**Software Requirements Specification**

**for**

**<SG parking>**

**Version 1.0 approved**

**Prepared by <zhenkai, Kenny, swee ngee, issac, lynn>**

**<No Turning Bac>**

**<01/02/2020>**

**Table of Contents**

**Table of Contents ii**

**Revision History ii**

**1. Introduction 2**

**2. Functional Requirements 2**

2.1 Login & registration 2

2.2 Searching 2

2.3 User's Feedback 4

2.4 Tutorial 5

**3. Nonfunctional Requirements 6**

3.1 Usability 6

3.2 Reliability 6

3.3 Performance 6

3.4 Supportability 7

**4. Dictionary 8**

**Revision History**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Date** | **Reason For Changes** | **Version** |
|  |  |  |  |
|  |  |  |  |

1. **Introduction**

The No Turning Bac team will develop an one-stop parking android application for drivers to search for, view and enquire about parking lots.

1. **Functional requirements**
2. The application should have a login and registration function
   1. The login function shall have a text box for email and a text box for password
      1. The application must display successful or unsuccessful login
      2. The application should store the user's setting and history after login
      3. The application should encrypt the user's password
      4. The ID should not exceed 20 characters
      5. The password should not exceed 20 characters
   2. The user can create an account with our application
      1. The user needs to provide the following information
         1. The user's name and last name 10 characters
         2. The user's email address
         3. The user's password less than 20 characters and more than 7
         4. The user's contact number
      2. The user will receive a verification code sent to their email
         1. User will have to enter the verification code in the application to verify their email address
3. The user can search for parking lots.
   1. The user must on GPS before using the application
      1. The application will have a pop-up dialog to prompt the user to on GPS
         1. The pop-up dialog will not be removed until GPS is ON
   2. There will be a "map view" & "listing view" tab at top left hand corner of the display.
      1. The default tab will be "map view" when user log into the application
      2. Users can only be in 1 tab at a time.
   3. The search query must have at least one of the parameters
      1. The name of the car park must be in valid English characters and not exceeding 50 characters
      2. The location of the carpark based on the GPS location of the device
      3. The budgeted price of parking, or a range of acceptable prices from a minimum to a maximum price
   4. Each search shall return the following information
      * 1. The carpark name not exceeding 50 characters
        2. Price in 2 decimal places in SGD per hour
        3. The distance of the car park from the current location in meters
        4. "No search result found" will be displayed below the search bar in the font size of 15.
        5. A box of specific color will be used to indicate the availability of the search results
           1. Green indicating at least 50% of the lots are occupied
           2. Yellow indicating at least 80% of the lots are occupied
           3. Red indicating 90% of the lots are occupied

A cross overlapping the box will indicate that all of the lots are occupied

* + - 1. Absolute values of each carpark’s vacancy slots will be shown
  1. Each search can be sorted based on the following parameters either before or after search. The following parameters will be displayed as a slider
     + 1. The carpark names in alphabetical order within 50 alphabetical order
       2. Price of the car park per hour (increasing order) in SGD
       3. Distance to the car park in meters (increasing order) in KM/M
       4. Car park availability based on number of unoccupied slots in integer (decreasing order)
       5. Indoor or outdoor car parks, this option will be displayed as a tab. The default will be no tab selected and users can only select 1 tab at any moment.
       6. After using the sorting function, a message “Applied successfully” will be shown for 2 seconds
  2. The search results can be filtered based on the following parameters either before or after search results are displayed
     + 1. A maximum distance from the current location to the carparks, can be selected using the slider, the distance will be in meters.
       2. A price range giving the maximum cut-off price in SGD, users can choose their input using the slider.
       3. The car park availability based on the percentage occupancy of the car park, the slider value must be between 1 - 100.
       4. After using the filter function, a message “Applied successfully” will be shown for 2 seconds
  3. The user can get directions to the parking lot
     + 1. The directions to the parking lot will be displayed on a map with clear route path (green/blue)
          1. Three routes with order will be suggested to user

Highest ranking route being the fastest route towards parking lot

The application will automatically allocate the highest ranking route for user to use to navigate

User can change route at any point of time during travelling

Time needed to travel will be included

User can choose to avoid tolls by activating the option of "avoid tolls" in the interface

* 1. The user can also get the direction for the shortest exit from the HDB carpark to the main road
     + 1. The directions to the nearest exit will be displayed on a map with clear route path (green/blue)
       2. There will only be one suggested route, indicating the shortest route to the main road
       3. This feature will only be offered to users if user is within the vicinity of any registered HDB on the government HDB API.

1. The application will have a channel to communicate feedback
   1. The user can report a car park
      1. A report button will be shown after a car park has been selected from the map or from the search results
      2. The user can report the listed attributes of the car park
      3. The user has the option to suggest new attribute values of the following:
         1. The user can suggest the address and the GPS coordinates of the car park
         2. The user can suggest the type of car park as either ‘Multi-storey’, ‘Basement’ or ‘Surface’
         3. The user can suggest the short term parking duration as either ‘No’, ‘Whole day’ or input a valid start and ending timing
         4. The user can suggest the free parking duration as either ‘No’ or input a valid start and ending timing
         5. The user can suggest the night parking as either ‘Yes’ or ‘No’
         6. The user can suggest the car park decks as a valid integer number, given the type of car park is listed as ‘Multi-storey’
         7. The user can suggest the height of the gantry as a valid floating point number
      4. The carpark will have a default status of ‘Open’
         1. The user can flag the status of the car park as ‘Closed’
         2. The user can flag the car park as ‘Renovating’
   2. The application should have a help center function
      1. The help center should be a floating action button that is visible throughout the main application
      2. The help center will answer the following Frequently Asked Questions (FAQs):
         1. The help center will have a "how to plan route" description
         2. The help center will have a "how to view history" description
         3. The help center will have a "how to view car park price" description
         4. The help center will have a "how to filter search results" description
         5. The help center will have an option to contact the dev team for miscellaneous queries
            1. The user can contact the team through an in-app messaging channel
            2. The user can contact the team through the given email address
            3. The dev team will respond at the earliest possible time

1. The application will have a quick tutorial to teach user how to use the app
   1. First-time user will be directed to the tutorial page
      1. There will be a step-by-step guide about the application
         1. The tutorial will contain guidelines on how to navigate through the application
         2. The tutorial will contain guidelines on how to search for car park
            1. Based on location
            2. Based on price
            3. Based on availability
      2. It is not a must to finish the tutorial before using the application
         1. Users can exit the tutorial at any point of time
   2. Users will be able revisit the tutorial while using the application, even if they had used the application before
2. **Non-functional requirements**
3. Usability
   1. The application must give useful help information when there are errors like
      1. User has no internet access
      2. API cannot be reached
      3. Application undergoing maintenance
      4. User’s GPS location cannot be accessed
   2. The font size must be reasonably big enough for users to be able to read while on-board on the vehicle

1. Reliability
   1. APIs used in the application must be from a reliable source such as government websites
   2. The application will still continue to function even when
      1. New carparks are built
      2. Carpark is under maintenance
   3. The application must not reveal any personal information
      1. Personal particulars must not be displayed on the main functionality page
         1. Phone number/address/email address/age/etc must not be shown
      2. User's historical record can only be accessed by the user himself
      3. User information will be deleted from the application when he logs off from the application
         1. If the user does not have an account, user information will be deleted from the application when he uninstalls the application
2. Performance
   1. The availability of carpark will be constantly updated every 3-5 minutes
   2. The application shall take at least 5 second to load for every page
   3. The application can at most handle 50 users at any point of time
3. Supportability
   1. The application shall be extended in the future
      1. New user interface and designs will be developed in future editions
      2. New APIs can be integrated
         1. Search function for the nearest petrol station
         2. Current and forecasted weather conditions to ease driving conditions
         3. Notification on road traffic accident/congestion
         4. Navigating within the car park itself
   2. The development team will maintain the application and debug when necessary
   3. The application shall be adapted to iOS and desktop versions when popularity increases
4. **Dictionary**

|  |  |
| --- | --- |
| GPS | A functionality that almost all smartphones have today. It uses the satellite to return the ground position of the smartphone. It is the acronym for Global Positioning System. |
| Map view | A Map displayed on the application, there will be other items displayed base on the different functionalities |
| Listing view | Objects/items show in sequence from top to bottom, it could be sorted. |
| Parameters | The different types of option user can choose to select to either filter or sort their search result |
| Carpark | A facility designed to allow motorbikes/cars/vans/etc to park over long hours. |
| Slider | A horizontal scroll button,allowing users to drag to their desired amount |
| Carpark availability | Number of available parking lots in a car park which has not been occupied, this information can be obtained from the API |
| Directions/routes | This will show the users the possible routes to the car park depicted by a line from current location to the desired car park by a line |
| Application | The SG parking app developed by the No Turning Back team. |
| HDB carpark | Car parks which are located within the vicinity of a housing development board estate. |
| API | An application programmable interface where the application is able to get information or data from a third party. |
| Feedback | Users are able to report a problem and give textual responses which will be sent to the administrator of the application who will then proceed to try and rectify the problem. |
| FAQ | A screen which shows the frequently asked questions which will give basic information for users of the application. |
| tutorial | A guide for first time users to know how to use our application, showing them basic functionalities |