

POLO-S (A CARPOOLING SERVICE)

Abstract

Efficient and reliable transportation is crucial in today's fast-paced world, necessitating innovative solutions to overcome the limitations and concerns associated with traditional car booking systems. With the help of a user-friendly system, passengers would be able to travel more happily, safely, and affordably thanks to the PoLo project. This is based on the idea of getting a ride with a stranger that is safe. It enables the drivers and passengers to keep an eye on one another while also allowing the passengers to choose their fellow travelers based on personal information. The main advantage of this strategy is that all available rides and passengers with the same destination and source route may be listed nearby, saving time for travelers who would otherwise have to scour the entire road for a transport. An individual will be able to view the travel companions while also splitting the cost equally among all passengers hence reducing the actual cost. Additionally, the application is successful in keeping track of each rider's trip information for whom rides have been completed. One of the projects that will improve and streamline the sharing of travel experiences is POLO-S.

Keywords: Efficient transportation, innovative solutions, car booking systems, user-friendly system, safe ride

Authors

Nikhil John Jose

Computer Science
Saintgits C.O.E
Kottayam, India
nikhil.csb2024@saintgits.org

Pillai Midhun Unnikrishna

Computer Science
Saintgits C.O.E
Kottayam, India
pillai.csb2024@saintgits.org

Naveen Wilson

Computer Science
Saintgits C.O.E
Kottayam, India
naveen.csb2024@saintgits.org

I. INTRODUCTION

Booking cars is quickly becoming a recognised and utilized business model. Numerous companies are using software that enables customers to book cabs with only a few clicks of their fingers. It is not an overstatement to suggest that the procedure of reserving a ride on the Internet is growing simpler, according to the online Ride booking system project. This ride-sharing system project aims to create a welcoming environment for carpooling where you can pick the passengers you ride with. Customers are drawn to today's ride-sharing applications not only because they are very handy, but also because they offer a broader variety, comparable rates, better ride information (including user reviews), and incredibly straightforward navigation.

Ride-sharing has emerged as a cutting-edge and thrilling technology globally. By providing effortless access to rides, it offers unparalleled convenience to individuals, making it one of the most widely adopted applications today. The system has successfully incorporated online ride functionality, expanding beyond anonymous ride-sharing and allowing users to easily comprehend and accept riders of their choice. This progressive approach has greatly accelerated the development of ride-sharing applications, especially with the advent of platforms like Uber and Ola, which have revolutionized the industry with their user-friendly and convenient services.

This project is a riding system for similar ride searches that runs on both Android and iOS. Users can directly search for available drivers on the Internet in real time without the use of middleman services by using online ride sharing and prebooking. The goal of this initiative is to use the advantages of online rider and driver searches to physically avoid time- and money-consuming searches. helps you use your Android mobile to get transportation anywhere via the internet. Riders can therefore request rides and select the services they want from their preferred or chosen drivers.

- 1. Project Objective:** Through a single internet gateway, PoloS for ride-sharing aims to offer comprehensive solutions for both users and drivers. It will allow drivers to acquire direct riders without having to physically wait on the highways for hours, and it would allow passengers to choose the driver and other passengers they choose to take the ride with. Both users and drivers will be able to accept and refuse rides using the user-driver module.
- 2. Project Scope:** With acceptable terms of application, this system can be applied in any tiny local regions or across borders. On demand, we locate the appropriate rides, drivers, and ride systems for you. Riders can choose from a variety of rides from any location with the help of an online interface, saving them time from having to navigate through traffic. Both iOS and Android users will be able to download the software.
- 3. Project Overview:** The technology offers a simple way for drivers to find riders without spending hours driving around looking for them with an added benefit for riders to select the other riders with whom they want to share the ride with along the way. The suggested system can be used by any inexperienced user and does not require any training, prior experience, or technical understanding in the field of computers, but it is helpful if the user is familiar with how to use a phone.

II. LITERATURE REVIEW

This study of the literature compares and contrasts the many systems frequently employed in the creation of ride-sharing apps, taking into account their features, scalability, security, and adaptability. Systems used to build ride-sharing applications show the significance of dependable geolocation and mapping services, strong backend infrastructure, and secure payment processing. Scalability and dependability are provided by cloud-based plat-forms like AWS or GCP, while effective backend development is facilitated by frameworks like Node.js or Ruby on Rails. Effective ride matching and navigation support are ensured by integration with precise geolocation and mapping services. The usage of secure payment processing technologies also fosters consumer convenience and confidence. Ride-sharing software may provide consumers streamlined and dependable transportation experiences by using these systems efficiently.

India's ride-sharing services demonstrate how they might improve urban mobility, manage traffic issues, and handle other transportation-related issues. For ride-sharing services to expand sustainably, however, infrastruc-tural, safety, and regulatory issues must be resolved. Design and usage of ride-sharing programmes may be further enhanced by understanding user behavior, preferences, and cultural considerations unique to India. Ride-sharing has important effects on urban mobility in India and has the potential to develop a more integrated, open, and sustainable transportation system. To maximize the advantages of ride-sharing apps in the nation, future research should concentrate on solving the special difficulties and possibilities in the Indian setting.

III. REQUIREMENT ANALYSIS

1. **Feasibility Study:** The system feasibility can be divided into the following sections:

- **Economic Feasibility:** The concept is financially viable because all that is required is an Android or iOS device that satisfies the aforemen-tioned basic criteria. The sole expense incurred by users in order to access the programme is Internet connectivity.
- **Technical Feasibility:** To deploy the application, the only technical aspects needed are mentioned below: OS: Windows 10 or above For Users: Android 6 and Ios 13 or above Internet Connection
- **Behavioural Feasibility:** The application doesn't need any particular technological assistance, and each view it offers is self-explanatory. Users are given clear instructions on how to use the system, and all actions made are accompanied by warning and error notifications.

IV. OBJECTIVES AND FUNCTIONALITIES

1. Objectives

- Our project's goal is to provide a user interface that allows users to either receive a ride as a driver or a ride with other regular riders through online mode.
- A user can login into the system and then search for rides to their desired locations.
- The drivers can then view corresponding requested rides within a proximity.

2. Functionalities

- Provides the searching facilities based on various factors. Such as area, user, destination and source, ride confirmation.
- PoloS also manages the request details online for Request ride details, Confirm ride details.
- It tracks the information of Riders, Distance traveled.
- Manage the information of Location.
- Manage the User information.
- It deals with monitoring the information and motion of the current rides.
- It deals with monitoring the information and rides within a users' login.
- Searching and requesting is made easy with proper management of distances.

V. DESIGN

1. Technology Stack

Frontend

- **Flutter:** Flutter is an open-source UI toolkit developed by Google, revolutionizing the way developers build high-performance, visually stunning applications across multiple platforms. This one-page description provides an overview of Flutter's key features, benefits, and its impact on cross-platform app development.
- **Android Studio:** The official Integrated Development Environment (IDE) for developing Android apps is called Android Studio, and it offers programmers a wide range of tools and resources to help them produce top-notch Android applications. Android Studio, which is based on the IntelliJ IDEA platform, provides a user-friendly interface and a wealth of capabilities that speed up the development process. It features a sophisticated code editor with automatic code completion, debugging tools, and integrated emulators for testing and running programmes. Additionally, Android Studio easily interacts with the Android SDK, giving developers access to a wide range of frameworks, APIs, and development tools, making it a crucial tool for building effective and reliable Android applications.

Backend

- **Firestore:** Google offers Firestore, a strong and complete platform for creating and managing online and mobile apps.

It provides a wide range of tools and services that streamline and quicken the development process. With-out the need for complicated server architecture, developers can quickly set up authentication, real-time database storage, cloud messaging, hosting, and more using Firebase. Additionally, it has strong analytics and crash reporting features that give developers insightful knowledge on how users behave and how well their applications run. For developers wishing to create feature-rich and scalable applications, Firebase is a fantastic option due to its scalability, usability, and thorough documentation.

2. Requirement Specification:

• Functional Requirements:

- Users must register if they want to search for rides. Unregistered users will not be able to access the application.
- The User logs in to the system by entering a valid email ID, Phone number and password.
- A User can search for rides by giving a source and drop off location or cancel the search after logging in or registering.
- A User can search for other riders with the approximate same pickup and drop off for requesting shared rides by pinging them and adding them as friends.
- In this system, the payment type is cash payment. Extend this to upi payments ,credit cards, debit cards, PoloPay etc. in the future.
- After placing a ride, the system sends the information of driver to rider and rider to driver by the connected system database.

• Non-Functional Requirements

- The Application should be easily maintainable for the users.
- The system shall provide an easy and attractive graphical interface for flexible use
- Flexible rider-base architecture will be highly desirable for future extension.
- Better component design to get better performance at peak time.
- Driver based availability.
- Secure access to consumer's confidential data.

3. Activity Diagram

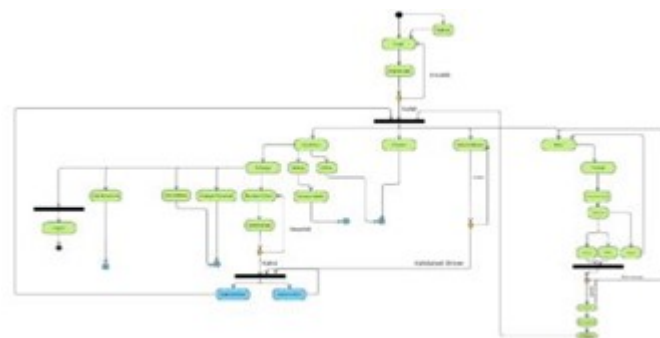


Figure 1: Activity Diagram

4. ER Diagram

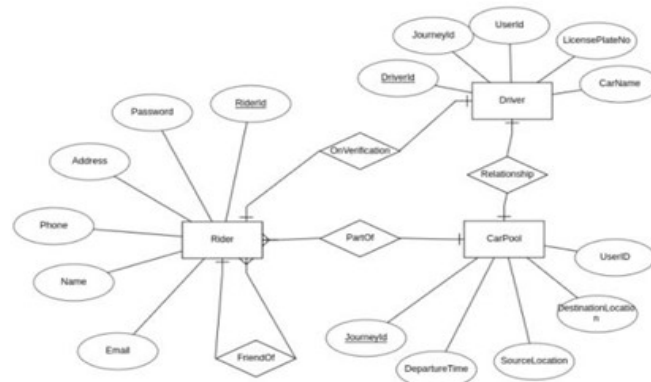


Figure 2: Entity Relationship Diagram

5. System Architecture Diagram

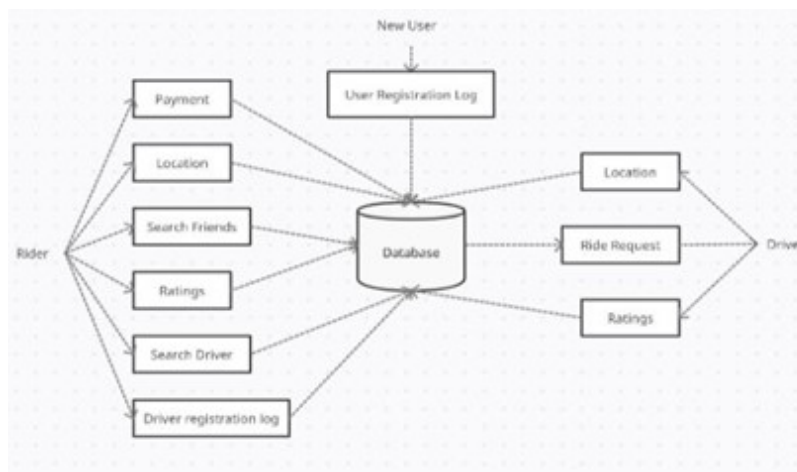


Figure 3: System Diagram

6. Use Case Diagram



Figure 4: Use Case Diagram

VI. DEVELOPMENT

1. **Modular Description:** Root page is the Index page. This is the home page that displays all the types of rides that are available at the current moment. There is a navbar that navigates to Home Screen, Driver-Rider switch, Friends and Ride. There is an icon menu that opens up 3 options: Settings, Offers(not for driver), History of rides.

There are 2 panels: User and Driver panel

- **Driver:** All drivers who wish to become drivers have to firstly register as riders. After which the driver can then enable the switch to driver option by adding the required documents and information for becoming a driver in the settings page. The Drivers will have a map of the region and the rider requests will be mapped on the map in the drivers close proximity. This map will be directly provided in the Home page for drivers. Drivers can choose the riders by selecting them and viewing their profiles.
- **Rider:**
 - **Registration Module:** Used for registering the new users of the system.
 - **Login Module:** Used for managing the login details.
 - **Ride Module:** Used for requesting rides and managing the ride details.
 - **Payment Module:** Used for managing the details of payment.
 - **History Module:** Used for managing the Previous and upcoming ride history.

2. **Environment Setup:** We are using Android Code as our Environment Android Studio provides: Intelligent Code editor, Android SDK manager, Instant app support, Integration with Firebase

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