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Ryder: A Ride Sharing Application

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Abstract: This is a study of Ride sharing applications. Ride-sharing platforms have changed urban transportation by offering a convenient and eco-friendly alternative to taxis and public transits. These platforms use mobile apps and algorithms to connect riders with drivers, reducing traffic congestion. Ride-sharing also fosters social interaction and improves accessibility for people with disabilities. However, there are safety concerns and potential negative impacts on traditional public transits which is a challenge. Overall, ride-sharing platforms offer a promising solution for urban mobility, with continuous innovation addressing current limitations.

Index Terms – Urban Transit, Ride-Sharing, Mobile App, Ride-Sharing Safety, Urban Traffic Congestion

I. INTRODUCTION

Ride-sharing applications have transformed the landscape of urban transportation, offering convenient and efficient means of travel for millions of people worldwide. One can easily search for a ride in local region and save precious time that would have been wasted for waiting for public transport. However, despite their widespread adoption, there remains a lack of comprehensive research that would explore the detailed functionalities and impact of these Ride Sharing platforms within this growing industry of transport. This paper seeks to address this gap by conducting a thorough investigation into Ryder, which is a ride-sharing application tailored to the transportation needs of rural areas within Maharashtra, India. Especially, this application is centered to use in Ratnagiri district which is mostly an urban area. In line with the prevailing trend in ride-sharing technology, Ryder application harnesses the power of mobile technology and sophisticated algorithms to make a connection between riders with drivers, facilitating efficient and cost-effective transportation solutions. User can either upload a ride or choose between rides that are available.

However, while the overarching concept of ride-sharing remains consistent across various platforms, it is imperative to delve deeper into how Ryder's unique features, pricing model, and target market differentiate it within the competitive landscape of the region. Moreover, beyond the realm of convenience and accessibility, ride-sharing has been associated with a myriad of social benefits, including mitigating traffic congestion, reducing pollution, and enhancing overall mobility. This paper endeavors to explore how Ryder contributes to the realization of these societal advantages, with a particular focus on its potential to serve diverse demographic groups, including individuals with disabilities or specific transportation needs prevalent within rural communities. Safety concerns represent a paramount consideration within the ride-sharing industry, and Ryder is no exception. Through rigorous background checks, driver verification processes, and in-app safety features, Ryder endeavors to uphold the highest standards of passenger security. This paper will critically examine the efficacy of these safety measures and their implications for enhancing trust and confidence among users.

Furthermore, the disruptive impact of ride-sharing on traditional transportation systems, such as local taxi services and public transit, necessitates careful scrutiny. By analyzing Ryder's influence on existing transportation infrastructure and service providers within Maharashtra, this research aims to elucidate the broader implications of its presence in the region.

II. Methodology

Algorithms used

Dijkstra's Algorithm:

In the context of a ride-sharing system, Dijkstra's algorithm is employed to optimize the selection of routes for multiple passengers with the aim of minimizing travel time, distance, and overall congestion. This algorithm is integral to the efficient allocation of resources, such as vehicles and drivers, in order to fulfill ride requests while optimizing the utilization of available capacity. The process begins with the construction of a weighted graph representation of the transportation network, where nodes represent pickup/drop-off locations and edges represent possible routes between these locations. Each edge is associated with a weight that reflects the distance, time, or cost required to traverse it. Initially, the algorithm assigns tentative distances to all nodes from a designated source node, typically the current location of the vehicle or a central hub. These tentative distances are continuously updated as the algorithm iterates through the graph, exploring neighboring nodes and adjusting the distances based on the weights of the edges. During each iteration, the algorithm selects the node with the shortest tentative distance as the next node to explore. It then examines the neighboring nodes of this selected node, updating their tentative distances if a shorter path is found. This process continues until all nodes have been visited or until the destination node for each ride request has been reached. Additionally, in a ride-sharing context, Dijkstra's algorithm may be adapted to consider various factors such as passenger preferences, real-time traffic conditions, and dynamic pickup/drop-off points. This adaptation ensures that the selected routes not only minimize travel time and distance but also accommodate the specific needs and constraints of the passengers and the prevailing transportation environment. Overall, Dijkstra's algorithm plays a crucial role in optimizing the allocation of resources and routes within a ride-sharing system, ultimately enhancing the efficiency, reliability, and user experience of the transportation service.

Place API

The Place API is a service provided by various mapping and location-based platforms, such as Google Maps or OpenStreetMap. It allows developers to programmatically access information about places, such as businesses, landmarks, and points of interest. By sending requests to the API with specific parameters, developers can retrieve details about places, including their names, addresses, coordinates, categories, ratings, reviews, and photos. This information can be integrated into applications to provide users with location-based services, such as finding nearby restaurants, hotels, or attractions, and displaying them on maps. The Place API simplifies the process of accessing and utilizing geographic data, enabling developers to create more engaging and personalized experiences for their users.

Tools and Technologies

Android Studio: Android Studio is the official integrated development environment (IDE) for Android application development. It is based on IntelliJ IDEA, a Java integrated development environment for software, and incorporates its code editing and developer tools.

React Native: React Native is a JavaScript framework for writing real, natively rendering mobile applications for iOS and Android. It's based on React, Facebook's JavaScript library for building user interfaces, but instead of targeting the browser, it targets mobile platforms.

Research methodology

The data required to analyze the region where Ryder application was to be implemented is taken mostly from internet. We have considered the importance of public transport in rural areas. Various factors can be taken in consideration before constructing such system. First of all, we have to understand the structure of public transport in a specific region which includes ways of public transport, amount of usage of different public transport facilities, their availability to common public, impact of their absence. We can further consider the impact of a ride sharing platform if implemented in the area. This can be understood by considering mentality of the local people, availability if personal vehicles which can be used to share ride, pre-existence of any carpooling or ride sharing system in the locality.

Conducting research about the above-mentioned points for the region, we have come to the conclusion that in a place where intra-city transportation is necessary for almost 60% of the population, people are highly relied on the public transport systems that are available like Buses, Rickshaws, Taxis etc. In this case, lack of transport facilities or any issue in the schedules of the system can lead to major interruption in daily life of travelling people. There are also people who do carpooling to avoid time waste for public transport

and to save the fuel. The number of people who are travelling with their own vehicle are also considered to check whether a ride sharing system can be implemented here. It is clear that an alternative for public transport will be surely appreciated if it is satisfying the needs without adding in more complexities or other issues. A ride sharing platform can be successful if more people are involved and actively participating in the activity. We may first make people aware about the efficiency and benefits of such platforms to make it more user friendly.

The safety concern still remains an issue to the efficient implementation of this ride sharing system as the matching of rides is based on routes provided to the search, the drivers who have uploaded rides can be from any locality. We can solve this by authenticating the identity and asking for proper documents as well as undertaking from drivers as well as passengers before they can avail the service. This can help in building trust among people about the system.

III. Existing System

There are few existing systems that can be considered while constructing a Ride Sharing Application like Bla Bla Car, InDrive and Rapido. There are certain points that can be improved in this system to build a more efficient Ride Sharing system. Indrive application gives you a choice to offer your fare while searching a ride, it is convenient in some cases but it can also create problems when offered fares are highly inappropriate for the ride. The application is also limited to certain types of vehicles and city region.

Another application “Rapido” provides similar facility but is only allowing registered vehicles to offer rides which again acts as a normal public transport system which can lead to same issues as of public transport. There are such small issues in each existing system that we are trying to emcounter.

IV. Implementation

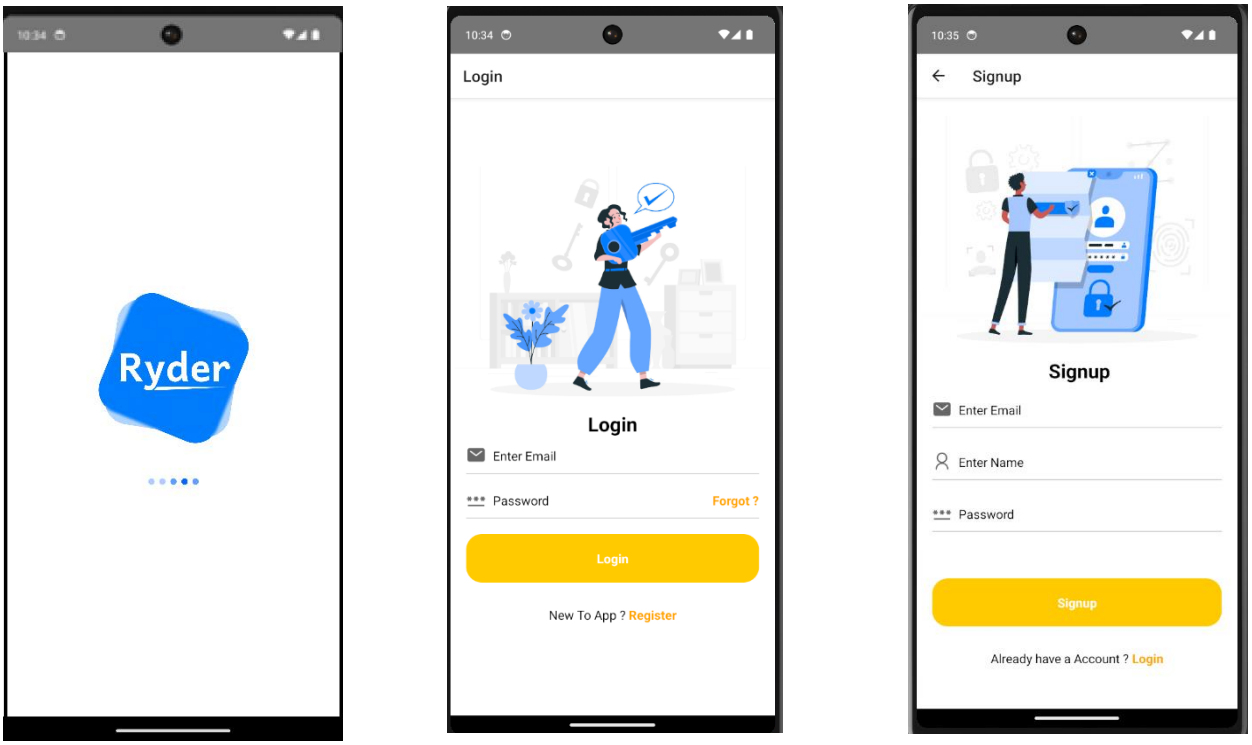

Fig 4.1 Splash screen, Login and Signup pages

Here user can log in to his/her previously generated account or register with new details to create new one to avail the services provided in the app.

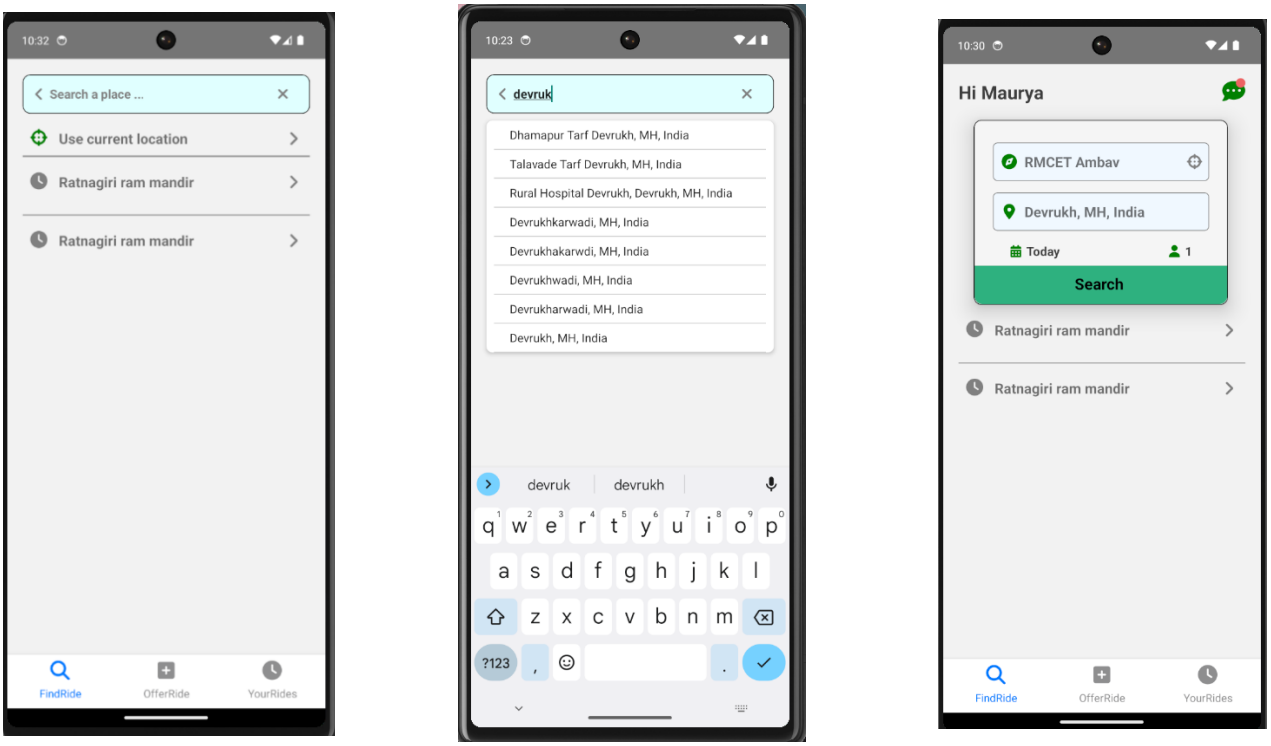

Fig 4.2 Searching Rides with location or manual searching

Once registered, user can search for rides with either their location or manual searching for destinations they want to get to.

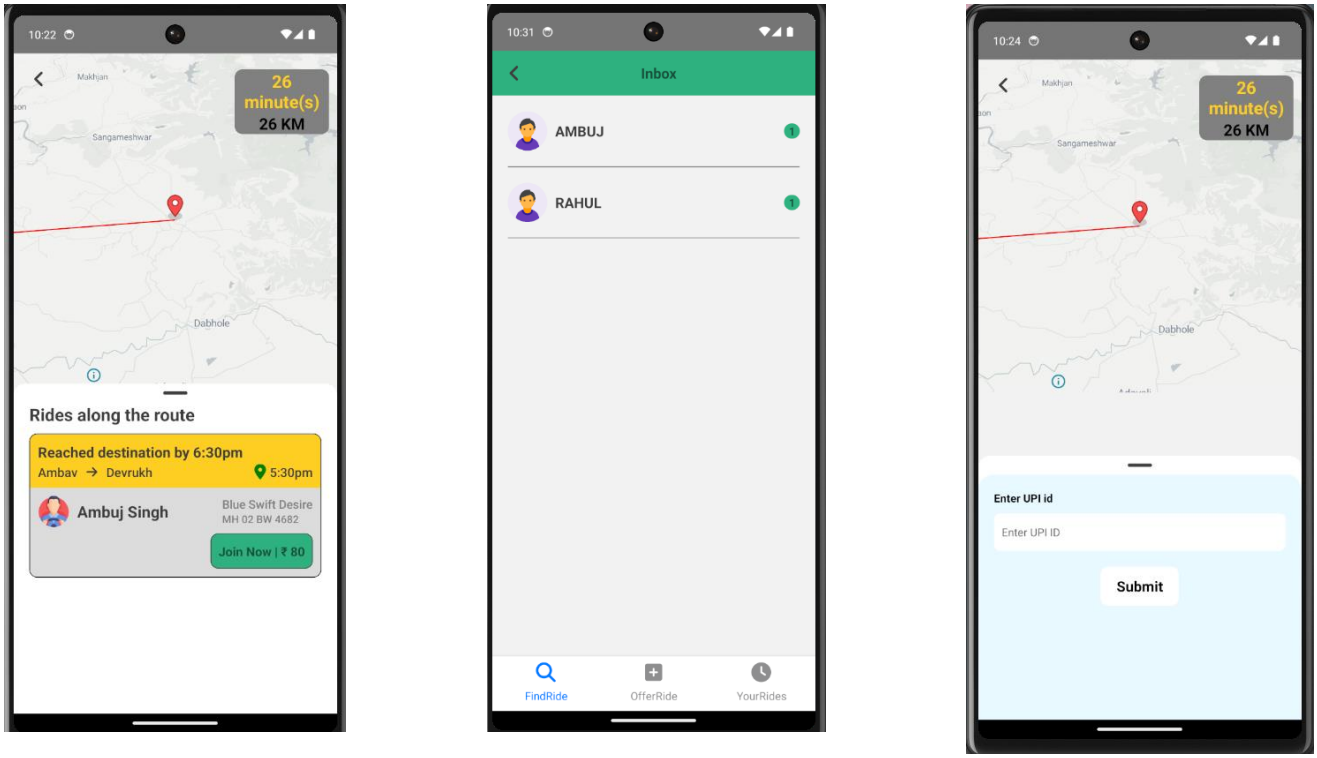

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Fig 4.3 Rides results, Chat box and payment options

After searching for rides, users can choose between rides if available for the route. They can also chat with the rider to communicate and also pay for the ride.

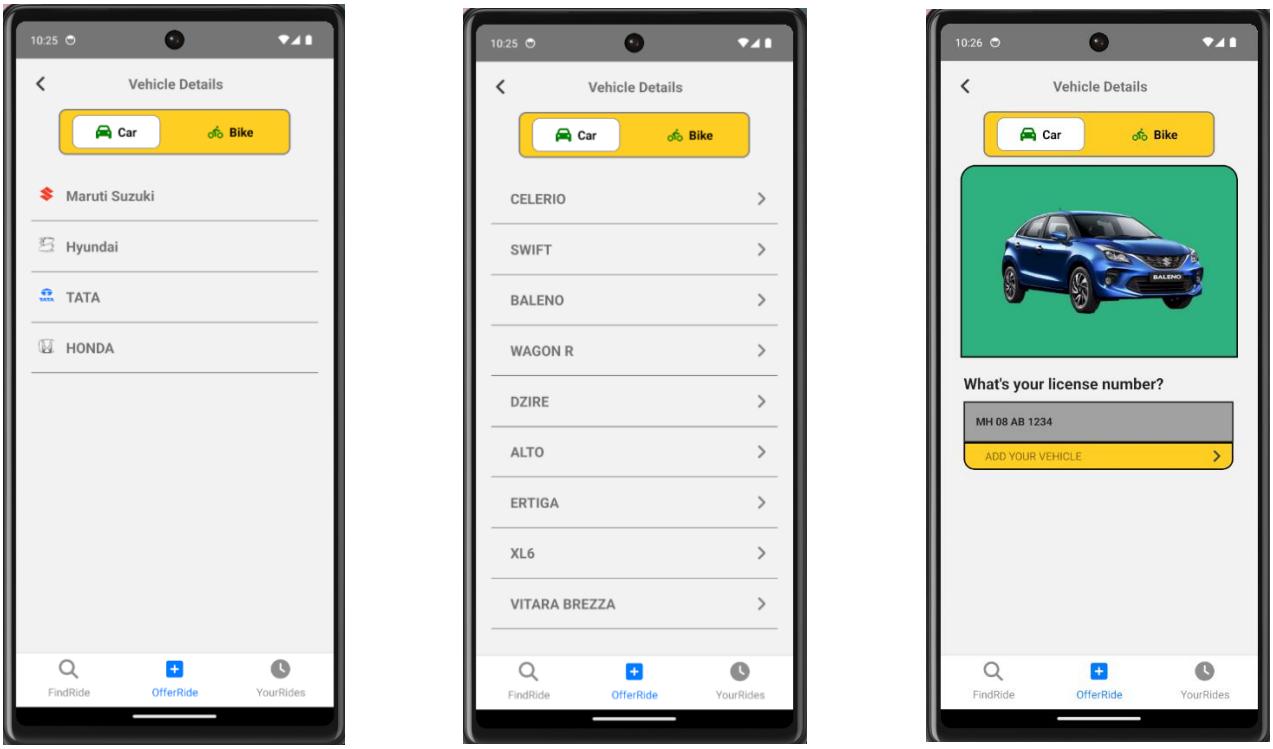

Fig 4.4 Selecting Vehicle to upload ride

User can also act as a driver, offering ride includes first step of registering their vehicle to the system. User can select over a large range of vehicles including two wheelers and four wheelers.

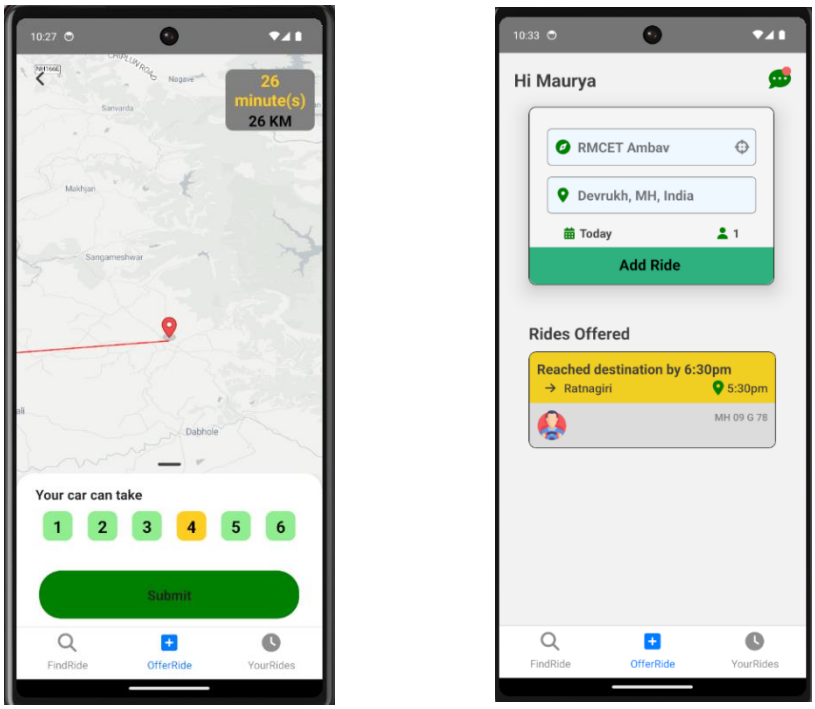

Fig 4.5 Uploading ride with number of passengers

Once the vehicle is uploaded, driver can choose the number of passengers he can take. Now they can upload the ride for chosen path. They can also see previous rides offered by them.

V. Conclusion and Future Scope

Ryder: Ride Sharing Application is very useful system for ride sharing and carpooling. Individuals requiring transportation yet lacking access to a personal vehicle can leverage ride-sharing applications. Through a simple interface, users can either request a ride or offer their own vehicle to a designated destination. This technological innovation has significantly enhanced the efficiency and convenience of carpooling in the modern era. Furthermore, ride-sharing applications contribute to environmental sustainability by reducing the overall number of vehicles on the road, thereby mitigating carbon emissions.

For the future development of the system, we are planning to

1. The ride sharing algorithm for matching rides and passengers as well as paths for the ride
2. Including additional features like driver feedback and driver ratings.
3. Driver validation to ensure safety of the ride.

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