NM3221 Assignment 3

Part 1: App Proposal

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Application Proposal Overview

A carpark mobile application that gives users information of the nearest carpark from their current location and they can find out about the availability of slots of a certain carpark which helps them decide where they can park their car.

I chose to work on the solution specifically in the form of mobile applications, because drivers are busy focusing on the road and they have to be able to find carparks on the go while they are driving. A mobile application will be very convenient for them and allow them to navigate through the application quickly.

I decided to this application after coming across the article "10 carparks in Singapore that are always annoyingly crowded" (Chan, 2018) that shared about some of the crowded carparks in Singapore. The article shared many information about when the carparks are crowded and the prices per entry for each of the carpark.

I thought that it would be interesting if I could create an application that can help drivers avoid or reduce the crowd given the same information from the article. At this stage, I was still not certain of what exact features or purpose the application should serve. Therefore I chose some of the below datasets only after interviewing my interviewees and understanding what they wanted.

Descriptions of Datasets

Data sets used for proposed application:

- Carpark Rates (Major Shopping Malls, Attractions and Hotels)
- Carpark Availability
- HDB Carpark Information

Carpark Rates Dataset:
This dataset includes rates of all carparks for shopping malls, attractions and hotels. It contains rates of peak and non-peak hours on weekdays, weekends and public holidays.

Carpark Availability Dataset:
This dataset allows API calls that shows the availability of carpark slots at a given time at any carparks in Singapore.

HDB Carpark Information Dataset:
This dataset includes all information on Singapore HDB carparks containing: the carpark locations type of carpark, the number of decks in a carpark, short-term parking, carpark basement, free parking, night parking and gantry heights.

Summary of Interviews

To get more information for my application design, I interviewed two people who regularly drives their car.

The interview questions are as follows:

- Tell me more about your carpark experience. (What do you do when you drive into a car park, your thinking and actions)
- How do you decide where to park your car?
- What do you think is the most important when choosing where to park? (Price/Availability/convenience?)
- Have you used any carpark applications before?
- What functionalities would you like to have in a carpark application that can help you in any way?
- Do you have any other suggestions?

I came up with these questions in order to understand the thought process of a driver when they enter a carpark, to get an idea of what they look out for and their actions, which will help me with identifying their needs. It also enables me to realise their prioritisations as a driver who is searching for a place to park their car.

Insights from Interviewee 1:

Firstly, he finds it very expensive especially parking in the Central Business District area. If possible, he will park somewhere cheaper and then take a public transport ride into town. Driving in a carpark is very stressful and it is more susceptible to accidents happening due to the narrow design of some carpark spaces. It is time consuming as he has to search for where the carpark entrance is, and has to always drive around the carpark to find out where to exit from the carpark. He also finds it difficult to find carpark lots which is very frustrating as it takes up a lot of time as well. Usually a carpark is very big, and his car key remote cannot sense and search for his car when he tries to figure out where he parked his car.

When asked about how he chooses his parking spot, he told me that he usually finds places cheaper to park and where carpark lots are bigger so that he would not risk getting scratches on his car. The next important point is the availability of carpark lots and the convenient parking locations nearby.

He do not use any parking mobile apps at the moment, but will use it if he finds one that is effective and free.

He gave me some of the functionalities he would like to see in a carpark application that will help him when searching for a place to park. The application should help him find the entrance and exits of the carpark, search for bigger spaced lots for bigger cars, find out which carpark slots are available, nearest place to park and the cheapest places to park.

Insights from Interviewee 2:

Interviewee 2's main priority is to find available parking spots. He usually follow the counters at the carpark to keep track of the number of free slots in the general vicinity. He finds it uncomfortable to stay in Multi-Story carparks as the air circulation is bad since there are many other drivers waiting around the carpark in their cars for available slots as well.

When parking, he chooses to park near lift lobbies whenever possible. Price is very important to him as he feels that parking at most locations are very expensive. Usually, he prefers to park in indoor areas as it is very hot in Singapore, and it is more comfortable to park under shelters.

He uses the Parking.Sg application to pay for the parking, and finds that paying through phone is much more convenient than having to purchase physical parking coupons and is generally satisfied with the application.

He would love to have a map in a parking application to show where available carpark slots are at. It will be great if the application can incorporate "Smart AI suggestions" or a map of the carpark to guide him to the available slots. He also hopes to have a calculator in the application that can calculate the carpark fee before entering the carpark which shows dynamic pricings that changes according to time. Another feature he would really like to have is a location tracking system which will help the user find their car should they forget where they have parked.

Justification (Dataset and Target Audience)

I decided to interview those who drive frequently as they are most familiar with how carparks work as they drive almost every day. They know about the layout of carparks and have experienced frustrations when it comes to finding spaces to park their cars. They provided me with very useful information and guided me on which datasets I should look at.

The carpark rate dataset is one of the most important as both my interviewees highly prioritise the costs for parking their car. It provides a list of all the parking rates for most of the carparks in Singapore. It is important that the application shows the different prices for each carparks in Singapore.

The carpark availability dataset is required as my interviewees all have trouble finding places to park, where one of them complains that it is very time consuming. The dataset shows which carpark slots of certain carparks are available at a given time. This dataset will help the drivers save time and find available parking lots quickly if given the information.

For the HDB carpark information dataset, it contains address locations of all HDB carparks and information on its parking types (free-parking/short-term parking). This will serve to be very useful as my interviewees generally park at places that are cheaper and convenient and HDB carparks can be easily found throughout Singapore. The carpark type is also included as one of the interviewee also looks out for sheltered carparks. The type of parking system also

matters, as some places requires you to pay by coupon or by electronic payment, and my interviewees have used application like parking.sg to make payment for their parking.

Functionalities of proposed application

From the interviews conducted, here are the following functionalities that will serve to be useful for the drivers:

1) Calculation for the dynamic pricing rates of carparks based on how long they want to park
2) Carpark payment system (Do not have to physically buy coupons for certain carparks)
3) Identify closest carpark based on current location
4) Show the available slots of the carpark
5) A navigation map to navigate around the carpark area (showing the entrance and exit signs)
6) Allow users to remember where they parked their cars
7) Show extra information like carpark type (Sheltered/Open area/Multi-Storey)

These functionalities I feel are the most important and must be included in the application. They will be implemented since they are the most feasible and mostly desired by both drivers and it will help them make their parking process more efficient.

The calculation of rates and carpark payment system will allow the drivers to conveniently check the price rates of the carpark before entering, which will appeal to most drivers who are finding cheaper places to park. With dynamic pricing rates shown, it will save drivers time from searching, and it will be more relevant for them to look at while they are driving.

Even though I could not find the dataset for the payment system functionality, I decided to adopt it into the application as one of the users has used a similar application, “Parking.Sg” which helped to speed up his parking process. It will be a natural choice to have a payment system in my proposed application since it will provide more convenience for the drivers as they would not have to make sure that their cash cards have sufficient values or if they have to buy physical coupons just to park at certain places. They will be able to pay through their phone quickly, once they have successfully parked at a lot.

There should be a live map that shows their current location with the nearest carparks closest to them, to help them decide where the most convenient places are available for parking. After deciding on the place to park, information on the current available lots can be shown so that the drivers would not need to waste time driving around to search for lots once they reached the carpark. Some other information of the carpark like the carpark type will also be shown, for users who requires more information before deciding on a carpark.

An inbuilt navigation map for the carpark will be shown once the driver is near the carpark. It will help guide drivers around the carpark, showing them where to find the available slots as well as the entrance and exit directions.

Once the user has successfully made payment, the application will remember the location of which the user has parked their car, so that when the driver is returning to his car, he can easily locate where he last parked his car.

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