DESIGN THINKING:

EASY-ACCESS PARKING SYSTEM

SECP1513-06 : TECHNOLOGY AND INFORMATION SYSTEM

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1.   Introduction

In an effort to find potential methods and solutions that may not be readily apparent in our initial level of understanding, **Design Thinking** is an iterative method in which we aim to understand the consumer, question assumptions, and redefine issues. Simultaneously, Design Thinking offers a solution-oriented approach to fix the issues.

There are 5 phases of design thinking:

- Empathize
- Define
- Ideate
- Prototype
- Test

Easy-access Parking System (EPS) is a system that make use of sensor technology and make them aware on parking options in the area.This system helps to minimize the time spent

looking for car parks, and the use of smart parking systems will ensure better use of unoccupied parking spaces.

2.   Details of Design Thinking Process

For this project, we wondered on how to perfect the parking lot system. So, we made it as our topic and proceed with the steps below.

❖ **Step 1: Empathize**

To create the products and services, we need to understand who our users are and what they need. What are their concerns and challenges do they face? What are their expectations regarding the product we are designing?

Example: we interviewed 3 people to find their problem regarding parking lot.

❖ **Step 2: Define**

In define, we determine the user problem that we want to solve. First, we collect all of our findings from the empathize phase and start putting them together.

Example: we have an online meeting by video call on WhatsApp to list the problems and brainstorming to find the solutions.

❖ **Step 3: Ideate**

Ideate consists of the generation of ideas. We should know who our target consumer are at this stage, and what they want from our product.

Example : we brainstorming on how to build a system to include all of our solution. Then, we decided to make the Easy-access Parking System to solve the problem.

❖ **Step 4: Prototype**

In prototype, we will create a prototype based on the ideas that we generate on step 3**.** A prototype, be it a basic paper model or a more immersive digital representation, is basically a scaled-down version of the product.

Example: we made and developed EPS prototype using a tissue box as a monitor and a small box as a ticket provider and card scanner.

❖ **Step 5: Test**

The fifth step in the Design Thinking process is related to testing by putting our prototypes in front of potential consumer and seeing if they like it or not..

Example: we interviewed 2 people to test our prototype and give reviews on it.

3.   Detailed descriptions on Design Thinking Process

For this project, we decided to make a system that can improve the parking lot system to all drivers including OKU drivers. To find the perfect system for our project, we do the design thinking process step-by-step.

First of all, for empathize, we interviewed three drivers including one OKU driver to ask if they have any problem finding a parking space. All of them replied that they do have problems regarding that topic but each of them have different concerns about that. The problems is explained in Table 1.

Image 1: Interviewing (Empathize)

The second step is define. Due to the pandemic, we cannot do any meeting physically as all of us lives far from each other. So, we decided to do the meeting virtually by video-calling on WhatsApp. While video-calling, we used Google Docs to discuss and list all of the problems (Table 2) that our interviewees are facing, together.

Image 2: Discussing (Defining)

Next, we proceed ideate immediately after we finished defining. After a lot of brainstorming on how to put all of our problems in one system, we decided to make the Easy-access Parking System (EPS). We discussed on how should we create the prototype, what material should we use, etc. Ridzwan sketched the prototype by using Microsoft Words. After we all agreed by the design of the prototype, we proceed on creating the prototype.
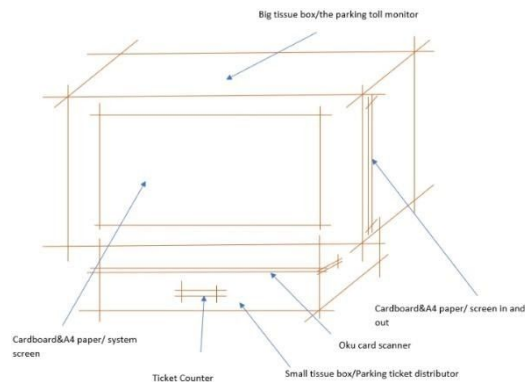

Image 3: Sketching (Ideate)

The prototype was created by Sulaiman as all of us cannot meet with each other. Despite only one member of the group who create the prototype, the prototype was successfully created without any huge flaws.

Image 4: Prototype

Lastly, we let two other drivers watch the video about how the prototype functioning. Both of them gave positive reviews on how the idea and the system of the prototype can help them finding a parking spot more efficiently and easily without wasting a lot of their time .

Image 5: Interviewing (Test/Feedback)

4. Design thinking evidence

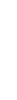## 4.1 The sample work to solve the design challenge

Below are the sample works throughout our journey to solve the design challenge:

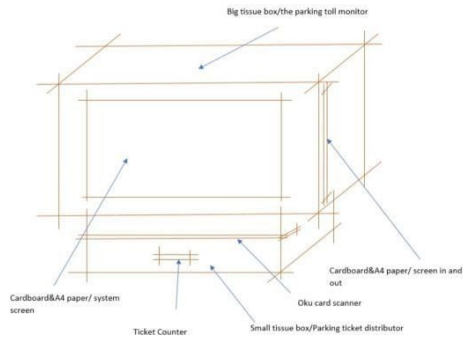*Figure 1 : Empathy*

Figure 2 : Define

Figure 3 : Creating a prototype   *Figure 4 : Ideate*

Figure 5 : Feedback from user

4.2 The record for each of design thinking process

4.2.1 Empathize

We have interviewed 3 drivers to ask if they have any problem finding a parking space. All of them replied that they do have problems regarding that topic but each of them have different concerns about that.

Interviewee	Driver Type	Problem

Nurul Hanisah, 19	PWD	● Everytime she wants to park in OKU parking lot, the parking lot is already occupied by a normal driver that is misusing the OKU parking space ● The guard takes too long to notice and take care of it
Syaahira Razzuanny, 22	Normal	● Finding a parking spot takes too much time ● She waste a lot of her time finding a parking lot when actually the car park is already full
Tanzeem Junaid, 21	Normal	● Disturbed by the unorganized parking lot resulted from people park their car randomly ● It is harder for him to search for an empty parking spot

Table 1: List of Interviewee's Problems

Image 6: Interviewee 1

Image 7: Interviewee 2

Image 8: Interviewee 3

4.2.2 Define

Table 2 shows the list of problems and pre-solution that we have discussed:

Problems	Pre-solution
Normal driver parked in OKU parking lot	● Prepare a scanner that scan OKU card as a verification ● Add a sensor that will trigger the alarm when normal driver want to park in OKU parking lot while there's no OKU verification
Finding a parking lot takes too long	● Ticket parking will be printed with the parking lot number that is available that are automatically picked for them
Unorganized parking manner	

Unknown empty parking lots/ full parking lot	● AI cameras to detect empty spots and a monitor that will display remaining parking lot in front of the gate

Table 2: Problems and Pre-solution

4.2.3 Ideate

Next, we discussed and sketched a prototype that's suitable, so that we can achieve our pre-solution ideas. After brainstorming for a while, we decided to make Easy-access Parking System (EPS).
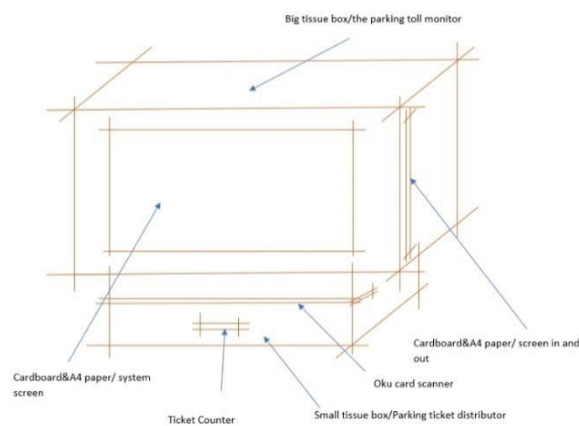

Figure 6: Sketch of the EPS prototype

4.2.4 Creating EPS prototype

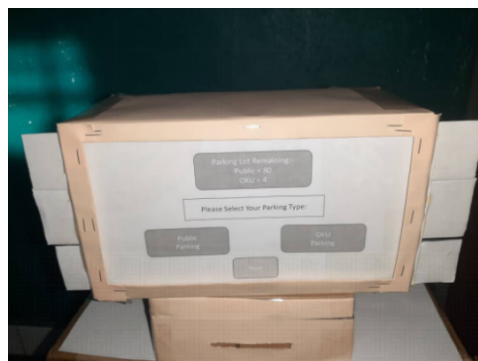EPS prototype was planned throughout the discussion. Below is the final product:

Figure 7: Easy-access parking system prototype

The prototype was developed using a tissue box as the monitor and a small box as a ticket provider and card scanner. First off, a rectangular was cut hole on the surface and cut a long hole from both sides of the tissue box. Then, we cut a cardboard as the screen from the monitor to display each interface by sliding it in whichever side of the box. Secondly, for the tiny box, it was slice on the upper and the bottom surface as the card scanner and ticket provider, respectively. Lastly, the two boxes were glued together where the tissue box was placed on top and the tiny box was placed underneath it.

4.2.5 Testing EPS prototype

EPS prototype was tested by some users that gave us feedback claiming it was decent and user-friendly. The prototype is easy to use and can really fasten up the line for the drivers to park their car.
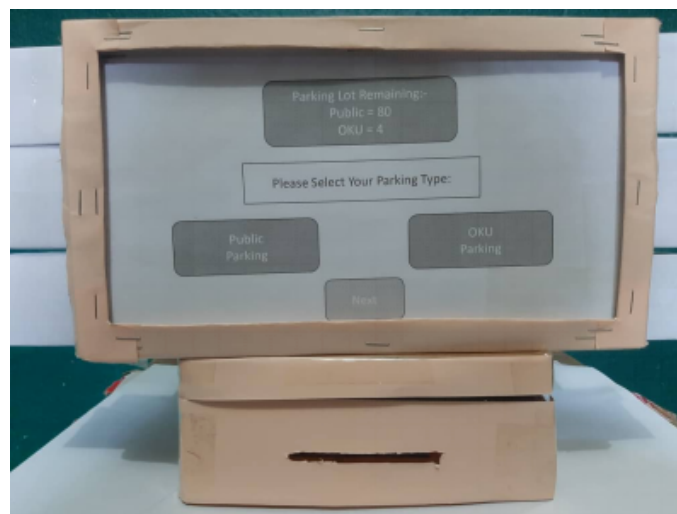

Figure 8: EPS prototype step 1

1. After arriving to the gate, user will encounter this monitor that display the remaining parking lot and two options to identify what type of parking do user want .
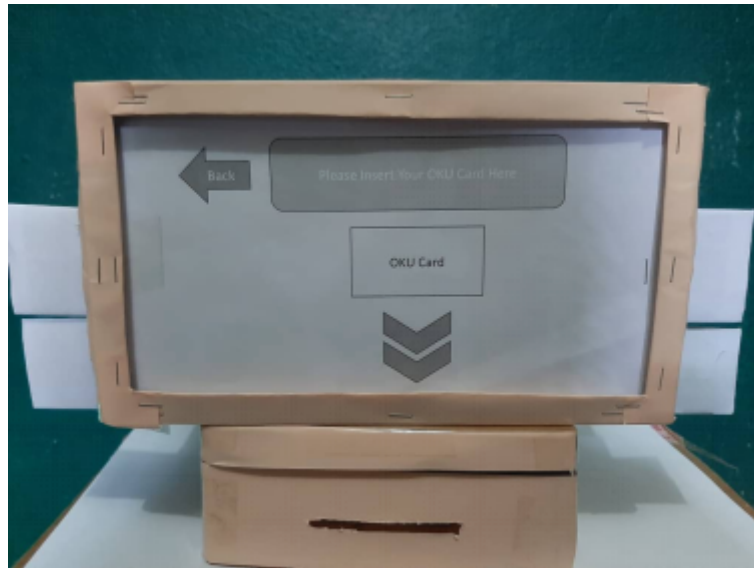
Figure 9: EPS prototype step 2

2. If user choose "OKU Parking", then it will lead user to the second screen where it requires user to scan their OKU card.

Figure 10: EPS prototype step 3

3. Next, by sliding the card user have proved that they are in fact a disabled driver.
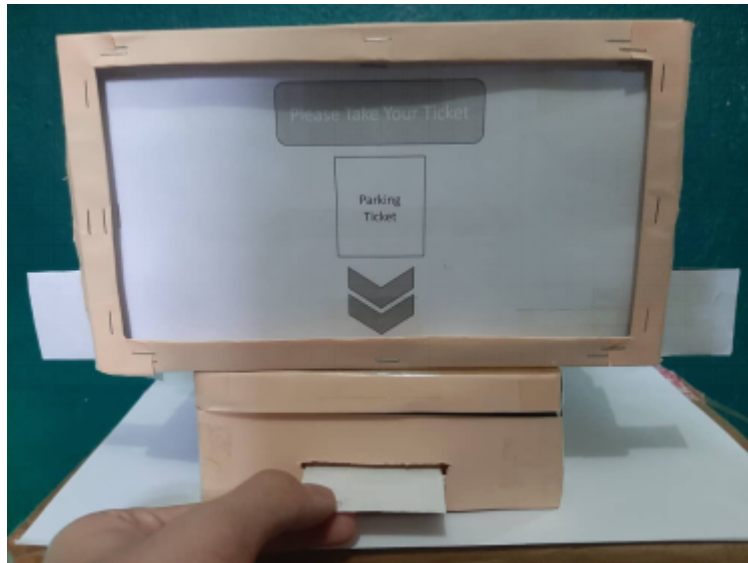
Figure 11: EPS prototype step 4

4. Then, the ticket will emerge. The ticket will provide user their location to park their car.
5. However, if user choose "Public Parking", they will immediately skip to this screen where they only need to take the ticket.

5. Reflections

5.1 What is our goal/dream regarding our course/program?

We hope by taking and learning technology and information system, we can improve our innovative thinking and problem-solving skills in a very creative way. Besides, we hope by taking this course, we can continually expand our knowledge on the technology and information system so that we can apply it in our daily life and our career life in the future.

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

Design thinking is a platform where the team is working together thinking and solving the problem in our surroundings. By involving in this program, we develop our creativity in problem-solving skills and become more innovative when we do our job. It can improve our teamwork and communication where we can apply in our careers in the future.

5.3 What is the action/improvement/plan necessary for us to improve our potential in the industry?

The proper implementation of modern technology and a more practical learning environment can drastically improve our potential in the industry. While we are advancing with comparatively an older system, adapting to the newer technologies can help us reach our goal in a more convenient and innovative way.

6. The task of each member

All of the members have contributed a lot on this project. Below is the task that have been assigned for each member:

Name	Task
Nurin Farzanah Binti Mohd Hilmi	- Interviewing for empathize - Report writing (section 3, section 4.1, section 4.2.1, section 4.2.2, section 5.1) - Formatting and proofreading report (cover page, table of content, list of figures, list of images, list of tables)
Fayruz Tahzeeb Rahman	- Interviewing for empathize - Testing prototype - Video editing - Report writing (section 5.2, section 5.3, section 6)
Muhammad Sulaiman Daud Syu'aib Bin Yaacob	- Creating the prototype - Record the procedure of the prototype - Report writing (section 4.2.4, section 4.2.5)
Muhammad Roby Herfian	- Report writing (section 1, section 2) - Be host of meeting and discussion - Manage time and progress of group member activities
Muhammad Rizdwan Bin Roslan	- Sketching the prototype - Getting feedback from user - Observing and helping group member doing their tasks

	● Report writing (section 4.2.3, section 5.1, section 6)

Table 3: Task of each members