Car Pool’up – Real-time Carpooling using GPS

B. Akshay, G. Asmita, J. Kshetrapal and W. Archana

Abstract--- Real-time ridesharing is promoted as a way to better utilize the empty seats in most passenger cars, thus lowering fuel usage and transport costs. It can serve areas not covered by a public transit system and act as a transit feeder service. It is also capable of serving one-time trips, not only recurrent commute trips. Furthermore, it can serve to limit the volume of car traffic, thereby reducing congestion and mitigating traffic’s environmental impact.

Real-time Carpooling is a service that arranges one-time shared rides on very short notice. This type of carpooling generally makes use of three recent technological advances:

- GPS navigation devices to determine a driver's route and arrange the shared ride
- Smartphones for a traveler to request a ride from wherever they happen to be
- Social networks to establish trust and accountability between drivers and passengers

Pool’up—Carpooling using GPS is a real-time mobile based application that mainly aims at facilitating car pooling amongst travelers. It allows users to book their journey with a person travelling on the same route beforehand. It allows users to locate their travel partners on the map displayed on their mobile screen and accordingly make changes in their itinerary. It also enables users caught up at a deserted place to find another user traveling on the same route and request them to provide a lift.

It is an android application that runs on a GPS enabled mobile phone. It interacts with a central server and provides processed information to the users. Pool’up being a mobile application provides portability and requires low maintenance. It reduces cost of travel, traffic on the road, pollution and ultimately global warming. This application will successfully overcome the drawbacks of previous application which can be accessed only by the driver and not the passenger which resulted in inflexibility and also is less expensive and anyone can afford it on their Smartphone and is quite more user-friendly.

Benefits of Pool’up

- Easy to use: The only job of the user is to fill in some information about the source and destination of his journey and he will receive the relevant data.
- Portable: As it is a mobile Application, portability is one of the most noticeable benefit of Pool’up. Mobiles are handy and can be carried anywhere easily.
- Real time: This application provides real time data about the users interested in carpooling and their location.
- Flexibility: This application notifies users in case a participant in running late. It enables users to continue their work in case their fellow user is not able to reach on time.
- Low cost: As it runs on mobile, it requires low cost and maintenance. All that is maintenance required is a cell phone with GPRS connection.
- Free to use: The only job of the user is to fill in some information about the source and destination of his journey and he will receive the relevant data.

I. Introduction

With the advances in Mobile technology, mobiles are proving to be the next generation computers. Developers are trying to explore the potential of mobile technology to its fullest.

Pool’up is an application that adds on to the pool of already existing, useful software’s. Pool’up runs on a mobile and using GPS technology enables car pooling in a more efficient and flexible manner.

A. Car Pooling

Carpooling is a concept in which people who travel to the same destination can share their vehicle with others which reduces the fuel cost, reduces the traffic on the road and ultimately reduces pollution and global warming. With the ever-increasing population worldwide, it is necessary to carpool to preserve the world for our descendants.

B. Need for a Mobile Application

There are many websites for carpooling but these websites fail during the actual working. Carpooling websites are not flexible and does not give an assurance during the payment matters. The Carpooling application for apple phone was also not that much flexible because of driver can keep tracking the passenger and the passenger does not know the status of driver and also there were issues related to security. The apple application “Carticipate” is not flexible in countries like India, where people have operating system like android, symbian. So we developed an application on android as it is more user-friendly and easily available.

C. Benefits of Pool’up

All these limitations posed by available technology call for a mobile application like Pool’up.

- Portable: As it is a mobile Application, portability is one of the most noticeable benefit of Pool’up. Mobiles are handy and can be carried anywhere easily.
- Real time: This application provides real time data about the users interested in carpooling and their location.
- Flexibility: This application notifies users in case a participant in running late. It enables users to continue their work in case their fellow user is not able to reach on time.
- Low cost: As it runs on mobile, it requires low cost and maintenance. All that is maintenance required is a cell phone with GPRS connection.
- Easy to use: The only job of the user is to fill in some information about the source and destination of his journey and he will receive the relevant data.

Keywords— Carpooling, Android, Google Maps, Real-Time Tracking, Rating, Comment
transferred to his cell phone in an understandable manner.

D. Limitations of Previous Systems

The Carticipate carpool application is not susceptible because it was not able to fulfill the requirement which are listed below:

- User/Passenger cannot track the driver.
- Cannot be used on other operating systems.
- More Expensive.
- Security issues.

Carticipate tends to struggle from lack of users. Only 10.8% of all commuters carpool due reasons such as finding people willing to carpool with them. There are different websites which help in carpooling but fails at some level while dealing with issues like payment, security and real-time tracking.

II. Proposed System

Pool’up is a android based mobile application that works on all android enabled phones. As it is a mobile application it is easily portable and requires low maintenance. It mainly consists of multiple clients and single server. The client and server interact via internet. Users needs to first register and create an account during which he needs provide certain mandatory information about photo identity such as driving license etc. for security purposes.

The method comprises the steps of opening up a carpool schedule web page from a carpool application, submitting a carpool schedule change, updating the carpool schedule web page, sending an email notification to the group of carpoolers, pushing a notification to the group of carpoolers, pushing a notification to a plurality of mobile devices owned by the group of carpoolers.

The system comprises a plurality of mobile devices for loading a carpool schedule web page corresponding to a carpool group from a carpool application and submitting a carpool schedule change, carpool schedule server for storing and providing carpool data related to one or more group of carpoolers, receiving the submitted carpool schedule change and sending an email notification and pushing a notification with respect to the submitted carpool schedule carpool schedule change.

To overcome the drawbacks of previous system or applications, we proposed a application for android users. In our system we are mainly dealing with security issues which resulted in failure of previous systems. To deal with security issues we are using a comment and rating system. The passenger and driver are given a provision to rate and comment each other. This details will be helpful for people who are travelling with same passenger and driver. Our system will contain a driver, passenger module, modules for comment and rating and for google maps.

The system will be communicating with xampp server which is having Mysql and php as cross platform. The system will work in a two-way communication between driver and passenger and thus creating a flexible environment. The details which are given by passenger will be displayed on drivers phone and vice-versa. The passengers can booked the seats by reviewing the history and then taking final decision of whether to carpool or not.

The reason behind choosing Android is it is more popular among users and is less expensive. The applications can be easily downloaded from the Google Play and can be used whenever want. Inspired by the use of android applications in different sectors, we tried to develop an application which will help in conserving environment and also in reducing traffic congestion problems. The main aim or goal of our system is to provide a application which will help in serving the customer requirements and also because of following points listed below:

- Enhanced security for women passenger.
- High reliability due to real-time tracking.
- Enhanced payment features.
- Reviewing the history.
- Both driver and passenger can stay in touch with each-other.

III. DESIGN

3.1 The Carpool Android System

A. System Architecture

The System architecture shown in fig.1 show how the system actually works interacts. The main modules are the passenger and driver. The application will be installed on both the devices and they will interact with each other.

![System Architecture with Internet Access](image)

The Carpool application will contain the most important things and they are listed below:-

- The application will be deployed on the driver and passenger android phone.
- The database which will allot id to the driver and passenger.
- The central database which will manage other database and control the activities.
- The ratings and comments history will be displayed on mobile phones.
Thus the above fig 2 shows the actual working of the application. The database plays an important role as it is automatically updated and process all activities.

**B. System Design**

In this we are giving a detailed description of how exactly the user and passengers will interact and also some use-case diagram and also class diagram. The passenger or the driver has to register themselves if they are using the application for the first time. If they are already registered they have to login using their phone number and password. After login, they have to select whether they are driver or user. If he/she is a driver then the details of carpool will be filled and it will be stored in database. If he/she is a passenger then the details will be displayed on their respective phones. The passenger will fill the details and seats will be booked. After successful carpool, the driver as well as passenger will rate and comment and this will be stored in database. The google maps will be displayed for the source and destination given by driver.

**Fig. 3.a: Start of Journey Situation**

The sequence of steps in proposed system is as follows:-

1) Users can register themselves through website.
2) Once registered a user can login through their mobile and perform various functions like:-
   - Get nearest car location.
   - Schedule Drive i.e. user will book his drive.
   - Check car schedule i.e. user can check schedule of the booked car.
   - User can track the car location on the Google map.
   - User can post his/her offer/s so desired carpoolers can have look on it.
   - User can check the profiles of person who are carpooling with him/her for security purpose.
   - User can check for fares for particular destination.

   The mobile application will perform the functions mentioned above using the car pooling server and Google map.
3) After the ride each and every user will rate the passenger and drivers for future reference and for security reasons.

**IV. REQUIREMENTS**

**A. Server Hardware**

1) Computer with minimum configuration of processor 1.33 GHz, 512mb RAM, 80 GB hard disk.
2) Internet Connection for server.

**B. Server Software**

1) Eclipse IDE(3.4) tool
2) Microsoft SQL Server
3) Xampp server which is having Mysql and php as cross platform.

**C. Client Hardware**

1) Android enabled mobile phone with GPS.

**D. Client Software**

1) Android sdk 1.2 or above.
2) Google Maps.

**V. CONCLUSION**

In this paper, we presented a solution to an ever-rising traffic problems which will prove a boon to next generation driving way. We always strive to bring new change in society, which will change the life of people so Carpooling will help in bringing an emergent change and also help in providing beneficial features to society, individual and last but not least environment.

**REFERENCES**