UNIVERSITI TEKNOLOGI MALAYSIA

SCHOOL OF COMPUTING

Faculty of Engineering

TECHNOLOGY & INFORMATION SYSTEM

Section – 07

Lecturer: Dr. Haswadi bin Hasan

CHP – 5

SYTEM UNIT

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Introduction

Design thinking is defined as an iterative and non-linear process that can help us to understand the problem that is faced by the user, to define and make an assumption about the problem chosen, and to challenge them with the analysis and information from the experiment that we did. Which able us to think about new, alternative ways in solving the problem. Design thinking is very important nowadays for inventors and developers to improve their services and create new products up to user expectations. It is also the best way for them to think outside the box in viewing a problem and undercover new ways of improving the user experience in using their services or product.

A secondary device is known as non-volatile, long-term storage. Computer systems usually transfer the desired data from the secondary storage to the primary storage through input and output channels. Secondary storage is important in preventing our data and programs stored in the computer memory to be lost when we switch off the computer. So the modern day's computer has more secondary storage than primary storage as secondary storage's prices are less expensive than primary storage. There are three main types of secondary storage which consist of solid-state storage devices, optical storage devices, and magnetic storage devices.

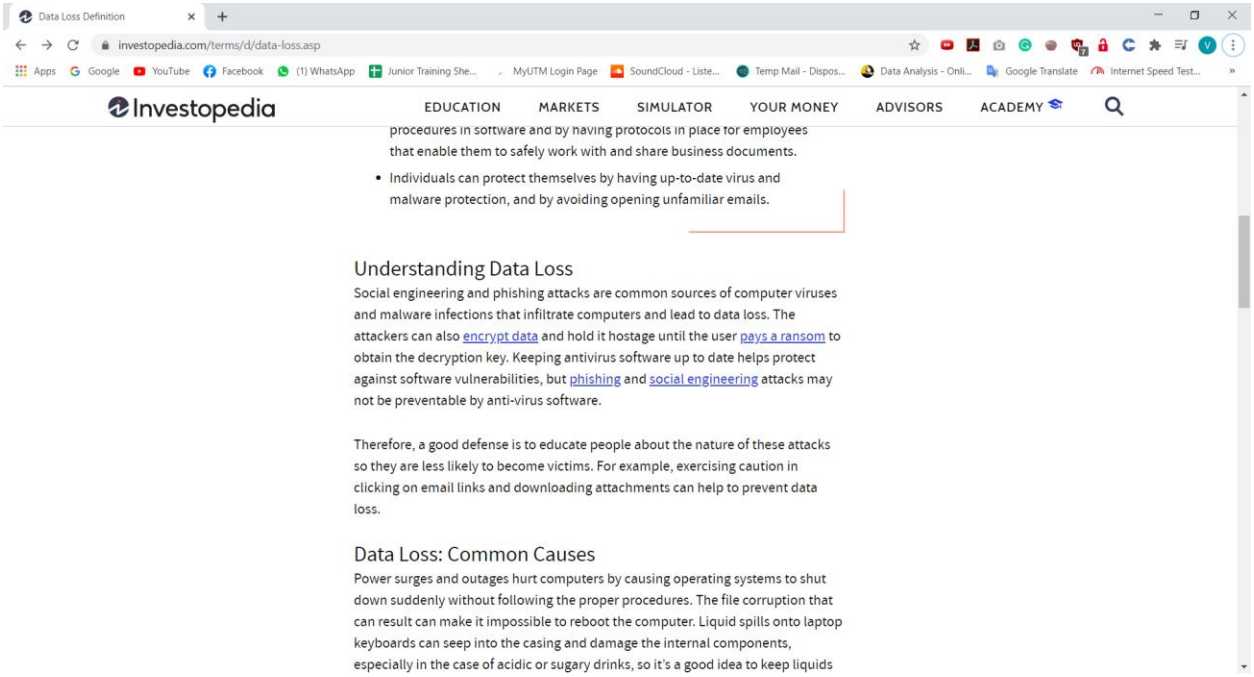
Detail Steps

Design thinking has five common steps which are empathizing, define, ideate, prototype, and test. Stage one is empathizing, empathizing with the problems that the user faced allowed us to understand the problems through their points of views. Stage two is defining, which is when we able to state our users' needs and expectations in solving the problems by accumulating the information we gather during the empathize steps. Stage three is ideate which includes us to start to think in a new mindset for new alternative ideals in analysing and created the most desirable solutions to the problems stated. Stage four is the prototype. It is when we start our experimental phase which will help us to identify the best possible solution for each identified problem. It is mostly involving paper prototyping in investigating the ideas we have generated in the ideate phase. Stage five is testing our prototype. This stage is very important as the result that we obtained often used to redefine one or more further problems faced during the testing stage. It will able us to return to the previous stages to make a further alteration in our prototype to create a high-quality product up to the global standard.

Detailed Descriptions

Nowadays, data loss has spread widely in all devices. We can find that while using our PCs or even handphones. This is not the only problem, it goes far once it comes to then big companies, brands, or even government institutions.

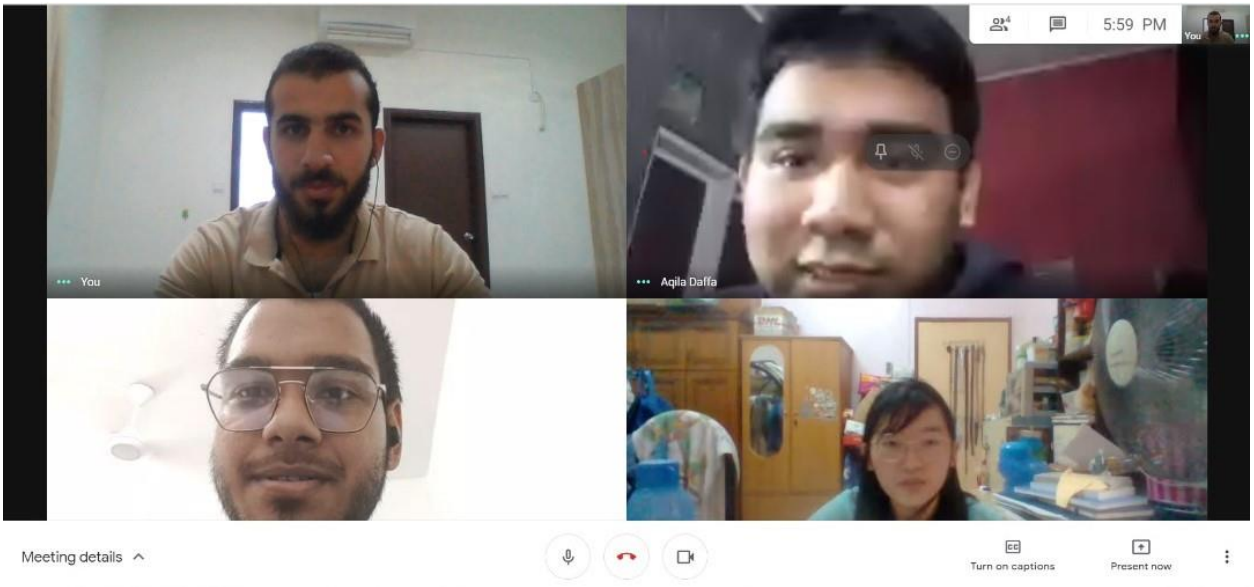
We have searched about data loss (system crash) to find out more about how is happens and why and we have got much information but we would rather specify this report on the description.



Picture 1 (searching)

In the begging I would like to define data loss simply in a few words: it's when an important, valuable or sensitive data got disappeared it could be happened by human error, malware viruses, or power failure.

After we made meetings and these were more than 80 minutes and each member tried to find out about that problem more and each person was searching on his/her own as well to know more and get as much as information he/she could.



Picture 2 (meetings)

We have concluded that these days there are many ways to save data and many ways to have the backup of the data on such as online clouds or any kind of storage like HHD, but what about those days back on for example in 1990. We have tried to found out how were they storing data as and after a few searches we found about the SSD. It is similar for the HHD but that is what they have got back there.

Picture 3 (SSD)

Finally, it is approved by the doctor in a few days and all of the favor goes to each person on the team.

Design Thinking Evidence

There are total of five steps of design thinking which we followed in sequential order. In this part, we are going to show some images as evidence of our work.

I. Empathy: In this part, we took some interviews of our friends and an expert, Mr. Aris Arifin. When he was asked about his problem with pc, he said that it was the storage of huge amount of data. Due to excess data storage, his data storage device crashed, and all his data was lost.

Then we also interviewed some of our friends. They were asked about the problems they were facing while using a computer. Their answers have been written below:

1st friend: Once my hard disk crashed and I had to replace it and all of my data was lost.

2nd friend: My computer takes a lot of time to open a software. The computer is also very slow.

II. Defining the Problem

Then we started to gather all the problems that have been faced by the people and started discussing my arranging virtual meetings about what could be the solutions to all these problems. Then all the members came to a solution,

Problems:

- Computer crashed and loss of data.
- The computer is very slow, applications take time to open.
- A damage on the computer caused data loss.

Solutions:

- A device which does not crash easily.
- A device which can make the computer work fast.
- A more durable data storage device.

III. Ideate

It was time to make our thoughts into action. We started doing planning and develop ideas on how to successfully create the solution. We identified all the problems and their solution.
Finally, we started planning on how to build the prototype.

IV. Prototype

After compiling the ideas, one of our group members took the initiative to make the prototype. With the material: Pieces of cardboard, sample of SSD printed, Glue, and Scissor.

The first step: we cut the cardboards into the size of sample of SSD printed.

The second step: merge the sample of SSD printed with the cardboard.

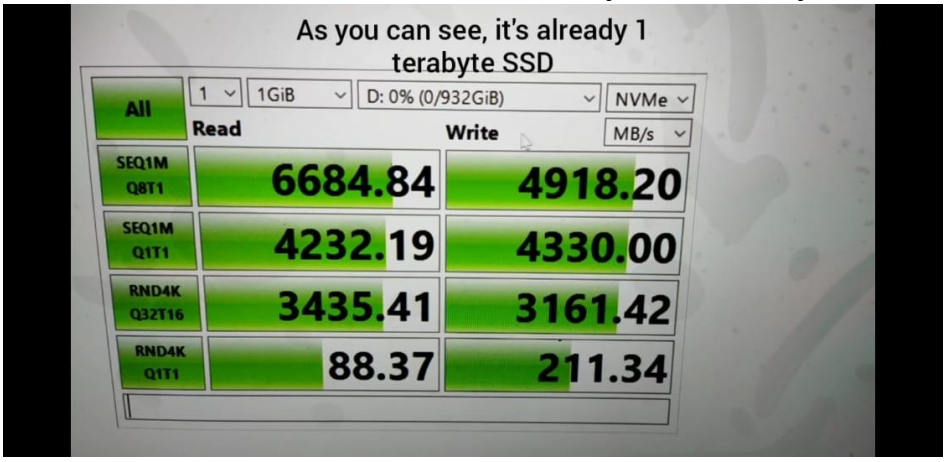
Then after all those process, the prototype was finally made.

V. Testing

After successfully making the prototype, we did the testing to check whether the Solid State Drive (SSD) of 1 Terabyte works or not.

The first step: Put the SSD into your Laptop or PC.
The second step: open task manager and then click performance.

And after that as we can see the SSD of 1 terabyte worked very well.



Reflections:

Reflection Muhammad Aqila Karindra Daffa (A19EC3010):

In nowadays, the revolution of this era is really fast growing as we can see the development of technology in this world is getting bigger and bigger. Therefore, as a student we have to follow the progress of this technology era by studying more about how to manage the technology well.

This project (Design Thinking Project) gave me a lot of knowledge about technology that will be important for me in the future. We learnt about how to analyse or define a problem that ever faced by someone then we have to make our decision to solve the problem, in this part we can get many skills that will be used in our future, for example, a good communication and teamwork skill (we can get it when we did the discussion with our group about defining the problem), a problem-solving skill (when we tried to make our decision to solve the problem).

My goal from this course is I want to know more about technology, how technology is used, and how we can improve the technology in the future. I think this project is really important and I am so glad that I did this project in a group with all members from different countries, we got so much knowledge and skills from this project (as I mentioned before). To sum up, if we want to improve our skills or potential in the industry firstly, we have to make so many friends (no matter they are from various countries or not) because they will help you to improve your communication well. Second, we have to join an organization that is related to our course in the faculty because it can increase your teamwork and leadership skills that will be used in the industry. And the last, we have to always do some explorations of any problem or event that occurred in this world because it can keep us update about the growth of this era.

Reflection LIM LI TING (A20EC5008):

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

As a student of the software engineering program, my goal is to be a software engineer that able to analyse and design a full-function software system. I hope that when I graduated I will be able to design, developing, and testing a system that fulfills my user needs. Other than that, I wish that I can work with the users to determine their software needs. Move over, I want to be able to fix and update the system to ensure my user has the optimal experience in using the system made. Besides, I will have learned to work with other developers and engineers to create new software.

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

The design thinking project is important for me to archive my goal as a software engineer is because I can learn to understand what my user needs. Other than that design thinking also help me to learn to better communicate and working together with others which is necessary for designing a system. Besides that, design thinking is a way for me to think critically in solving problems faced in designing and improving a system. Design thinking projects also help me to accept others' opinions to improve our tasks perfectly.

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

To improve my potential in the software engineering industry, I planned to improve my programming skill in using C++ and Java. Besides that, I will improve my knowledge of software engineering by reading more books and journals regarding software engineering. I also planned to improve my communication skill with others as communication is important in understanding other problems and needs. Finally, I will learn to work together with others by accepting other opinions and help others when they have problems with their task.

Reflection Ahmed Abdalla Ramadan Abdrabbou (A19EC4043):

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

I have enrolled computer science (software engineering) after ages of thinking.
I was thinking in the begging to enroll in mechatronics then computer engineering to achieve what I thought I liked but here I am changed my mind to be here. I actually do not have a major goal but I think I am just trying to be a good programmer, and I am trying to find out what kind of programming I would prefer more such as web development, gaming or whatever

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

   First, I have known the real problem that I do not know what kind of programmer I really want to be in the future. Then I am trying to know about each of these kinds of programming. While this I am trying to know the basics and try to involve myself in one these to get an experience.

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

   First, working on the programming basics to understand and be allowed to know about each language. These basics such as ++C, problem solving … etc.
   Then trying to apply it on the major that I would prefer and involving on it.
   Finally, I will be chosen my way to work on.

Reflection Mohammed Ruzhan Islam (A20EC4028)

- I am a software engineering student. I like to work with information and technology systems. Through software engineering, I can create or modify a software. But before that we need to have a basic idea about all the IT components that are required to work in this field. I think through this course I can acquire those knowledges.

- The design thinking project has been a new experience for me. I learned many new things besides my regular learning like, task management, communication with others, how to agree on an opinion, and last of all how to think and solve a problem. As a software engineer, I have to provide solution to the problems of the user. I think design thinking has been the first step for me in this matter.

- I think software industry is a very competitive and big industry specially in the recent times. To survive in this industry, we need to enough qualified. Now, not only the academic qualification is enough for one to survive here. People need many other qualities like management, communication. I hope to develop these extra skills besides my academic qualification, which I think is the main objective of design thinking.

The Tasks for Each Members:

A. Interviews:
   - Interview with expert = Muhammad Aqila Karindra Daffa (A19EC3010)
   - Interview with normal clients = Mohammed Ruzhan Islam (A20EC4028)

B. Problem-solving:
   - All members (Muhammad Aqila Karindra Daffa (A19EC3010), Mohammed Ruzhan Islam (A20EC4028), Lim Li Ting (A20EC5008), Ahmed Abdalla Ramadan Abdrabbou (A19EC4043)), we did some discussions.

C. Prototype:
   - Muhammad Aqila Karindra Daffa (A19EC3010)

D. Testing:
   - Muhammad Aqila Karindra Daffa (A19EC3010)

E. Video Editing:
   - Mohammed Ruzhan Islam (A20EC4028)

F. Reports:
   - All members (Muhammad Aqila Karindra Daffa (A19EC3010), Mohammed Ruzhan Islam (A20EC4028), Lim Li Ting (A20EC5008), Ahmed Abdalla Ramadan Abdrabbou (A19EC4043)).