SCHOOL OF COMPUTING
SESSION 2019/202 SEMESTER 2

SCSP 1513-06

Technology and Information Systems

Design Thinking

Databases

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INTRODUCTION

Design thinking is a non-linear, iterative process aimed at educating customers, questioning assumptions, redefining issues and developing innovative design and test solutions. The approach consists of 5 phases — Empathizing, Defining, Ideating, Prototyping, and Checking, and is most useful when dealing with problems that are unresolved and uncertain.

A database is an organized collection of data, generally stored and accessed electronically from a computer system. Where databases are more complex, they are often developed using formal design and modeling techniques.

Database management system is important because it manages data efficiently and allows users to perform multiple tasks with ease. A database management system stores, organizes and manages a large amount of information within a single software application.

Advantages

- Reduced data redundancy.
- Reduced updating errors and increased consistency.
- Greater data integrity and independence from applications programs.
- Improved data access to users through use of host and query languages.
- Improved data security.
- Reduced data entry, storage, and retrieval costs.

It still has some shortcomings and as well as some disadvantages in the same factors. So, that is what we are going to discuss and try to improve with our prototype.

EMPATHY

The first stage of the process of design thinking helps you to develop an empathetic understanding of the problem you are trying to solve, usually through user research. Empathy is key to a system of human-centered development such as design thinking, as it helps you to set aside your own world perceptions and gain real insight into users and their needs.

Databases that stores related information across multiple tables and allows you to query information in more than one table at the same time. It's easier to understand how this works by thinking through an example of databases.

We found these various problems to be somewhat significant but it seemed to be critical after we conducted an interview of Dr. Muhammad Iqbal Tariq bin Idris on this matter. After talking to him we found that the current databases still have too many disadvantages. So, we moved forward with keeping these disadvantages in mind.

Here is the list of questions that we prepared to ask our respondent.

(i) What do you think about the security of information processing in the database system?

(ii) Are there any specific limitations and barriers in collecting and processing information in database system?

In short, stated below is the information about our respondent.

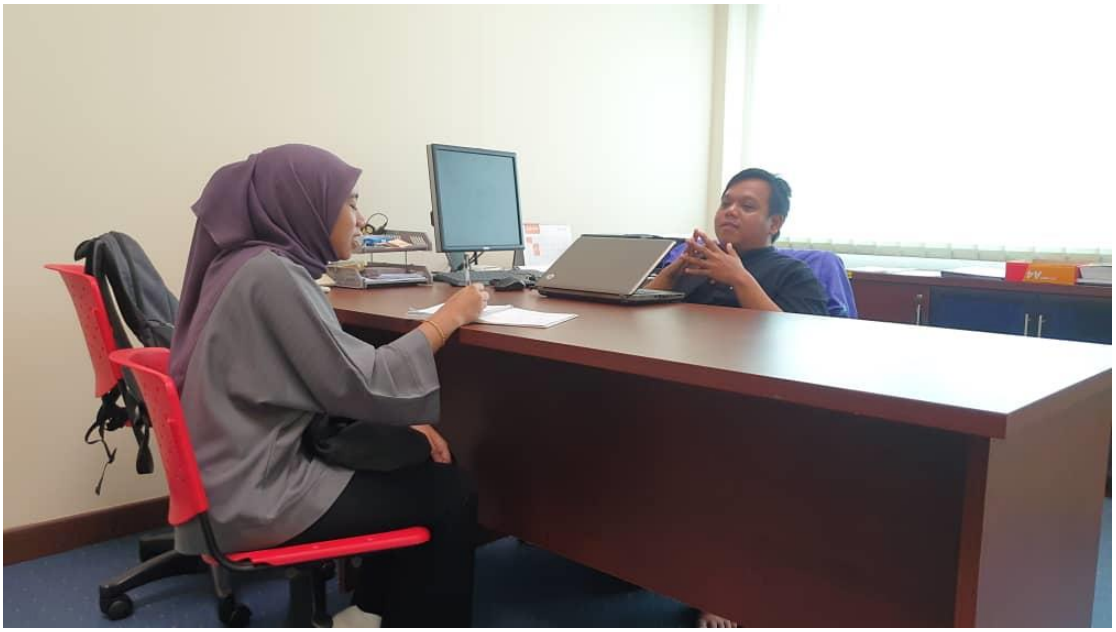
Name: Dr. Muhammad Iqbal Tariq bin Idris

Senior Lecturer (DS51),

School of Computing,

Faculty of Engineering, UTM

E-mail: miqbaltariq@utm.my



Through the interview, we have concluded some highlights that are referring to the importance of database based on our respondent's experiences.

For the first question we asked, the respondent answered that absolutely the database system has better security than the physical database or the other name is manual file system. This is because when it comes to database means all the data are in virtual form which concerns the privacy of it.

Moving on to the next question, our respondent explained he could not sure on whether there are limitations or not. But one thing he realised was everyone needs to have be aware with the revolution of database. Why is it important? Collecting and processing information using database system really gives positive feedbacks to the user. By operating and applying the use of database when be needed would reduce the cost of database. This is because everyone is already aware and knows the basic of using IT that includes database thus, there's no need to attend any beginner class.

DEFINE

You store the knowledge you generated and obtained during the Empathize phase in the Define period. You are reviewing and synthesizing your findings to identify the key issues that you and your team have found so far. You should always try to define the assertion of the issue as you do this in a human-centered way. The key problems that we found are actually very basic if we mention them casually. But these basic problems are also very crucial in the actual sense. The issue of limited size, security and speed. The database created to replace the manual file system. And also, be able to organize large scale of data in a time.

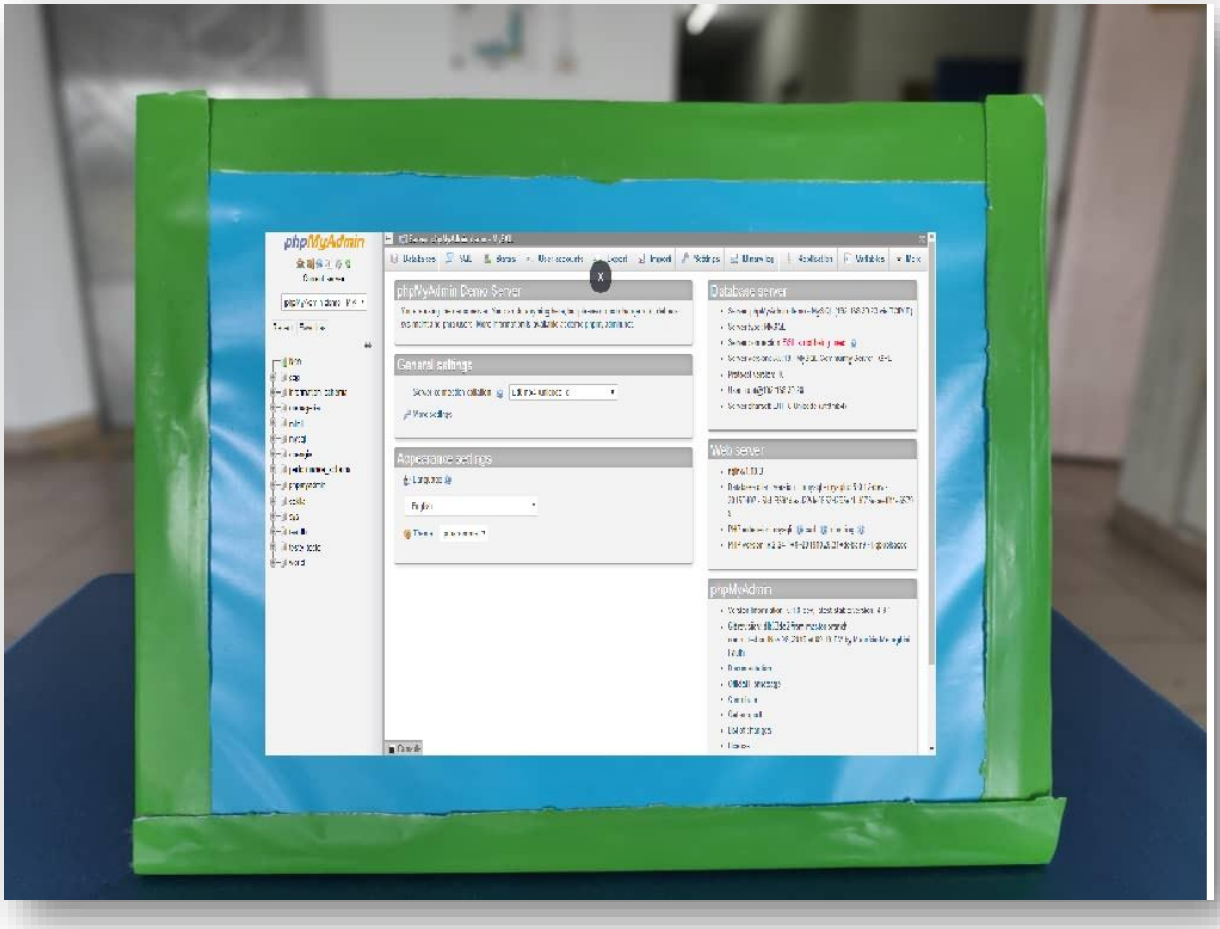
IDEATE

Designers are able to come up with ideas when they reach the third level of design thinking. The strong information experience from the first two phases means that you can start thinking outside the box, search for different ways to view the issue, and find innovative solutions to the problem statement you have made. The problems that we faced led us to the decision that the future of databases is dependent on the cloud systems. Cloud storage is a very useful and lucrative way of storing data.

As it is in a foreign server so there is no problem of portability. The speed of the service depends on the internet and the type of node connection. And if it is password protected then we can ensure a proper security for our data. So, we decided on making a prototype that will be able to provide improvements for all the aforementioned shortcomings.

PROTOTYPE

Prototype is the preliminary version of a system which is used to explain the idea and also to design the other forms. To design the prototype, at first, we held a meeting. We researched about some existing systems including the software's and hardware's which relates to our project. Then we designed our prototype with the help of the knowledge we got from our research. We used different stationery products to make the prototype. That is how we developed the prototype.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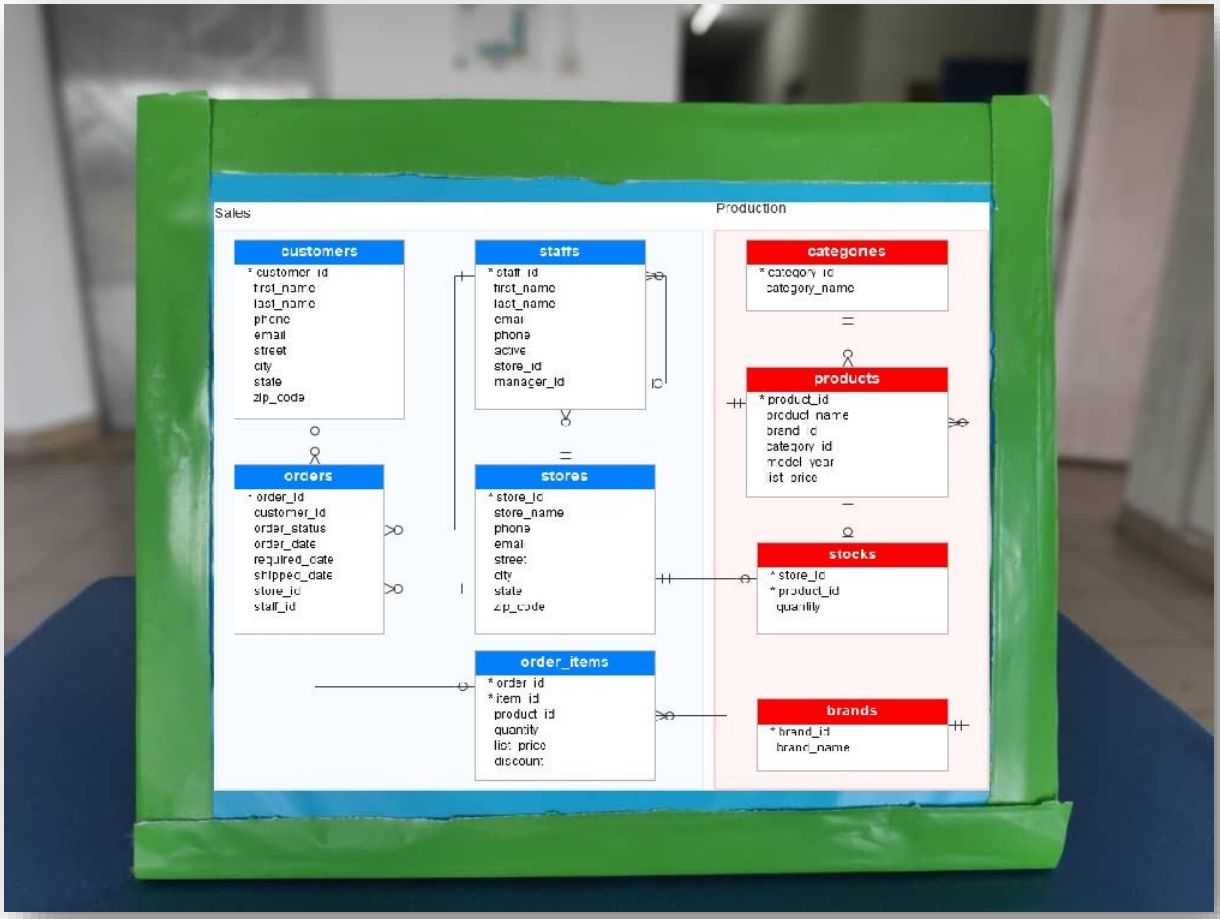
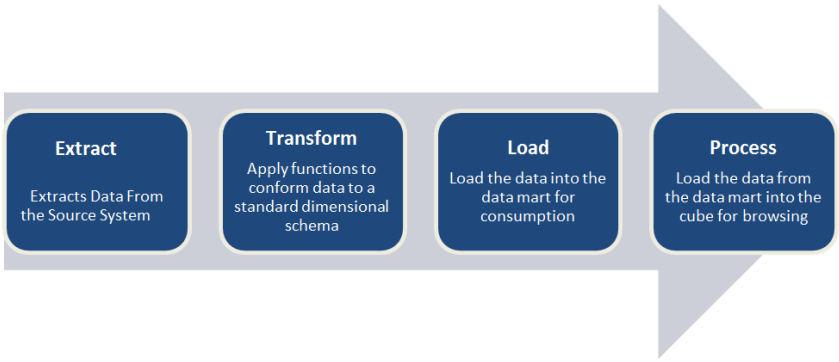


TESTING

Designers or evaluators use the best solutions found in the prototype phase to rigorously test the complete product. This is the final phase of the prototype, but the results produced are often used in an iterative process such as design thinking to redefine one or more additional problems. Instead developers can choose to go back to previous stages in the process to make more revisions, improvements and refinements to exclude alternative solutions. The testing process is given step by step below:



REFLECTIONS

Developing and refining skills that help us to understand and respond on rapid changes in our environment and actions has become crucial over recent decades. The world has become profoundly interconnected and dynamic, and design thinking offers a way to cope more human contortedly with all this transition. Design teams use design thinking to fix unresolved and unknown problems (otherwise known as wicked issues) as the system reframes these issues in a human-centered way and helps developers to concentrate on what is most important for consumers. Design thinking gives us a way out of the box to think and dive into problem solving that bit deeper. This lets developers perform the right kind of testing, develop models, and check products and services to find new ways of meeting the needs of consumers. Over the past few decades, the design thinking process has become increasingly popular because it has been key to the success of many high-profile, multinational organizations — companies including Google, Apple, and Airbnb, for instance, have made a notable impact. This outside the box thinking is now being taught at the world's leading universities and is being promoted at all business levels. Due to its ability to create new ideas in a disruptive and innovative way, design thinking transforms the environment around us every day. Design thinking is more than just a technique, it opens up a whole new way of thinking and provides a series of hands-on methods to help you implement this new way of thinking.

VIDEO LINK:

Video Link : https://youtu.be/ZTXB0JY_45g

TASK FOR EACH MEMBER

NO.	NAME OF MEMBER	TASK
1	Bayes Ahmed Shoharto (A18CS4051)	❖ Report Writing ❖ Idea generation ❖ Making presentation slides ❖ Taking Interview ❖ Prototypes design ❖ Recording video ❖ Video editing
2	Rezwanul Ashraf Ruddro (A19EC4020)	❖ Idea generation ❖ Making presentation slides ❖ Taking Interview ❖ Prototypes design ❖ Recording video ❖ Video editing
3	Nurul Syamira binti Amat Jifri (A19EC0145)	❖ Idea generation ❖ Making presentation slides ❖ Taking Interview ❖ Prototypes design ❖ Recording video

*****THANK YOU*****