Software Requirements Specification

For

JoyRide®

Submitted by

System Architects

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Revision History

Date of Revision	Document Version	Changes Description	Authored By
11/08/2017	**1.0.0**	**Initial Documentaion**	**Sadhana Muralidharan**
11/15/2017	**1.0.1**	• **Section 2.3: User Characteristics – Figure 2** Updated diagram to show new use cases • **Section 3.2: Functional Requirements** New Use Cases Added (UC18 – UC21) & All existing Use Cases updated • **Section 6.1.1: Figure 4** Diagram Added • **Section 6.1.2: Information Flow (BNF)** Information Flows in BNF added for major processes • **Section 6.2: Product Backlog** Backlog updated to accommodate new use cases	**Sadhana Muralidharan**

1 INTRODUCTION

This is the Software Requirements Specifications for JoyRide®. This section briefly introduces the application and the document.

1.1. PURPOSE

This document aims to provide a detailed view of the JoyRide® mobile application, the software's purpose and functionality including the various components comprised within. This document will serve as the baseline and reference point for all further requirement changes, application development and implementation. This will be the primary document used while making a product proposal to potential clients.

The intended audience for this SRS would be all stakeholders including product owners, development teams, investors and other financial institutions; along with application users and other business clients.

1.2. SCOPE

The JoyRide® application is a mobile application where users can exchange information about their travel plans and coordinate with others travelling towards their destinations. The product is targeted at increasing ride sharing by carpooling, all while having the comfort of the travelers' own vehicles and schedules. This not only contributes to more comfortable and economical travel options, but also contributes towards a more sustainable environment.

The users of the JoyRide® mobile application will be able to request and post travel plans, ranging from daily commuting to long distance trips. Other users who travel to the destinations or other destinations en route can select posted ride information and travel together. The trip fares such as toll amounts and fuel charges will be shared among all the travelers and paid to the designated traveler (the person who made the payments). The application tracks all rides and provides rewards and discounts for users, based on levels of activity and feedback from co-travelers.

Security is a major concern for user information and personal safety during trips and the application has various security measures are provided to ensure safe and secure travels. Driver and passenger verification is done through government portals for background verification. Payments are made through secured payment portals included within the application.

This application will be available for download from and supported on both Apple iOS and Android OS. A database pointed to cloud based MSSQL database servers will be used to store all data relevant to the users accessing the application. Global Positioning Systems will be used to coordinate pick-up and tracking rides initiated using the application. Internet is required on mobile devices to access the application.

1.3. DEFINITIONS, ACRONYMS & ABBREVIATIONS

Expression	**Definition**
User	Drivers & Passengers are collectively referred to as Users.
Driver	User who brings the vehicle (own/rented).
Passenger	Accompanying traveler.
Admin	Back-end associate who facilitates the application's processes.

MSSQL	Microsoft Structured Query Language (also refers to Microsoft SQL Server).
Clients	Outlets which want to participate and post ads using JoyRide®

Table 1: Commonly used Expressions and their Definitions

1.4. REFERENCES

1. IEEE Software Engineering Standards Committee, "IEEE Std 830-1998, IEEE Recommended Practice for Software Requirements Specifications", October 20, 1998
2. https://www.onedesk.com/writing-a-software-requirements-specification-document/
3. https://microtoolsinc.com/papers/how-srs/
4. http://www.cse.chalmers.se/~feldt/courses/reqeng/examples/srs_example_2010_group2.pdf
5. https://www.boost.co.nz/blog/2012/01/use-cases-or-user-stories.html
6. https://www.cise.ufl.edu/class/cen3031sp13/SRS_Example_1_2011.pdf
7. https://www.mountaingoatsoftware.com/agile/scrum/scrum-tools/release-burndown/alternative
8. http://whatis.techtarget.com/definition/Reliability-Availability-and-Serviceability-RAS
9. https://requirementsquest.com/nonfunctional-requirement-examples/#accessibility

1.5. OVERVIEW

This rest of this document provides an overview of the application, detailing the functional requirements, types of users, their use case descriptions and overall descriptions of the technology involved in making the application work as required including data flows and user interaction.

The document is organized into four more sections. The second section provides information on the product itself and constraints. The third section lists its functional specifications. The fourth and fifth section explores other significant requirements and open issues respectively.

Finally, there is an appendix which has some additional information which provides information regarding the development logic, information flows and development plans. While the appendix is included, it is not considered to be part of the requirements definition.

2 OVERALL DESCRIPTION

This section presents the application, its various features and functional requirements it entails. Included in this section are the user descriptions who interact with the system, assumptions made and constraints on the system.

2.1 PRODUCT PERSPECTIVE

The JoyRide® application has only a mobile interface. This will be utilized by all users to carry out actions within the application. The application is essentially self-contained, in the sense, it does not specifically depend on refer to any other product or device other than a database server and the mobile device on which the application is installed.

The mobile application will need to communicate to a GPS application within the mobile phone, see Figure 1 below. The GPS will provide the mobile application with locations of the users and in times of emergency when the user can send a distress message providing exact location details using the GPS. It will also provide maps and have the ability to display the important ride information on the map. The functionality provided by the GPS will be embedded into the application, providing a seamless user experience.

As the application provides the feature of certifying user identity, the database will have to communicate to an external application to verify the details provided by the user.

For the purpose of storing user information, maintaining travel history and tracking rewards, a database will be used. The mobile application will only use the database to get data and all of the database communication will happen via Internet.

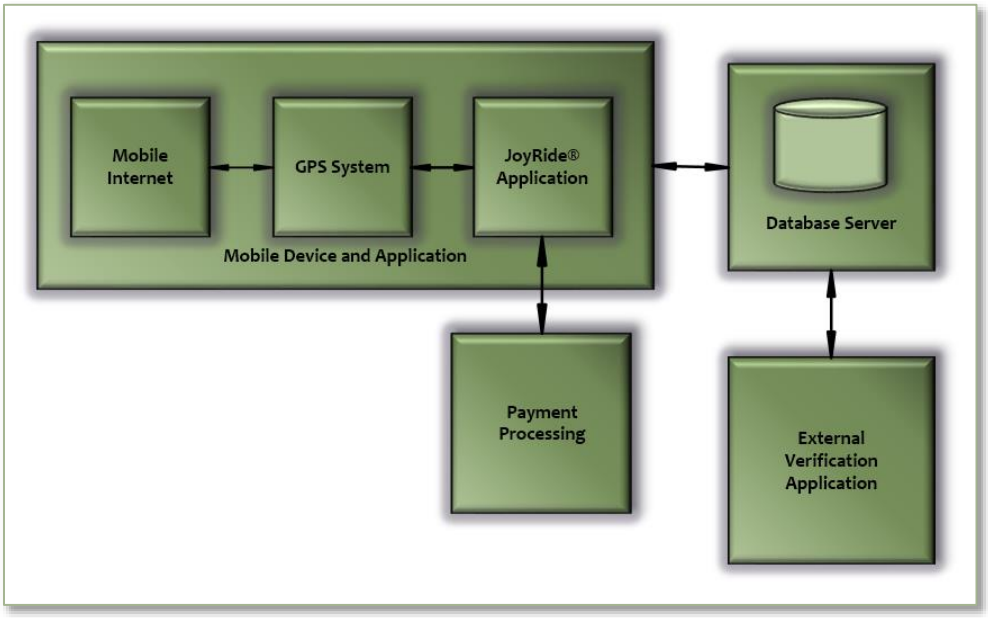

Figure 1: Model Diagram of the Application and Other Components

2.2 PRODUCT FUNCTIONS

This section provides a summary of the main functions that the JoyRide® application will perform.

1) Registration:
    - All users of the application must create a username and password to register to the application.
    - User can define ride preferences and other requirements or special requests.
    - User will be required to indicate which profile they wish to register for: 'Driver & Passenger' or 'Passenger only' and provide the necessary proof for verification.
2) Search and select rides:
    - Users can search for rides based on dates or departure and destination names.
    - Users can select the most suitable ride from the search results and reply to the post, thereby placing a request.
    - The rides are confirmed once the initiating party has approved the other's request.
3) Chat with Co-travelers:
    - All users will be provided with an internal chat feature which they can use to make initial contact. Users will choose to share phone numbers and other information not on their public profile.
4) Request or Post rides:
    - A driver can post rides which other users can respond to by providing basic ride information.
    - A traveler (passenger only profile user) can request for a ride and notifications would be sent to users who opted in for receiving such notifications.
5) Rate a User:
    - Users can rate and provide feedback on other users who they have traveled with after completing a ride. These ratings are used for calculating rewards points.
6) Make Payments for costs incurred:
    - The application can be used to track expenses such as tolls, fuel charges, etc. amongst all the users involved in a ride.
    - The application provides a payment method to pay these amounts via the mobile application using credit cards or PayPal®.
7) Security:
    - For safety purposes, it is required that the application and location services are enabled once the ride is initiated.
    - In emergency situations, the application can be used to send out text messages to predefined contacts, providing details such as the user's current location details.
8) Groups and communities:
    - The application allows users to create groups where users traveling together frequently can exchange ride information.
    - This keeps the rides posted within communities to be kept private unless the initiating user decides to make the ride information public.

- Corporate organizations can subscribe to the application and their employees can sign in with their employee identification and will have corporate customized version of the interface.

9) Support & Feedback:
   - Users can contact customer care when required.
   - Feedback can be given about the application by users, but is an optional feature.

2.3 USER CHARACTERISTICS

The JoyRide® application does not require any technical or domain experience for those who interact with the system. The user interface will be direct and straightforward, facilitating the ease of use.

In this section, the roles or actors of the system who interact with the system, such as "users", "clients" and "Admin", will be explained further. Below is a categorization of the groups who are expected to use the application:

- **User:**
  This group of people will be using the application the most often, accessing the application any number of times within a day. Any person familiar with the Android or Apple operating systems will be easily utilize the application and the GUI will be self-explanatory, hence there is no training required.
  Offices can use our application and the employees who use this application will also be classified under this group. Though they will have a slightly varied user interface, their functionalities remain similar to the public user category.
  This entire group can be segregated into two smaller groups and the roles are interchangeable. The categorization changes for every ride since the user selects this information per ride.
  - ***Driver***: This sub-group is the designated driver for a ride. At the time of registration, if the user would like to drive on one or any of the shared rides, they will be required to provide valid driving license and other necessary documentation. The information is verified and only when the user is certified, can they offer rides. Most importantly, this role is almost always responsible for bringing the vehicle.
  - ***Passenger***: This user sub-group refers to all those who accompany, or ride along with, the driver during a ride. They will be required to provide some government issued identification for verification purposes. A registration on the application is given a "Passenger" status by default and can start selecting existing rides or request new rides as soon as their documents are certified.
- **Clients:**
  This group refers to all participating outlets such as coffee houses, gas stations, café bistros, eateries, etc. who would like to advertise on our application. They will have a designated single log in and can request the Admin to post ads. This group requires no formal training.
- **Admin:**
  This refers to the person who facilitates the various processes in the application. This role is generally a secondary actor in most use case scenarios and since they handle all processes behind the application, thorough training will be provided offline. Specifically, these are the functions of the administrator role:

- ***Support***: This is the support system which handles all questions, complaints, feedback and other communications with all other users.
- ***Verification***: This is a service that will be used to verify the identification information provided by the users at registration.
- ***Payment Processing***: Coordinate the payments that are made while sharing travel costs. Though this feature is optional for the application users but for those who do opt to utilize it – it's ensured that the payments are processed quickly and securely.

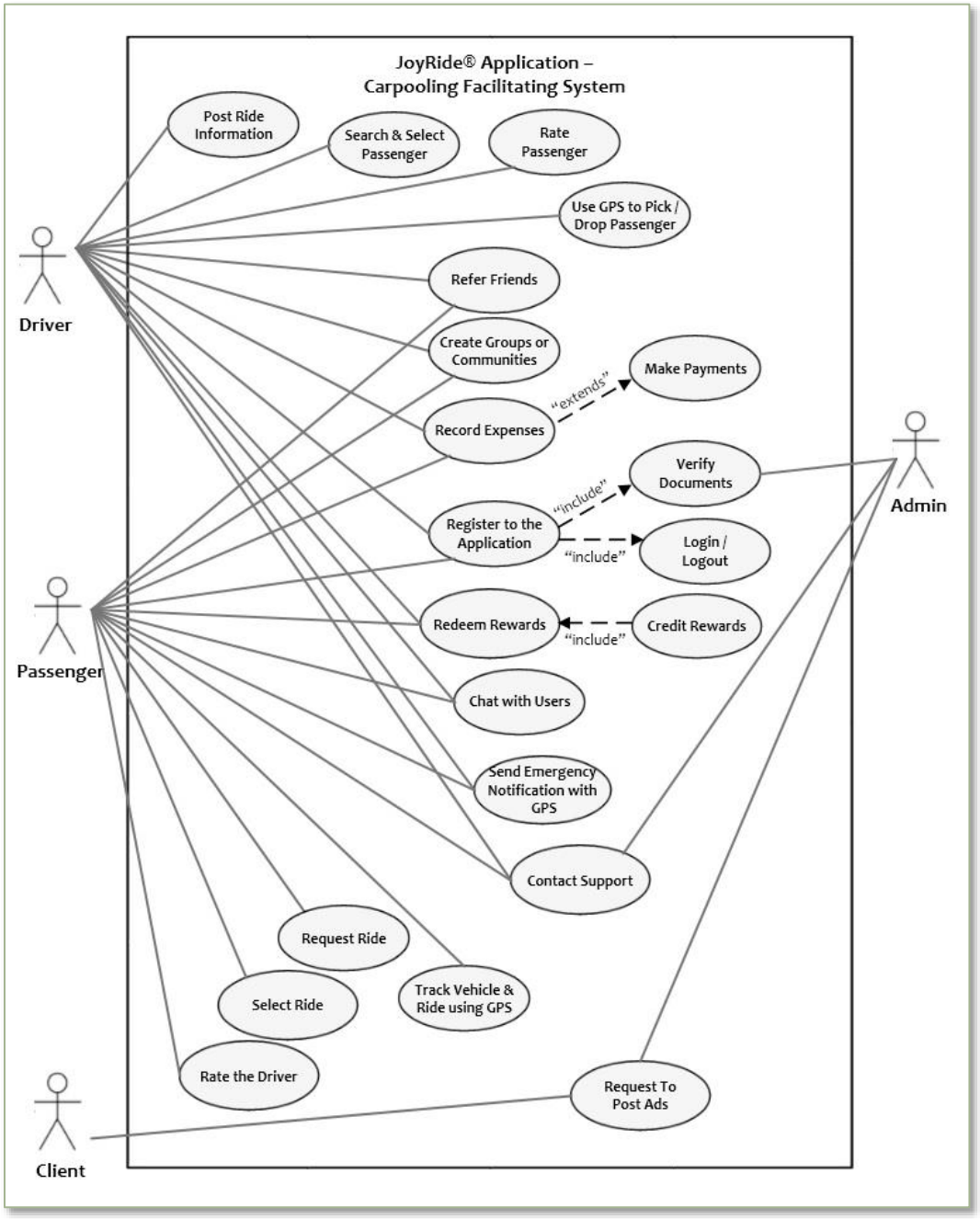

Figure 2 System Level Use Case Diagram *(With Primary Actors on the Right and Secondary on the Left)*

2.4 CONSTRAINTS

There are a couple constraints that could affect the development of this application.

First, developers must keep in mind that the application needs to be designed efficiently enough to handle the expected potential traffic, keeping the application working without any glitches or freezing suddenly. Second, developers must ensure that the application is compatible with the hardware components that the application requires to function – GPS and software components – text and push messages, maps applications.

These constraints could affect the development of the application if there are any changes in the underlying technology.

2.5 ASSUMPTIONS AND DEPENDENCIES

A few important assumptions are made for this application, and all development would be done on the basis that certain conditions are satisfied. These are:

1) Internet access will be available consistently and in required strength on the mobile device running the application.
2) That all GPS systems work similarly and a device specific development for the application's GPS usage will not be required to function properly. If any such changes do occur, the application will need to be updated accordingly.

The dependencies that could be listed for the JoyRide® application would be all the components that are required for the effective functioning of the application. These have been discussed briefly in previous sections but have been briefly reiterated below:

1) This GPS systems are used by the application but is actually available as part of the device's hardware.
2) The application is also dependent on external agencies and services which are used by JoyRide® to certify the users for validating the identification provided.
3) The payment methods like credit cards or PayPal have to be coordinated with the various interfaces for effective delivery of functionality.
4) The maps, text and push messages used by the application will also be available in the mobile's software.

Though there are various assumptions and dependencies, none of these pose any major risk to the viability of the application and at the most may require quick patches which can be released in further iterations of development. In summary, they are simply a record of features used by the application to perform as expected.

2.6 APPORTIONING OF REQUIREMENTS

Many of the above mentioned features are essential to obtaining the complete user experience of the application. As such, these functionalities have been planned into the first three iterations of the

development cycle. A product backlog has been included in the section 'Appendix B' to provide an overview of the development plan.

Given the current plan, the features involving rating and providing feedback will be held for further releases. Though this is not an optional feature, it has been ranked lesser priority, thereby being pushed to later iterations.

3 SPECIFIC REQUIREMENTS

This section details more technical and feature specific functionalities of the JoyRide® application. Details pertaining to the interface, requirements, user level scenarios and some non-functional requirements that will be incorporated into the application.

3.1 EXTERNAL INTERFACES

3.1.1 DATA INTERFACE

For the JoyRide® application, data is not moved through many services or applications. The user information inclusive of personal information, credit cards, and other validation documents information is stored on a designated database server.

The verification of users which is done by collecting identification is verified by the Admin using a licensed application which will not store any information that is provided. Various programs are employed to ensure no data is retained while such verifications are done.

Payment processing is done by the Admin with the aid of APIs from payments processors which is safe and secure.

The application communicates with the GPS and ensures no data is available to other applications on the mobile device.

3.1.2 USER INTERFACE

This carpool application is intended for drivers and passengers with travel needs from one place in a specific direction. All users have their own user name and password to log in to the application and operate the functions as per the system practicality.

A registered user is going to be able to navigate and edit their profile, perform a ride search, produce a ride, view different rides, be a part of a ride, and delete their own ride, whereas making carpool rides, users will establish their own most popular origin and finish destinations, selection of passengers whom they wish to share the journey with.

Within the sign-up process, there will be e-mail verification and an option to provide other documents to verify the user. After that point, users will sign in through the mobile interface. Once logging in, users are going to be able to sign off whenever they desire.

All user interface is intended to be self-explanatory and seamless in transition. The technology used to implement this UI has been selected with this as foremost importance. The following screen mock-up

in Figure 3 has been provided to give an idea of what the application's graphic user interface may look like.

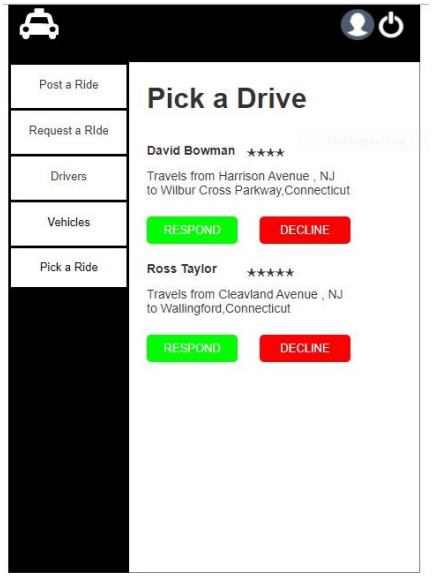

Figure 3 A screen mock up showing the screen where a user can select a ride

3.2 FUNCTIONAL REQUIREMENTS

This section details out the use cases that are found in the JoyRide® application. All use cases are in the template suggested by Alistair Cockburn.

UC1: Search and Select Passenger	
Characteristic Information	
Goal in Context	Drivers can search for and select a passenger(s).
Scope	JoyRide® application
Level	Primary
Preconditions	Driver should be logged into the application.
Success End Condition	Driver select riders to travel with.
Failed End Condition	No passengers are available for selection.
Primary Actor	Driver
Channel to 1˚ Actor	Mobile Device
Secondary Actor	System, Passenger (optional)
Channel to 2˚ Actor	Mobile Phone for Passenger
Trigger	None
Main Success Scenario	
1. The driver searches for passengers who have responded to a ride posted by the driver. 2. The System recommends the passengers by matching the start and destination locations and the date of travel. 3. The driver selects the passenger(s) whose details are closest to their requirements. 4. The system notifies the passenger that their request has been confirmed and the ride is planned.	
Extensions	
3a. The driver messages the passenger through the application asking for information. 3a1. The passenger responds and gives the required information. 3a2. The driver selects the passenger after receiving the necessary clarification.	
Variations	
Step 1: a. The driver may not have posted the ride and may decide to search through select a passenger who has requested for a ride.	
Related Information	
Priority	High
Performance Target	1-2 minutes for Searching, less than a minute for Selection
Frequency	High - many times a day
Superordinate Use Case	None
Subordinate Use Case	Chat with Users (Use Case UC6)
Open Issues	
None	
Schedule	
Due Date	Release 1 – Sprint 1

UC2: Request Ride	
Characteristic Information	
Goal in Context	Passengers can request for a ride.
Scope	JoyRide® application
Level	Primary
Preconditions	Passenger should be logged into the application.
Success End Condition	The passenger requests a ride successfully by providing the necessary information.
Failed End Condition	The ride request is not created in the system.
Primary Actor	Passenger
Channel to 1˚ Actor	Mobile Device
Secondary Actor	System
Channel to 2˚ Actor	None
Trigger	None
Main Success Scenario	
1. The passenger provides the ride request information from the corresponding screen. 2. The system validates the values entered and if mandatory fields are filled. 3. The system saves and notifies the passenger that their request has been created. System displays the ride. 4. The passenger reviews the saved ride request and exits the screen.	
Extensions	
None	
Variations	
Step 2: a. The system may notify the passenger that one or more required fields have not been filled or filled incorrectly. b. The passenger corrects the error and saves the ride information again. Step 3: a. The system may identify another ride information which is similar to the ride saved. b. The passenger can choose to keep the ride request created or delete the ride request.	
Related Information	
Priority	High
Performance Target	2-3 minutes for saving ride information.
Frequency	High - many times a day
Superordinate Use Case	None
Subordinate Use Case	None
Open Issues	
None	
Schedule	
Due Date	Release 1 – Sprint 1

UC3: Make a Payment	
Characteristic Information	
Goal in Context	Passenger/Driver (User) makes a payment using the application.
Scope	Payment Processing System
Level	Primary
Preconditions	1. User should be logged into the application. 2. User should have a valid credit/debit card.
Success End Condition	The calculated amount is paid and processed successfully.
Failed End Condition	The payment is not processed.
Primary Actor	Passenger, Driver *(collectively referred to as User)*
Channel to 1˚ Actor	Mobile Device
Secondary Actor	System
Channel to 2˚ Actor	None
Trigger	None
Main Success Scenario	
1. The user provides the payment amount and card details on the Make Payment screen. 2. The System records the information and sends this to a secure portal for collection and notifies the user once the transaction is complete. 3. The user receives the payment confirmation.	
Extensions	
2a. System displays an error message and redirects the user to reenter their payment information. 2a1. The user provides the information again and makes the payment. 2a2. The system displays the payment confirmation.	
Variations	
Step 1: a. The user may have registered with a PayPal account, which can also be used to make payments in the application.	
Related Information	
Priority	High
Performance Target	About 1 minute for User, less than a minute for processing.
Frequency	Medium: approx. 200 times per day.
Superordinate Use Case	None
Subordinate Use Case	None
Open Issues	
None	
Schedule	
Due Date	Release 1 – Sprint 2

UC4: Log in to the system	
Characteristic Information	
Goal in Context	Users logs in to the system by username and password.
Scope	JoyRide® Application
Level	Secondary (Sub-function)
Preconditions	User should be registered and their identification verified.
Success End Condition	User is logged in to the system and can access the application.
Failed End Condition	User is not logged in to the system due to some issue.
Primary Actor	Driver, Passenger
Channel to 1˚ Actor	Mobile Device
Secondary Actor	System
Channel to 2˚ Actor	None
Trigger	None

UC5: Create Groups & Communities	
Characteristic Information	
Goal in Context	User creates groups with other users who travel often or to nearby locations.
Scope	JoyRide® Application
Level	Primary Task
Preconditions	User should be logged in to the application.
Success End Condition	User creates a group with the selected users in the application.
Failed End Condition	The group is not created successfully.
Primary Actor	Driver/Passenger (User)
Channel to 1˚ Actor	Mobile Device
Secondary Actor	System
Channel to 2˚ Actor	None
Trigger	None

UC6: Chat with Users	
Characteristic Information	
Goal in Context	Users can chat with each other.
Scope	JoyRide® Application
Level	Primary
Preconditions	Users should be logged in to the account.
Success End Condition	Users successfully chat with each other.
Failed End Condition	User couldn't send or receive messages.
Primary Actor	Driver/Passenger (User)
Channel to 1˚ Actor	Mobile Device
Secondary Actor	System

Channel to 2˚ Actor	None
Trigger	None

UC7: Post a ride	
Characteristic Information	
Goal in Context	Driver posts information about a new ride in the application.
Scope	JoyRide® Application
Level	Primary
Preconditions	1. Driver should be logged into the application. 2. Driver should have a vehicle and required papers ready for travel.
Success End Condition	The driver successfully posts a ride.
Failed End Condition	The driver is unable to post a ride information. Information does not save.
Primary Actor	Driver
Channel to 1˚ Actor	Mobile Device
Secondary Actor	System
Channel to 2˚ Actor	None
Trigger	None

UC8: Rate the passengers	
Characteristic Information	
Goal in Context	Drivers rate the passengers.
Scope	JoyRide® Application
Level	Primary
Preconditions	1. Driver should be logged into their accounts. 2. They should have completed the ride with the passenger whom they are going to rate.
Success End Condition	Driver rates the passenger and provides feedback.
Failed End Condition	Driver could not rate the passenger.
Primary Actor	Driver
Channel to 1˚ Actor	Mobile Device
Secondary Actor	None
Channel to 2˚ Actor	None
Trigger	None

UC9: Rate a Driver	
Characteristic Information	
Goal in Context	Passengers rate the drivers.
Scope	JoyRide® Application
Level	Primary
Preconditions	1. Passenger should be logged into their accounts. 2. They should have completed the ride with the driver whom they are going to rate.
Success End Condition	Passenger rates the driver and provides feedback.
Failed End Condition	Passenger couldn't rate the driver.
Primary Actor	Passenger
Channel to 1˚ Actor	Mobile Device
Secondary Actor	None
Channel to 2˚ Actor	None
Trigger	None

UC10: Use GPS to pick up/drop passengers	
Characteristic Information	
Goal in Context	Drivers use GPS to pick up & drop passengers at their respective locations.
Scope	JoyRide® Application
Level	Primary
Preconditions	1. Drivers should have steady internet access on their mobile device. 2. GPS enabled mobile device.
Success End Condition	Driver pick up/drop the passenger at the correct location using GPS.
Failed End Condition	The application does not synchronize with GPS. Maps interface does not work.
Primary Actor	Driver
Channel to 1˚ Actor	Mobile Device, Maps Interface
Secondary Actor	System
Channel to 2˚ Actor	GPS System
Trigger	None

UC11: Select a ride	
Characteristic Information	
Goal in Context	Passengers search and select a ride that has been posted.
Scope	JoyRide® Application
Level	Primary
Preconditions	Passenger should be logged in to the application.

Success End Condition	Passenger selects a ride to carpool on.
Failed End Condition	Passenger cannot select a ride.
Primary Actor	Passenger
Channel to 1˚ Actor	Mobile Device
Secondary Actor	System
Channel to 2˚ Actor	None
Trigger	None

UC12: Refer to Friends	
Characteristic Information	
Goal in Context	Users refer the application to friends and family in promoting application thus, get more users to register.
Scope	JoyRide® Application
Level	Primary
Preconditions	People being referred should not be existing users.
Success End Condition	Referral is successfully sent to the user.
Failed End Condition	Referral not send out.
Primary Actor	Passengers, Drivers
Channel to 1˚ Actor	Mobile Device
Secondary Actor	System
Channel to 2˚ Actor	Text Messaging Application on Mobile Device
Trigger	None

UC13: Request to post ads	
Characteristic Information	
Goal in Context	Vendors request to post ads on the application.
Scope	JoyRide® Application
Level	Primary
Preconditions	None
Success End Condition	Requests to post ads are made correctly.
Failed End Condition	Ad requests are not recorded or received.
Primary Actor	Client
Channel to 1˚ Actor	Telephone, Email
Secondary Actor	Admin
Channel to 2˚ Actor	System Database (Backend)
Trigger	None

UC14: Verify Documents	
Characteristic Information	
Goal in Context	Admin verifies the documents submitted by users.
Scope	JoyRide® Application
Level	Secondary
Preconditions	A tie-up with an external ID validation agency.
Success End Condition	The documents submitted by the user is verified.
Failed End Condition	The documents are not verified because of bad-quality uploads. Identification cannot be validated in the external database.
Primary Actor	Admin
Channel to 1˚ Actor	System Database (Backend)
Secondary Actor	None
Channel to 2˚ Actor	None
Trigger	User should have registered and uploaded documents (Use Case UC18).

UC15: Contact Support	
Characteristic Information	
Goal in Context	Users call Support when facing issues or have queries.
Scope	JoyRide® Application
Level	Primary
Preconditions	User should be an existing user.
Success End Condition	User is able to contact Support and have their issue resolved.
Failed End Condition	User is not able to reach a resolution.
Primary Actor	Passengers, Drivers.
Channel to 1˚ Actor	Mobile Device
Secondary Actor	Admin
Channel to 2˚ Actor	Telephone/Chat
Trigger	None

UC16: Redeem rewards	
Characteristic Information	
Goal in Context	Users redeem reward points for loyalty.
Scope	JoyRide® Application
Level	Primary
Preconditions	1. Users should complete at-least one ride – activity directly relates to rewards earned. 2. A minimum defined limit (to be determined) has to be reached for rewards to be redeemed, for example, minimum of 100 points.
Success End Condition	Users successfully redeem their reward points.

Failed End Condition	Users do not have enough reward points to redeem.
Primary Actor	Passengers, Drivers.
Channel to 1˚ Actor	Mobile Device
Secondary Actor	System
Channel to 2˚ Actor	None
Trigger	None

UC17: Track Vehicle and Ride Using GPS	
Characteristic Information	
Goal in Context	Users track vehicles and trip routes using GPS.
Scope	JoyRide® Application
Level	Primary
Preconditions	1. GPS enabled mobile device 2.Steady Internet connection
Success End Condition	User is able to track the vehicle and the trip entirely.
Failed End Condition	GPS interface or internet is unsteady and user is unable to track the vehicle.
Primary Actor	Driver, Passenger
Channel to 1˚ Actor	Mobile Device, Maps Interface
Secondary Actor	System
Channel to 2˚ Actor	GPS System
Trigger	None

UC18: Register to the Application	
Characteristic Information	
Goal in Context	User can register to the application to use its features.
Scope	JoyRide® Application
Level	Primary
Preconditions	1. User will need a valid government identification to complete the registration process. 2. User needs a valid email address and phone number.
Success End Condition	User successfully uploads documents and creates an account on the application.
Failed End Condition	User does not able to register. User cannot upload documents or complete the registration.
Primary Actor	Driver, Passenger
Channel to 1˚ Actor	Mobile Device
Secondary Actor	System
Channel to 2˚ Actor	None
Trigger	None

UC19: Credit Rewards	
Characteristic Information	
Goal in Context	Users are credited rewards based on usage and activity such as number of trips taken, ratings earned, etc.
Scope	JoyRide® Application
Level	Primary
Preconditions	Users should already be registered and actively making trips using the application.
Success End Condition	Rewards are credited to the users.
Failed End Condition	Rewards are deducted or not credited to the user.
Primary Actor	Admin
Channel to 1˚ Actor	System database (Backend)
Secondary Actor	None
Channel to 2˚ Actor	None
Trigger	Users accumulating a defined number of points triggers a notification for the Admin to credit rewards to the users.

UC20: Record Expenses	
Characteristic Information	
Goal in Context	User records expenses after trips so that it can be shared among all of the co-travelers.
Scope	JoyRide® application
Level	Primary
Preconditions	User should be logged in to the application.
Success End Condition	User records all expenses and the amounts are divided among all travelers equally.
Failed End Condition	User is not able to record expenses. Amount spent is not divided.
Primary Actor	Driver, Passenger
Channel to 1˚ Actor	Mobile Device
Secondary Actor	System
Channel to 2˚ Actor	None
Trigger	None

UC21: Send Emergency Notification using GPS	
Characteristic Information	
Goal in Context	User can send emergency notifications to designated contacts using the GPS system and mobile device's text messaging application.
Scope	JoyRide® application
Level	Primary
Preconditions	1. User should have access to the application. 2. Users should be on a trip and at least one of the users travelling in the vehicle should have initiated the trip in the application.
Success End Condition	User successfully sends text notifications to their contacts.
Failed End Condition	Emergency notification process failed due to poor GPS signals or weak mobile internet access.
Primary Actor	Driver/Passenger (User)
Channel to 1˚ Actor	Mobile Device
Secondary Actor	System
Channel to 2˚ Actor	Text Messaging Application Service
Trigger	None
Main Success Scenario	
1. User navigates to the maps screen showing the trip progress and clicks on "Send SOS!" 2. The system finds the contact information that the user has stored in the account preferences. 3. The system sends out text messages specifying the location and a short message to all designated contacts (maximum of three). 4. The system sends a distress event notification to the Admin.	
Extensions	
2a. The user may not have stored emergency contacts prior to start of trip. 2a1. The system cannot find any contact information designated for this purpose. 2a2. The user is redirected to the contact list where they must select at least one contact (maximum of three).	
Variations	
None	
Related Information	
Priority	High
Performance Target	Less than 1 minute
Frequency	2 – 3 per month
Superordinate Use Case	None
Subordinate Use Case	None
Open Issues	
None	
Schedule	
Due Date	Release 1 – Sprint 3

3.3 NON-FUNCTIONAL (QUALITY) REQUIREMENTS

3.3.1 PERFORMANCE

A major non-functional requirement which determines the quality of the application and the user experience is performance. Performance would not be an issue because the database server only handles limited pieces of data per transaction. Server updates will happen within a few seconds as long as the phone can maintain a steady mobile Internet connection signal. Seamless user interaction is expected to be achieved and maintained with little to no trouble.

3.3.2 PORTABILITY

The JoyRide® application does not have many external devices or programs that it depends on for functioning, it is intended to be hosted on different operating systems – the Android operating system and on Apple iOS. Though it is not anticipated that any major changes will occur to these operating systems which limits the application's functionality, it is something that needs to be periodically reviewed and updated.

Most of the other coding that goes into the application is self-contained and will not be impacted by external changes, making portability very simple if the need so arises.

3.3.3 SECURITY

Security is an important concern in our application since users are required to provide identification to verify their information. Once personal information is obtained from customers, it is utmost importance to keep this information private and secured. All best practices required to protect and ensure data safety will be taken, including:

- Encryption of passwords and other data,
- Usage of a dedicated server for user information,
- Resolution plans in worst case scenarios such as breach, and
- Secured payment portals, etc.

3.3.4 SCALABILITY

Scalability is the degree to which the JoyRide® application able to expand its features and capabilities upward and outward to support business growth. Depending on the success of the application, we hope to incorporate more features within future updates in the application. These will be made available in the application stores of both intended operating systems – thereby providing no hindrance to the users or their regular usage of the application.

The application shall be scalable to accommodate unrestricted growth in the number of users accessing and utilizing the application. The roll out of corporate memberships will not restrict growth or negatively affect website performance.

3.4 LOGICAL DATABASE REQUIREMENTS

As mentioned in previous section, the JoyRide® application does require a database to maintain the information for saving profiles, calculating credits and recording travel details. This data will be organized into the following collections:

- User Details – This is a collection of information about the user that is gathered at the time of registration. It will store all the identification details provided by the user. Once certified, the user will be activated in the system and notified.
- Travel history – this is the set of data which details all rides that have taken by users through the application. It stores information such as date of travel, to and from locations, which user was the passenger and the driver, and what costs were incurred.
- Payment history – this collection records all payments made through the application and records the payments even if they were settled offline.
- Ride postings – this is the collection of data that records which rides have been posted by the driver and requested by passengers. This information would be maintained here until the ride is completed or expired. The information regarding which passenger(s) and driver are coordinating for a travel is also recorded here until the trip is completed.

Please refer to Figure 4 which describes how the logical database would be organized at a high level.

3.5 DESIGN CONSTRAINTS

No particular design constraint requirements have been identified.

3.6 STANDARDS COMPLIANCE

No particular standards compliance requirements have been identified.

4 OTHER REQUIREMENTS

Most of the requirements have been designed and contained within the application. However, there are some basic requirements such as:

- Mobile device should be on the Android or iOS platforms.
- Mobile Internet should be available for the effective usage of the application.
- Basic knowledge of operating smart phone is necessary.
- The GPS hardware should function properly for the application to be accurate.

5 OPEN ISSUES

No global open issues have been identified currently.

6 APPENDIX

6.1 APPENDIX A: SUPPORTING ANALYSIS INFORMATION

6.1.1 DATA FLOW DIAGRAM

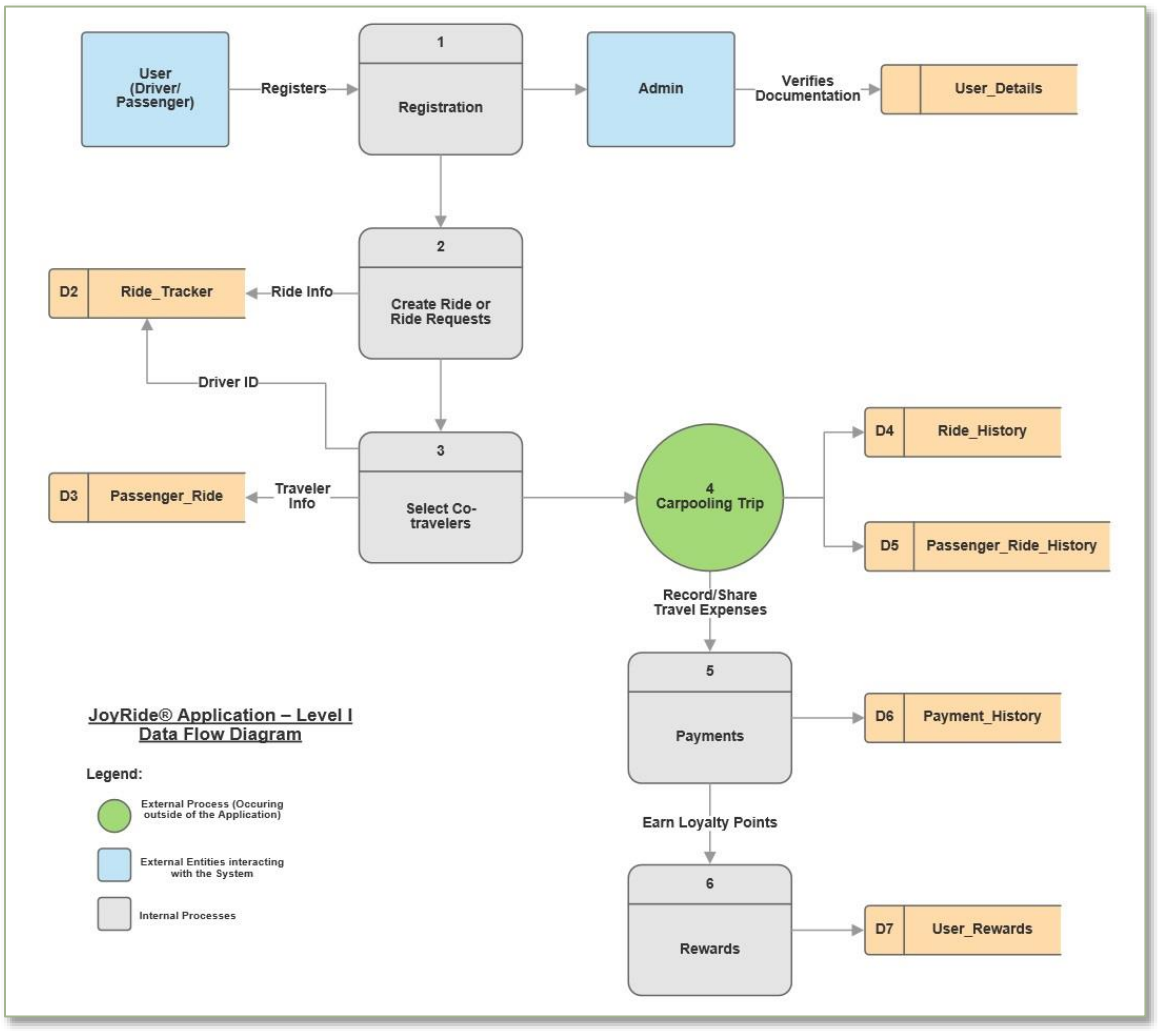

Figure 4 Level I Data Flow Diagram for the JoyRide® system

6.1.2 INFORMATION FLOW (BNF)

The below are the information flows in BNF for the major processes displayed in Figure 4 of the Level I Data Flow Diagram of the application:

1. **User Registration BNF**
   registration => user_name + dob + address + email + phone_no + (card_info)
   user_name => first_name + (middle_name) + last_name
   address => building + street + zip + (country)
   card_info => card_no + card_name + security_code + exp_date
2. **Creating Ride Information BNF**
   ride_info => from_location + to_location + start_date + end_date + (seats) + creator
   from_location => [zip | place]
   to_location => [zip | place]
   place => city + state
   creator => [driver | passenger]
3. **Selecting Co-traveler BNF**
   travelers => passenger + driver
   passenger => (“passenger1”) + (“passenger2”) + (“passenger3”) + (“passenger4”)
4. **Payment Processing BNF**
   payment => payment_amt + pay_user + payment_method
   payment_method => [card_payment | PayPal]
   PayPal => Acc_username + password
   card_payment => card_info => card_no + card_name + security_code + exp_date
5. **Rewards**
   points => ({points_trip})
   points_trip => [pts_trip1|pts_trip2|....|pts_tripN]

6.1.3 USER INTERACTION SEGMENT CHART

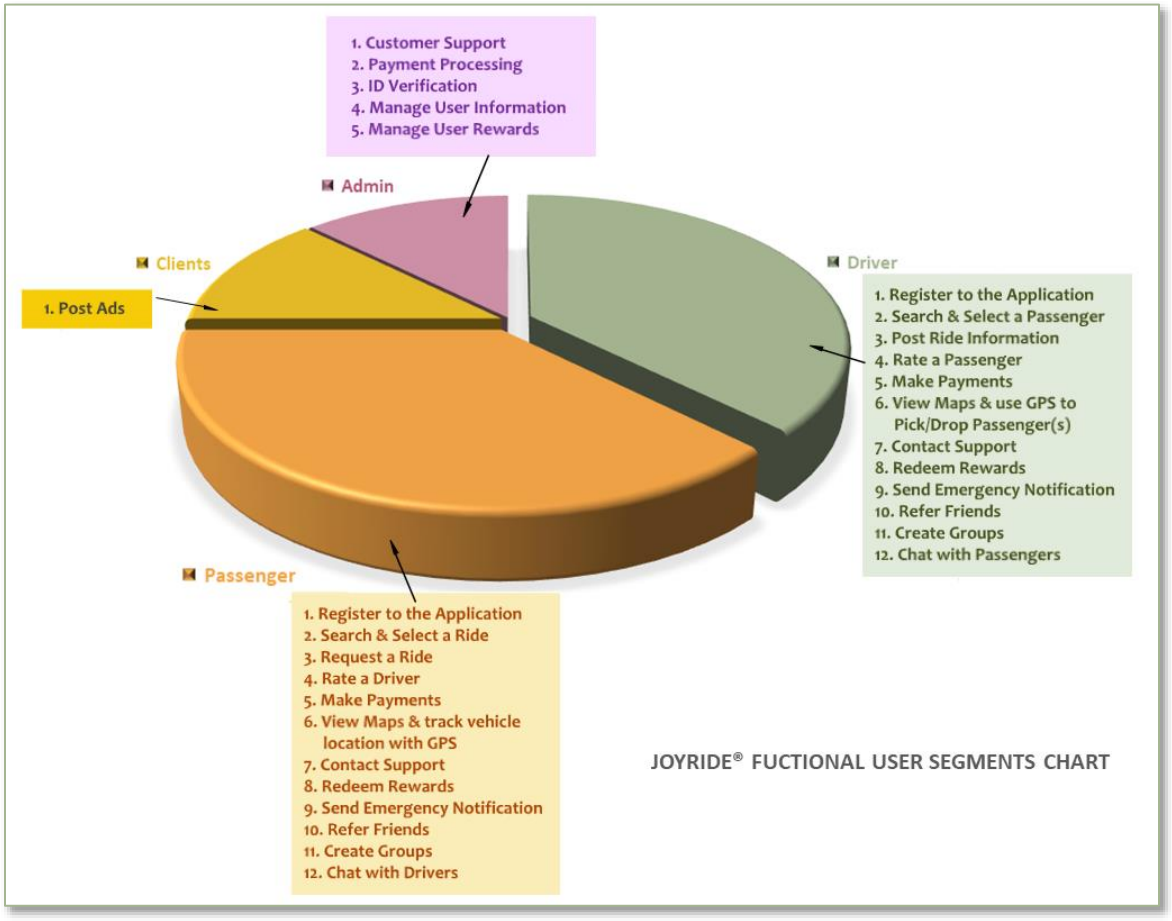

Figure 5 Chart showing the application usage by the User Classes, listed with their functions

6.1.4 LOGICAL DATABASE DESIGN DIAGRAM

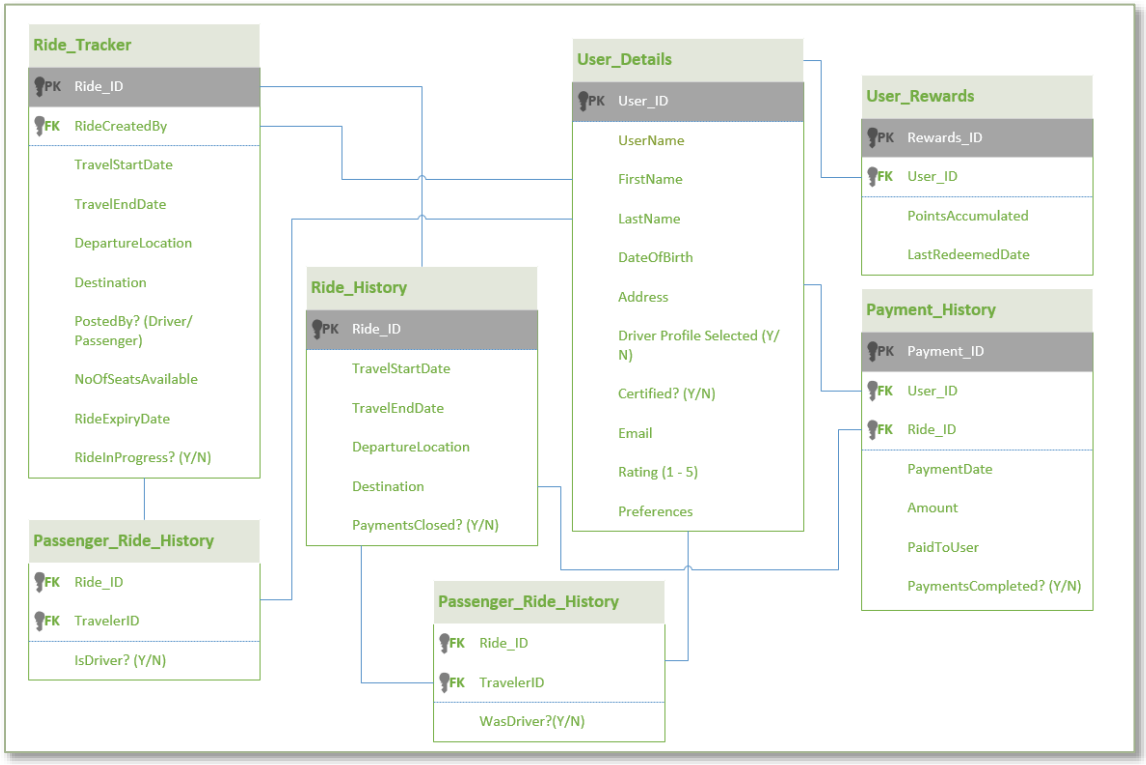

Figure 6 Diagram displaying the Database Design for JoyRide®

6.2 APPENDIX B: PRODUCT BACKLOG

The below is the Product Backlog of the first release of development, inclusive of four sprints with user stories mapped to their corresponding use cases as listed above.

ID	Type	Title	Rank	Estimates	Linked Use Cases	Owner	Iteration	Status
US-001	User Story	As a Product Owner, I want to create a market research analysis document so that we can study competitors and their features.	1	2	N/A	Rachana	Sprint 0	Accepted
US-002	User Story	As a Product Owner, I want to create a Risk Management document so that we can plan and analyse the risks and determine ways to mitigate them.	1	1	N/A	Shivadhar	Sprint 0	Accepted
US-003	User Story	As a Product Owner, I want to create a Problem Statement document so that we can record and establish fundamental details and ideas about the application.	2	1	N/A	Rachana	Sprint 0	Accepted
US-004	User Story	As a Product Owner, I want to create a Process Model document so that we can register the software methodology used and corresponding information about the project.	2	1	N/A	Shivadhar	Sprint 0	Accepted
EP-001	Epic	As a Product Owner, I want to create a list of Use Cases and a Use Case diagram so that we can describe the set of interactions between the system and the users.	1	5	N/A	Poojitha	Sprint 0	Accepted
EP-002	Epic	As a Product Owner, I want to create a Software Requirement Specifications document so that we can produce a baseline document to record all functionalities and requirements (internal and external).	1	3	N/A	Sadhana	Sprint 1	Accepted
US-007	User Story	As a User, I want to register for the application so that I can use all the features.	1	2	UC18, UC4	Sankalp	Sprint 1	Accepted
US-008	User Story	As a User, I want to post or request a ride so that other users can respond to it.	1	3	UC2, UC7	Sankalp	Sprint 1	Accepted
US-009	User Story	As a User, I want to select a ride from different users so that I can ride with the following driver.	2	2	UC1	Shivadhar	Sprint 1	Accepted
US-010	User Story	As a User, I want to upload the documents so that my profile gets verified.	1	1	UC14, UC18	Poojitha	Sprint 1	Accepted
US-011	User Story	As an Admin, I want to verify the documents so that users are certified and can begin using the application.	1	2	UC14	Poojitha	Sprint 1	Accepted
US-012	User Story	As an Admin, I want to provide and manage a payment gateway option so that the users can pay through the application.	2	2	UC3	Shivadhar	Sprint 1	Accepted
US-013	User Story	As a User, I want to have GPS tracking system so that I can track the ride location	1	5	UC10, UC17	Sankalp	Sprint 2	Accepted
US-013	User Story	As a User, I want to pay for the ride so that I can share the expenses.	2	3	UC3, UC20	Sankalp	Sprint 2	Accepted
US-015	User Story	As a User, I want to view the User Profile so that I can opt to ride with a selected user.	4	3	UC11	Poojitha	Sprint 2	Completed
US-016	User Story	As a User, I want to request a special ride so that I can ride on my own accordance.	3	4	UC2	Sankalp	Sprint 2	Accepted
US-014	User Story	As a User, I want to rate the ride so that I can provide feedback about other users.	3	2	UC8, UC9	Rachana	Sprint 3	Accepted
US-017	User Story	As a User, I want to contact the customer care so that I can seek help for an issue.	3	1	UC15	Poojitha	Sprint 3	Completed
US-018	User Story	As a User, I want to create groups of users who frequently travel together.	2	3	UC5	Shivadhar	Sprint 3	Completed
US-019	User Story	As a User, I want to send ride details to my contacts during an emergency situation.	1	8	UC21	Sankalp	Sprint 3	Completed
US-020	User Story	As a User, I want to receive notifications about a ride so that I can respond to the user.	2	5	UC6	Poojitha	Sprint 3	Completed
EP-001	Epic	As an Admin, I want to provide reward coupons for the user with good ratings and feedback, so that they can use the redeem rewards.	3	4	UC16, UC19	Shivadhar	Sprint 4	Planned
EP-002	Epic	As a Client, I want to request the Admin to post ads to promote my business in the application.	4	3	UC13	Poojitha	Sprint 4	Planned

Figure 7 Product Backlog of Release 1 of Development