



NM3221 Assignment 3

Part 3: Documentation (Hi-Fi)

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Table of Contents

<i>Heuristic Evaluation</i>	1
Visibility of system status	1
User control and freedom	1
Consistency and standards	2
Flexibility and efficiency of use	2
Aesthetic and minimalist design	3
<i>Justification of application</i>	3
How the application have served the target users	3
Iterations made from Heuristic Evaluation	4
Visibility of system status	5
User control and freedom	5
Consistency and standard.....	5
Flexibility and efficiency of use.....	5
Aesthetic and minimalist design	6
Overall iterations made from Mid-Fi to Hi-Fi	6
Colour Theme	6
Typography	7
Transitions	8
Home Screen.....	8
Parking Screen	9
Payment Screen	9
Favourites Screen	10
<i>Future Considerations</i>	11
<i>References</i>	12
<i>Appendix</i>	12

Heuristic Evaluation

I will use the following rating scale of 0 to 4 as proposed by Nielson (1994, November 1) to rate the severity of usability problems in my application.

0 = I don't agree that this is a usability problem at all

1 = Cosmetic problem only: need not be fixed unless extra time is available on project

2 = Minor usability problem: fixing this should be given low priority

3 = Major usability problem: important to fix, so should be given high priority

4 = Usability catastrophe: imperative to fix this before product can be released

Visibility of system status

Rating: 3

Generally, my evaluators find it easy to navigate through the applications. Each screen of the application consists of a header title to inform them the progress of the application they are in. The icons in the bottom navigation bar are bolded depending on which screen section the users are looking at. The price buttons in the filter menu changes colour when pressed, to show that the price has been selected. These helps the user understand what is going on throughout my application. However, there is a misinterpretation between the calculator screen and the carpark payment screen. Most of my evaluators found it hard to differentiate between the two and thought that they had already made the payment when the carpark screen has shown up earlier on. (Fig 1. & Fig 2.) A rating of 3 is given because the problem of the payment screen is a major issue and it should be rectified since payment is one of the most important functionality of the application and it will affect the users' parking experiences in the case where they may think that they had already paid for the carpark but in fact, they have yet to do so.

User control and freedom

Rating: 3

During the evaluation phase, I allowed one of my evaluators to test the application. He was browsing the “Favourites” screen (Fig 3.) and decided to delete a favoured carpark. However, he changed his mind after that and asked me if he could undo his deletion. Being stumped, I told him that my current application did not cater for undo and redo. He had to go

to the “Carpark” screen and search for the carpark location he wanted to favourite again due to the deletion mistake. This has created lots of inefficiency issues for the user and should be addressed immediately, therefore it was given a rating of 3. From these tests, I concluded that the rest of the application are allowing for user control and freedom since there is the bottom navigation bar easily accessible on every screen for users to perform “Emergency exits”. There are also many back buttons on each screens that allows the users to go back to where they were previously.

Consistency and standards

Rating: 2

According to the evaluators, the font size and the shades of grey colour theme I used have been consistent throughout the application and there were not much comment about it.

Moving on to the buttons, it is clear to them which buttons are actionable buttons. The blue colour helps them in identifying these buttons which I have used consistently throughout the application to go navigate to different screens. However, I broke the internal consistency of the application with the green and yellow colour used in the “Home” screen (Fig 4.). Initially the colours of green and yellow were used to indicate the percentage of available lots in different parking locations in the “Parking” screen (Fig 5.). However, the parking status and time remaining labels in the “Home” screen used the same colour and because of this, they were no longer able to rely on the colours to help them determine the availability of slots in the “Parking” screen anymore. Apart from that, the external consistency were good since they were able to easily identify similar shaped and styled icons throughout the applications. Some examples are the ‘Star’ icon which means favourite, and the plus and minus buttons to increment and decrement values (Fig 1.). The rating of 2 is given since only the internal consistency of the colour is broken, but there are wordings on the labels in the parking status and time remaining labels, which makes what each of the label describe, self-explanatory.

Flexibility and efficiency of use

Rating: 0

The evaluators did not experience any scenario problems while testing the application. The application design accounts for flexible processes. The user can choose to search for a parking location of their choice with the filter menu, or they can tap on the “current location” icon on the bottom right of the screen to zoom into their current location which shows the

nearest parking lots, or they can manually navigate the map and search for suitable carparks. The flexible process allowed the evaluators to pick whichever methods they want to find a carpark location to park their car. This allows them to be more efficient in finding carpark spaces. The same goes for when they want to use the “Find my car” and “Find exit” functionalities. The users can choose either choice. If they picked “Find my car” then after finding their car, they will be prompted with the “Find exit” actionable button consecutively, which do not require them to go back to the “Home” screen just to click on “Find exit”. (Fig 4.) Therefore a rating of 0 is given since the application helps users speed up their parking processes and it accounts for many cases of scenarios.

Aesthetic and minimalist design

Rating: 3

My application is not very focussed on colours but it keeps content and visual design of the user interface focussed on the essentials. By Nielson’s (1994, November 1) rule for aesthetic and minimalist design, the signal-to-noise ratio represents the ratio of relevant to irrelevant information. In my application there are no extra icons or designs in order to decorate the application. My main aim is to bring across communication to the users rather than decoration. My evaluators gave me some feedback about how the background “Home” and “Favourites” screen (Fig 3. & Fig 4.) did not look pleasing and suggested that I improve it. Another suggestion was that the “Search for Carpark name” in filter option of the parking screen seemed more like a title than a text box for searching (Fig 5.). Other than that, each text in my application brought about clear communication and directives for them to take. A rating of 3 is given due to the text box for search not being obvious enough, and search is of some importance which I should amend since it helps users quickly select the carpark of their choice.

Justification of application

How the application have served the target users

My carpark application has served the target users (drivers) by helping them in finding available carpark slots with ease. The “Parking” screen allows users to search for parking places to check for carparks that have available slots for them to park and it also lets them browse for nearby places to park. Furthermore, the search filter menu lets them filter by

prices and types of carparks depending on the price range they are willing to pay and the types of carpark they want to park in.

Once the driver taps on a carpark that they have searched, a pop-up screen will show all the details of the carpark which includes the current slots available, the carpark type, an image preview of how the carpark looks like and a calculator to let drivers calculate how much they will have to pay if they parked at the carpark.

Continuing on with the parking process, after the driver has entered the parking location, a navigation map will show up, guiding him around the carpark and showing him all the slots which are already parked with cars and those that are still empty. This navigation map helps the driver to quickly find empty slots to park his car. (Fig 4.)

After parking the car, a payment screen will pop up and allow for users to pay for their parking through the phone instead of having to use physical coupons. The “Find my car” functionality helps drivers find their car in the event where they forgot where they parked their car or if the carpark itself is very big. The “Find exit” functionality plots the path to the carpark exits and it helps drivers especially in big carparks since it saves them time in driving around the carpark.

With the “Favourites” screen, they can easily access and check for availability of their favourited carparks quickly. They would not have to go through the entire process of searching for the carpark they parked at before, each time they enter the application.

Overall, the application speeds up a driver’s process in finding a place to park with the functionalities explained above. And throughout the entire process from low-fi to hi-fi, I have included the functionalities that my interviewees wanted from the first interview.

Iterations made from Heuristic Evaluation

I have made quite a few changes due to the heuristic evaluations performed.

Visibility of system status

From the evaluation, I added the “Payment” title to the “Payment” screen which I did not before. I feel that after adding this in, it will help users differentiate “Payment” screen from the “Calculator” screen. Initially, the header of the “Payment” screen was the carpark location the driver is currently in (Fig 2.), however it caused a lot of confusion, and I decided to shift it down to the main body of the screen instead of placing it in the header (Fig 7).

User control and freedom

From the results of the evaluation, I realised that there is no “Undo” action to allow a user to correct their mistake. It was highlighted that in the “Favourites” screen, if a favoured carpark was deleted by accident, the user has to navigate to the “Parking” screen to search for the carpark location and favourite it again. This requires some effort. My application is supposed to be efficient and therefore a countermeasure has to be put in place to fix the issue of when a user makes a mistake in deleting a favoured carpark. I added in an optional “Undo” feature with a countdown timer (Fig 8.) so that if the user actually wanted to delete a favoured carpark, he can ignore the undo tab, however, if the user made a mistake of deleting the favoured carpark, he can tap on the undo tab, and the deleted favoured carpark will reappear in the “Favourites” list. With the undo feature, users will have more control and freedom, and the application now accounts for deletion mistakes.

Consistency and standard

From the evaluation, I discovered that I broke the internal consistency of the application when working with colours. It created some confusion among users since I reused the colours of the availability indicators in both the “Home” screen and “Parking” screen (Fig 4. & Fig 5.) My evaluators were not able to rely on the colours of green and yellow while they were using the application. I provided a fix for this, by changing the colour scheme of the parking status and the time remaining labels in the “Home” screen. (Fig 9.).

Flexibility and efficiency of use

My application has accounted for the many different scenarios which may happen. During the test, none of the evaluators raised issues on this therefore I feel that there is nothing I should change unless given more time, perhaps I could ask for more feedback on improving the application.

Aesthetic and minimalist design

There were minor changes made to the application since there was a rating of 2 given for the evaluation. According to the evaluators, I brought about clear communication in the application apart from some issues. The first thing to tackle is the search box of the carpark name in the “Parking” screen, which looks like a title instead of a search box (Fig 5.). This time, I inserted a round edged text box, with a magnifier glass icon to make it more obvious that it is a search box that users can type into (Fig 10.). Many of the evaluators often mislooked and assumed that the initial search box was the title of the filter menu, but it was actually the search box. Hopefully, this will help users to identify where to search more easily than before.

For the other issue where “Home” and “Favourites screens were not pleasing to the eye, I changed some of the colours and background images to be of a darker tone. I will explain more on it in later parts of this report. (Fig 8. & Fig 9.)

[Overall iterations made from Mid-Fi to Hi-Fi](#)

This section will show the before and after comparisons from Mid-Fi to Hi-Fi and detailed explanations for the changes.

Colour Theme

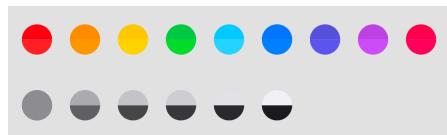
Shades of grey (Colour Theme):



As discussed in the Mid-Fi report, I decided to use monochromatic colours as the application is more focused on its functionality rather than its aesthetic design since it's a parking application. There will be a lot of things going on the screen if too many colours are in the application. I came up with the idea of using monochromatic colours for my application after reading a medium article by Manandhar (2015, September 25). According to Manandhar (2015, September 25), monochromatic colours creates a harmonious, visually cohesive look. At the same time, it is a go-to choice because I would not have to stress over picking colours

and wondering if they go well together. Initially I spent a lot of time trying different colours but they did not fit the application. I decided to prioritise working on the functionality of the application rather than the decorative design which brought me to using shades of grey as my colour theme in the application.

Buttons



For the buttons, I used the colours as described in the Apple IOS design guidelines. I feel that the bright colours of red, green and orange are good enough to work with the colour indicators in my application since the platform I am targeting is IOS and my users will be familiar with these colours thus it would not require them to process a familiar colour that they have seen before.

Typography

For the font used, I used “Fira Sans”. From browsing through the fonts library on Adobe’s website, I tried to incorporate some of the fonts into my application, however they looked out of place, and there were many funky fonts which were difficult to read. For a utility application like the parking application, words have to be very clear and readable to users. For each word, there should be a reasonable spacing between each letters so that the letters are not clumped together. It was because of this, I decided on the “Fira Sans” font.

Fira Sans SemiBold Italic </>

Deactivate font

The quick brown fox jumps over the lazy dog

Throughout my application, I kept a consistent font size. I used a font size of 40 for title headers, since I felt that the users should always know which screen they are currently in. It helps them track their parking process. For normal texts in the application, I stuck to a font size of 20, because I felt anything below that will be too small and users will have trouble trying to decipher what the texts are saying. The fonts should be easily readable so users can be efficient in using the application.

Transitions

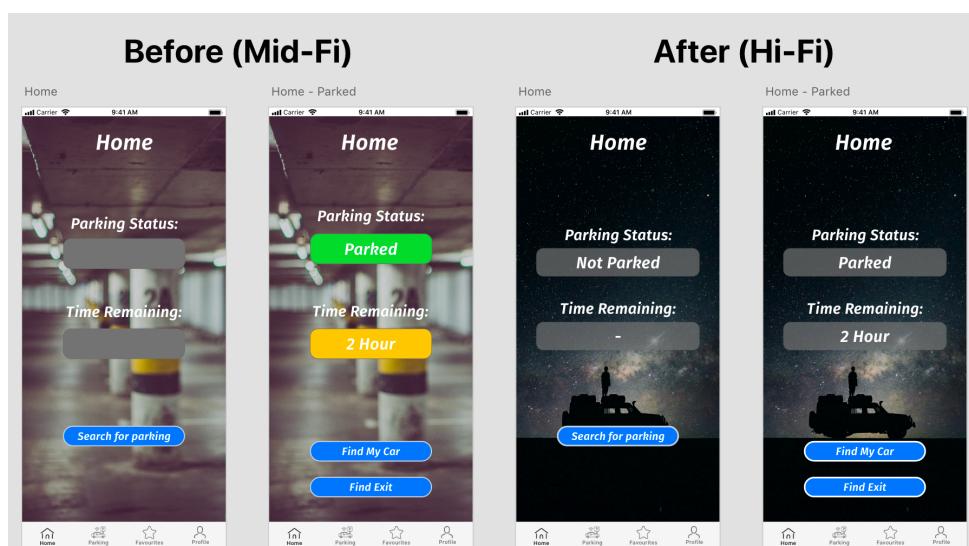
I received numerous feedbacks about the transitions between screens for my Mid-Fi. For my Mid-Fi, I used the “Slide Left” and “Slide Right” animations. But according to the people who tested my application, they told me that it was very unsightly to have the screen sliding left and right each time they complete a part of the parking process. Therefore, to make the screen changing look more seamless throughout the application, I changed the “Sliding” animations to “dissolve” animations. By doing so, it will make the user experience more comfortable for users.

Home Screen

In the “Home” screen, I made changes to the background images and the colours of the labels for Parking Status and Time Remaining.

The new background image makes the words in the “Home” screen much more readable and it is less distracting as compared to the previous image. Users can now focus more on the details much better as compared to before.

For the Parking Status and Time Remaining labels, I gave it a lighter grey colour, and removed the previous bright colours so as to not break the internal consistency for the colours used in the application as explained in the consistency and standard section.



Parking Screen

In the “Parking” screen, I changed the colour of the header section, shape of the colour indicators and the position and style of the search filter menu.

The grey header section was changed to a very dark colour to provide emphasis on the header title and to make it more prominent. This is implemented across all screens to ensure consistency.

The colour indicators were changed into rectangular shapes and are spread across the width of the screen because the initial design made the indicators seemed like pressable buttons which many users have tried tapping on.

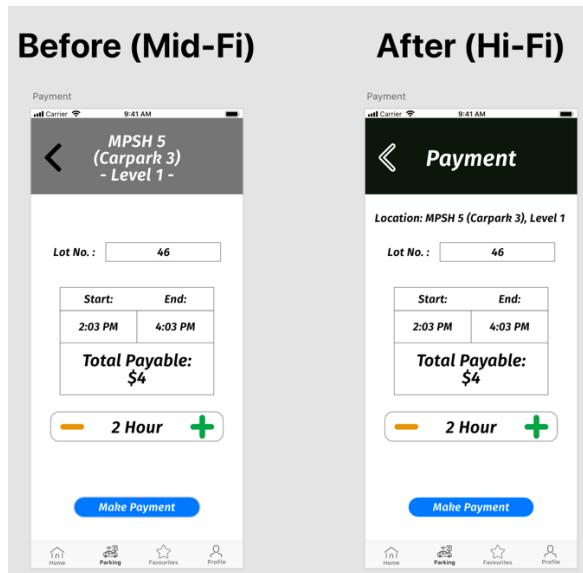
I also changed the position of where the search filter is minimized at. Instead of being at the bottom, it is now at the top. This change was done because after letting my evaluators test the application, many of them did not notice the search filter at all when it was at the bottom. I redesigned it to be at the top of the screen to make it more noticeable since users will look at each screen from top to bottom and by following the conventions of many other applications in the application store.



Payment Screen

For the “Payment” screen, I only changed the colour scheme of the header and the title since the title was previously misleading and my users wondered which screen they were on as the

“Payment” screen is very similar to the “Calculator” screen. I moved the details of the location of the carpark to the body of the screen instead. Then I replaced the header title to “Payment”. Users will now be able to differentiate the “Calculator” from the “Payment” screen. The changes made are fixes to what was previously mentioned in the visibility of system status section.

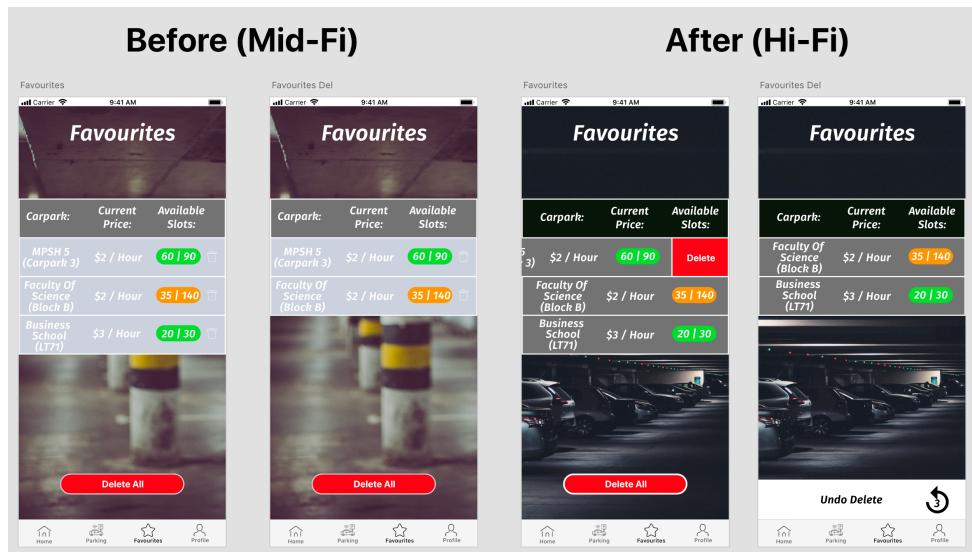


Favourites Screen

Initially in the “Favourites” screen, the grey colour for each favourited option was too light which made the texts difficult to read. And from a feedback given, the option to delete each option was not very obvious. Readability and communication of details to my users are very important, therefore I changed the light grey colour to a darker grey. The texts are much more readable now.

The delete button is now changed to something that IOS users are much more familiar with. They can now drag across each option to reveal the delete button. With this new feature, the “Favourites” screen looks much cleaner than before.

Also, as mentioned in the user and control section, I included in an optional tab that shows up at the bottom to enable the “Undo” functionality in the case where a user may have deleted an option by accident.



Future Considerations

For the future developments of the parking application, I hope to improve on some functionalities and the design of the application.

For design improvements, the current filter menu in the “Parking” screen has very sharp edges and I would actually like to continue with further user evaluations to decide on what layout users prefer, then make the necessary changes.

For functionality wise, Artificial Intelligence (AI) is becoming more well-known and available in many applications today. If possible, I would like to have the carpark application to be able to guide users on parking their car in the centre of the slot. From the interviews I carried out in the beginning, one of my interviewee actually shared that he was afraid of carparks with very narrow carpark slots because there is a higher chance of his car being scratched and damaged by other cars that are not properly parked. This feature will be an add-on to the current application and there should be some sort of simulation shown on the screen or implementation of “Google Voice” or “Siri” to guide the drivers when they park their car. There could also be some penalty fee charged to drivers who recklessly park their cars and cause inconvenience to others. These new add-ons will make the parking experience a more pleasant one for all drivers.

It will also be good to have notifications through the application to inform users of important carpark information. An example is when a car is moving off from its parking lot to leave the

carpark, the application can notify the nearest driver in the vicinity that an empty parking lot near them is now available. This can save users a lot of time when they are using the application. Another example of the use of notifications is that, the application can notify a user that their time remaining for parking is going to expire soon. This reminds users that their parking session is ending, and it can prevent them from exceeding their parking time limits, saving them money.

References

Nielson, J. (1994, April 24). Retrieved from <https://www.nngroup.com/articles/ten-usability-heuristics/>

Nielson, J. (1994, November 1). Retrieved from <https://www.nngroup.com/articles/how-to-rate-the-severity-of-usability-problems/>

Manandhar, I. (2015, September 25). Monochromatic Coloring Technique : evoke the feel into design [Blog post]. Retrieved from <https://medium.theuxblog.com/monochromatic-coloring-technique-evoke-the-feel-into-design-9c63ed92a4dd>

Appendix

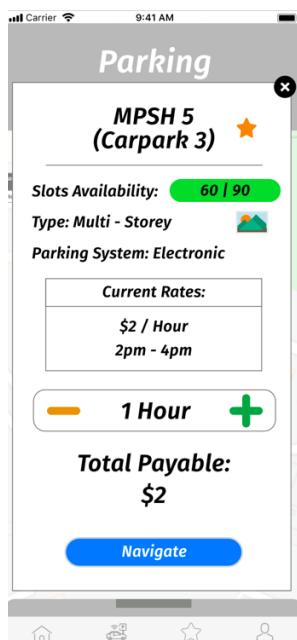


Figure 1.

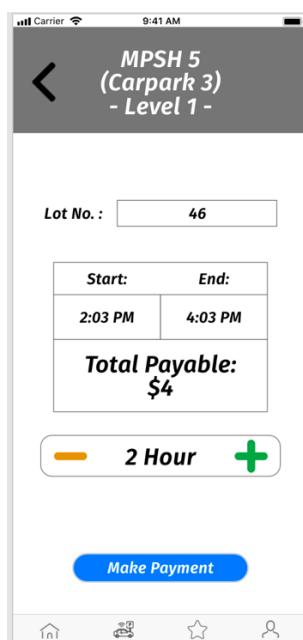


Figure 2.

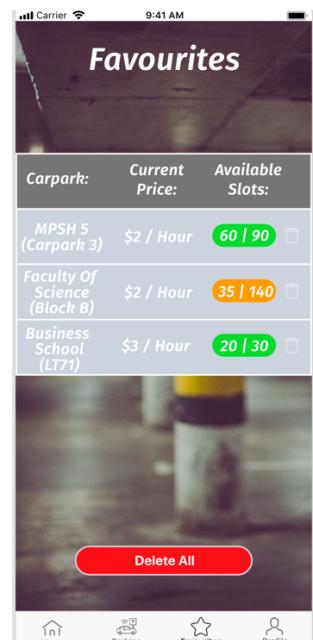


Figure 3.

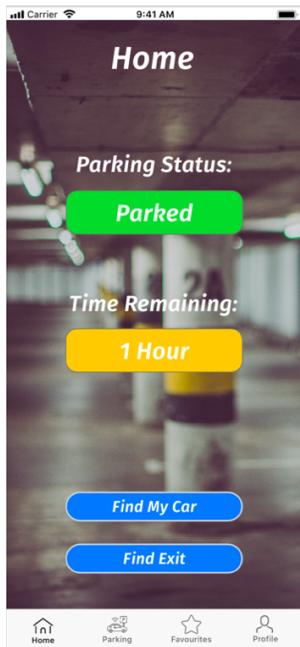


Figure 4.

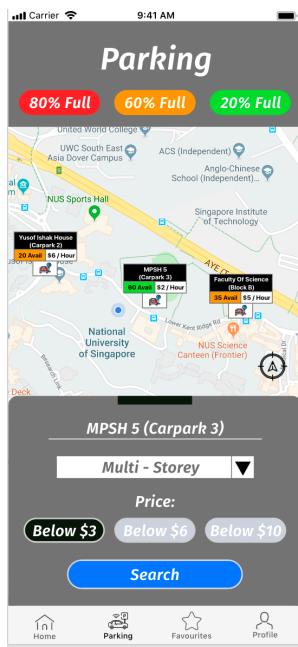


Figure 5.

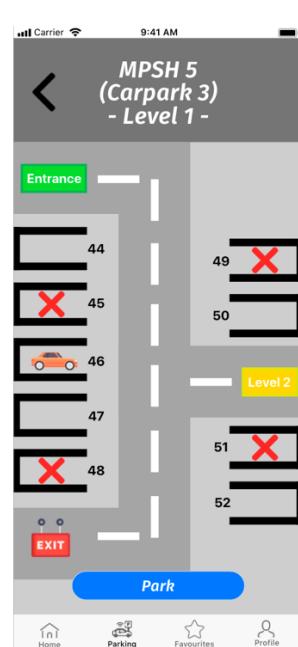


Figure 6.

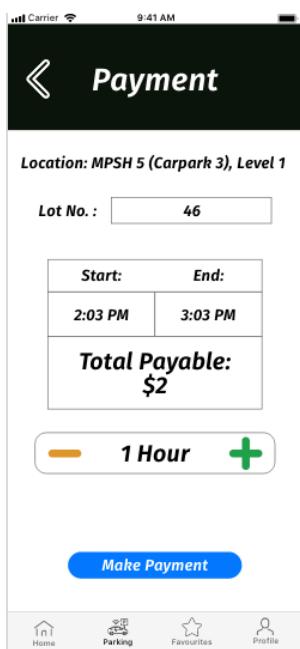


Figure 7.

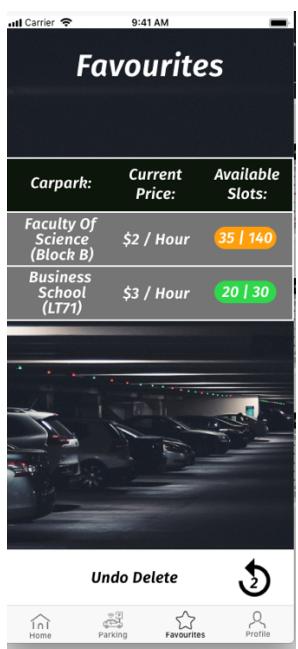


Figure 8.



Figure 9.

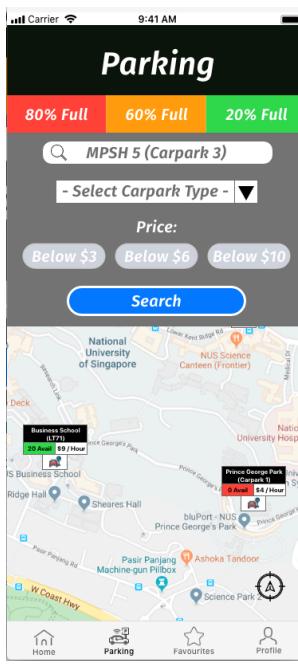
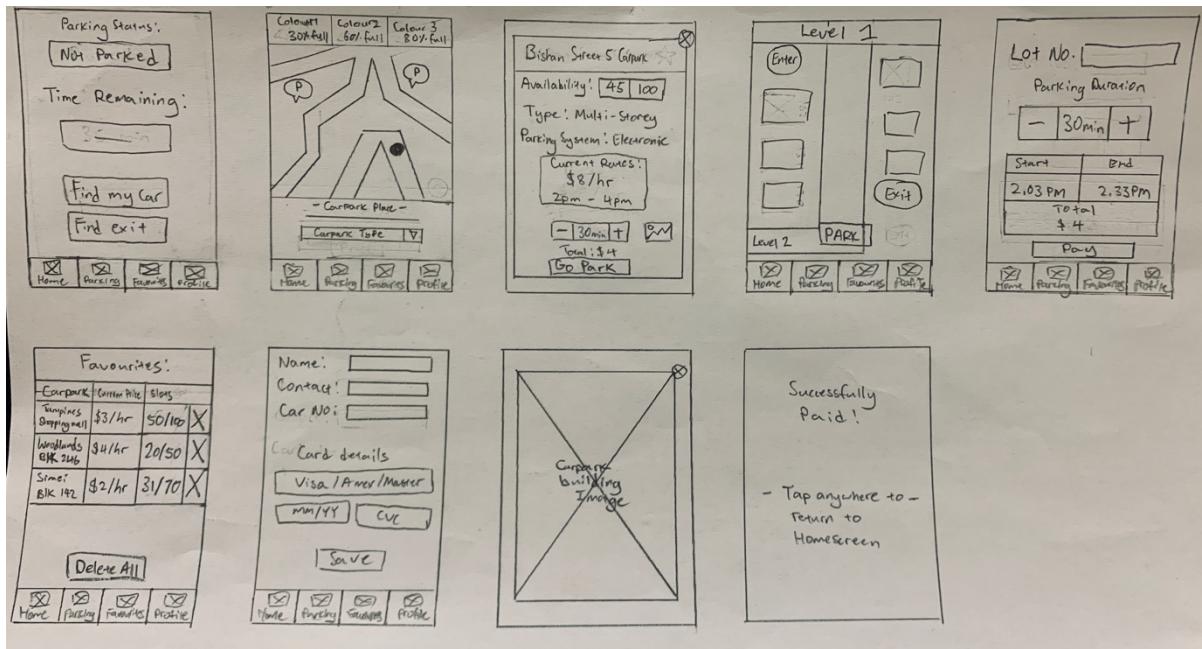


Figure 10.



(Wireframe sketch in the beginning, designed to fit the descriptions of what my interviewees wanted in a carpark application)

Some things to note when trying out the prototype

- In the “Parking screen”, the search filter will maximize upon tapping on it to reveal other filter options available.
- Only the first option (MPSH5) can be deleted individually in the “Favourites” Screen. It can be deleted by dragging from the right side of the option to the left to reveal the “Delete” button. But you can still use the “Delete All” button to delete every option.

- To press the “Navigate” buttons in the “Calculator” screens, you have to increment the time duration before being able navigate. The same goes for the “Payment” screen.
- In the “Profile” screen, clicking on “Save” will auto-fill in the credit card details of the user. I did not create insert a keyboard for each textbox since I have already shown how the keyboard will show up on the screen when tapping into a textbox in the filter menu of the “Parking” screen.

Shareable Link to the prototype

<https://xd.adobe.com/view/e28918cb-c01c-44dd-75fd-ad8241e73643-94b8/>