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A Smart Real Time Ridesharing Android Application

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Abstract—Due to the rising population growth and rapid increase in urbanization, there are lot of problems faced in travelling especially in india. People are migrating from rural areas to urban areas in search of job and better lifestyle. This results in increasing population and thus resulting in insufficient transportation facilities. That is why people probably prefer to travel through private vehicles. This leads to problems such as increasing number of private vehicles, traffic congestion,increasing consumption o ffuels, heavy cost on resources, parking problems and many more. In order to overcome this situation very much different but realistic solution is "Ridesharing" which facilitates users especially employees, classmates, to share their vehicles with unacquainted person who is travelling to the same destination or nearby destination. Ridesharing reduces each person's travels costs such as tolls cost, fuel expenses and distress the driver environment while driving. Carpooling or Ridesharing is one method that helps to resolve problems that continue to plague urban areas. This paper describes the architecture for a collaborative Ridesharing android System which is gaining popularity worldwide especially in india.

Keywords: *Ride sharing, Carpooling Android Application, Web Services, GPS navigation.*

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I. I NTRODUCTION

These days transportation has been of major issue. Roadways is one of the most used means of transportation which mostly includes private passengers car. These cars are generally used with only a single rider. Over use of cars creates various problems such as increased traffic, increase pollution, parking congestion and many more.[3]

The growth of recent advancements in technology is progressing day by day. Migration from one city to another city in search of jobs is increasing theses days. This leads to increase in transportation facilities and increase in pollution causing natural resources to deplete. To overcome these problems "Ridesharing" is of atmost need.[2,3,5,8]

In order to decrease traffic jam during peak hours, to sustain fuel, and to enhance the parking facilities, ridesharing is atmost necessary. Ridesharing aims at solving this problem by targeting the empty seats in the private cars. People of the same locality or the students going to the similar school or offices can share rides. But when a person going on an inter city trip does not know if any person also intends to make the same journey. The applications helps you in seeing people and schedules journey and make an informed decision about of travelling alone, save money along with safety.

In the proposed system we will create an android application as a service or platform for ridesharing which can be installed on Android based Smartphone's. This software is developed for android system. The two main reasons for choosing Android OS instead of another one are:

Android is an open source operating system, and thus allows reusing some pieces of program to create a new application. It is also quite well documented and sources can be found on Internet to learn how developing applications for this platform.

Android is fast growing operating system, and it became the world's leading smartphone platform in January 2015 and it will help for bringing more and more users for ridesharing.

This application will allow users to share there rides details prior to it's journey making other join it. The application is cost effective as it shares the money by dividing fuel costs among fellow passengers. Real-time ridesharing aids for onetime rideshares within a short span.

Advantages of Proposed System:-

- Creating an android application for ride sharing.
- Establishing primary database for passenger's and riders registration.
- Integrating Google map API for real time navigation for route.
- Developing real time messaging feature in android application for communication between rider and Passenger.

The rest of the paper is organized as follows: Section II gives a brief idea of the problem that exists and idea how it will be solved by our proposed system. Section III provides comparisons of various existing system. System IV describes the implementation plan along with the algorithm and details of the android manifest file. Finally, the conclusion and the major contribution to this paper are discussed in the remaining sections.

II. LITERATURE REVIEW

Ridesharing is a promising approach for saving energy consumption and assuaging traffic congestion while satisfying people's needs in commute. Ride sharing has

been studied for years to deal with people's routine commutes, e.g., from home to work . Recently it became more and more difficult for people to hail a taxi during rush hours in increasingly crowded urban areas. Naturally, taxi ridesharing is considered as a potential approach to tackle this emerging transportation headache.[1]

III. MOTIVATION

The Ridesharing android application under consideration, is a novel idea in tackling various transportation issues. This became our source of motivation for going ahead with this project. All the current car pooling methods aress

1. Time consuming.
2. Require a lot of before-hand planning.

Require several rounds of communications in the form of series of e-mails or a series of telephonic conversations.

Also, The motive behind the research is the extreme situation of pollution in Delhi where even the "odd-even" formula to restrict the on roaad vehicles has failed. So in this situation the Ridesharing would be of better choice for delhi's people for better transportation and lesser pollution.

IV. INNOVATIVE CONTENT

The application is designed to run on every android smartphones as every processing of the data will be done through web services. The central database will be the source for storing the every single details of registered users along with their uploaded rides and the rides joining request.

The platform will be integrated with google fusion table which serves as a database for storing geocordinates of rides along with both rider and passenger. This module converts the physical address in to Geo location coordinates and stores them in the Google fusion tables.

The web service serves as the processing unit of our application. The mobile client transmits the user data to the web service. The web service stores this data in the database. When the user requests his ridesharing options the web service queries the database for other users, filters the users who do not fit and sends only the appropriate users to the mobile client.

Also, A messaging interface will be developed between the rider and passengers in order to build trust. Once the rider accept the passenger request (likewise in instagram where we can send the follow request) it will form a group among rider and several passengers. In this the innovation will be "The group members will be limited to the number of seats available in the ride".

V. PROBLEM DEFINITION

Population growth and increasing population density, particularly in metropolitan areas, has leads to increase in number of vehicles, few percentage points per year (3.6% increase in 2010 alone).

Ridesharing is a promising approach for saving energy consumption and reducing traffic congestion, Now a days Hailing taxis has became more and more difficult for people during rush hours in increasingly crowded urban areas. Naturally, ridesharing is considered as a potential approach to tackle this emerging transportation headache.

One of the main drawback of existing application of ridesharings are they are unable to build trust in order to overcome this problem we will be developing a messaging interface for communication among rider and passengers. With the help of this application the android Smartphone user shares the ride in a private or a public vehicle with two or more individuals. The application is cost effective as it shares the money by dividing fuel costs among fellow passengers. Ridesharing has a greater advantage to the community by reducing emissions and pollution thereby creating a better environment.

VI. PROBLEM REPRESENTATION

Algorithm:
Step 1 – In the beginning if the user is new then he/she is supposed to register before using any services.
Step 2 – The users who are registered can sign in and is supposed to provide every single details along with phone number.
Step 3 – The users who have signed in is supposed to upload ride with vehicle no, license no, along with route details, if he/she wants to find people with people travelling in similar route.
Step 4 – The users who wants to search for rides needs to insert the details of source and destination. The passenger is displayed with the details of available rides.
Step 5 – The passenger then sends the ride joining request to the rider, based on the number of seats available.
Step 6 – The rider can accept or reject the passenger's request, if it is convenient.
Step 7 – As soon as the request is accepted by the rider a group is created among the rider and the accepted passengers for messaging interface so as to develop the feeling of trust.
Step 8 – The current location details of every single individual will be displayed to every members of the group.
Step 9 – Through the prior communication, the pickup location will be decided and the journey will be commenced.
Step 10 – Every single expense related to tolls, petrol and driving cost throughout the journey will be divided amongst the fellow passengers.

VII. PROBLEM DOMAIN

1. The problem we tackle in this paper is achieving concept of ridesharing through Android application using Android smartphone. The following are the different types of ridesharing concepts with different technologies being implemented below:
2. GPS Enabled Car Pooling System: In this, the user with current location retrieve the list of users near by in the Google maps who wants to join ride.
3. Ridesharing System with SMS Alerts: It provides details of the owner and his/her car to maintain transparency between users of the system. It will track the location of users those who involve in pool through GPS Navigation system. It has SMS Alerts facilities for notification purpose.
4. Rideshare matching using GIS: The real-time rideshare matching system can be increased to provide matches not only for origin-destination but alse en-route pick-up and drop-off of riders. A Geographic information system linkup with ridesharing databases, is proposed for implementing such rideshare matching services.

VIII. SOLUTION METHODOLOGY

Fig. 1 shows the architecture diagram of Ridesharing. In the proposed system, The System consists of two participants - Driver and Rider. Both of them can benefit from the ride sharing platform through the ride sharing application installed in their android based mobile phones. To participate in the ride sharing, both users rider as well as driver have to register for the firstly using their mobile application. This processes of registration and login activity is effected by the service registration and the user account data is stored in the Accounts profile of database. Other then login data, the accounts profile database also comprises of extra details for security such as the user address, the organization where he/she is working.

The process begins with the rider registering his ride through the mobile application. The ride registration data consists of source address, destination address, journey dates and start time of the journey or ride. The Google's Geo coding service then receives the start time of the ride. This module converts the physical address into Geo location coordinates and saves those coordinates in the Google fusion tables. The rider after login gets displayed with the available rides through the ride search activity. The ride request is then processed by the web sevice of the ride sharing application. The rating service sorts out each rides based on the reviews provided the passenger. The filtered search result is presented to the rider or passenger along with the entire details of driver. After the rider selects a driver, rider request is then send on to the driver's mobile application by the ride sharing service.

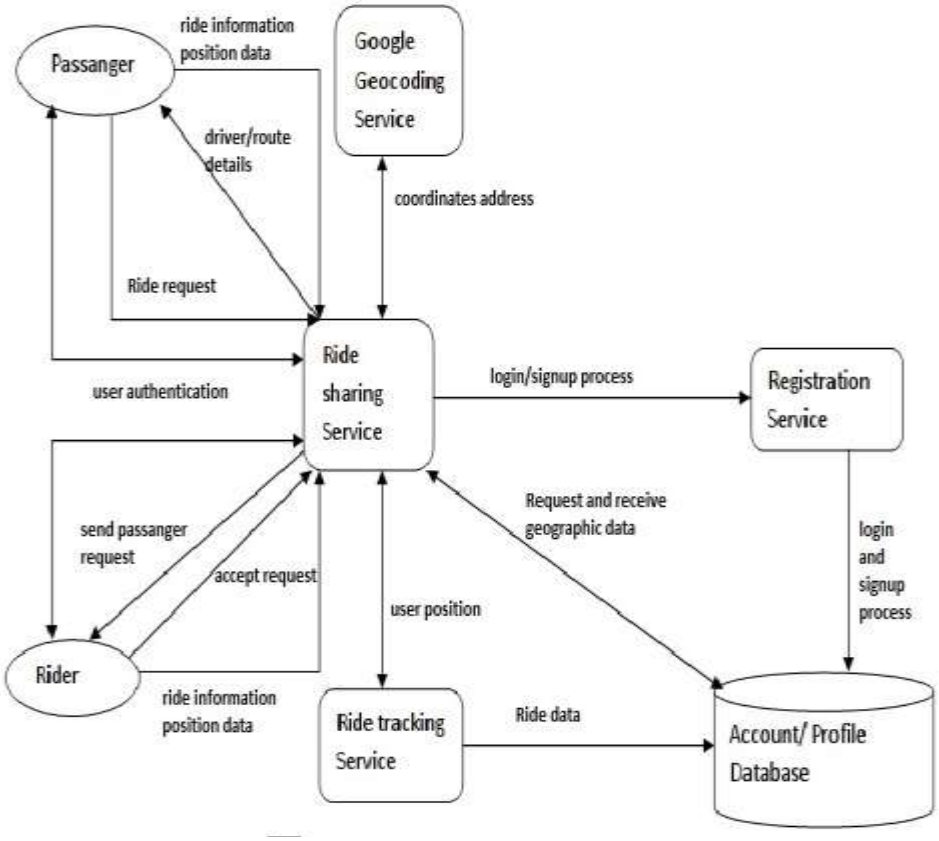

Figure 1: Architecture diagram of Ridesharing.

Once the driver approves the request, driver and rider are enabled to communicate with each other through chat module. Once the ride starts, ride tracking service starts tracking the journey through the GPS coordinate data from the user's mobile device. The account profile database stores the coordinate data temporarily to provide assistance in the emergency situation. Once the journey gets finished, rider rates the journey commenced so as to further process the rated service and stores them along with profile data in database of the driver's accounts profile.

IX. DATA MODEL

Proposed System: The above figure: Sequence Diagram describes the role of the following components in this project.

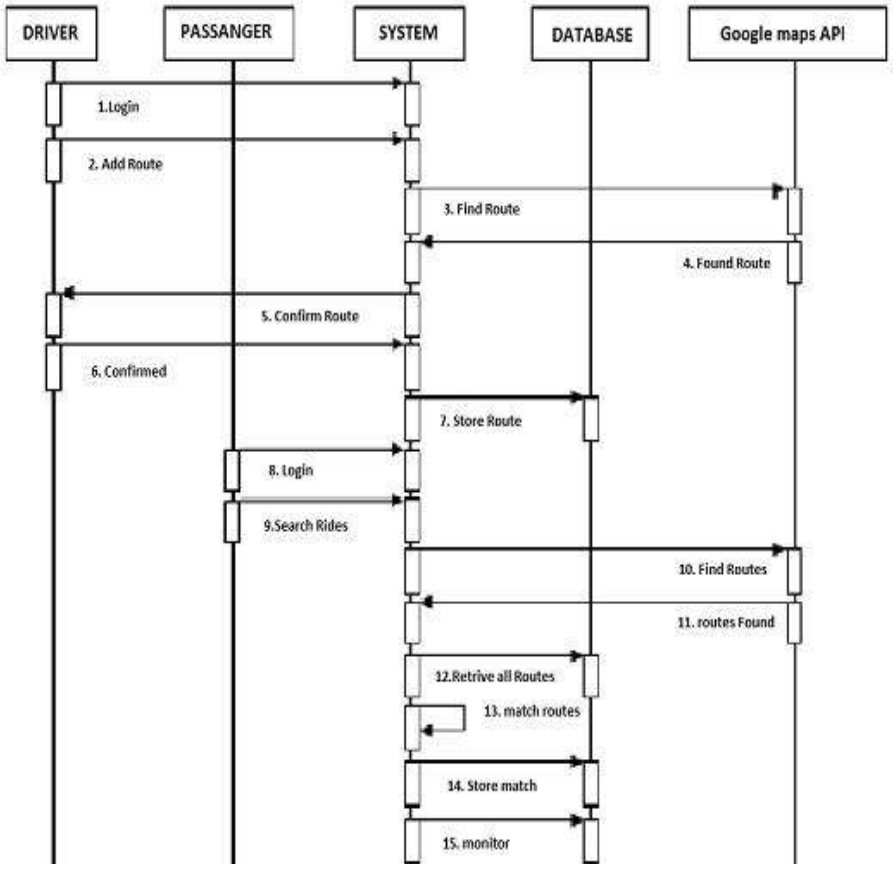

Figure 2: Sequence Diagram of How the ridesharing concept will work?

Driver: The various roles of the rider are:
1. Uploading the next commencing journey with details of source and destination.
2. Disclose it's own identity.
3. Accept Passenger request to join his/her ride.

System: The various roles of the system are:
1. Providing options for uploading rides and sending request for joining.
2. Interaction with users(riders/Passengers)
3. Provide interface for real time messaging.

Passenger: The various roles of the Passenger are:
1. Disclose it's identity.
2. Check for riders with same route and send request to them.
3. Join other user's ride willingly.
4. Provide confirmation to the accepted request

The above figure 2,describes the flow of the system that how the process of sharing ride with unacquainted person will undergo. Here the role of the user is both either user can be rider or can be a passenger depending on the purpose of the user. Here in this, How the process of route matching algorithm works is described.

IX. CONCLUSION

This paper describes the design and implementation of A Real-Time Ridesharing Android application over Android system based on Linux. As it is an Open source operating system used worldwide (90.12% people use android phones around the world). This application is highly useful for in areas where it is densely populated and where there is no convenient mode of transportation and it is also by reducing emissions of poisonous gases and traffic congestion in densely populated cities such as Mumbai and Delhi. Developing an android platform for ride-sharing will be of more portable and ease of use. We demonstrated how the working of an application will take place in Android API's and will form a connectivity between the android application and the web service of ridesharing platform.

We also demonstrate how to add rides and send joining request for it.

Carpooling system is very effective mean to reduce pollution and the vehicles congestion in cities. It also provides an eco- friendly mode to travel. It also provides an opportunity to meet unknown person. As mostly people prefer private vehicle to travel other than public transportation due to delay caused by them. As private vehicles provides journey in a luxurious manner. Pre-registration makes sure that only pre registered user gets into the vehicle who wants to join ride so that trust can be established.

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