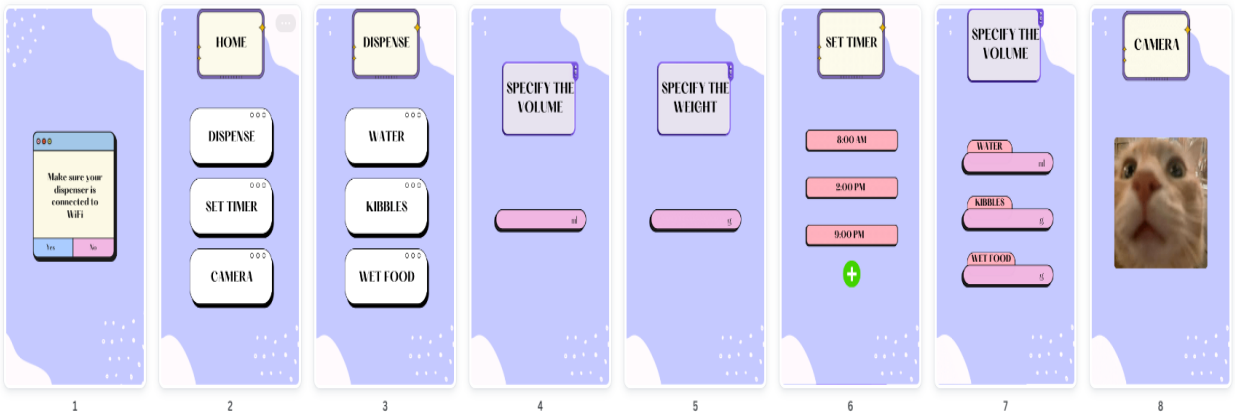


(Diagram : Discussion via Google meet to brainstorming ideas for the third phase)

Prototype

After the decision of ideas, we start to proceed to prototype. First, we use a pencil and ruler to measure the size and scale on the cardboard. Next, we cut the cardboard and use the hot glue gun to combine the cardboard into shape. We also put together the plastic bottle and the shaped cardboard. Finally, our prototype is done.

(Diagram : Prototype making for the fourth phase)



(Diagram : Prototype testing for the fifth phase)

3.0 DETAILED DESCRIPTIONS

3.1 Problem

We have listed out some problems. Cats definitely cannot take care of themselves on their own. Some cat owners are also not affordable for the expensive cat hostel. Besides, wet cat food is also hard to preserve for an extended period under room temperature.

3.2 Solution

After our discussion, we decided to design a multi-functional cat food dispenser. First of all, our cat food dispenser has three containers to keep dry food, wet food and water separately. The volume of the container is about 1.5L. For wet food containers, we place a cooler inside the container so that the wet food is durable.

Besides, we designed our product to be electronic so that it can be controlled remotely. This is because if the owners of cats forget to give food to the cat, they can remotely control the cat food dispenser to feed the cat by using an application. There are a few modes of cat food dispenser so that users can set the timer and quantity of cat food on their own. The first mode is the fixed mode which means that a fixed amount of cat food will be released at a fixed time. The second mode is the free mode which means that users can set different amounts of cat food for different periods of time. This can benefit the user who has more than one cat.

Apart from that, there are two power supply methods for the cat food dispenser which are through battery and via USB power cable. We also attached a large wide-angle night vision camera with the cat food dispenser so that users can always keep an eye on the cat's condition. When the container is almost empty, a warning will also be given in the application.

3.3 Team working

We have distributed the tasks among ourselves. All of us are writing the report together. Some of us will be in charge of the prototype while the rest of the members play their roles in video making. In this project, we respect each other and have a good team working that allows us to perform a good assignment.

4.0 DESIGN THINKING ASSESSMENT POINTS, WHEN SHOULD ASSESSMENT HAPPEN

Design thinking alone could result in poor decisions and results if assessments aren't made or our discussion outcomes aren't settled. We make sure that our process of making decisions is constantly evaluated by carefully establishing assessment points throughout the project, especially when phrases of design thinking are changing. This approach serves to reduce the possibility of neglecting important factors and promotes more comprehensive possible solutions.

Empathize

We used an in-depth approach to obtain information in order to build a solution specifically for cat owners. We ensured a varied range of perspectives by distributing Google Forms to cat owners and doing in-person interviews. These interviews helped us better understand the unique requirements and preferences of our target group while also achieving insightful information about the difficulties and worries faced by cat owners. A solid foundation for ideas has been offered by the information collected through online surveys and personal interviews.

Define

Our focus now shifts to a thorough review and summary of the problems found during the empathetic phrase in this crucial phase. Our goal is to effectively condense these findings into a clear problem statement that will serve as our process map for design. "How can we enhance and innovate an automatic cat feeding dispenser based on the insights gleaned from the interviews?" is how we initially define our problem statement. This problem statement not only points out the need for innovation, but it also reflects our dedication to improvement.

Ideate

Our creative process starts with a thorough brainstorming session during the ideation phase, with the goal of coming up with solutions based on the problem in every way. To improve hygiene, for instance, we propose a bowl covered in plastic that automatically replaces itself in the maintenance and cleaning section. Furthermore, other functions include smartphone app integration or camera monitoring. The cat food dispenser has an enormous, wide-angle night vision camera attached to it so that owners can monitor the cat using cutting-edge technology.

Prototype

After that, we started to make our prototype which is an automated cat food dispenser. One well-known idea that evolved was the design of a multipurpose electronic cat food dispenser. This dispenser is made to be both automatic and multifunctional, which will improve the cat's entire care experience.An important aspect of our projected prototype is its wireless remote performance, which is enabled by the WiFi technology that can be connected to the application that is being developed specifically to the prototype.

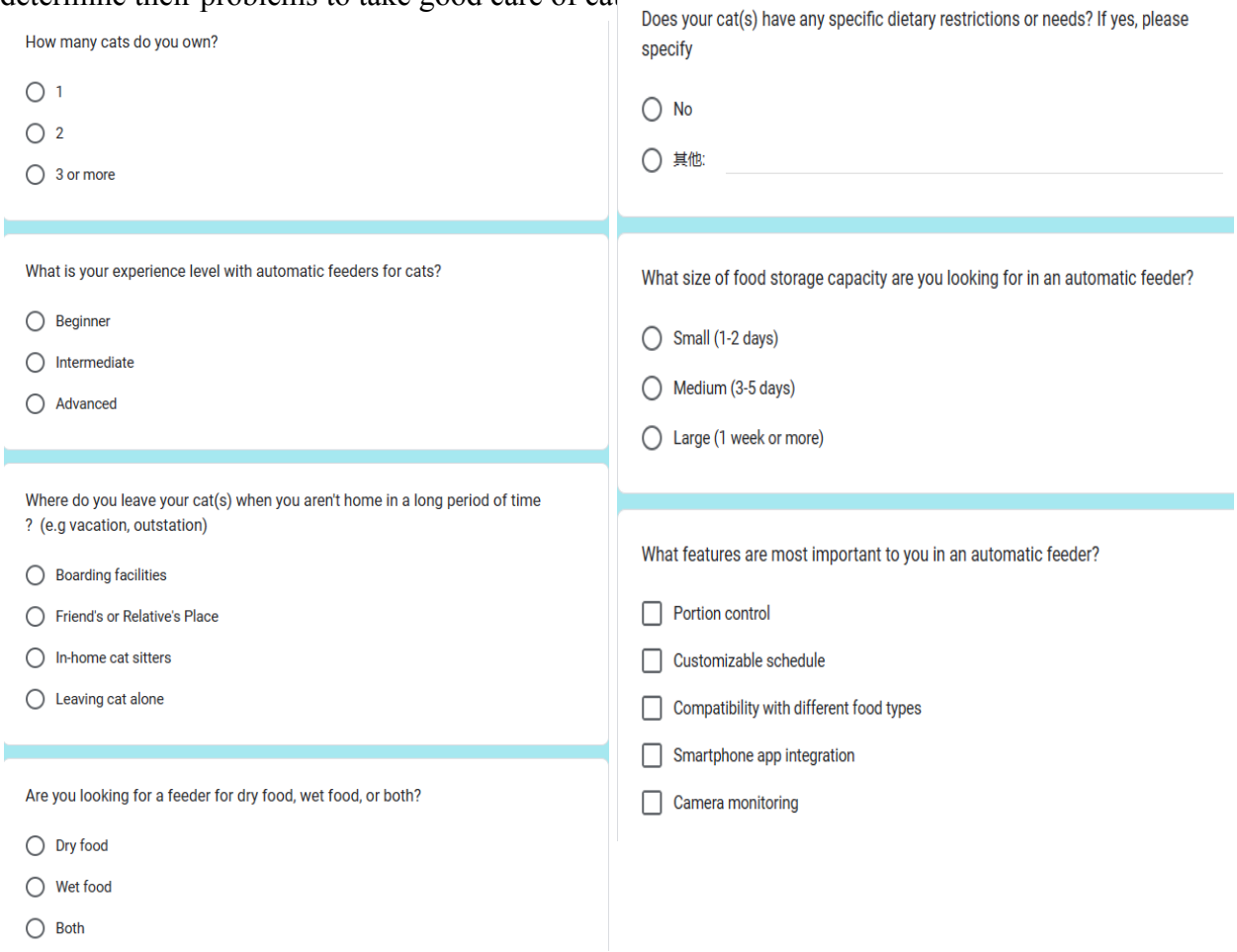
5.0 DESIGN THINKING EVIDENCE

5.1 The sample work by students working to solve the design challenge

Since some of our group members have cats, we decided to design a product that is related to cats. Through our conversation with the people who have cats, we found out that most of them face the problem of taking good care of cats when they are not with cats.

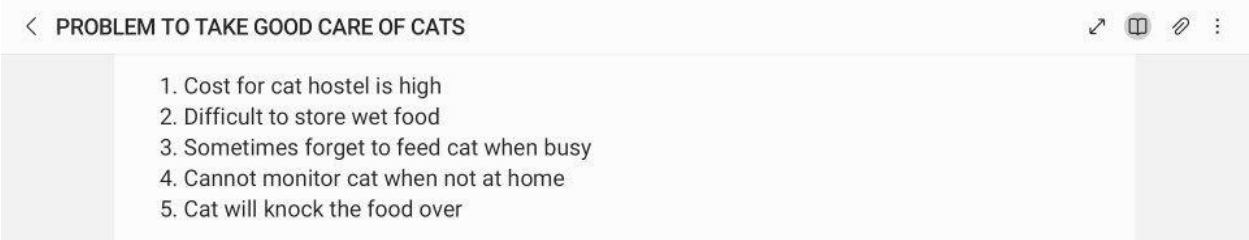
5.2 Record for each phase

In the first phase which is empathy, we need to know the problems that a cat owner faces. Therefore, we interviewed some people by using google form for those who have cats to determine their problems to take good care of cat



(Diagram : Questions in Google form)

In the second phase which is defined, we have listed out some problems that a cat owner faces. After that, we summarize the problems to define the main factor of problems.



(Diagram : List of problems that we summarize)

In the third phase which is ideate, we are brainstorming to determine the best solutions for the problems. Each of us provides some ideas to solve the problems that are listed out in phase 2. After our long discussion, we made the decision to design an electronic multi-function cat food dispenser.

In the fourth phase, which is a prototype, we worked together to make a prototype by using some recyclable materials such as plastic bottles and cartons. We also draw the app interfaces by using Canva application.

In the last phase, which is the test phase, we test our prototype with the cats to show how the prototype functions. We also show how the application works by displaying the app interfaces using mobile phones.

6.0 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?

TAN ZHAO HONG

a. My goal with regards to my program is to help to analyze the biological pathways and networks that are an important part of systems biology. The field of bioinformatics has involved the analysis and interpretation of various types of data. For example, sequence analysis, gene and protein expression and analysis of cellular organization.
b. This design thinking project allows us to analyze data and brainstorming ideas to find the best solutions for the problems. Through the five phases which are empathy, define, ideate, prototype and test, we found that the problem and solutions can be determined easily.
c. I will keep studying continuously so that I have adaptability to change in this constantly evolving technology era. I will also always improve my skills in some aspects such as databases, computational, statistical and programming techniques to improve my potential in the industry.

MUHAMMAD AMIRUN IRFAN BIN SAMSUL SHAH

a. My current goal in regard to my course/program is to understand and help develop a program or system related to the bioinformatics industry while at the same time study data management. I would also like to study further in regards to computer and technology related knowledge to ease my career path.
b. It helps me to find a problem from a user perspective while also helping me to solve it with critical thinking from a developer perspective. This will be a good experience for me as a student and allow me to feel it firsthand on how will I approach the problem and solve it
c. The necessary action that I need to take is to further develop my skills as a programmer and a developer especially in the programming area while also taking the chance to experience solving more problems. I can develop these skills through platforms like Stack Overflow and LeetCode.

ANGELA LEE SU ING

a. My goal is to help to extract meaningful information from large sets of biological data, such as DNA sequences, protein structures, and gene expression profiles. Regarding the course, I have further understanding about basic components and functions of computers. This enables me to use the computer to solve problems and also collect data. Therefore, I want to have the hang of the knowledge and skills learnt in this course completely. Through this, I can accumulate knowledge and apply it well in order to achieve my goal.
b. In this design thinking, I have learnt the importance of teamwork. All members have given cooperation to complete this design thinking by combining the idea and finally creating a satisfactory prototype. This gives me a sense of achievement in our team work. Besides, I also learn how to proceed the stages in design thinking which is empathize, define, ideate, prototype and test. Therefore, I am able to cooperate with my partners well by applying these skills in the future to reach my goal.
c. I plan to enhance my problem-solving skills to address challenges faced with a systematic mindset. Moreover, I will be open-minded to take on board any creative ideas so that I will not miss any opportunity to develop new technology and products. Besides, communication is a very significant part to improve potential in the industry. I will always practice to express my ideas concisely to boost the efficiency in communication. Through this, I believe that I am able to improve my potential in industry.

AMELIA ADLINA BINTI AZRUL

a. My main goal as a bioinformatics student is to become an experienced analyst who is knowledgeable about the specifics involved in biological data mining. I want to be knowledgeable in a wide range of skills, such as multiple programming languages and computational biology. In the future, I hope to use my knowledge of bioinformatics to advance technology in our nation, especially as it relates to issues facing the environment, agriculture, and healthcare.
b. The application of design thinking has brought insight into the value of using a problem-solving approach to real-world issues in the field. The elements that are essential in bioinformatics solutions have been made accessible by design thinking. Gaining skills in these fields will help me reach my goal of being a bioinformatician who can solve problems creatively and advance both science and society.
c. My improvement strategy focuses on developing fundamental bioinformatics abilities, such as proficiency with relevant programming languages, bioinformatics tools, and computational biology. In particular, I want to improve my knowledge such as data visualization and ethical data handling for biological systems.

NURUL ATHIRAH SYAFIQAH BINTI MOHD RAZALI

a. My goal is to be able to produce software of increasing size and complexity for a variety of application fields by applying fundamental knowledge, computational principles, and skills from the field of bioinformatics. Aside from that, my goal was to use my skills in computer science, databases, machine learning, and other IT fields to analyze and evaluate huge quantities of biological and medical data.
b. This design thinking allows me to understand the problem that people are experiencing. I also learn how to tolerate group members and work well with others. It has an impact on me because it helps me to think critically in order to solve a problem. I also gained a few new general understanding about technology from this design thinking, such as user interface and the difference between bluetooth and wifi connectivity. It assists me in improving myself in my course.
c. The necessary action that I must take is to increase my technological skills and knowledge in order to improve my potential in industries. That means I need to do well in my course and always strive to participate in some technology-related competition to develop my critical thinking and skills. I also need to develop my communication abilities because it is a necessary skill for me to reach my full potential.

7.0 TASK FOR EACH MEMBERS

The tasks have been evenly divided among the group members. In order to make sure the assignments are equal, Amelia divided up the work, assigned it to the group members, and led a discussion. Ultimately, each member of the group contributes to the collective report writing process. Writing the introduction and definition contents is Angela. When it comes to the assessable points for empathy and design thinking, Amelia and Amirun are taking over. The people in charge of the ideate and detailed description are Athirah and Zhao Hong. Additionally, creating prototype models and in charge of design thinking evidence falls to everyone. The person in charge of video editing is Amirun Irfan. Last but not least, Amirun Irfan and Zhao Hong are in charge of creating the application's user interface.