Project Report

on

Share Wheels: Ride Sharing System

Submitted for partial fulfillment of requirement for the degree of

BACHELOR OF ENGINEERING

(Computer Science & Engineering)

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CERTIFICATE

This is to certify that the Project (8KS07) entitled

Share Wheels: Ride Sharing System

is a bonafide work and it is submitted to the

Sant Gadge Baba Amravati University, Amravati

By

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in the partial fulfillment of the requirement for the degree of

Bachelor of Engineering *in* ***Computer Science & Engineering****,*

during the academic year ***2023-2024*** *under my guidance*.

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ABSTRACT

The introduction of the Share Wheels ride-sharing system presents a creative solution to the challenges of urban transportation, aiming to address issues such as traffic congestion, environmental concerns, and rising fuel prices. By leveraging state-of-the-art technology and user-friendly interfaces, Share Wheels connects car owners with users seeking transportation, facilitating shared rides that optimize urban mobility and foster social connections. Emphasizing user trust and data security, the system incorporates strict privacy regulations and a public rating system to ensure accountability and dependability within the community. Integration with public transportation networks enhances the holistic mobility experience while promoting environmental responsibility. The project's objectives encompass reducing traffic congestion, minimizing pollution, conserving resources, boosting efficiency, encouraging sustainable behavior, providing cost savings, aiding in achieving urban sustainability goals, and strengthening community connectivity. Social aspects of the project include promoting community participation, decreasing social isolation, improving accessibility, encouraging trust and cooperation, raising environmental awareness, empowering users, supporting the local economy, and fostering a positive social impact. The system analysis outlines functional and non-functional requirements, capacity estimation, and hardware configurations necessary for the implementation of Share Wheels. Finally, the conclusion highlights the project's significance in addressing pressing societal issues and outlines future scopes for technological advancements, fleet modernization, user engagement strategies, sustainability initiatives, global reach, and innovation, underscoring Share Wheels' role as a sustainable and eco-friendly solution for urban transportation.

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1. INTRODUCTION

1.1. Introduction

The ride-sharing system, Share Wheels is a creative way to encourage sustainable and efficient car sharing, which helps to address the problems associated with urban transportation. A region characterized by growing traffic jams, environmental issues. This system provides a dynamic platform for people to share rides and resources, maximizing urban mobility, in line with changing mobility preferences.

In essence, the system uses state-of-the-art technology to link car owners and users who are looking for transportation in the meanwhile. Participants can create and search for ride listings using an intuitive interface. Algorithms that consider user preferences, scheduling, location, and other criteria help to facilitate compatible matches in addition to lowering the number of cars on the road, this encourages social connections between users.

The system's emphasis on user trust and data security is a key feature. Strict privacy regulations are put in place to protect user data, and a public rating and review system encourages accountability and dependability within the community. Furthermore, seamless travels that mix shared rides with current transit options are encouraged by the system's possible integration with public transportation networks, providing a holistic mobility experience.

The ride-sharing system acknowledges its influence on the environment. It contributes to a greener urban scene by quantifying decreases in carbon emissions and congestion. This knowledge corresponds with the rising demand for environmentally friendly transportation options, enabling users to make ethical decisions in addition to using the system as a convenience. A timely and practical answer arises with the ride-sharing system as metropolitan areas work toward sustainable growth. It defines a new paradigm for urban transportation that values efficiency, environmental responsibility, and the communal well-being of its users and the communities they live. It does this by encouraging shared mobility, lowering congestion, and increasing community participation.

1.2. Motivation

The problem of transportation in today's urban landscape has developed into a complicated one. The increasing issues of environmental degradation, traffic congestion and rising fuel prices have made new solutions imperative.

The way transportation is now set up frequently results in inefficiencies and difficulties that affect commuters as well as the environment. Addition to increasing traffic congestion, the prevalence of single-occupancy vehicles also contributes to increased carbon emissions and the depletion of important resources. Furthermore, the lack of an efficient way to promote contact among prospective carpoolers leads to lost possibilities for ride-sharing, which makes the already difficult situations worse.

The urgency created by these pressing problems serves as the basis for the "ShareWheels" project. Utilizing mobile applications and GPS technologies, our project seeks to address the details of inefficient transportation and the unfavorable effects on the environment.

Our aim is to empower customers by offering them the ability to find the closest vehicle based on their current location, particular parameters like departure time, cost considerations, and even the quantity of empty seats.

With the proposed application, we hope to create a network where community members can easily connect with other commuters, resulting in fewer cars on the road overall. Furthermore, this would optimize travel patterns and promote a sense of shared responsibility for environmental protection. We are dedicated to supporting the institution's larger sustainability goals by increasing the use of currently registered vehicles and reducing fuel usage.

1.3. Problem Definition

i. In recent years, we have seen an acute increase in traffic on our roads. This surge has not only made commuting a cumbersome process but has also led to an escalation in the usage of fuel. Such excessive consumption has resulted in the hike of fuel prices, adding to the distress of daily commuters who rely on personal vehicles for transport. Alongside these inconveniences, the use of

vehicles also contributes significantly to environmental pollution, leading to adverse effects on both human health and the ecosystem.

ii. Despite these issues, the concept of car sharing has gradually started to gain traction as a potential solution. The idea of multiple individuals utilising the same vehicle reduces the number of cars on the road, thus easing traffic congestion, lowering fuel consumption, and reducing pollution. However, the implementation of car sharing is not without its challenges. Concerns around security, trust, and coordination often arise, posing hurdles to its widespread adoption.

iii. The solution to this conundrum lies in a mobile-based Carpool system. This system would serve as a platform that connects individuals seeking to share rides, thereby providing a safe, secure, and convenient way to carpool. The functionality of such a system could be versatile, catering to both short daily journeys—such as commuting to work within the city—and longer inter-city trips. Through such a system, individuals can coordinate their travel schedules, agree upon pick-up and drop-off points, and share the costs of the journey, all while contributing to the alleviation of the broader issues of traffic congestion, fuel costs, and environmental pollution.

iv. The growing worries of resource depletion, pollution, and traffic congestion in today's fast-paced world are serious problems that need immediate response. Traditional modes of transportation are becoming more and more constrained as urban areas and populations rise. This results in hazardous emissions, traffic jams, and a depletion of natural resources.

v. Acknowledging these difficulties, the "Share Wheels: Ride Sharing System" project has surfaced as an innovative solution meant to tackle these problems head-on. The idea presents a smartphone application that uses GPS to completely transform how people commute inside their communities. Through the use of technology, Sharewheels seeks to improve carpooling by streamlining the procedure and making it more effective, convenient, and ecologically friendly.

vi. Fundamentally, Sharewheels uses location-based technologies and mobile devices to instantly match commuters with suitable ride-sharing options. Users

may simply arrange pick-up and drop-off locations, divide the cost of the trip, and locate other drivers who are traveling in the same route by using the user-friendly mobile application. In addition to lowering the amount of cars on the road, this encourages commuters to interact socially and form strong bonds with their communities.

vii. A big step in the direction of implementing sustainable urban transportation options is the Sharewheels project. It seeks to lessen transportation congestion, cut carbon emissions, and preserve priceless natural resources by promoting carpooling and making the most use of already-existing resources. Furthermore, Sharewheels has the ability to change people's perspectives on daily commutes by offering an approachable platform that is available to everyone, encouraging a shared mobility and environmental stewardship culture.

1.4. Objectives

i. **Reduce Traffic Congestion:** The project's goal is to lessen traffic on the roads, particularly during rush hours, by promoting carpooling using the Sharewheels platform. To achieve this goal, fewer single-occupancy cars will be on the road, which will help to alleviate traffic congestion in cities. Sharewheels reduces traffic congestion and maximizes road capacity by pairing commuters heading in the same direction. This results in improved traffic flow and shorter travel times for all users of the road.

ii. **Minimize Pollution:** Sharewheels aims to reduce pollution by encouraging shared mobility choices, which lead to a decrease in the number of cars that produce harmful emissions. Reduced carbon emissions and other pollutants result from fewer cars on the road, improving air quality and benefiting public health. The project tackles the urgent problem of air pollution in metropolitan areas and promotes environmental sustainability by rewarding carpooling and lowering the overall carbon footprint of commuting.

iii. **Conserve Resources:** By making the best use of the current transportation infrastructure and lowering the demand for new roads, parking lots, and other resources related to individual car ownership, the project seeks to conserve natural resources. Sharewheels reduces the environmental effect of

transportation and encourages responsible resource management in urban settings by making ride-sharing arrangements more efficient.

iv. **Boost Efficiency:** To make ride-sharing in communities more efficient, Sharewheels uses mobile applications and GPS-based technology. Through the platform's real-time information on available rides, compatible travel partners, and best routes, users may carpool more efficiently and save time and effort when setting up shared rides. Achieving this goal is essential to promoting the broad use of shared mobility solutions and optimizing the advantages of ride-sharing for commuters and the environment.

v. **Encourage Sustainable Behavior:** Sharewheels hopes to instill a culture of environmentally responsible transportation among commuters by offering incentives for shared mobility and a user-friendly platform. The project encourages behavior change toward more environmentally friendly commuting patterns by making it simple and comfortable for people to choose shared trips over driving alone. This goal is in line with more general initiatives to support sustainability and lessen the carbon impact of urban transportation.

vi. **Provide Cost Savings:** Sharewheels enables cost savings for users through the sharing of transportation expenses, such as fuel, tolls, and parking fees. The platform increases the affordability and financial sustainability of commuting for individuals and households by distributing the cost of rides among several passengers. This objective is particularly relevant for low-income commuters who may encounter financial barriers to accessing transportation services and for whom cost savings can have a substantial impact on their daily lives.

vii. **Aid in Achieving Urban Sustainability Goals:** Sharewheels supports efforts to create livable, dynamic cities, encourages effective land use, and helps reduce greenhouse gas emissions in order to achieve urban sustainability goals. Carpooling is encouraged and reliance on single-occupancy vehicles is decreased, which helps communities meet sustainability goals and construct greener transportation networks. Achieving this goal is crucial to building resilient, future-ready urban environments that put the needs of people's quality of life and sustainability first.

viii. **Strengthen Community Connectivity:** By enabling shared transportation and providing possibilities for networking while traveling, share wheels promotes

social engagement and community connection among commuters. The platform encourages social cohesion and lessens social isolation by bringing people together in shared cars, especially for those who might otherwise commute alone. This goal advances the general quality of life for locals and helps to create stronger, more cohesive communities.

1.5. Social aspects of project

i. **Community participation:** By uniting people who travel similar commute routes and destinations, Share wheels promotes community participation. By means of shared rides, commuters can effectively engage in social interactions and cultivate a sense of community among fellow members.

ii. **Decreased Social Isolation:** Share wheels provides possibilities for shared experiences throughout travel, reducing social isolation for people who might otherwise commute alone. Getting a lift with someone else might help reduce feelings of isolation and loneliness, especially for people whose daily routines don't always include regular social encounters.

iii. **Improved Accessibility:** Share wheels improves accessibility for people who might encounter obstacles using conventional forms of transportation by offering a practical and reasonably priced way of transportation. This includes senior citizens, persons with impairments, and residents of underprivileged areas who might not have easy access to private or public transportation.

iv. **Encouragement of Trust and Cooperation:** Users who consent to share rides with one another must have mutual trust and cooperation for Share wheels to succeed. By use of the platform, commuters can foster cooperative connections and trust with one another, so enhancing the sense of community and mutual support that exists inside the network.

v. **Environmental Awareness:** Share wheels encourages environmentally friendly transportation methods in order to raise awareness of the environment. Users can actively reduce air pollution and greenhouse gas emissions by opting to carpool and reducing the number of automobiles on the road. This

practice also promotes environmental stewardship and responsibility.

vi. **Empowerment of Users:** By providing users with more options for how to get around, share wheels empowers users. Users may simply arrange rides, choose their favorite travel companions, and lessen their environmental effect with the help of the mobile application. Users who feel empowered have a stronger feeling of agency and autonomy, which improves their commuter experience.

vii. **Support for Local Economy:** Share wheels can help the local economy by lowering the financial burden of transportation expenditures on individuals and households by increasing shared mobility options. By doing this, resources that could be used for other urgent needs or neighborhood companies can be freed up, boosting the local economy.

All things considered, the Share wheels project not only tackles the real-world issues of pollution and traffic jams but also has a positive social impact by encouraging community involvement, lessening social isolation, encouraging cooperation and trust, and enabling users to choose environmentally friendly modes of transportation.

1.6. Organization of report

The organization of our project report is as follows:

1. **Introduction:** In the initial chapter, we delve into a concise introduction concerning our application, its problem definition, and the purpose behind our choice of this project. We also provide the impetus that motivated us to embark on this journey.
2. **Literature Survey:** This section features a comprehensive literature review, incorporating various renowned authors' research and insights on the ride-sharing system. We elaborate on how their groundbreaking studies and ideas have significantly contributed to our project.
3. **System Analysis:** Here, we discussed the required system specifications, shedding light on the necessary technological requirements for building this

app. We also list the hardware configurations essential for creating and using this project.

4. **System Design:** This phase offers an in-depth view of our project's overall system design. Our team developed the class diagram, data flow diagram, and sequence diagram to showcase the app's workflow and uses. These diagrams have also proved instrumental during the project's development phase.
5. **Implementation and Results:** In this section, we discuss the practical application of our research findings in our application and the integration of the database with the frontend. This segment also features the user interface of our project, offering glimpses into the results of our hard work.
6. **Conclusion and Future Scope:** As we reach the end of our report, we present our project's conclusion and outline the potential for future improvements. This segment serves as a projection of what lies ahead in the journey of our application.
7. **References:** This section lists the references we have cited throughout the report. It includes government reports, academic papers, and other valuable sources that have informed our understanding and shaped our project.

2. LITERATURE SURVEY

2.1. Literature Survey

Temporary solutions are often useful for temporary traffic disruptions such as road or bridge resurfacing or reconstruction. The concept of ride matching can be particularly beneficial in these situations, especially when the street is heavily congested. Milica Šelmic supports this theory and suggests implementing ride-sharing using the advanced K-means algorithm during the reconstruction of the Gazela Bridge in Belgrade[4].

This system implements an even-odd concept, where vehicles with license plates ending in an even/odd number are only allowed on the roads on certain days. In each cluster, one driver with an odd-numbered license plate and one with an even-numbered license plate are selected.

A matrix is generated based on general characteristics such as origin, destination, arrival, and departure time, as well as the type of license plate. A matrix of centers is also created, with the initial number of centers equal to the total number of passengers. Binary matrices are then generated, showing the shortest distance/time for all passengers from all generated centers. After applying constraints such as tolerable time and distance for passengers, the binary matrices are multiplied. The resulting matrix shows which centers are suitable for each passenger.

In Carpooling: A Step to Reduce Congestion (A Case Study of Delhi). Engineering Letters by Dewan, K.K. & Ahmad, Israr have given a problem which is traffic congestion, and how we are solving it with Sharewheels or carpooling methodology [1].

Sharewheels is the sharing of rides in a private vehicle among two or more individuals. It involves the use of one person's private or company vehicle to carry one or more fellow passengers. Carpooling is the easiest and most common ridesharing arrangement. It usually consists of two to four persons commuting in a vehicle. Sometimes carpoolers share driving and other responsibilities. In other cases, one person does all the driving and is reimbursed for mileage by his or her riders. The carpool driver may pick up passengers from their homes, or the passengers may find a way to get to the driver's home at a specified time, or they may meet at a particular

location. Sharewheels is defined as an effort by drivers of motor cars who agree to take turns sharing rides from places of residence to places of employment. As the definition implies, car-pooling therefore refers only to the exercises carried out by the owners and drivers of private motor cars [12].

For example, if two persons A and B would like to share a vehicle, they must first be owners and drivers of that vehicle. They will then organize among themselves as to who is to drive on which day which route to follow, and so forth. Preferably, A and B would alternate driving on a daily or weekly basis, or on any other basis they prefer. There will not be any charges or fees involved. Excluded from the definition are those who ride share but do not own a motor car, and those who own motor cars ride share regularly but do not share driving [5]. In these two cases, payment of fees is usually involved. If a car owner drives alone to work every day and spends approximately Rs. 5392 including fuel, maintenance, parking, etc., it is assumed that on average, he travels 40 kilometers per day. If he shares the car with three carpoolers who have their car and drive to the same workplace, then each of them can save Rs. 4044 per month of the total spent on commuting to the workplace. All four carpoolers have to bring their car for a week in a month and drive themselves with the other three carpoolers [3].

In Sasikumar C, Jaganathan S. A Dynamic Carpooling System with Social Network Based Filtering. Research J. Engineering and Tech. states how social networking can help us share vehicles and encourage social interactions [6]. Carpooling is essential for reducing fuel consumption, alleviating traffic congestion during peak hours, and enhancing parking facilities. It is an arrangement where a ride in a private or public vehicle is shared by two or more individuals, reducing total expenditure as costs are divided amongst passengers [2].

Real-time ridesharing allows for one-time rideshares at short notice. This system primarily utilizes three technologies: GPS for route information and locating drivers and passengers, Android phones as an interface between riders and requestors, and social networking sites like Facebook, WhatsApp, Twitter, etc., to establish trust and accountability between riders and requestors [9].

Carpooling can be implemented in various ways, such as designated driver carpool, alternating carpool, employer carpool, and vanpool carpool [7]. It supports the utilization of empty seats in any type of vehicle.

The government should encourage carpooling through advertisements and community outreach programs. A significant advantage of carpooling is its ability to support areas not covered by the public transport system.

There are numerous methods to enable automatic matching between passengers who share the same origin, destination, and travel time. For instance, Yan Huang developed a method called 'Noah' that dynamically matches taxis and trip requests [8]. It relies on three main components: a fast-shortest path algorithm, a fast-dynamic matching algorithm, and a spatial indexing method for quickly retrieving moving taxis.

Abutaleb, Soha & El-Bassiouny, Noha & Hamed, Sara. (2020). Sharing rides and strides toward sustainability: an investigation of carpooling in an emerging market. Management of Environmental Quality An International Journal. ahead-of-print.[22]

The objective of this project is to examine consumer intentions toward carpooling as a collaborative consumption practice. The paper uses the theory of planned behavior (TPB) in studying consumer intentions toward carpooling. It extends the theory to add personal norms as a major component in examining consumer intentions. It also adds two main motivational factors for collaborative consumption, which are economic benefits and sustainability.

3. SYSTEM ANALYSIS

3.1. List of Requirements

In this section, we provide a detailed overview of the requirements, libraries, hardware specifications, and software infrastructure for the ShareWheels Ride Sharing System. The system leverages the various database integrations and logical matching of Rides.

The ShareWheels System has Specifc requirment based on problem statement to ensure its functionality and effectiveness:

3.1.1. Functional Requirements

1. Users should be able to see all the Rides available with minimum price and Estimated time of Arrival
2. Passengers should be able to see all nearby drivers in real-time
3. Users should be able to book a cab for their destination
4. Users should be able to see the location of the driver
5. Users should be able to cancel their ride whenever they want
6. Users should be able to share their rides or post their rides so others can join them
7. Once a ride is accepted, both the driver and customer must see the other's current location for the entire duration of the trip.
8. Passengers can get all the information of driver before starting the journey.

3.1.2. Non-Functional Requirements

- **Internet Connectivity:** The system requires a stable internet connection for data retrieval and updates. This connectivity enables the system to access the latest nutritional information, dietary guidelines, and updates from online sources. It ensures that the system remains up-to-date with the most recent data.
- **Low Latency**: Latency is the delay between a user action, like requesting a ride, and the system's response. For ShareWheels, low latency is crucial to offer a smooth and responsive user experience. Users anticipate speedy

responses when they search for rides, view ride options, or book rides. Keeping latency to a minimum ensures that users can find and book rides quickly, boosting user satisfaction.

- **Performance**: The platform should handle high user traffic efficiently, with fast loading times and responsive functionalities.
- **Security**: Secure user authentication, data encryption for product details and communication.

3.2. Capacity Estimation

Let's assume we have 5 million active users on our application with 200,000 drivers and on an average, there are 1 million rides daily. If a user performs 5 actions on an average then we need to handle 5 million requests daily

- How many requests per second our system need to handle?

5 million requests daily would make approx. 58/requests per second

- How much storage we need everyday?

Let us assume each message on an average is about 500 bytes, so we'll require about 2.32 GB of space everyday.

3.3. Hardware Minimum Configuration

i. For Android devices:

- Android version 10 or higher
- Jetpack (AndroidX)
- com.android.tools.build:gradle v7.3.0 or later
- compileSdkVersion 28 or later

ii. For iOS devices:

- iOS 9.0 or higher.

iii. Operating system and Hardware configuration:

- Windows 7/8/10
- All Windows 11 devices

- Operating System**:** Windows, macOS, or Linux.
- Processor**:** Minimum dual-core processor.
- RAM**:** Minimum 4GB of RAM, but 8GB or more is recommended for better performance.
- Storage: At least 10GB of free disk space for installation and project files.

Once you have installed all of the necessary software, you can create a new React Native project and add Firebase to it.

3.4. Software Infrastructure

3.4.1. React Native

React Native (also known as RN) is a popular **JavaScript-based mobile app framework** that allows you to build natively-rendered mobile apps for iOS and Android. The framework lets you create an application for various platforms by using the same codebase. React Native isn't a 'newer' version of React, although React Native *does* use it.

React (also known as ReactJS) is a JavaScript library used for building the frontend of a website. Similarly, to React Native, it was also developed by the Facebook engineering team. Meanwhile, React Native – which is powered by React – lets developers use a set of UI components to quickly compile and launch iOS and Android apps.

React is a JavaScript library. It's also referred to as ReactJS or React.js. Like React Native, it provides developers with building blocks for development, such as pre-written code and configurations. Unlike React Native, those building blocks are web components rather than native components. When used together, React.js and React Native complement one another. The chart below explores some similarities and differences between React and React Native.

Table 1: Comparative analysis of React and React Native

React	React Native
JavaScript Library	JavaScript-based framework
Used for front-end web development	Used for mobile application development
Developed by the Facebook engineering team	Developed by the Facebook engineering
A virtual representation of the user interface (UI) renders to the browser's programming interface. This representation is also known as a virtual document object model (VDOM).	The UI renders to the native platform's programming interface rather than creating a web-based view.

When an application or software is native, it's written for the computer's natural operating system (OS). Cross-platform development is the practice of building software that is compatible with more than one type of hardware platform. A cross-platform application can run on Microsoft Windows, Linux, and macOS, or just two of them. A good example of a cross-platform application is a web browser or Adobe Flash that performs the same, irrespective of the computer or mobile device you run it on.

Cross-platform is considered the holy grail of software development – you can build your codebase once and then run it on any platform, as opposed to software built natively for a specific platform. Developers are able to use the tools they're proficient in, like JavaScript or C#, to build platforms they're foreign to. Software owners are also keen on it as product development, in terms of time to market and costs, is cut in half. React Native is written with a mixture of JavaScript and JXL, a special markup code resembling of XML. The framework has the ability to communicate with both realms – JavaScript-based threads and existent, native app threads.

How does this communication work? React Native uses a so-called “bridge”. While JavaScript and Native threads are written in completely different languages, it’s the bridge feature that makes bidirectional communication possible.

Here’s a great visualization of the bridge concept:

Figure 3.1. React Native working

3.4.2. React Native Expo

Expo is a framework that you can use to build JavaScript and React Native applications. It includes libraries as well as a set of services and tools designed specifically for React Native development and testing. Expo was created to simplify universal app development for the web and mobile platforms like Android and iOS.

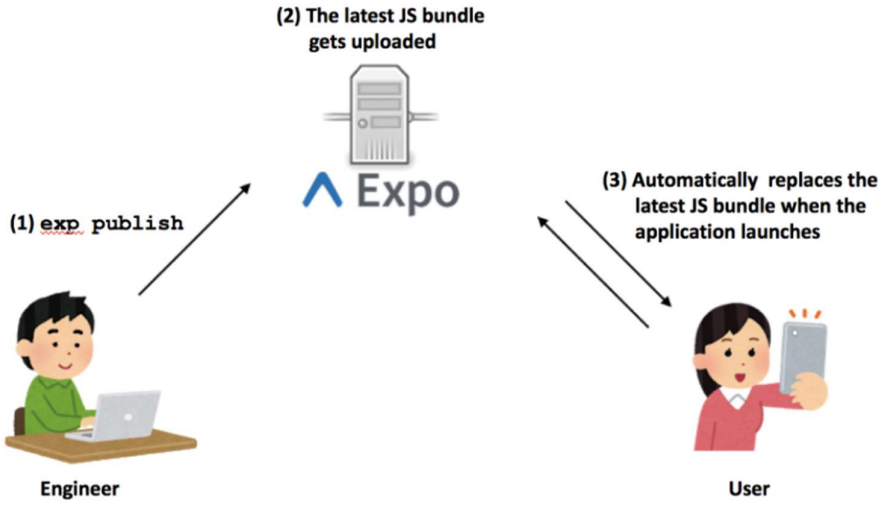

Figure 3.2. Expo Local Dev Server

One of the key features of Expo is its development tools, which include a local development server, live reloading, and a graphical user interface for managing

project settings. These tools help developers streamline the development process and focus more on building features. Expo also comes with a wide range of built-in components and libraries that make it easy to create common app features such as navigation, gestures, and animations. Developers can easily access device features like the camera, location, and sensors using Expo's JavaScript APIs, without having to write native code.

Another advantage of Expo is its support for over-the-air updates, allowing developers to push updates to their apps without going through the app store review process. This can be useful for quickly fixing bugs or adding new features to an app. Expo supports building apps for both iOS and Android platforms using a single codebase, which helps reduce development time and costs compared to building separate apps for each platform. The platform also has a large and active community of developers who contribute libraries, tools, and resources, as well as official forums and documentation for support.

In summary, React Native Expo is a powerful platform for building cross-platform mobile apps, offering developers a wide range of features and tools to streamline the app development process and create high-quality mobile applications. Expo is a global React application framework and platform. It’s a suite of tools and services centered on React Native and native platforms that allow you to create, build, deploy, and improve iOS, Android, and web apps using the same JavaScript/TypeScript codebase. We can use it in the development of your app for the fastest development, greater API accessibility, building Native codebase, and over-the-air updates. As it is an open-source platform, developers nowadays choose Expo in their development.

3.4.3. Firebase

Google Firebase is a Backend-as-a-Service (BaaS) platform that provides a suite of cloud-based tools and services. These services enable developers to create high-quality applications, grow their user base, and earn more profits. The essential services Firebase offers range from real-time databases and authentication to cloud messaging and analytics and much more. Firebase is a comprehensive mobile and web application development platform developed by Google. It provides developers with

a suite of cloud-based tools and services designed to help create, maintain, and improve applications.

Firebase works as a Backend-as-a-Service (BaaS) platform, which essentially means it provides developers with a ready-made, scalable cloud-based backend for their applications. Its main function is to abstract away the complex server-side operations that come with developing a web or mobile application, thus allowing developers to focus on creating the front-end, user-facing aspects of the application.

At a high level, Firebase **operates as a collection of APIs** (Application Programming Interfaces) that developers can call from their applications. These APIs are linked to various cloud-based services which Firebase provides. When a developer builds an app with Firebase, the application interacts with these Firebase APIs to carry out tasks that would typically require server-side programming. For example, if an application needs to authenticate a user, instead of the developer having to write a server-side script to handle the authentication, they would use Firebase's Authentication API.

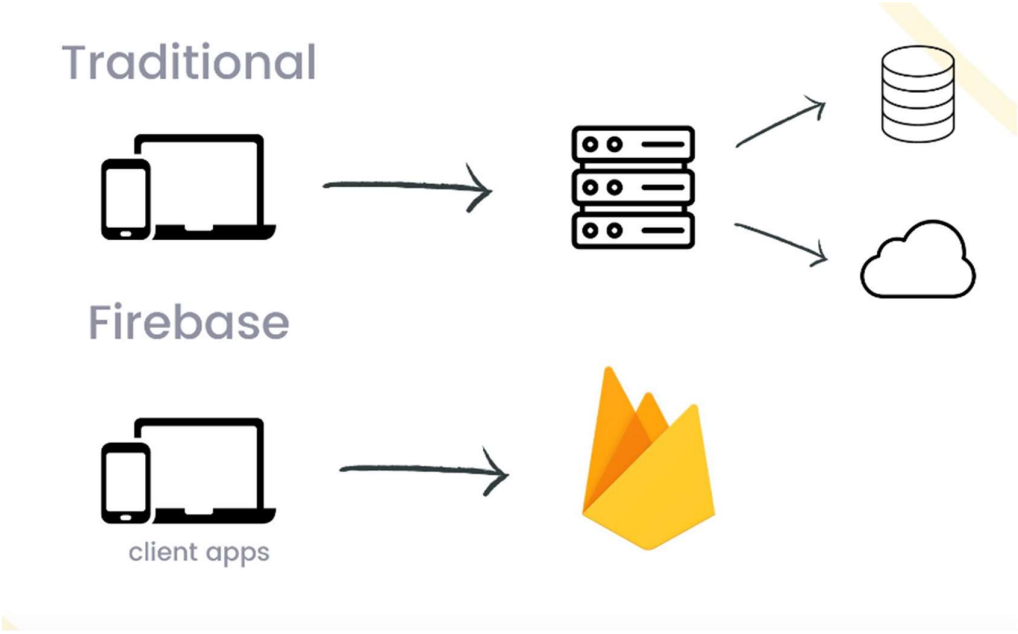

Figure 3.3. Traditional VS Firebase Backend

The same principle applies to data storage. When the app needs to store or retrieve data, it communicates with Firebase's cloud-based databases, such as the Realtime Database or Cloud Firestore, through their respective APIs. All these interactions are managed and facilitated by Firebase's SDKs (Software Development

Kits), which are available for different platforms like Android, iOS, and the Web. These SDKs provide the interface for the app to communicate with Firebase services.

Firebase also takes care of the complexities of scaling and security. As the user base of an application grows, Firebase automatically scales the backend resources to meet the demand. Moreover, Firebase offers robust security features to ensure that the data stored in its databases is secure.

Figure 3.4. Core Features of Firebase

3.4.4. NoSQL

The term 'NoSQL' refers to nonrelational types of databases, and these databases store data in a format that's different from relational tables. However, NoSQL databases can be queried using idiomatic language APIs, declarative structured query languages, and query-by example languages, which is why they are also referred to as "not only SQL" databases. NoSQL databases are widely used in real-time web applications and big data, because their main advantages are high scalability and high availability.

NoSQL databases are also the preferred choice of developers, as they naturally lend themselves to an agile development paradigm by rapidly adapting to changing requirements. NoSQL databases allow the data to be stored in ways that are more intuitive and easier to understand, or closer to the way the data is used by applications

with fewer transformations required when storing or retrieving using NoSQL-style APIs. Moreover, NoSQL databases can take full advantage of the cloud to deliver zero downtime.

SQL databases are relational, while NoSQL databases are non-relational. The relational database management system (RDBMS) is the basis for structured query language (SQL), which lets users access and manipulate data in highly structured tables. This is foundational model for database systems such as MS SQL Server, IBM DB2, Oracle, and MySQL. But with NoSQL databases, the data access syntax can be different from database to database.

To understand NoSQL databases, it's important to know what the difference is between RDBMS and nonrelational types of databases.

The data in an RDBMS is stored in database objects that are called tables. A table is a collection of related data entries, and it consists of columns and rows. These databases require defining the schema upfront, that is, all of the columns and their associated datatypes must be known beforehand so applications can write data to the database. They also store information linking multiple tables through the use of keys, thus creating a relationship across multiple tables. In the simplest case, a key is used to retrieve a specific row so that it can be examined or modified.

Conversely, in NoSQL databases, data can be stored without defining the schema upfront—which means you have the ability to get moving and iterate quickly, defining the data model as you go. This can be suitable for specific business requirements, whether it's graph-based, column-oriented, document-oriented, or as a key-value store.

The unprecedented speed and scale of digital interaction and data consumption seen in the last two decades has required businesses to adopt a more modern, fluid approach to how they store data and how they access it. With users worldwide demanding an uninterrupted stream of content and functions, it's no wonder that databases have had to adapt quickly. With this in mind, here are some of the key reasons why developers are choosing NoSQL/nonrelational databases:

- **Flexibility** with SQL databases, data is stored in a much more rigid, predefined structure. But with NoSQL, data can be stored in a more free-form fashion

without those rigid schemas. This design enables innovation and rapid application development. Developers can focus on creating systems to better serve their customers without worrying about schemas. NoSQL databases can easily handle any data format, such as structured, semi-structured, and non-structured data in a single data store.

- **Scalability** Instead of scaling up by adding more servers, NoSQL databases can scale out by using commodity hardware. This has the ability to support increased traffic in order to meet demand with zero downtime. By scaling out, NoSQL databases can become larger and more powerful, which is why they have become the preferred option for evolving data sets.
- **High performance** the scale-out architecture of a NoSQL database can be particularly valuable when data volume or traffic increases. As shown in the graphic below, this architecture ensures fast and predictable single-digit millisecond response times. NoSQL databases can also ingest data and deliver it quickly and reliably, which is why NoSQL databases are used in applications that collect terabytes of data every day, while also requiring a highly interactive user experience. In the graphic below, we show an incoming rate of 300 reads per second (blue line) with a 95th latency in the 3-4ms range, and an incoming rate of 150 writes per second (green line) with a 95th latency in the 4-5ms range.

3.4.5. Tailwind CSS

Tailwind CSS is a utility-first CSS framework that streamlines web development by providing a set of pre-designed utility classes. These classes enable rapid styling without writing custom CSS, promoting consistency and scalability. Tailwind's approach shifts focus from traditional CSS components to functional classes, empowering developers to efficiently build responsive and visually appealing interfaces with minimal effort.

Why Tailwind CSS?

- The faster UI-building process
- It is a utility-first `CSS` framework which means we can use utility classes to build custom designs without writing CSS as in the traditional approach.

Advantages of Tailwind CSS:

- No more silly names for CSS classes and IDs.

- Minimum lines of Code in CSS file.
- We can customize the designs to make the components.
- Makes the website responsive.
- Makes the changes in the desired manner. CSS is global in nature and if make changes in the file the property is changed in all the HTML files linked to it. But with the help of Tailwind CSS, we can use utility classes and make local changes.

Native Wind uses Tailwind CSS as scripting language to create a **universal style system** for React Native. Native Wind components can be shared between platforms and will output their styles as CSS Stylesheet on web and Stylesheet Create for native.

Its goals are to provide a consistent styling experience across all platforms, improve Developer UX and code maintainability. Native Wind achieves this by pre-compiling your styles and uses a minimal runtime to selectively apply responsive styles.

4. SYSTEM DESIGN

4.1. Problem Statement

In recent years, we have seen an acute increase in traffic on our roads. This surge has not only made commuting a cumbersome process but has also led to an escalation in the usage of fuel. Such excessive consumption has resulted in the hike of fuel prices, adding to the distress of daily commuters who rely on personal vehicles for transport. Alongside these inconveniences, the use of vehicles also contributes significantly to environmental pollution, leading to adverse effects on both human health and the ecosystem.

Despite these issues, the concept of car sharing has gradually started to gain traction as a potential solution. The idea of multiple individuals utilising the same vehicle reduces the number of cars on the road, thus easing traffic congestion, lowering fuel consumption, and reducing pollution. However, the implementation of car sharing is not without its challenges. Concerns around security, trust, and coordination often arise, posing hurdles to its widespread adoption.

The solution to this conundrum lies in a mobile-based Carpool system. This system would serve as a platform that connects individuals seeking to share rides, thereby providing a safe, secure, and convenient way to carpool. The functionality of such a system could be versatile, catering to both short daily journeys—such as commuting to work within the city—and longer inter-city trips. Through such a system, individuals can coordinate their travel schedules, agree upon pick-up and drop-off points, and share the costs of the journey, all while contributing to the alleviation of the broader issues of traffic congestion, fuel costs, and environmental pollution.

Issues around security, trust, and coordination hinder its adoption. A mobile-based carpool system could provide a safe, secure, and convenient way to share rides, addressing traffic congestion, fuel costs, and pollution. It could cater to daily and inter-city journeys, allowing individuals to coordinate travel and share costs. Traditional transportation, contributing to resource depletion, pollution, and traffic congestion, is becoming untenable as urban populations grow. The "Share Wheels: Ride Sharing System" project is a smartphone application using GPS to revolutionize commuting,

making carpooling more efficient, convenient, and eco-friendly. Share Wheels uses location-based technologies to match commuters with ride-sharing options, reducing cars on the road and promoting community interaction. Share Wheels aims to reduce transportation congestion, carbon emissions, and resource depletion. It presents a platform for everyone, promoting shared mobility and environmental stewardship.

4.2. Proposed System

The proposed system for the ShareWheels ride-sharing application includes:

i. **Frontend Development:** This is built using React Native with Expo for cross-platform mobile application development. The design will be intuitive for easy ride booking and management. Responsive design principles will be applied to ensure compatibility across various devices and screen sizes.

ii. **Backend Development:** Firebase is used for backend development. As a cloud service platform, Firebase provides a database, storage, authentication, and various features for application development.

iii. **Authentication and Authorization:** Firebase authentication provides authentication service with which user can register to our application with user's email and password. It also collects additional user data, like phone number, gender and users unique id. The scrypt hashing algorithm will be used for storing passwords in the database, ensuring security and reliability.

iv. **Database:** Our database uses NoSQL, a non-tabular type of database that stores data differently than relational tables. The database will contain three main modules: Users, SharedRides, and BookedRides. The "users" database stores general information such as email, username, and a unique ID for each user. The "SharedRides" dataset contains data about rides offered by drivers, accessible to all passengers to view available rides. The third dataset, "BookedRides", includes rides booked by passengers. It contains unique IDs for both passengers and drivers, as well as their current location information.

v. **Ride Booking and Management:** Developed a feature-rich ride booking system with real-time ride tracking, ride history, and sorting rides by minimum fares.

vi. **Driver Management:** A module for driver management is created which allows drivers to register, update availability, and accept ride requests. This will include driver rating and feedback features.

vii. **Geo-location and Maps:** Google Maps API will be integrated to provide live locations of drivers and passengers throughout their journey.

viii. **Payment Processing:** A payment gateway (e.g., Stripe, PayPal) is integrated for secure and seamless ride payments from passengers to Drivers.

ix. **Notifications and Messaging:** A notification system is implemented to keep users informed about ride updates, payment status, and other important information using push notifications. Mobile messages will notify passengers and drivers about ride bookings or cancellations.

x. **Safety Features:** This allows users to ensure safety during their journeys. If a passenger or a driver feels unsafe, they can alert authorities and notify their friends or family by pressing this option four times.

4.3. Data Flow

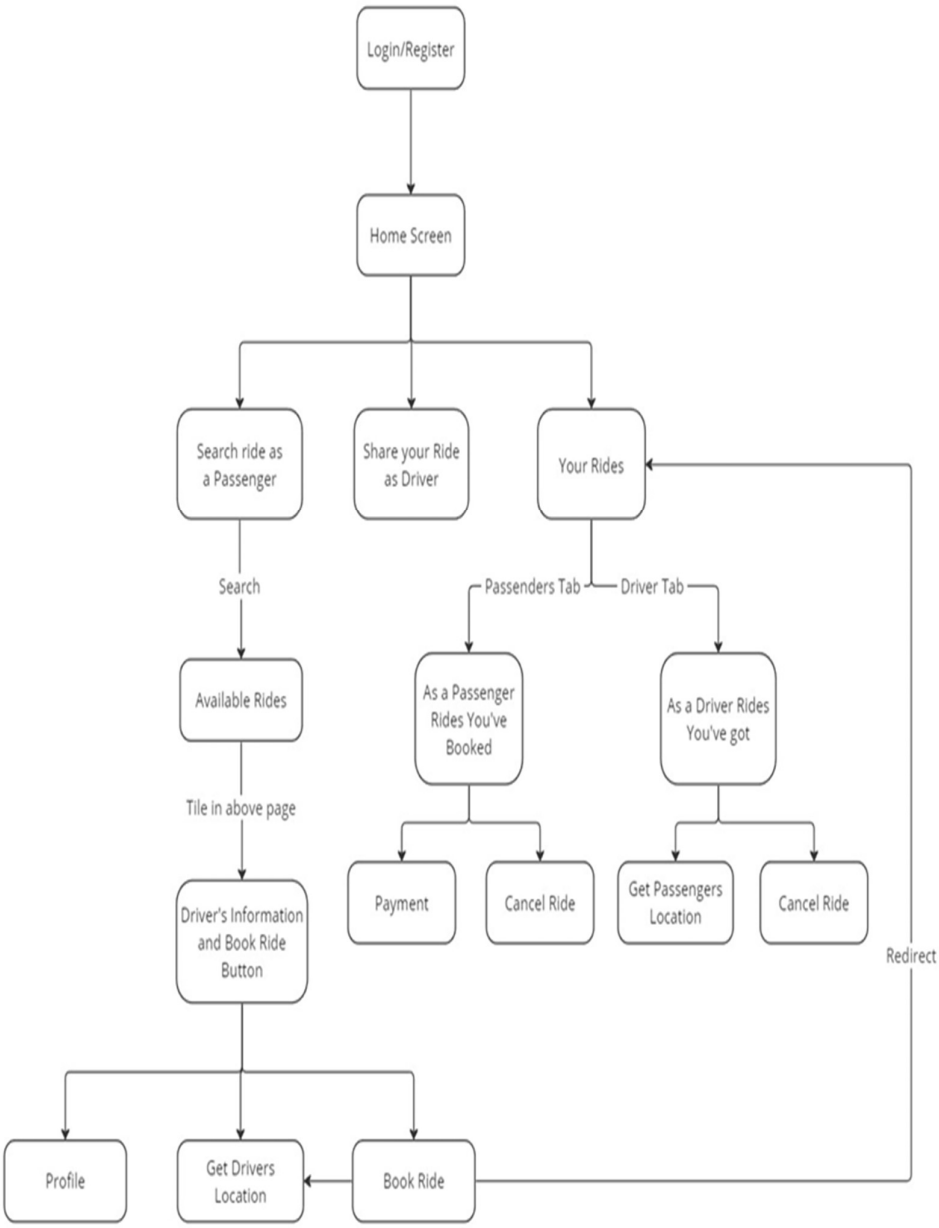

Fig.4.1. Data Flow Diagram

4.4. Class Diagram

A class diagram is a static structure diagram in the Unified Modeling Language (UML) that visually represents the structure and relationships of classes within a system. It's a blueprint of a system or subsystem that shows a collection of classes, interfaces, associations, collaborations, and constraints.

In ShareWheels our database consists of three main classes which stores different information required to the system.

a. Users: When a person registers to our system it creates it database and stores it in users table with information respective to the diagram below.

b. ShareRides: It Stores the information related to driver and its posted rides. This class also helps to retrieves the data for the passenger about posted Rides.

c. BookedRides: It stores the rides which are booked with passengers also stores the unique booking id and passenger unique id and drivers unique id.

Fig.4.2. Class Diagram

4.5. Sequence Diagram

Sequence diagrams, which are part of Unified Modeling Language (UML), are used to show the order of messages between objects in an interaction.

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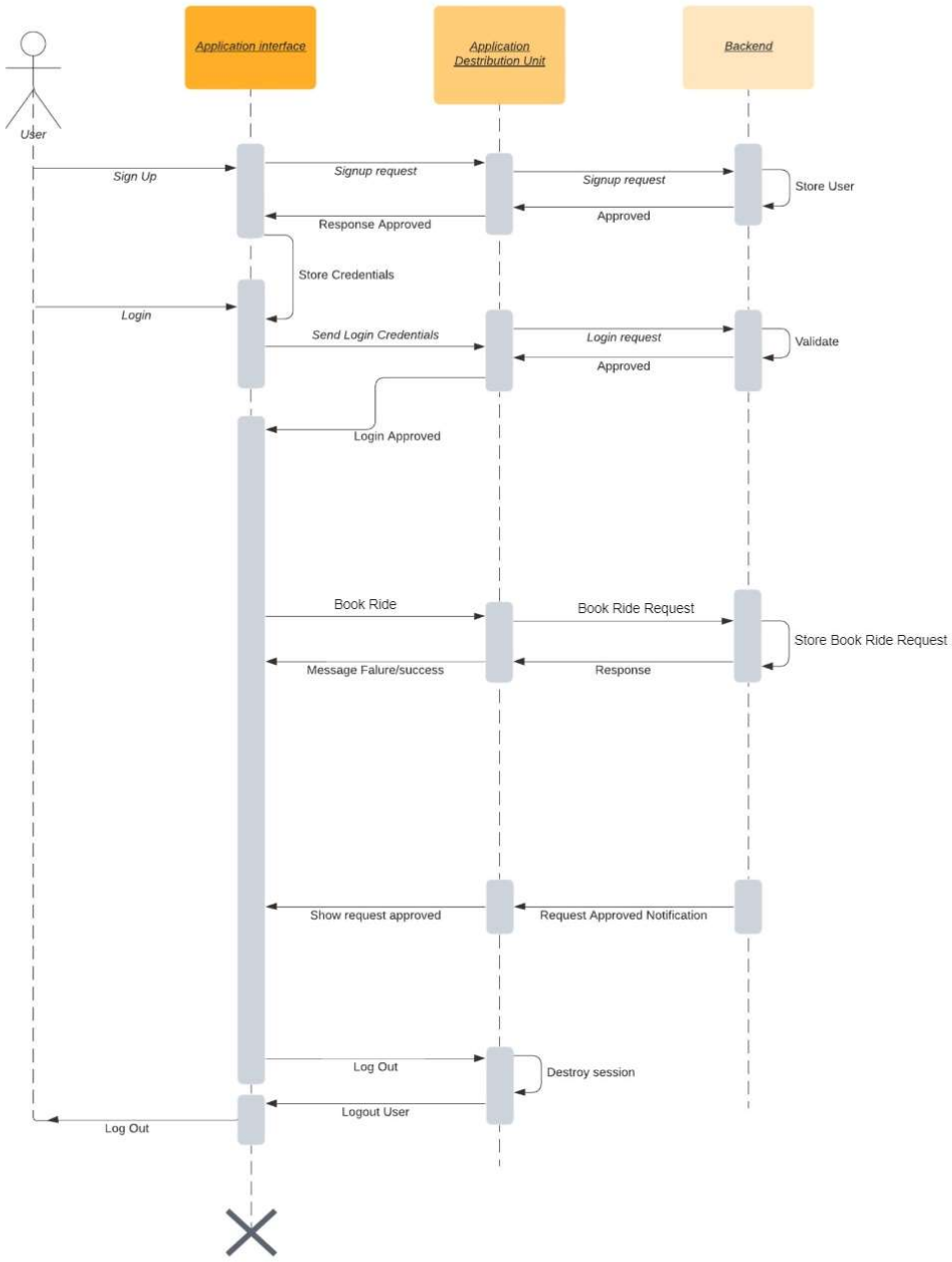


Fig.4.3. Sequence Diagram for Passenger

Sequence diagrams are dynamic, which shows how user interact and communicate with our application and its backend.

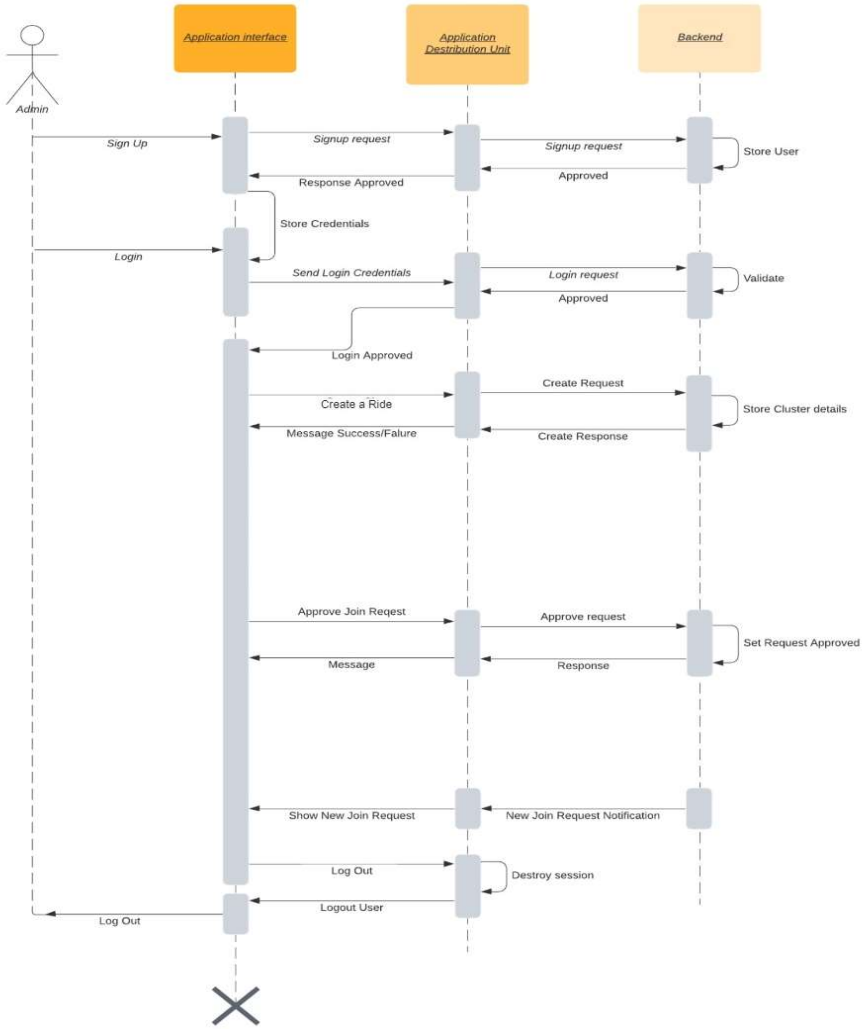


Fig.4.4. Sequence Diagram for Driver

They depict the processes and objects involved and the sequence of messages exchanged as needed to carry out the functionality.

5. IMPLEMENTATION AND RESULT

5.1. Main Required Features

Sharewheels app's smooth functioning is primarily based on the following basic features: geolocation, push notification, and SMS and payment integration technologies.

a. Geo-location

The app uses the following mapping and navigation technologies:

- It uses the CoreLocation framework for iOS and Google's location APIs in Android for detecting the device's location.
- For navigating from one point to another, the directions to the driver are given using MapKit for iOS users, whereas Google Maps Android API is used for Android.
- Sharewheels has integrated Google Maps for both iOS and Android platforms on their app. But it does not entirely depend on Google Maps, preferably also at times buys mapping technology teams for solving their logistic issues.

b. Push notifications and SMS

Once the ride is booked, It notifies the rider at various instances:

- the driver accepts the request
- the driver reaches the pickup location
- if the trip is canceled

Push notifications and SMS help the rider and the driver keep track of the trip status. Sharewheels uses an Android telecommunications provider to send SMS, whereas, for iOS, Apple Push Notification Service, and Google Cloud Messaging (GCM) is used for Android.

Note: Delivery of the push notification is not guaranteed. At times when the user is unavailable or offline, the push notifications do not get delivered, and

hence, integrating the messages into the system becomes crucial as it has a higher chance of being successfully delivered.

c. Payment Integration

The app implements payment through cards and wallets to avoid human errors. There are specific requirements that the company needs to fulfill while accepting card/wallet payment. It is known as PCI requirements (Payment Card Industry Data Security Standard (PCI-DSS) is a binding set of requirements for any organization that processes or stores credit card information)

The Payment Card Industry Data Security Standards are used in the US to ensure the secure handling of the payments and data.

5.2. Implementation

Implementing a ride-sharing application like ShareWheels using React Native, Expo, and Firebase involves several key components such as user authentication, database management, real-time updates, and map integration. Below is a detailed implementation guide for creating the ShareWheels app:

Step 1: Setup Firebase Project

1. **Create Firebase Project:** Go to the Firebase console and create a new project.
2. **Set up Firebase Authentication:** Enable Firebase Authentication and configure the authentication methods you want to use (e.g., email/password, Google sign-in).
3. **Set up Firebase Realtime Database:** Enable Firebase Realtime Database and set up the rules to allow read and write access.
4. **Install Firebase SDK:** Install the Firebase SDK in your React Native project using the Firebase documentation.

Step 2: Implement Authentication

1. **Sign Up:** Created a sign-up screen where users can register for an account using their email and password. Use Firebase's Authorization method to create a new user.

2. **Sign In:** Create a sign-in screen where users can log in to their account. Use Firebase's Authentication method to authenticate the user.
3. **Sign Out:** Implement a sign-out function that calls Firebase's Sign out method.

Step 3: Implement Database Structure

1. **Users Collection:** Created a users collection in Firebase Realtime Database to store user information such as name, email, and phone number.
2. **Rides Collection:** Created a SharedRides collection to store information about available rides, including driver details, destination, date, time, and available seats.

Step 4: Implement Screens and Navigation

1. **Home Screen:** Displaying a list of available rides. Users can view ride details and request to join a ride.
2. **Profile Screen:** Display user information and allow users to update their profile.
3. **Add Ride Screen:** Allow users to create a new ride listing, providing details such as destination, date, time, and available seats.
4. Available Rides Screen: Displays the information of rides available to passengers according to their search query.
5. Driver Screen: Shows driver's profile to passengers and shows their information such as driver phone number, review and rating and fare prices. it also shows the journey information to the passenger.

Step 5: Implement Ride Requests and Notifications

1. **Ride Requests:** Allow users to send ride requests to drivers. Update the ride's status in the database to indicate pending requests.
2. **Notifications:** Implemented push notifications using Firebase Cloud Messaging to notify users of ride updates, such as new ride listings or ride requests.

Step 6: Testing and Deployment

1. Test the application on both iOS and Android devices or simulators to ensure it works as expected.
2. build the app for release using Expo's build tools.
3. Distributing the app on Google Play Store or using Expo's Over-the-Air (OTA) updates for Expo apps.

5.3. Results

In this section, we present the results of the ShareWheels Ride sharing system. Below are multiple images showcasing different aspects of the application along with brief descriptions.

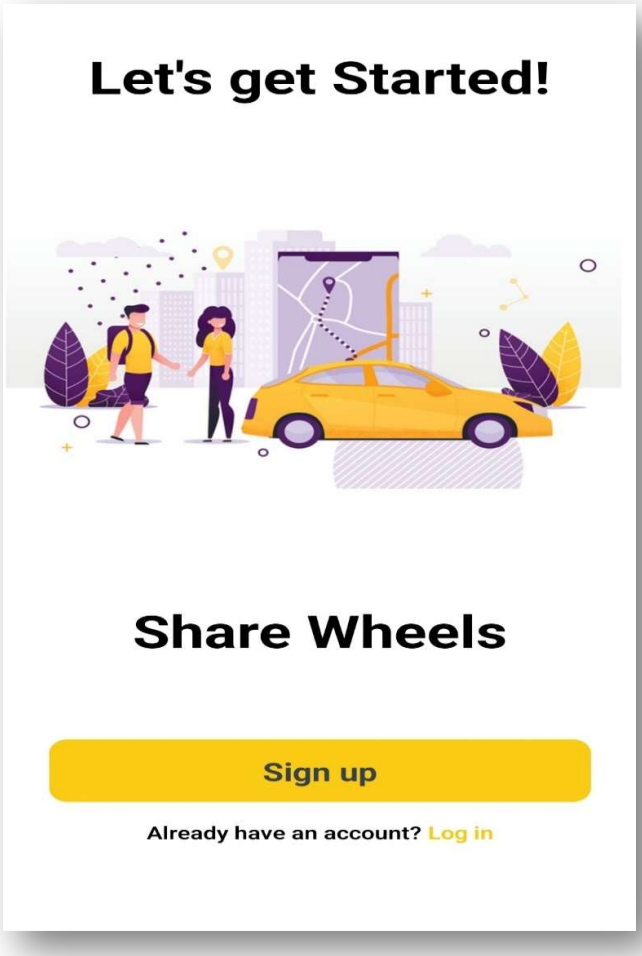


Figure 5.1. Welcome Screen

Welcome to the landing page of our application, a user-friendly space designed for your ease of navigation. Upon arrival, you as the user are presented with two distinct options. If you're new to our platform and don't yet have an account, you can choose to create one by opting for the 'Signup' option. This process is quick and easy, ensuring you can get started with our application in no time. On the other hand, if you are a returning user and already have an account with us, you can simply choose the 'Login' option. This will prompt you to enter your credentials and provide you with immediate access to our wide range of services.

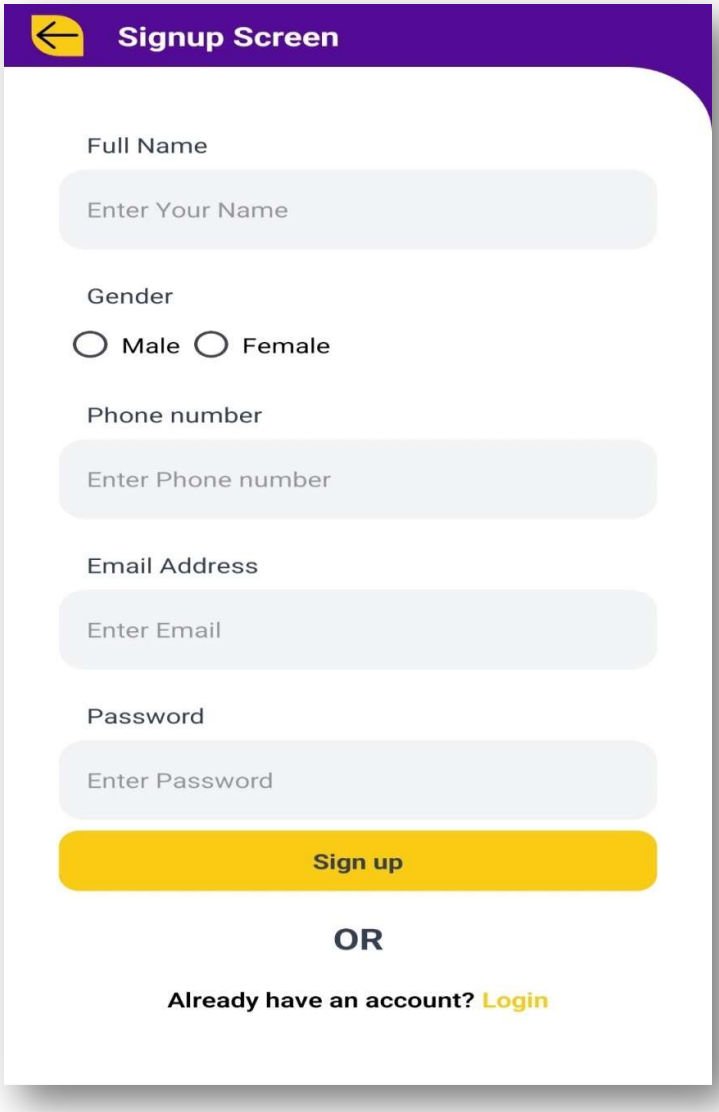


Figure 5.2. Signup Screen

This is a signup page where users enter various details such as name, phone number, gender, and email address. The page is designed so that both passengers and drivers can sign up using the same procedure in this application.

Once the user has entered these details, the next step involves setting a secure password. It's worth noting that this process is identical for both passengers and drivers, ensuring a seamless and user-friendly experience for all.

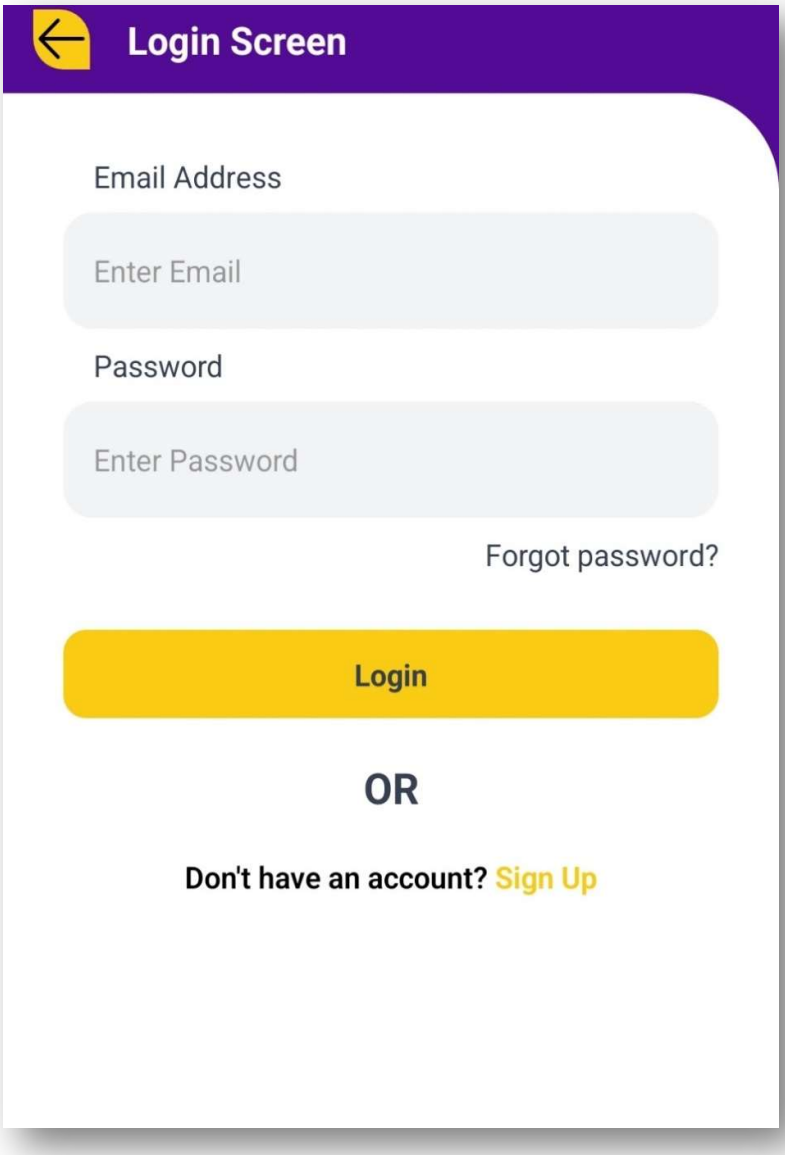


Figure 5.3. Login Screen

After successful signup user can login through login page and it can immediately start exploring our wide range of services tailored to meet their specific needs. Whether you're a passenger looking for a quick ride or a driver looking to offer your services, our application is designed to serve you efficiently and effectively.

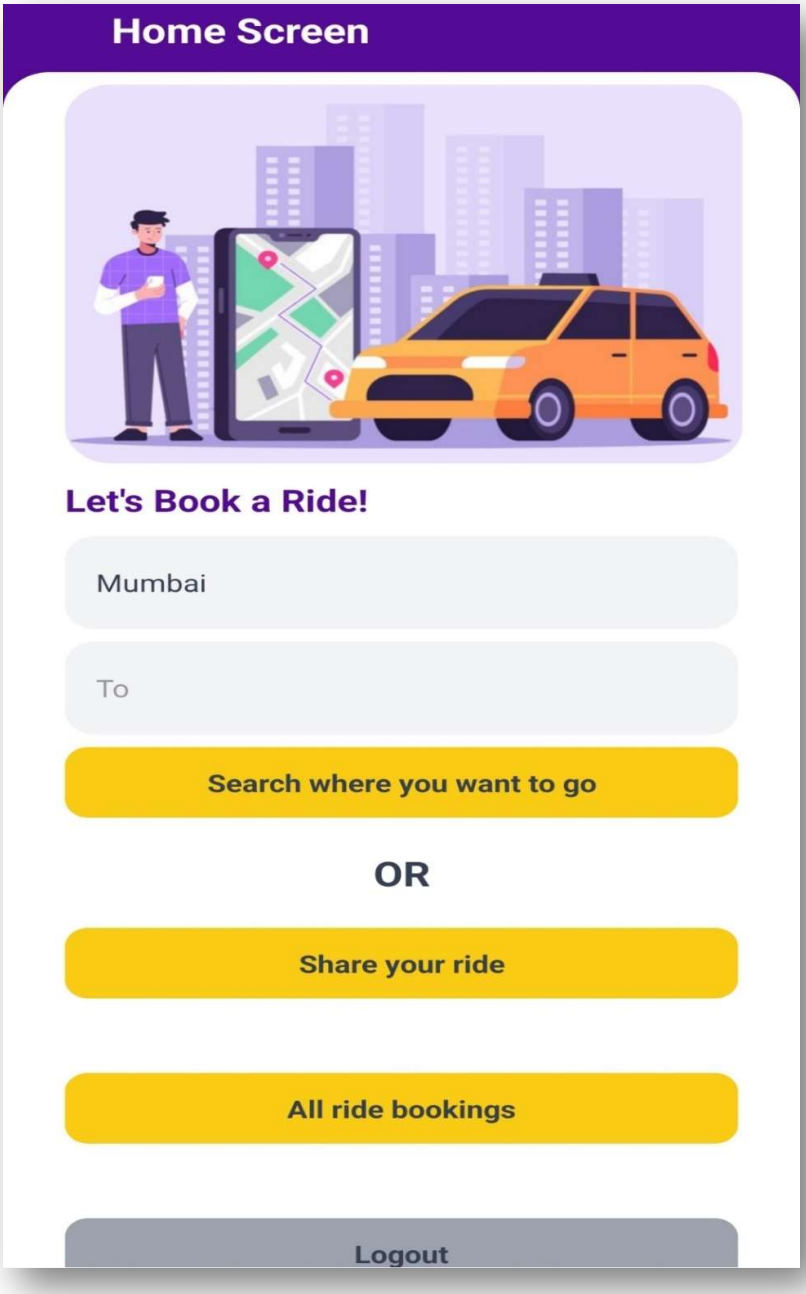


Figure 5.4. Home Screen

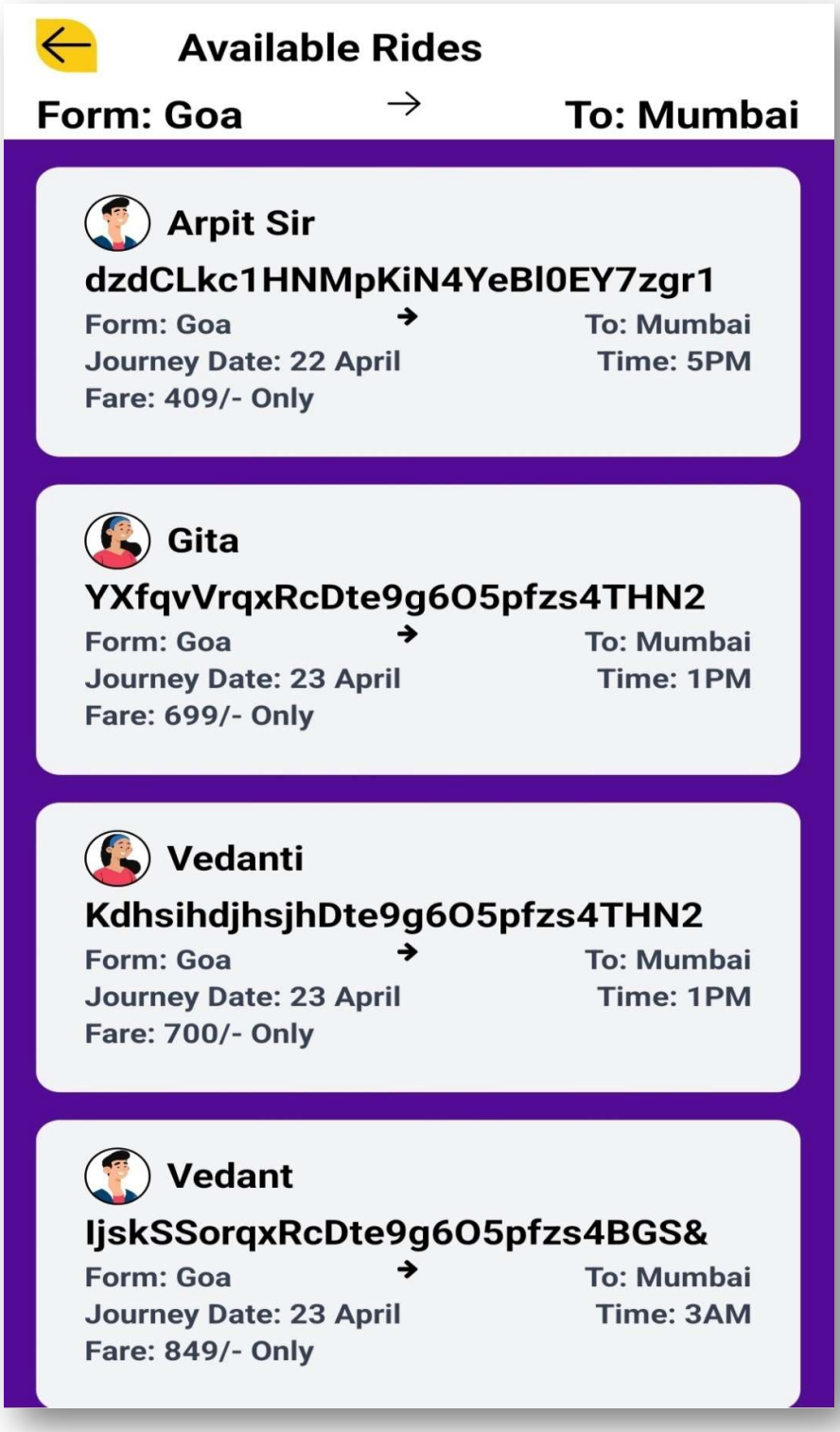


Figure 5.5. Available Rides Screen

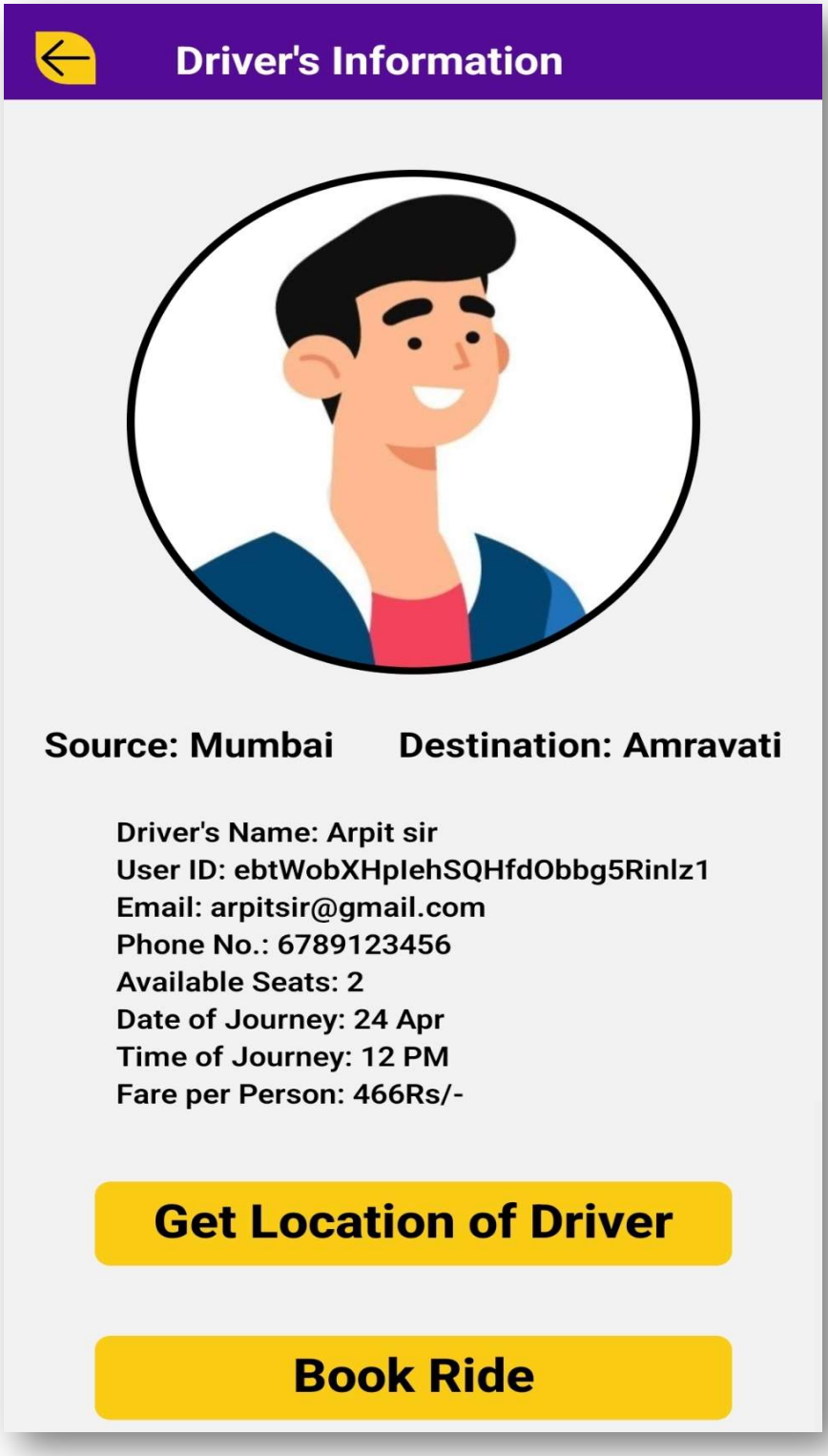
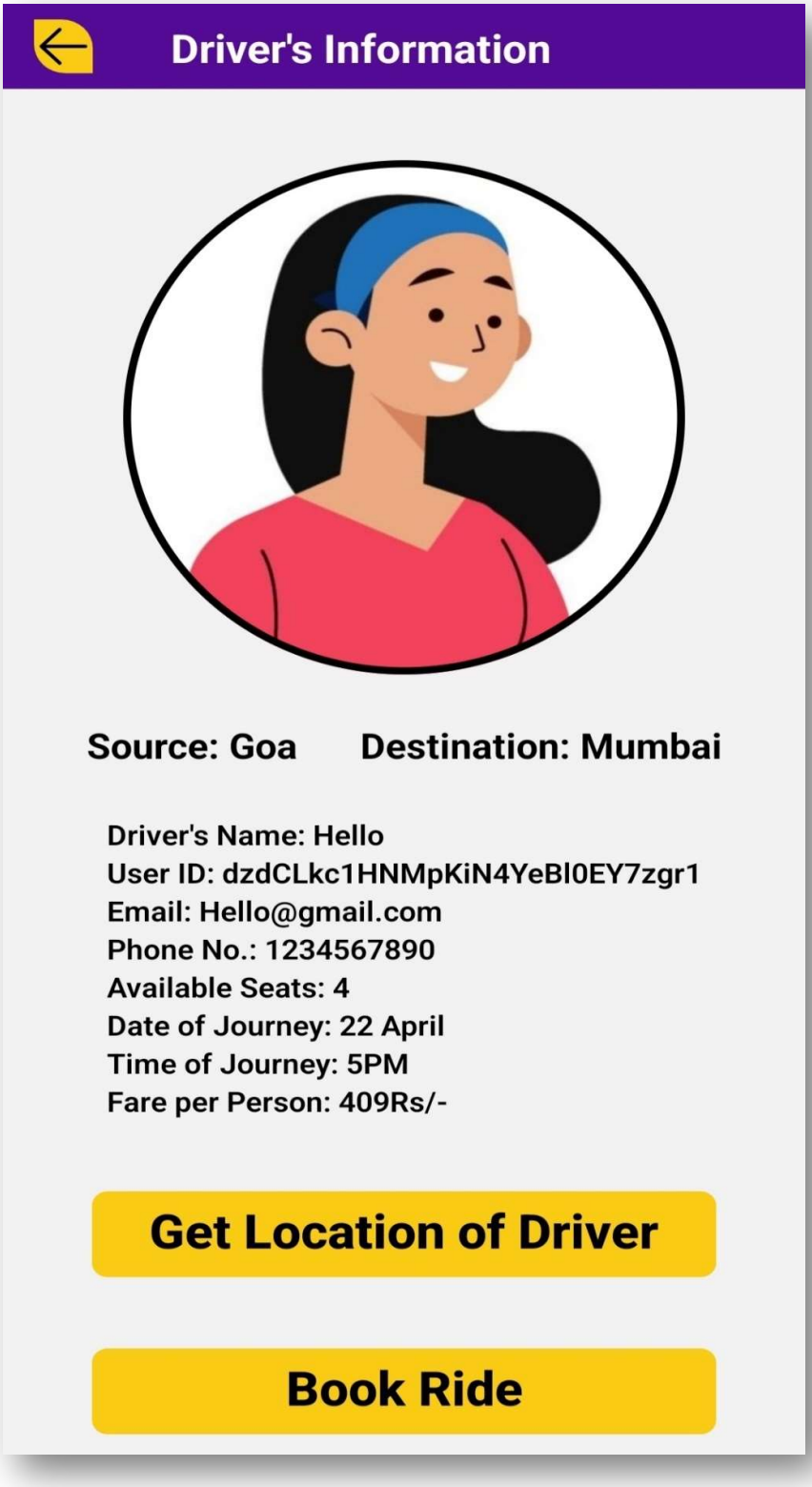


Figure 5.6. Drivers Information Screen (a)



5.7. Drivers Information Screen (b)

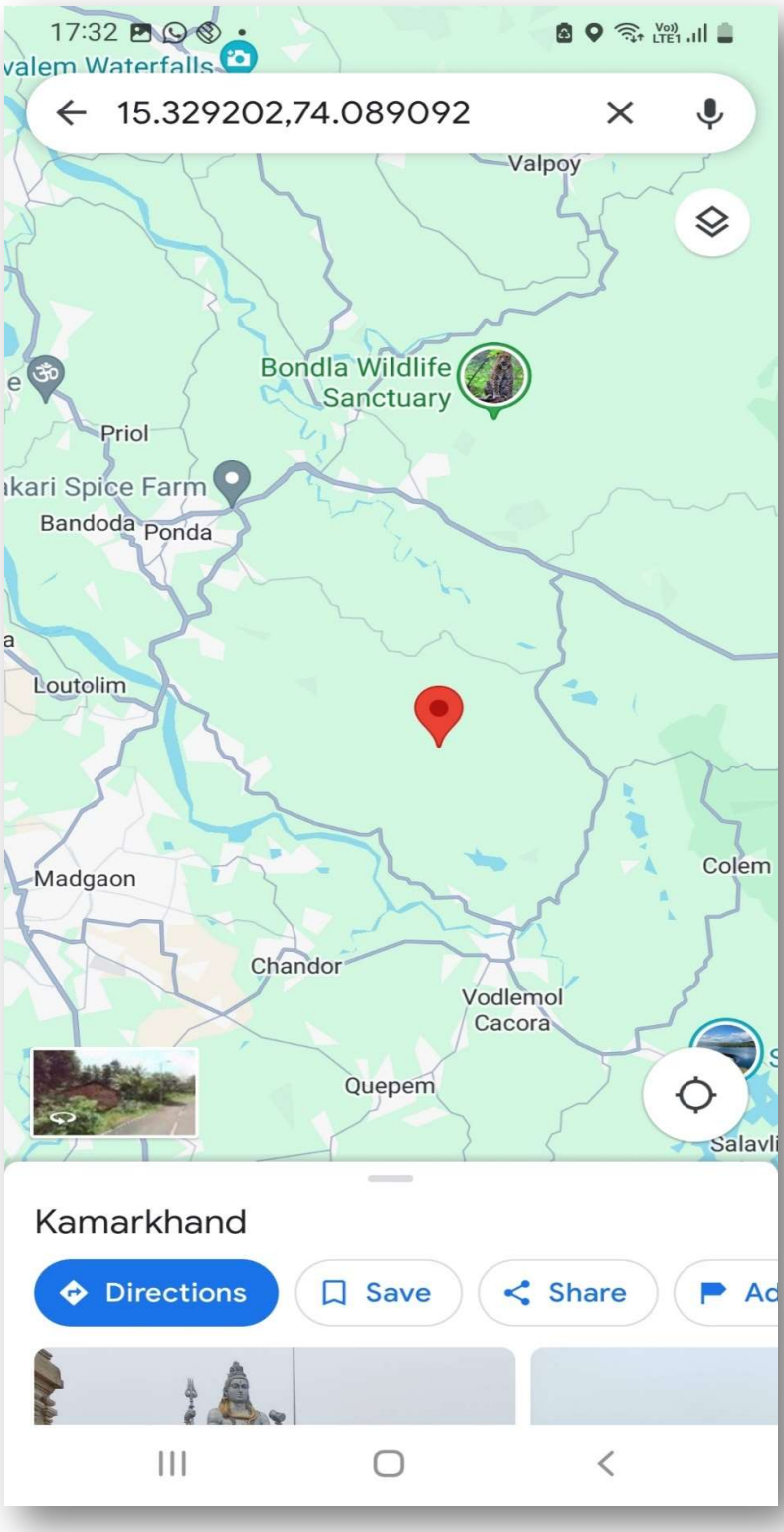


Figure 5.8. Getting Live Location of Driver through google maps

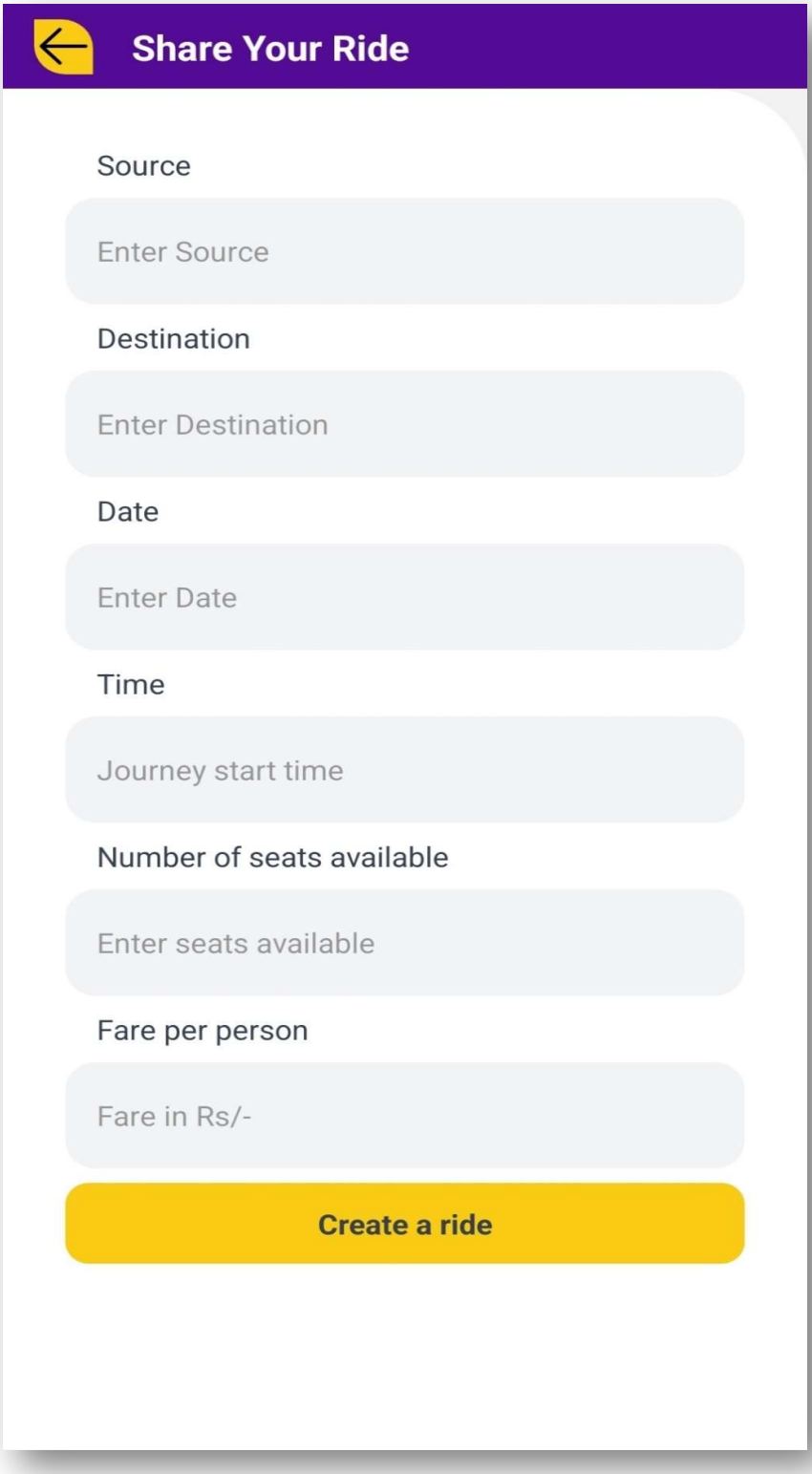


Figure 5.9. Share Your Ride Screen

6. CONCLUSION AND FUTURE SCOPE

6.1. Conclusion

The ever-growing problems of resource depletion, pollution, and traffic congestion have brought attention to the urgent need for sustainable transportation solutions in today's quickly changing world. In response to this increasing necessity, the "Sharewheels: Ride sharing System" project has emerged. Through the use of technology, particularly a GPS-enabled smartphone application, Sharewheels has established itself as a leader in cutting-edge projects that are transforming the way people commute within their communities.

The complex interaction of environmental, social, and economic factors inherent in the transportation sector is addressed through a multidimensional approach embodied in this project. Sharewheels makes carpooling easier by integrating mobile devices and location-based services seamlessly. This makes ride-sharing convenient and accessible for commuters. Sharewheels promotes community involvement and a sense of shared responsibility while reducing the negative effects of single-occupancy car use by organizing and optimizing shared journeys.

The importance of Sharewheels goes well beyond its apparent advantages in easing traffic jams and lowering pollution. It represents a paradigm change toward more equitable and sustainable transportation networks, setting the stage for a time when mobility is defined by accessibility, economy, and environmental responsibility. In addition, Sharewheels' success is evidence of how technology may change the world when used for the benefit of society.

Initiatives like Sharewheels provide a ray of hope and inspiration as we negotiate the complexity of the urban terrain of the twenty-first century by showing that creative solutions to urgent societal problems are achievable. It is essential that we keep funding and endorsing programs that put sustainability, resilience, and inclusivity at the top of the priority list for our transportation system going ahead. By doing this, we can all work together to create a more dynamic, connected, and sustainable future for future generations.

6.2. Future Scope

Looking towards the future, there is a vast potential for the expansion and enhancement of our platform by integrating additional features. One such feature could be the incorporation of a GPS tracking system that would allow real-time updating of information, ensuring users always have the most accurate and up-to-date details at their fingertips.

Another important facet we could consider adding is an SOS feature that, in the event of an emergency, would alert the necessary authorities. This would provide an additional level of security and peace of mind for our users. By combining advanced matching algorithms with the emerging technology of self-driving cars, we could pave the way for a more convenient and efficient means of carpooling. With self-driving cars, multiple individuals traveling along a shared path could be picked up, reducing the need for personal vehicles and promoting a more communal and eco-friendly mode of transport.

In terms of security and payment, we could harness the power of blockchain technology to develop a Sharewheels platform. This would result in a secure and decentralized network where users could safely share their data and make payments without the need for third-party involvement, thus enhancing the privacy and autonomy of our users.

1. **Technological Advancements:** Sharewheels aims to make your ride experience smoother and faster with upcoming upgrades. Imagine your ride being planned by smart computers using AI, ensuring you reach your destination quicker and with fewer detours. Plus, we're working on making our app easier to use, so you can book your ride effortlessly.
2. **Fleet Modernization:** We're gearing up to make our fleet eco-friendlier and more advanced. Soon, you might see electric cars and even self-driving vehicles as part of Sharewheels. Not only will this help the environment by reducing emissions, but it'll also make our rides more efficient and comfortable for you.
3. **User Engagement Strategies:** We want you to feel more connected with Sharewheels. That's why we're planning exciting loyalty programs and personalized recommendations to make your experience with us even better.

4. **Sustainability Initiatives:** We're committed to doing our part for the planet. Expect to hear more about our efforts to cut down on carbon emissions and our partnerships with environmental groups. Together, we can make a real difference.
5. **Global Reach and Impact:** Sharewheels isn't just about local rides. We have big plans to expand internationally, spreading our message of sustainable transportation across the globe. Imagine Sharewheels becoming a leader in eco-friendly commuting worldwide!
6. **Innovation and Adaptability:** We're always thinking ahead. Innovation is at the heart of everything we do. Whether it's adapting to new trends or embracing the latest technologies, Sharewheels is committed to staying ahead of the curve to provide you with the best ride-sharing experience possible.

Sharewheels is not just a mode of transport. It is a sustainable and eco-friendly solution that benefits not only the individuals who use it but also the environment. As such, it should be further promoted and more widely adopted by the general population.

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Share Wheels

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Abstract: ***A husbandry a variety of issues comes associated with speedy-fireplace boom in populace one similar primary problem is commercial enterprise visitors and different troubles prompted due to it. It has come a chief problem in severa metropolitan regions. During height hour this visitors is commodity every person has to witness due to the way the current society operates. There are numerous outcomes to the problem but one powerful end result is proportion wheels. Sharewheels is a system wherein automobile possessors will share their in detail possessed vehicle to other tripper travelling on the same course. This will drop the empty seats which might affect in decrease buses on road. The cutting-edge cab sharing system isn't crucial swerved from hack gadget which is also not so effective. This carrier will significantly income folks that travel on identical routes on diurnal base comparable as working human beings, scholars. It'll additionally assist the owner with affordability of electricity cutting the price.***

Keywords: Traffic, Travelling, Affordability, Sharing, Cab sharing.

I. INTRODUCTION

In a population wealthy united states comparable as India, connectivity is a first-rate aspect for boom of a state. Due to the nation having big populace it arises masses of troubles one comparable concerning trouble is enterprise. The quantum of in detail possessed automobile have soared and gives upward thrust to issues similar as business traffic, air pollution, sound pollutants, electricity inefficiency and severa further. There are results to conquer those troubles one comparable end result is the use of public delivery however a higher extra effective manner is cab sharing. Cab sharing is collaborating of in detail possessed vehicle with one or further human beings journeying at the equal course on occasional or diurnal base. This May not handiest exclude the trouble of business visitors however additionally significantly profit each the tripper in addition to auto owner. The distribution of electricity fee among all the tripper will income the automobile proprietor substantially. An internet site will act as a communique link among tripper looking for lift and automobile possessors searching for tripper. The automobile proprietor will submit the foundation of the ride and the stop destination and tripper can communicate consequently.

A. Advantages Of Using Share Wheels

1) Cost Effective Due to unyoking the fee of the experience along with different stoner it makes it bring powerful.
2) Environment Friendly as further wide variety of people will tour in same automobile on average it will lessen the variety of vehicle on road therefore dwindling the carbon emigrations. Business decrease buses will run on avenue making the trouble of enterprise traffic less excited
3) Socializing Share wheels presents an occasion to satisfy new humans, fraternize and make new musketeers that allows you to open new openings. Ameliorate productiveness Commuters can use their experience time in effective paintings similar as analyzing book or working.
4) For civic commuters, participating a hack eliminates the need to find parking, which can be precious and time- consuming in crowded metropolises. This can save both time and plutocrat for passengers.
5) Cab sharing services frequently use technology platforms that allow passengers to fluently find others heading in the same direction, making it accessible to arrange participated lifts. This can be particularly useful in areas where public transportation options are limited

B. Drwabacks Of Current System

1) Safety is a major concern when it comes to share wheels. Due to digital mode of enrollment it may lead to fake biographies being created.[4]
2) Share wheels may lead to conflicts between passengers over issues that they don't agree on making it an unwelcome experience for other passengers.

3) Time inflexibility is an issue as commuters not reaching on time on needed destination may lead to loss of time for potentially all the tripper
4) Share wheels sharing operations calculate on technology platforms to connect motorists and passengers. Specialized glitches, garçon outages, or issues with internet connectivity can disrupt the service and impact passengers' capability to find lifts or coordinate participated passages.
5) Sharing the cost of a ride can often get tricky, especially if people travel different lengths or if extra stops are made. This can cause confusion or upset among those sharing the ride over how to split the bill fairly.

C. Suggested Improvements

1) Seat Vacuity point to insure the tripper is informed about the number of abstracted space.
2) Estimate the cost of trip before the trip starts add a point of live position that can be participated with family/ musketeers in case of exigency or unwanted situations.
3) Allowing passengers to give feedback of the experience and write review about the same on either auto proprietor or passenger specific.

II. DETAILS RELATED TO PROPOSED SYSTEM

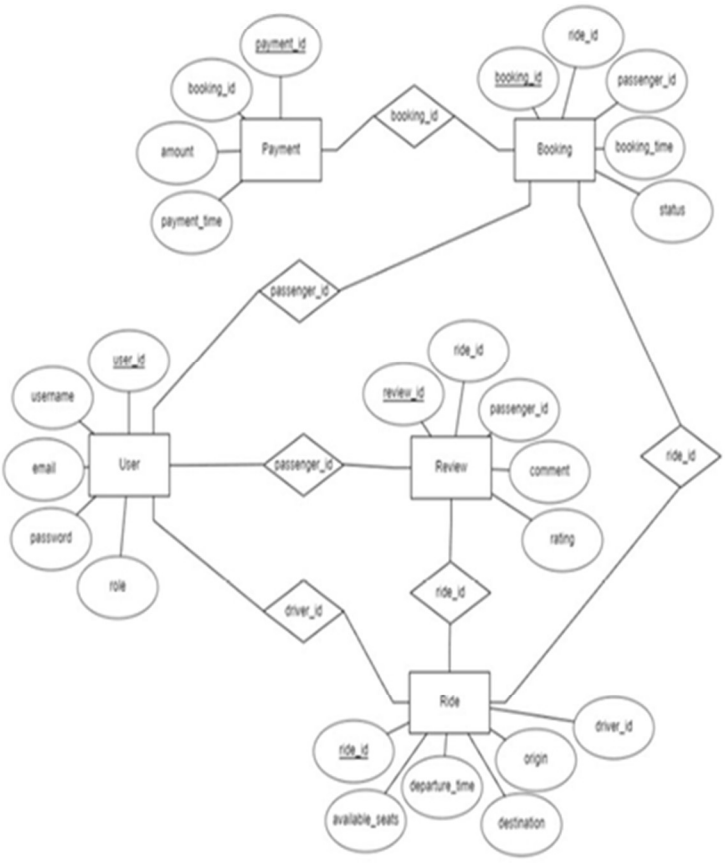


Fig 1: E-D Diagram of system

The different modules of Share Wheels are:

a) Stoner enrolment and authentication

This is the most critical module of share wheels. This will have two types of stoner which are auto proprietor and tripper. The auto proprietor is the bone that provides the vehicle whereas the tripper is the one who want to use the service for the specified route.

While the process of enrolment, authentication is veritably important to give a safe as well as secure terrain for the druggies. This can be assured by asking the stoner to give document that insure the unique identity which can be vehicle documents, auto enrolment and other details in case of auto proprietor and Aadhar card or visage card in case of tripper.

b) Route creation and operation

The auto proprietor will decide and post the origin and the end destination of the trip this data will also be stored in the database and shown to tripper. The tripper can also choose and give the volley and drop off spot to auto proprietor considering they're on the same route and not important swerved.

Different algorithms can be used to match the tripper and auto proprietor similar as k- nearest neighbors which can find similarity in auto proprietor handed path and tripper path to group them together. After the auto proprietor checks the volley and drop off spots can confirm the lift and do with the trip.

c) Communication

The auto proprietor and tripper should have a way to communicate with each other. A messaging converse can be integrated that allows both parties to communicate effectively and share needed information. Other than converse they can be handed with contact information for the same.

d) Payment:

After the trip is completed the tripper will pay for the quantum for the distance travelled which will be pre estimated. traveller can pay using any mode of sale credit or disbenefit or online or cash. For online mode of sale the tripper will be diverted to payment gate.

e) Standing and feedback:

After the completion of the trip the tripper as well as the auto proprietor both can post standing and feedback grounded on the experience. This can also be taken into consideration by unborn tripper and auto proprietor for their peregrinations.

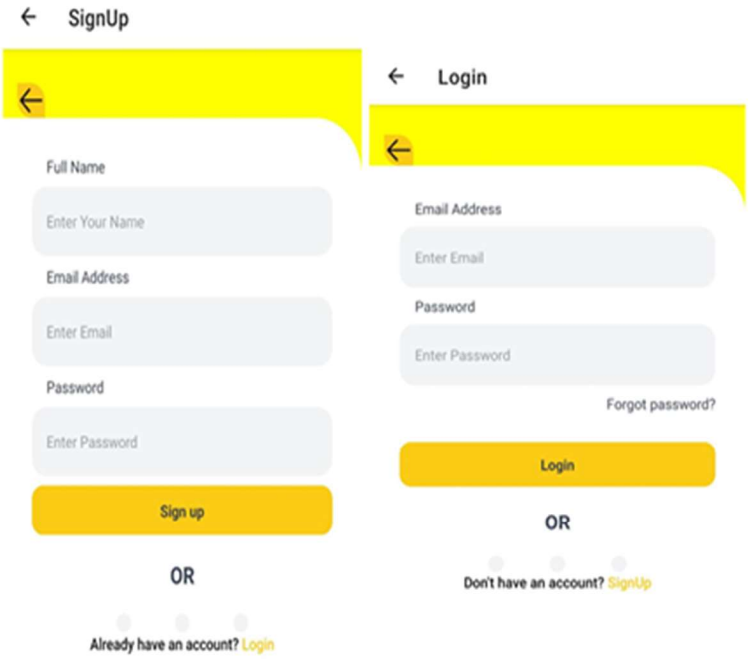
III. METHODOLOGY

1) Requirements accumulating: step one is to accumulate requirements for the application that can consist of character Necessities, business requirements, and technical requirements. This step includes accomplishing interviews with stakeholders, reading market dispositions, and identifying the scope of the venture.
2) Design and structure: the second one step is to design the utility's architecture and create a high level design that includes the user interface, statistics fashions, and backend offerings. This step includes developing wireframes, person stories, and flowcharts to guide the improvement system. Improvement: The third step is to increase the application the usage of ReactJS and Firebase. This step includes coding the frontend and backend of the utility, integrating 0.33-party APIs, and creating take a look at cases to make certain the utility's functionality and overall performance.
3) Testing: The fourth step is to test the utility to make Positive it meets the requirements and is worm-free. This phase consists of unit testing, integration testing, and system trying out to validate the functionality and overall performance of the application.
4) Deployment: The 5th step is to install the software to a production surroundings. This step involves configuring the application's servers, databases, and other sources to make certain that the software is to be had to users.
5) Protection and assist: The very last step is to hold and guide the software post-deployment. This step entails tracking the utility's performance, solving insects, and including new functions to satisfy evolving consumer necessities.

IV. USER INTERFACE

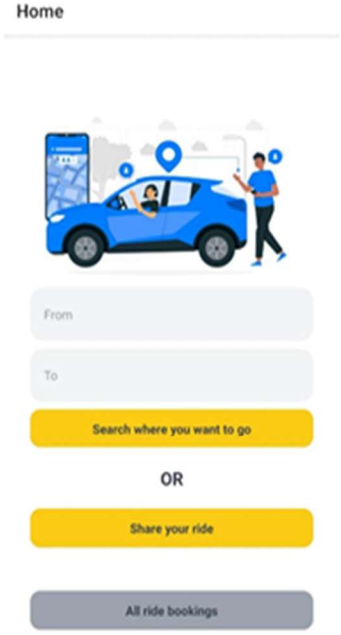
1) *Login / Register*

if the user already has an account, they can login or else opt for registration to create a account



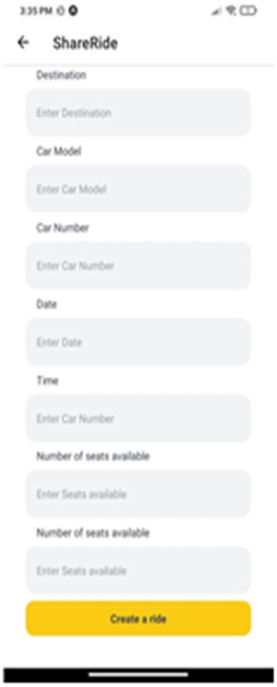
2) Home Page

Home page to search for destination and book rides or search for rides.



3) Add ride as a Captain

A cab driver will add his car details and the location he wants to drop the passenger from via and to final destination with desired date time and travel fair.



V. FUTURE SCOPE

As part of unborn compass, numerous fresh features can be added similar as GPS shadowing system for real time streamlining of information, SOS point that would warn needed authorities in case of exigency(3). Advanced matching algorithms paired with tone driving buses could lead to accessible and effective way to auto pool. Tone driving auto could volley multiple people on participated path, reducing the need of particular vehicles. Block chain technology could be used to develop a share wheels platform as it'll lead to secure and decentralized network, where druggies could partake there data and make payments without the need of any third party involvement. Overall share wheels is a sustainable mode of transport which should be promoted and used more extensively by the population that also benefits the individualities involved as well as terrain.

VI. CONCLUSION

Share wheels is a veritably effective result to some of the major problem faced by commuters as well as private vehicle possessors, with the help of share wheels the auto proprietor can cut down their cost of energy for travelling the same distance by sharing vehicle with other commuters. This will also help with business traffic which will increase the energy effectiveness in general as energy is a depleting resource in nature. It does not only profit the stoner but also profit the concerning environmental issue similar as global warming, carbon emigration, sound pollution. This can make a significant change in the wellbeing of society. By participating lifts, druggies can make new musketeers meet new people and develop connections which can change into meaningful openings. still, share wheels can also come with its own set of problems similar as safety and security of stoner, sequestration, operation of payments, conflicts in interests of other commuters and numerous further.

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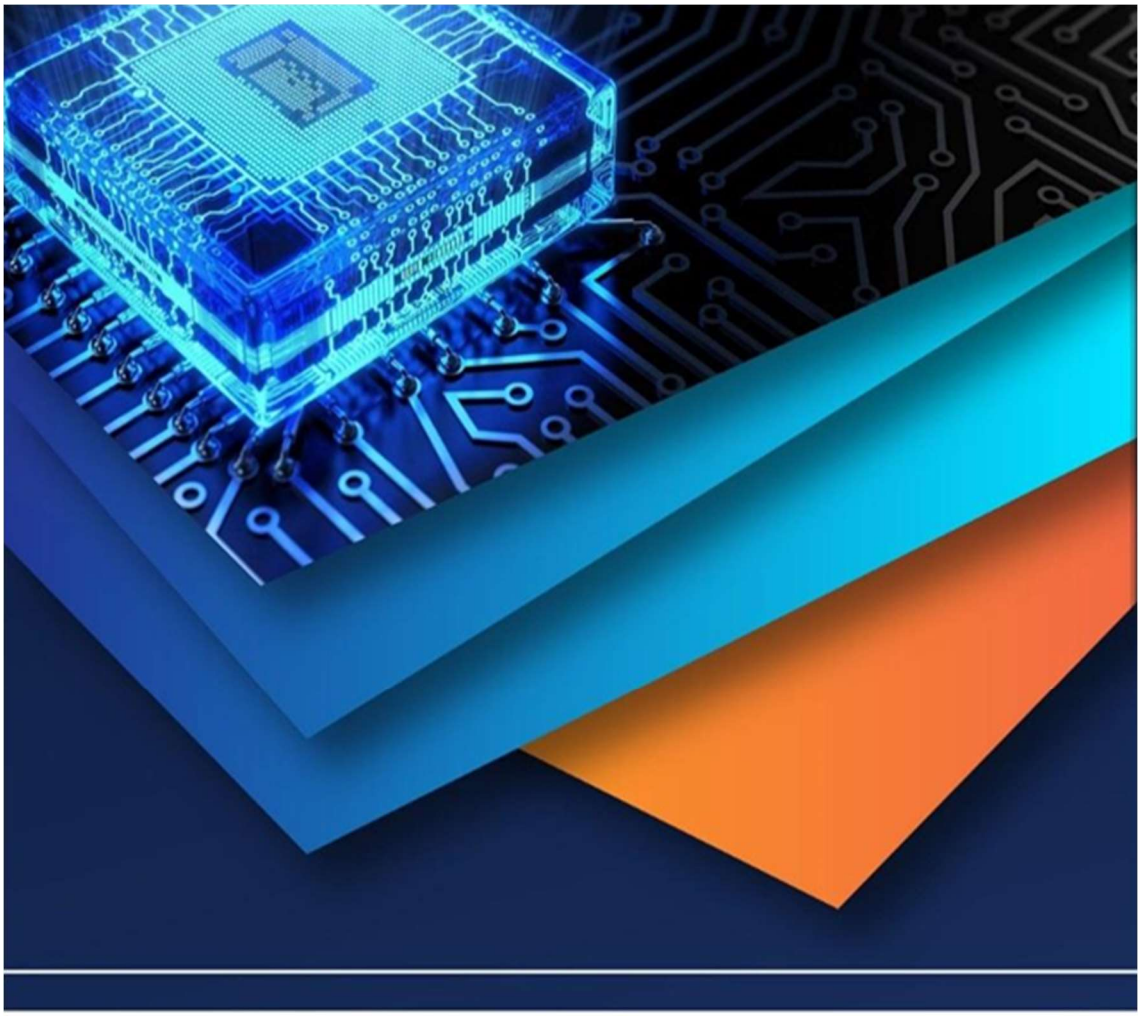

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10th SSC	Maharashtra State Board	**2018**	**96.80**
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Diploma	Maharashtra State Board Of Technical Education	-	-

Bachelor Of Engineering (B.E)		Passing Year & Month	Marks Obt/ Out of	% of Marks	Pointer
Ist Year	I - SEM	**W-2020**	**581/600**	**96.83**	**10**
	II - SEM	**S-2021**	**589/600**	**98.16**	**10**
IInd Year	III - SEM	**W-2021**	**646/700**	**92.28**	**9.85**
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IIIrdYear	V - SEM	**W-2022**	**518/700**	**74**	**8.7**
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	VIII - SEM				

PLACEMENT DETAILS	
Campus Placement (If Any)	**YES**
(If Any) Name Of Company	**Accenture**

FUTURE PLANNING		
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10th SSC	Maharashtra State Board		**2018**		**82.20**
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Diploma	Maharashtra State Board Of Technical Education		-		-
Bachelor Of Engineering (B.E)		Passing Year & Month	Marks Obt/ Out of	% of Marks	Pointer
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PLACEMENT DETAILS	
Campus Placement (If Any)	**YES**
(If Any) Name Of Company	**TCS Digital**

FUTURE PLANNING		
Higher Studies/ Job Preferences	Higher Studies	Yes
	Job	Yes
	Training	-
	Business	-

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10th SSC	Maharashtra State Board		**2018**		**69**
12th HSC	Maharashtra State Board		**2020**		**72**
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Bachelor Of Engineering (B.E)		Passing Year & Month	Marks Obt/ Out of	% of Marks	Pointer
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(If Any) Name Of Company	-

FUTURE PLANNING		
Higher Studies/ Job Preferences	Higher Studies	Yes
	Job	Yes
	Training	-
	Business	-

Place: Amravati

Signature

Date: / /2024

Vedant Ajay Deshmukh