Travelling Buddy : A Carpooling App

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Abstract: Sharing not only means the involvement of cooperate providers, it can also be a peer-to-peer(P2P) sharing of people who match private providers and users. One such example of this is carpooling. The sharing of an automobile ride is known as carpooling. Quite often we have seen the markable and considerable research on various types of pooling techniques. Recent years have seen considerable research on why people use these sharing services. As is the trend worldwide, India is undergoing rapid urbanization; and using a private car as a transportation system has become very common in industrialized countries. The costs of increasing dependence of people on cars and other transport is becoming very expensive, building new roads and their maintenance, high level of energy consumption in addition to the economic and environmental costs, pollution, traffic accidents and social inequities that arises when the poor are unable to access the transportation services at an affordable price. To overcome these issues many strategies have been introduced. We have also created an android car-pooling application (**Traveling Buddy**) to tackle this problem. In this application we have also implemented some of the new features which would help the users for convenient journeys. Some of the feature like providing the real time images of the car to check the car condition, an efficient way to provide communication between the rider and passengers, Even if one does not owns a car , he/she can still post the trip's details and a person who is willing to share the trip can communicate with him/her via calling and chat feature, Post initiator have to confirm the passenger of the trip before the actual day of trip after which he/she can't cancel any passenger's request. Carpooling would reduce the number of cars on streets hence providing worldwide environmental, economic and social benefits. Information and communication technology can aid in the matching of drivers and passengers [3].

1. INTRODUCTION

India is an emerging and developing country and the major issue that most of the people are facing nowadays is transport management problem. This transportation system can lead to many other hazardous problems like air and noise pollution. Urban traffic is responsible for CO2 emissions and emissions of other pollutants arising from road transport. It has deteriorated the quality of life in the urban areas. With the increase in the population and their demands for the transport system; the number of vehicles and their utilization is also increasing rapidly at a very high rate. Since the public transportation system is not as efficient as in cities, a tremendous increase in the vehicle pooling trend has been seen to commute which is less polluting and affordable.

Carpooling is a transport system which includes shared use of private cars which includes different individuals coming together to use a single car for the commute. It allows a car/entire vehicle's seating capacity to be utilised. It can be of two types – casual or organized by a service. A casual carpooling requires a high occupancy vehicle (HOV) and the trip cost is shared accordingly among the passengers and the passengers are decided on the spot. While in case of organized carpooling the user/client can book a trip prior to the journey and has the option to avail or cancel the trip anytime before the actual start of the journey. Examples of organized carpooling are RideSearch (www.ridesearch.com), Carpoolworld (www.carpoolworld.com), eRideShare (www.erideshare.com).

During the research what we observed in most of the apps which are already present in the market were lacking some of the features such as rejection of the trip by the driver at the last moment , details of the car like car images which could be helpful to check the real time condition of the car, chat and calling features to provide an efficient way of communication between the user and the trip initiator to discuss about their trips.
To overcome these problems, we have created this application which majorly focuses on resolving these conflicts.

The objective of this initiative is to rationalize the commuting trips, promote the use of collective private transport. It has also introduced many innovative transport systems, such as demand responsive services.

It is a peer-to-peer (P2P) platform organizing carpooling and sharing of trips, so that more than one person can travel in a car at an affordable price. It also matches supply and demand such that private individuals can offer empty seats in their car and this would help them to connect with the riders as well as with the passengers.

The travelers while pooling together not only share fuel and toll charge but it also helps to reduce the stress of driving alone [1].

2. LITERATURE REVIEW

-> Hajra Qadir (An Optimal Ride Sharing Recommendation Framework for Carpooling Services) [7], developed this system as a recommendation framework that combines multiple parameters of both drivers and passengers while computing recommendations. The parameters of passengers are (a) vehicle's capacity, (b) fare reduction, and (c) average time delay. The driver's parameters are: (a) profit increment and (b) driving distance. The vehicle recommended by their proposed framework is an overall preferred vehicle that takes into account the objective of each party participating in dynamic carpooling i.e., three types of passengers: new passengers, old passengers, and the driver.

-> Yunfei Hou (TicTac: From Transfer-Incapable Carpooling to Transfer-Allowed Carpooling) [8], demonstrated how TAC(transfer-allowed carpooling) can significantly improve SCR(successful carpooling ratio) compared to TIC(transfer-incapable carpooling) (by 35% to 60% both in our simulations and the real case study) and allowing one transfer per passenger improves the carpooling efficiency most, while allowing more than one transfer does not bring any noticeable benefits. From both a driver and passenger's standpoint, they introduce two effectives rideshare planning strategies to TAC, i.e., DES (Driver Experience-aware Strategy) and PES (Passenger Experience-aware Strategy), and perform large-scale simulations.

-> K.M. Mehedi Hasan Sonet (SharY: a dynamic ridesharing and carpooling solution using advanced optimized algorithm) [9], the most important point of their work was that they are not taking all the requests to satisfy all of the users in an optimal way, rather they proposed a solution where a host will pick that client(s) who will satisfy in terms of fare requirements and route selection that means that given the road that the host has chosen, he or she will not have to go a great distance. The host will be recommended optimally chosen clients based on both sides' requirements, resulting in combinations that benefit both parties. Therefore, in their research, they had devised a solution where the driver or the owner will not have to wait for passenger and system will pick a passenger if it matches a passenger with the same or around a path of the driver's destination.

-> João Ferreira(Collaborative Car Pooling System) [10], the main output of their system's specification, that aiming to increase the average rate of car occupancy, was: Real time traffic information, Best route search based on traffic information, based on dynamic route matching algorithms, Integration with public transportation information and parking facilities, Pre-booked parking place, Ad-hoc trip arrangements, Use of past-experience data to estimate time-to-pickup, User Profiles and credit mechanisms, to increase the motivate of cooperation among users.

3. PROPOSED METHODOLOGY

4.1 Features of the App

4.1.1 Account Creation

In this module a new user gets register itself and to maintain the authenticity of each and every user who login into the application we have used some of the user's personal and authentic details to ensure the integrity and the legitimacy with some essential details like name, DOB, mobile number, Aadhaar Card details, Pan Card, Photo of itself, Emergency Contact Number, Address, Profession.

4.1.2 Profile

A profile module consists of the user's profile which is accessible to all other clients; it also includes the public details required by other users to get the authenticity of any user. It deals with sharing of trips initiator's details with the interested users so that the users can get an approximation about the background of other users.

4.1.3 Add Trip

It is a feature that allows the users to post any trip in advance by providing essential details about the trip like Source Location, Destination, date and time of the trip and can add car details like car number, brand and model, seat and luggage capacity available and photos to check the condition of the car. If one does not owns a car , he/she can still post the trip's details and a person who is willing to share the trip can communicate with him/her via calling and chat feature.

4.1.4 Chat

Chat module acts as a bridge to overcome the communication gap between client and the trip initiator. It provides the facility of chatting between the users who are interested in a particular trip. With the help of this feature the user can negotiate the fair price and can discuss various facilities such as available luggage space, number of passengers, past driving experience, and can enquire about two-way trips. This feature also paves a way for the customers to cancel or delay the trip due to some unavoidable circumstances.

4.1.5 Book trip

All the posted trips are available in the user's feed and the user can navigate to any one of them in which he/she is interested to get more details about the trip such as who is the initiator of the trip, the model of the vehicle they are using along with the photos. If the user wants to book any trip of his preference, then it is just a click away from the user and he can also provide his details like pickup location, luggage capacity and can inform about the health condition.

While booking any trip the user has full permission to check the authenticity of the post initiator by looking into his profile details which includes Aadhaar details, Pan Card details and many other authentic details.

4.2 Software Used

4.2.1 Android Studio

The official integrated development environment (IDE) for Google's Android Development System is Android Studio, which is based on JetBrain's IntelliJ IDEA software and is tailored to Android development. On May 16, 2013, during the Google I/O conference, Android Studio was revealed.

4.2.2 Firebase

Google Firebase is a Google-backed app development platform that allows developers to build apps for iOS, Android, and the web. Data analysis, reporting, and debugging app difficulties and product trials are all possible using Firebase's features.

4.2.3 Figma

Figma is a digital mock-up, prototyping and designing tool. It's a user interface and user experience design programme that you may use to make websites, applications, and smaller user interface components that can be merged into other projects.

4.2.4 Github

GitHub is a code hosting platform for version control and collaboration. It lets you and others work together on projects from anywhere.

4.3 Programming Language Used

4.3.1 Kotlin It's a programming language which was developed by JetBrains. Initially it was shaped as a programming language based on the Java platform and JVM, Kotlin was designed with Java interoperability keeping in mind, which means that a Kotlin program can not only use the Kotlin Standard Library but the Java SE API and all Java libraries also, and Java programs can call useful helpers in the Kotlin Standard Library and all sorts of other Kotlin code as well. Kotlin has been expanded with Android support and support for native machine code as compiler target via Kotlin/Native.

4.3.2 Java Java is a programming language and computing platform first released by Sun Microsystems in 1995. It has evolved from humble beginnings to power a large share of today's digital world, by providing the reliable platform upon which many services and applications are built. New, innovative products and digital services designed for the future continue to rely on Java, as well. There are many applications and many websites that will not function unless you have Java installed. Java.com, this website, is intended for consumers who require Java for their desktop applications – specifically applications targeting Java 8. Developers as well as users who would like to learn Java programming should visit the dev.java website and business users should visit oracle.com/java for more information.

4.3.3 XML Extensible Markup Language (XML) is a markup language that is comparable to HTML but does not include any predefined tags. Instead, you create your own tags that are tailored to your individual requirements. It's a powerful tool to store and exchange data in a format that can be searched and saved. Most significantly, because the XML format is defined, whether you send XML across systems or platforms, whether locally or over the internet, the receiver will be able to understand the data thanks to the standardised XML syntax.
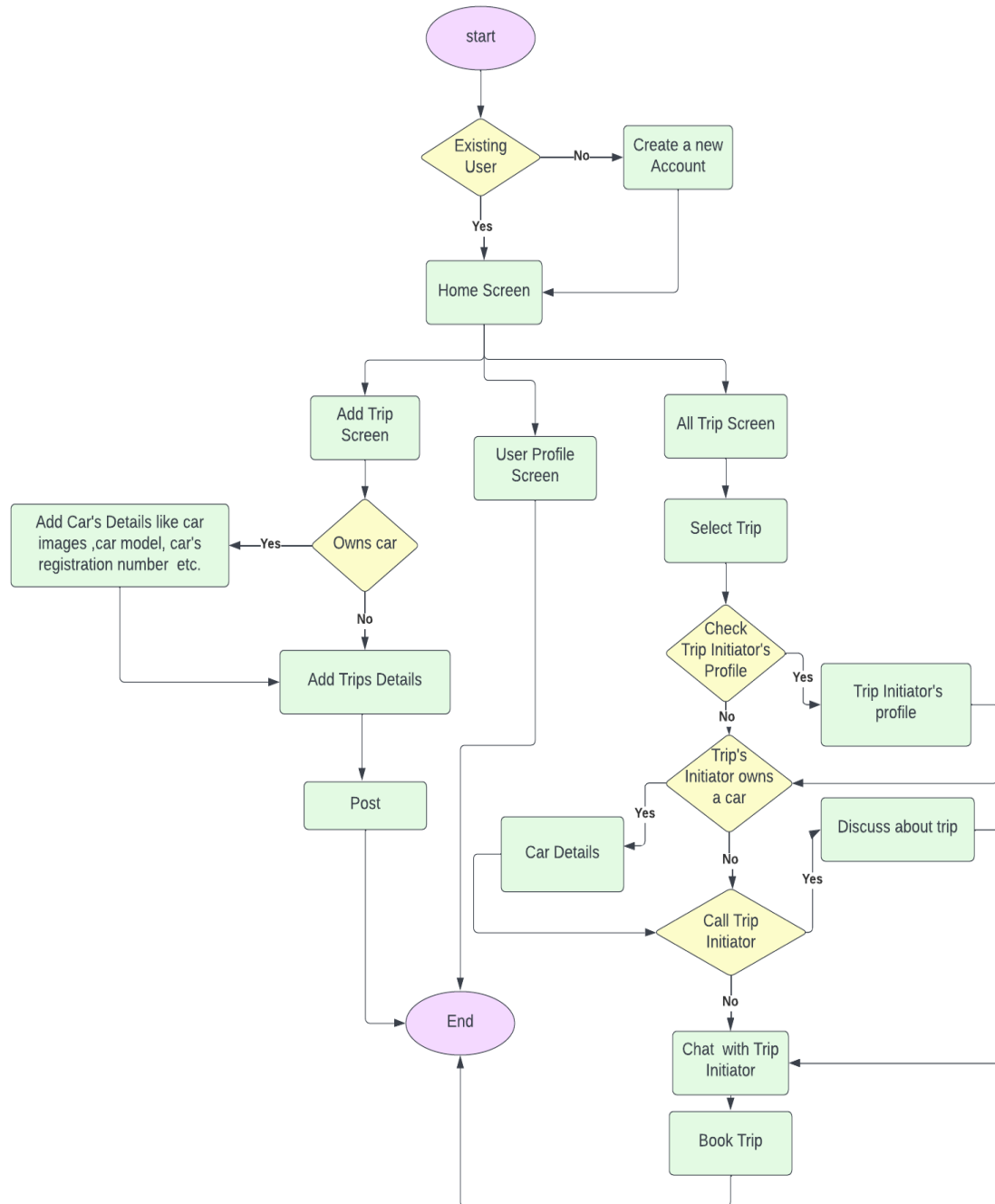
4.4 Flow Chart

Fig 4.4.1 Flowchart Diagram

5. RESULT

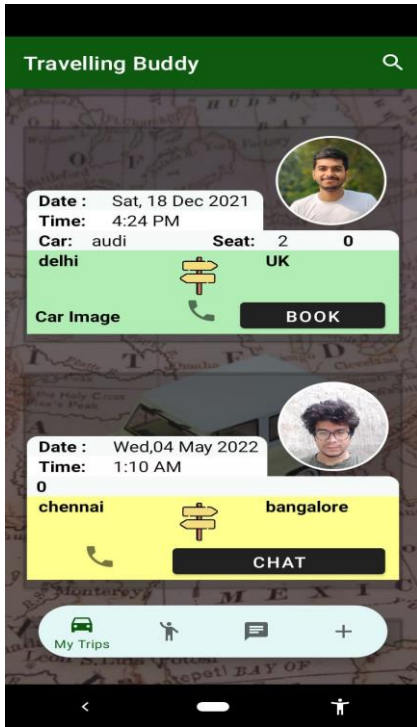**The following section provides the illustration of our system in figures.**
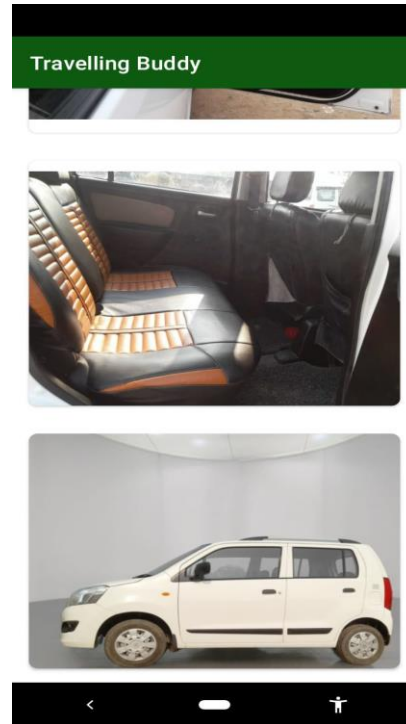

Fig 5.1 All Trip Screen

Fig 5.2 Car Image Screen
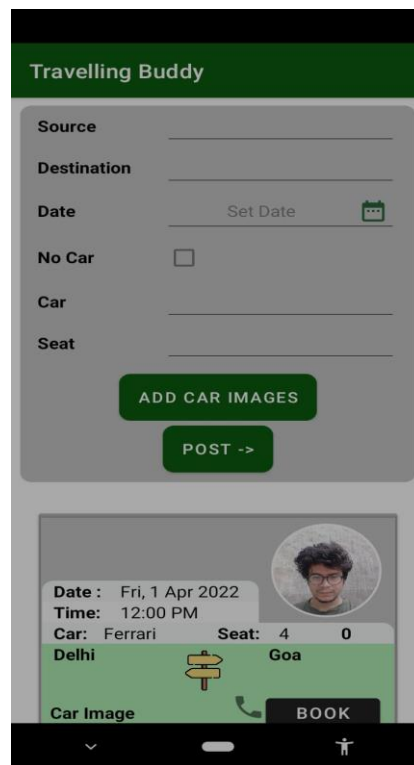

Fig 5.3 Profile Screen

Fig 5.4 Add Trip Screen

6. CONCLUSION

Instead of driving alone, carpooling allows you to share your vehicle with other people. Since an increasing number of individuals have become aware of the problem of climate change and wish to contribute to the battle against global warming, carpooling has become highly popular in the last decade. [3]

This paper describes the different techniques which helps in reducing pollution, greenhouse gases and traffic. It saves a thousand dollars in fuel, vehicle tear, parking and tolls. With the help of this technology we meet new people and reduce stress from driving. The more we prefer pooling; the more our wallet, car will thank us. and it will create a positive impact on the environment. It is a good opportunity for the people who can't drive. We might be able to work in the car since every day we are not the driver, we could just get your laptop and work a little bit. By doing so, we could use your time quite efficiently. Also, we can connect with the new people as we can share the car with strangers and we might become really good friends with our carpool crew.

This study presents a discussion of the psychological characteristics that encourage drivers and passengers to carpool. The proposed framework helps to make better and clear understanding of taking decisions for travelling.

We should encourage trip sharing by promoting its advantages.[4]

There are many reasons for sharing the trip - The most obvious reason to carpool is that we end up spending much less than us would by almost any other way to cover distance on our own. Not only does this provide us company during the ride but also helps us meet people from us own city or a fellow traveler.

It provides a one way solution for all the problems and helps to get the comfort of a journey without having to spend much time on traffic.[5]

It also allows riders to avoid spending time on parking, and helps the users to be productive during the drive too.

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