



PES UNIVERSITY, BANGALORE

Department of Computer Science and Engineering

Software Specification

Requirements

for

Cab Aggregator System

Version 1.0 approved

Prepared by:

Saakshi H Srinivasan – PES2UG20CS290

Sakshi Hulageri – PES2UG20CS300

Samhitha R Nadig – PES2UG20CS304

Shreya R Hegde – PES2UG20CS331

Organization: PES University

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Other Requirements

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Revision History

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Initial	01-09-2022	Initial Document	1.0



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Introduction

Purpose

Transportation is a very real problem in India with less than perfect public transport systems and increasing traffic on our roads. Cab aggregators are aiming to solve this very real problem by giving people an alternate method of travel that is cost-effective, safe and hassle-free. The purpose of this case study is to describe the cab booking system which provides the cab booking details, billing and cancellation on various types of booking such as Confirm booking, Online booking and Phone booking.

Intended Audience

The different types of readers are:

- *Customers*
- *Developers*
- *Management people*
- *Passengers*

Product Scope

One requires taxis/cabs for various reasons, be it for commuting from workplace to home or vice versa and for many more reasons.

The important part is that this industry is still unorganized, and the demand is growing. It shows that there is a huge business opportunity from an entrepreneur's perspective and at the same not ups the expectation service from the consumer's perspective to which cab aggregators evolved as a sure shot solution.

It aims to increase Passenger revenue enhancement and provide an improved and optimized service.

References

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Overall Description

Product Perspective

This product is a highly advanced replacement of certain existing systems that only aim at providing basic services on prior request. The main concept behind this product is to offer minimum downtime to an anxious rider/customer who is facing problems with his/her motor vehicle. Integration of multiple different features (ranging from servicing to paperwork legalities) covering all possible aspects of a vehicle, thus making the product highly scalable for the company and easy to use for the user.

Product Functions

- **Payment Systems** *On the technical side of things, the payment method of the app is the most important function. There should be no problems with making the payment for the trip in advance. Mobile wallets, mobile banking, and physical cash should all be available to customers.*
- **Geolocation** *Users and drivers will be able to see precisely where the request originated by using the geolocation capability. Riders have the option of designating the places where they would want to be picked up and dropped off; they are also alerted to pick up requests through geolocation which they may accept or reject at their discretion. Drivers and passengers can connect with other persons near them by using this function.*
- **Booking** *This is all it takes to create a taxi booking application. Thanks to this functionality, users should be able to schedule appointments with a single swipe. People will be able to summon a cab by simply hitting a button or slider on your website if you provide one.*
- **Scheduled Rides** *Users will be able to book taxi services in advance using this function. Reservations may be made by mentioning the time and day, and a driver will be assigned based on the information provided. Once a ride has been scheduled, the user will get an email confirming the appointment.*
- **Security** *When booking a cab, everyone considers reliability as an important factor. The driver's name, phone number, and taxi number are all shown on taxi booking software, allowing you to determine whether or not the driver is the one you were expecting. Because of the services offered by the firms listed above, you won't have to be concerned about any of the risks mentioned earlier while traveling with a stranger.*



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- **Ratings** Both drivers and passengers may profit from this function. Please rate your overall satisfaction with your taxi journey in this location, as well as your overall satisfaction with your taxi driver. Customers may also be assigned a grade based on their driving behavior.

User Classes and Characteristics

Daily Basic User: These users use our services on a daily basis(4-7 per week) to get to work and back home. These users prefer basic and cheap modes of transportation.

Committed Basic User: This category users our basic cab service for every traveling need on a daily basis(12+ per week)

Weekly Basic Users: This category of users apply for our basic service (1 -3 per week)

Occasional Users: These are the users that uses our services very less for their special or emergency needs

Basic Service Provider: These are the drivers with basic rides.

Operating Environment

The software is designed to run in android devices. It requires a device with Android 4.4 or higher with a stable internet connection and GPS access. The software would need basic access to memory, processors and other such components required to run any Application on a Smartphone. Other than that the app would require access to GPS and Internet access.

Design and Implementation Constraints

Lack of GPS access on devices would make it harder to locate the user and driver. Unstable internet connection will interfere with the operation of the app.

2.6 Assumptions and Dependencies

Assumption is made that there is a daily market saturated with customers. If this assumption fails to hold up, the number of our drivers would outweigh the number of users in a timespan and hence decrease the profits.

Assumption is made that there are enough drivers within a reasonable distance to most locations.

Assumption is made that the users have a stable Internet and GPS connection.

External Interface Requirements

User Interfaces

Authentication Screen will have Username and password text box and a login button(register option provided).

Registration Screen will have textboxes to enter details to register as a user.

Home page will have a carousel of ads and services and a Book Ride Button.



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The Booking Page will have an option to choose the pickup and drop off location. It will show the optimal route to minimize costs.

Later the user will be given an option to choose a type of service. After the completion of service the user will be required to pay either by cash or E-wallet.

Software Interfaces

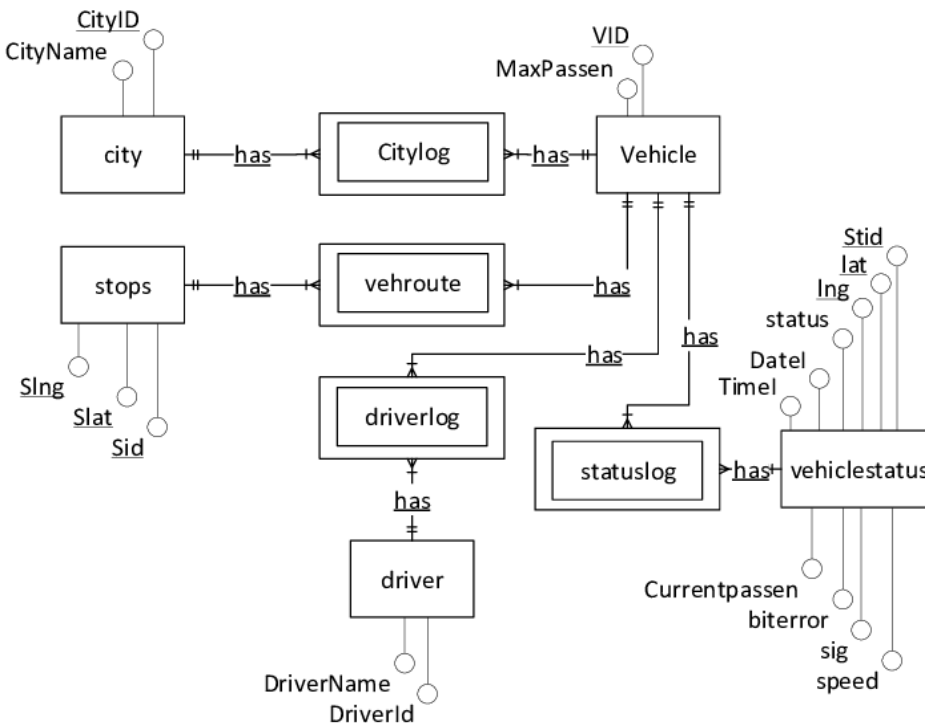
The product runs in Android 4.4 or higher. The personal data of the user and his/her travel history will be stored as cached data to optimize the App. Data regarding the booking and location will be sent to the server which marks the customer on the providers map.

Communications Interfaces

The communication architecture must follow the client-server model. Communication between the client and server should utilize a REST-compliant API web service and must be served over HTTP Secure (HTTPS). The client-server communication must be stateless. Users can reach out to Customer Support via email and phone.

The app would require access to GPS and Internet.

Analysis Models





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System Features

System Feature 1

5.1.1 Description and Priority

Before providing access to our services the user has to be recognized for both security and performance concerns. Login would allow the user to enter his/her Id and Password to gain access. If he/she does not have an active account the client would be allowed to register as a new user.

5.1.2 Stimulus/Response Sequences

On the event of opening the app for the first time the user would be shown a login screen, from here the user can enter his/her login id and password and click login button to gain access. If they do not have an active account they may click the register button and submit their details.

5.1.3 Functional Requirements

Advance Booking Features

A passenger can book a taxi in advance with the cab aggregator system.

Registration or Sign-Up

The cab aggregator system ensures the registration process is simple and smooth and isn't time consuming.

Estimate Of Arrival Time For The Booked Cab

This application displays the option of selecting a cab and the expected arrival time for the user's convenience.

Booking Confirmation Info

If users confirm that they want to book a ride right away, the cab-aggregator system displays a confirmation screen with all the ride's details and a free estimate.

The Precision Of Estimated Fare

Users will be able to view the estimated fare on the app. After the user selects the pickup and drop-off locations, they should be able to see an estimation of the ride cost.



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Confirmation Page For Ride Details: Once the journey has been confirmed, the application should allow the user to see the cab's current location, as well as the projected arrival time along with driver details, mobile no. of driver, cab registration number.

Completion Of Ride And Feedback Sharing: The users may be prompted with a screen showing the trip distance and cost after completing the ride.

Live Tracking Of The Ride: The user can monitor both the live status of the booked cab before it reaches the pickup point as well as the live status of the ongoing trip in this function.

In-App Communication: The driver and commuter can communicate over call/message before the cab's arrival.

Ride Option: Lists all rides taken - past, ongoing, and scheduled - for tracking complete documentation about journeys with the particular cab aggregator.

Administrator Aspect - Perform weekly plan of Drivers, Check feedbacks, Manage driver portfolio.

Driver Aspect - Logging into the system, to check their rosters, maintain daily logs, select availability, check online bookings

User Aspect - Make a booking, check their booking status, check driver history, make payments after the ride.



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System Feature 2 (and so on)

Other Non-functional Requirements

Performance Requirements

It is available during all 24 hours. Application interface of our system was unit tested at all levels of implementation, right from start of code writing, to integrating the code with other modules. Every module was tested fully to check its syntax and logical correctness. Error handling was implemented into relevant modules so that the code doesn't crash on errors.

Safety Requirements

The goal of safety requirements here is to identify protection requirements that ensure that system failures do not cause environmental damage. They define situations and events that should never occur. Functional safety requirements define: checking and recovery features that should be included in a system, and features that provide protection against system failures and external attacks.

Security Requirements

The software system defined in this SRS must follow industry recommended practices for secure software development. At a minimum, the software development must practice the principle of least privilege for defining access-level requirements of the software system and its associated services. The production-release version of the software system must pass an automated dynamic application security testing tool. Non-functional security requirements describe what a system has to be. These are statements that support auditability and uptime.

Software Quality Attributes

Quality attribute requirements are part of an application's nonfunctional requirements, which capture the many facets of how the functional requirements of an application are achieved. All but the most trivial applications will have non-functional requirements that can be expressed in terms of quality attribute requirements. To be meaningful, quality attribute requirements must be specific about how an application should achieve a given need. Defining which of these scalability measures must be supported by the system is crucial from an architectural perspective, as solutions for each differ. It's vital therefore to define concrete quality attribute requirements,

Business Rules



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The system must have at least a Super-User role and a User role defined for accessing and interacting with the system. Additional roles may be defined for the system as long as the business rules for the administrator and user roles are satisfied.

Other Requirements

Legal - The system must comply with all laws and regulations applicable to a taxi organization.

GPS - GPS is used as a positioning system. The positioning should be handled automatically without the driver having to interfere with the system.

Usability - The system must be user-friendly. In the cars, special care must be taken to ensure that the interface is as non-intrusive as possible for the driver. Most functions should be possible to perform while driving and it is essential that the information is clear, the display clearly visible, and the sequences for different functions are short.

Appendix A: Glossary

Application Programming Interface (API): A system of tools and resources (e.g., subroutine definitions, protocols) in an operating system that enables developers to create software applications.

Representational State Transfer (REST): A style of architecture based on a set of principles that describe how networked resources are defined and addressed for providing interoperability between computer systems on the Internet.

Global Positioning System (GPS): The Global Positioning System, originally Navstar GPS, is a satellite-based radionavigation system owned by the United States government.

HyperText Transfer Protocol (HTTP): An application protocol for distributed, collaborative, and hypermedia information systems in accordance with RFC 7230 and RFC 7540.

HyperText Transfer Protocol Secure (HTTPS): A communications protocol for secure communication over a computer network using Hypertext Transfer Protocol (HTTP) within a connection encrypted by Transport Layer Security (TLS), or its predecessor, Secure Sockets Layer (SSL).

Transport Layer Security (TLS): A cryptographic protocol that provides communications security over a computer network in accordance with RFC 6176.



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Secure Sockets Layer (SSL): An early standard security technology, later replaced by Transport Layer Security (TLS), for establishing an encrypted link between a web server and a browser.

Appendix B: Field Layouts

An Excel sheet containing field layouts and properties/attributes and report requirements.

Sample sheet with information required to register the customer

Field	Length	Data Type	Description	Is Mandatory
Account Number	16	Numeric		Y
IFSC code	11	Alphanumeric		Y
Card Amount	20	Numeric		Y
Mandate Start Date	8	Date	Date of Mandate Registration	N
Mandate End Date	8	Date	Date of Mandate Expiry	N
Status	25	Alphanumeric	Status of Registration	Y
Customer Name	60	String		Y
Reject Reason Code	4	String	Reject Reason code in case mandate is rejected	N



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Sample Report Requirements: Include the fields to be included in the report

Registration Report

Bank Account Number

IFSC Code

Bank Name

Account Status

Account Type

Customer Name

Card Number

SI Start Date

Status

Remarks

Transaction Report

Transaction Reference Number

Bank Account Number

IFSC Code

Bank Name

Customer Name

Card Number

Debit Transaction Amount

Transaction Date

Status

Debit Attempt Number

Remarks

Appendix C: Requirement Traceability Matrix

Sl. No	Requirement ID	Brief Description of Requirement	Architecture Reference	Design Reference	Code File Reference	Test Case ID	System Test Case ID



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