Department of Computer Science & Engineering
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System Requirements Specification
CSE 4316: Senior Design I
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Dr. Coders
Pick Bins

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Revision History

Revision	Date	Author(s)	Description
0.1	07.23.2020	UD	document creation
0.2	08.01.2020	BK, UD, ST, SG, HB	complete draft
0.3	08.13.2020	ST	release candidate 1
1.0			official release

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1 Product Concept

The application 'PICK BINS' is build to solve the waste management problems we've been facing. The confusion on specification between waste management company and customers not only leads to late service, time waste, diseases spread. There are situation when waste was not picked due to communication problem and misunderstanding which leads to overflowed waste polluting our environment. With the help of this app we can create mutual understanding between customers and company. People can use this application to request waste pickup whether it is one time or repeated pickup. The waste pickup request will be fulfilled by waste management agencies partnering with PICK BINS using agency portal of application.

1.1 Purpose and Use

PICK BINS will help to create good understanding between customers and company. App is created in such a way that it will be user friendly.

1.2 Intended Audience

Mainly the product target audience are house residents, apartments, institute or any people who uses the application. It is targeted to all group people even small age and old age people can use it because only thing you need to do is a one click.

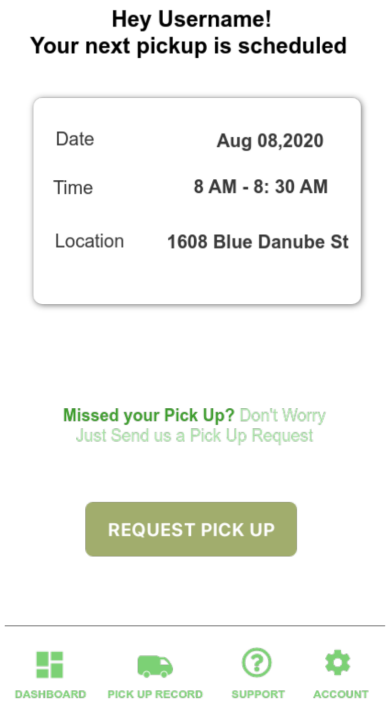

Figure 1: Prototype screen shot

2 PRODUCT DESCRIPTION

This section provides a description of Pick Bins and defines it's primary features and functions. The primary operational aspects of the product, from the perspective of end users, maintainers and administrators, are defined here. The key features and functions found in the product, as well as critical user interactions and user interfaces are described in detail.

2.1 FEATURES & FUNCTIONS

The main feature of the software application is to provide user with easy gateway to waste management. There will be many features available within the application. Requesting waste pickup, scheduling pickup for each week, pickup history, real time status of pickup will be the features that a user can find in this application. Like shown in figure 1 above user can see the list of next pickups scheduled or request a new pick up using same the application interface. Dashboard, Pickup Request, Support and Account setting will be the option available with in the application. Dashboard will show all the current information about status or any notifications, Pickup Request is the option which user will use to schedule a repeating pickup or one time pickup. Support is provided in case user wants to learn how to use the application, talk with customer support or get FAQs. Account option will let user edit their personal information like location, name, email address.

2.2 EXTERNAL INPUTS & OUTPUTS

The system requires user data during sign up process. The user should provide information such as address, time for pick up, options to repeat collection (e.g. daily, weekly, monthly). The system will store all these information in the database. The system will generate a pickup schedule based on these information. The schedule generated will be optimal. The system will notify end users with the pickup schedule such as date and time of pickup. Just in case the user miss the pickup date, they can request an immediate pickup. In this case, system will ask the user to provide the information about the pickup such as date, time, and location. The system will quickly generate a pickup schedule for this request. The system will notify the user with this new schedule.

2.3 PRODUCT INTERFACES

The application will have Start screen, Login screen, Home Screen, Pickup Request Screens, Account Setting Screen and many other interfaces needed to perform the task effectively. Some Screen shot of the prototype of interface are included below.

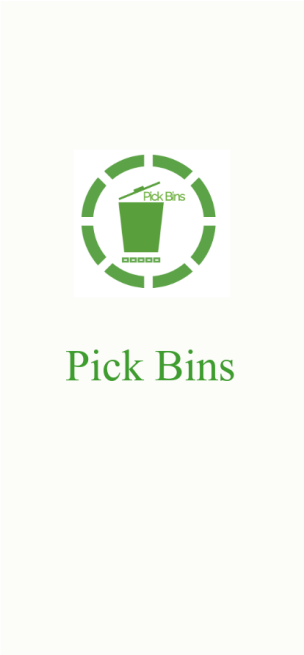

Figure 2: Start Screen

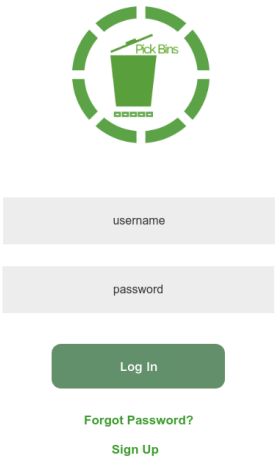

Figure 3: Login Screen

3 Customer Requirements

3.1 Location Access Permission

3.1.1 Description

While getting information about location of the user the system shall ask for user permission to access the device location.

3.1.2 Priority

Medium

3.1.3 Constraints

NA

3.1.4 Standards

NA

3.1.5 Source

Customer

3.2 Google Map API for location

3.2.1 Description

User have to be located in the maps in order to find the location of the waste product to be picked up or to send request to waste management agencies. For this google maps API will be integrated into the system and the system should be able use the API to find location of user.

3.2.2 Priority

High

3.2.3 Constraints

Google maps API might not get integrated properly into the application or may have compatibility issues.

3.2.4 Standards

NA

3.2.5 Source

Customer

3.3 Data, Time and Location Interface

3.3.1 Description

There needs to be an interface where user should be able to set the date and time along with the location for waste pickup.

3.3.2 Priority

High

3.3.3 Constraints

This should be easily achievable unless there is any issue that doesn't let us set date and time.

3.3.4 Standards

NA

3.3.5 Source

Customer

3.4 Sign Up Option

3.4.1 Description

A user shall be able to register their name, contact and user id into the system using the sign up interface.

3.4.2 Priority

Low

3.4.3 Constraints

Not able to store information in the database might be a problem here.

3.4.4 Standards

NA

3.4.5 Source

Product Design

3.5 Login using credentials

3.5.1 Description

The user shall be able to login using their user id and password using the login screen to get into their respective interface.

3.5.2 Priority

Low

3.5.3 Constraints

NA

3.5.4 Standards

NA

3.5.5 Source

Product Design

3.6 Push notification

3.6.1 Description

The app should be able to send push notifications to the user as well as drivers whenever required.

3.6.2 Priority

Low

3.6.3 Constraints

Notification not shown or delayed notification can be a constrain due to other technical issue.

3.6.4 Standards

NA

3.6.5 Source

Customer

3.7 Separate UI

3.7.1 Description

There should be separate interface depending on the type of user login i.e. (client or driver)

3.7.2 Priority

High

3.7.3 Constraints

Delay on deciding what feature to provide for user and what to provide for driver side may be a problem

3.7.4 Standards

NA

3.7.5 Source

Product Design

3.8 Re-request Pickup Option

3.8.1 Description

The system shall provide an option to the user to request for pickup again if they missed a pickup

3.8.2 Priority

Medium

3.8.3 Constraints

Unable to cancel previous request might be a problem

3.8.4 Standards

NA

3.8.5 Source

Customer

3.9 Account Information Update

3.9.1 Description

User should be able to change their address setting, name or email address setting using the account setting option. When someone needs to change the address one simply needs to login to application go to account setting and update the address.

3.9.2 Priority

High

3.9.3 Constraints

N/A

3.9.4 Standards

NA

3.9.5 Source

Customer

3.10 Accept Pickup Request Interface

3.10.1 Description

The system should provide an interface to the drivers of the waste management agencies to accept the pickup.

3.10.2 Priority

High

3.10.3 Constraints

Problem in communication from user to driver might create trouble implementing this feature

3.10.4 Standards

NA

3.10.5 Source

Product Design

3.11 Real Time Driver Location

3.11.1 Description

The system shall update the driver locations every 1 minutes. To provide user with the information about the nearest driver or driver on their way, system should be able to update the location of drivers frequently or provide a real time location

3.11.2 Priority

High

3.11.3 Constraints

Location update can be constrained by user not giving access to location of device or failure of GPS to function properly

3.11.4 Standards

NA

3.11.5 Source

Product Design

3.12 Google Distance Matix API

3.12.1 Description

The google distance matrix API shall be used to calculate the distances between any locations accurately

3.12.2 Priority

High

3.12.3 Constraints

N/A

3.12.4 Standards

NA

3.12.5 Source

Customer

3.13 Save Calculated Distance

3.13.1 Description

The calculated result should be stored in a database to improve the performance of the system.

3.13.2 Priority

Medium

3.13.3 Constraints

N/A

3.13.4 Standards

NA

3.13.5 Source

Product Design

3.14 Assigning Drivers for Pickup

3.14.1 Description

The system shall assign equal number of pick up tasks to each driver for scheduled pickup. It shall calculate the number of pickup assigned to each driver by dividing total number of scheduled user by driver available.

3.14.2 Priority

High

3.14.3 Constraints

N/A

3.14.4 Standards

NA

3.14.5 Source

Product Design

3.15 Shortest Route Possible

3.15.1 Description

The system shall be able to find the shortest possible route for any given driver to reach each of the scheduled pickup that driver has to make.

3.15.2 Priority

Medium

3.15.3 Constraints

N/A

3.15.4 Standards

NA

3.15.5 Source

Product Design

3.16 Schedule Based On Calculation

3.16.1 Description

Instead of making random schedule the schedule should be based on calculation made to operation efficient and cost effective

3.16.2 Priority

Medium

3.16.3 Constraints

N/A

3.16.4 Standards

NA

3.16.5 Source

Product Design

3.17 Notify Pick up Schedule

3.17.1 Description

Not only drivers but system needs to notify users about the pickup schedule along with vehicle information to perfrom pickup

3.17.2 Priority

N/A

3.17.3 Constraints

N/A

3.17.4 Standards

N/A

3.17.5 Source

Customer, System Requirement

3.18 Display Arrival time

3.18.1 Description

There should be a countdown time shown to both the driver and user through the interface until the pickup task is finished.

3.18.2 Priority

High

3.18.3 Constraints

N/A

3.18.4 Standards

N/A

3.18.5 Source

System Requirement

3.19 Cancel Request

3.19.1 Description

Sometime user might need to cancel the request given various circumstances, so there should an option to cancel the request given some condition or criteria

3.19.2 Priority

High

3.19.3 Constraints

N/A

3.19.4 Standards

N/A

3.19.5 Source

Customer

3.20 Pick up Request form

3.20.1 Description

User should be able to enter Time, Date and Location of the pickup and request for pickup using simple interface

3.20.2 Priority

High

3.20.3 Constraints

N/A

3.20.4 Standards

N/A

3.20.5 Source

System Requirement

3.21 Accept pick up request

3.21.1 Description

Accepting the request should be immediate and then system should start looking for driver, countdown time will start as soon as driver accepts the request

3.21.2 Priority

High

3.21.3 Constraints

N/A

3.21.4 Standards

N/A

3.21.5 Source

System Requirement, Customer

3.22 Search nearest driver

3.22.1 Description

The system will find the nearest pick up vehicle from the user locations. Finding nearest driver at the time of pickup makes the task easier and faster for both the parties involved.

3.22.2 Priority

3.22.3 Constraints

3.22.4 Standards

3.22.5 Source

3.23 Notify driver about new request

3.23.1 Description

It will aware the driver regarding the nearest pickup location

3.23.2 Priority

High

3.23.3 Constraints

N/A

3.23.4 Standards

N/A

3.23.5 Source

System Requirement

3.24 Accept Request

3.24.1 Description

The driver should be able to accept the request by user using some interface and follow with the time to pickup waste product.

3.24.2 Priority

High

3.24.3 Constraints

N/A

3.24.4 Standards

N/A

3.24.5 Source

System Requirement

3.25 Show confirmation

3.25.1 Description

The system shall notify confirmation to the user.It will ensure that the waste will be collected

3.25.2 Priority

High

3.25.3 Constraints

N/A

3.25.4 Standards

N/A

3.25.5 Source

System Requirements

3.26 Update Task list

3.26.1 Description

The system will update the task list in driver's UI. It will ensure driver won't miss any pickup that has been assigned

3.26.2 Priority

High

3.26.3 Constraints

N/A

3.26.4 Standards

N/A

3.26.5 Source

Product Design

3.27 Generate Receipt

3.27.1 Description

The system will generate the receipt after the waste is collected. It will serve as a proof.

3.27.2 Priority

Medium

3.27.3 Constraints

3.27.4 Standards

N/A

3.27.5 SOURCE

Customer

4 Packaging Requirements

Since the project is entirely online, there will not be a deliverable product. But our final application will be made available in multiple platforms.

4.1 Multiple Platforms

4.1.1 Description

The project will be made available in app store and play store. Customers will be able to download the application and use it conveniently.

4.1.2 Source

Customer preferences (play store and app store)

4.1.3 Constraints

N/A

4.1.4 Standards

N/A

4.1.5 Priority

High

5 Performance Requirements

App performance is one of the most important factor to determine the quality of the app.

5.1 Faster and Reliable

5.1.1 Description

Users won't be satisfied if the app takes a lot time to refresh the page. The page shouldn't load for long time for which we have to be able to sync or change data at multiple places at same time.

5.1.2 Source

We've been using React as front-end. Instead of scattering application state in various parts of the user interface we can store all the application state inside a central repository.

5.1.3 Constraints

Detailed description of applicable constraints...

5.1.4 Standards

This is possible using Redux. It centralizes application's state and makes the data flow transparent and predictable.

5.1.5 Priority

High

6 Safety Requirements

Since this is online virtual based product there will not be any physical safety requirement except the safety of data user provides to the application.

6.1 Data Privacy

6.1.1 Description

The system shall be able to secure users data provided during sign up process or through application input.

6.1.2 Source

Internet

6.1.3 Constraints

NA

6.1.4 Standards

NA

6.1.5 Priority

Low

7 Maintenance & Support Requirements

Product will be maintained online after publishing the software in various platform. Guides and Manual will be provided in electronic format.

7.1 Support each other

7.1.1 Description

The user or driver shall be able to support whenever required as there comes any problem while using the application

7.1.2 Priority

Medium

7.1.3 Constraints

N/A

7.1.4 Standards

N/A

7.1.5 Source

Customer

7.2 Product Maintenance

7.2.1 Description

Maintenance of the software needs to be done after publishing the application in various platform. Maintenance task like getting customer feedback, handling errors, fixing bugs if found, verifying constant running of application shall be done.

7.2.2 Priority

Low

7.2.3 Constraints

N/A

7.2.4 Standards

N/A

7.2.5 Source

Customer

8 Other Requirements

Since the availability of the product matters most when making an application popular and profitable, the application will be available in various platform.

8.1 Multi-Platform availability

8.1.1 Description

The application will be available to install in various platform like web, android, and ios.

8.1.2 Priority

Medium

8.1.3 Constraints

There is a chance the application may not function same on all of the platform making it difficult to perform each task efficiently on respective platform.

8.1.4 Standards

NA

8.1.5 Source

Team Decision

9 Future Items

The system might also implement an online payment processing between the customers and the company.

9.1 Payment Processing

9.1.1 Description

The system will implement a Google Pay API to processing any kind of payment required withing the application.

9.1.2 Source

NA

9.1.3 Constraints

Incompatibility might create problem while integrating API into the application

9.1.4 Standards

NA

9.1.5 Priority

Low

References