

Car Pooling Using Android Operating System-A Step towards Green Environment

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Abstract:- Carpooling is one of the latest technologies discovered which has made travelling convenient and efficient to the common man. It also known as car-sharing in which one can travel to their destination while sharing the vehicle and the expenses. Hence fuel costs, tolls and the stress of driving will be reduced when more people travel together in one vehicle. Carpooling is also an environment friendly app and we can save our mother nature by using this app. It also helps in reducing traffic congestion, and other poisonous gases in the air. We can save a lot of space in the Parking lot. We will make an Android based application that will allow passengers to collaborate with other like-minded people and plan out their journey using the easy UI of the app after signing in to it. People will be able to share expenses and not worry about reaching late while making new connections.

Keywords – carpooling, pooling, vehicle pooling

1. INTRODUCTION

Transportation is a major issue these days. One of the most used means of communication in roadways. One of the major forms of road transport consists of the private passenger car. These cars are generally used with only a single rider. Due to increasing number of vehicles, problems of fuel combustion, pollution are increasing at an alarming rate. This will result in extinction of natural resources like petrol, diesel and also harming the environment by releasing the contents of carbon dioxide, and other harmful gases in surrounding. To overcome or to find a accurate solution a concept of carpooling comes into picture. A carpool is a system in which several people share rides to work, school or other destinations. This system helps save money by dividing fuel costs among several individuals, instead of each person bearing the cost of his own fuel. It also reduces environmental pollution by limiting fuel consumption and reducing the number of vehicles on the road and subsequent emissions. Carpooling is an easy and effective way to reduce your environmental impact and save cash. By finding a co-worker or neighbor to share the drive with, you will also be reducing traffic congestion for yourself and others. The

main objective of this paper is to experience developing an android mobile application which is one of the booming trends in computing industry. The carpooling application is intended to people travelling, to make it a cheaper affair. The application will allow the user to select his/her role i.e. driver or passenger. This will lead to the user to login to the app. The passenger and the driver will enter his location, destination and time of travel. The passenger gets information about the drivers who travel along the same route. The passenger can confirm a particular driver and a message will be sent to the driver who also confirms the passenger and accordingly the seats will reduce.

2. RELATED WORK

2.1 Need for Carpooling 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 do 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.

2.2 Limitations of Previous Systems

The Carticipate carpool application is not susceptible because it was not able to fulfill the requirements 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.

2.3 Proposed solution to Carpool using Android

To overcome the drawbacks of previous system or applications, we proposed an 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. These details will be helpful for people who are travelling with same passenger and driver. 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 driver's phone and vice-versa. The passengers can book 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. 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 an application which will help in serving the customer requirements and also because of following points listed below.

- High reliability due to real-time tracking.
- Enhanced payment features.
- Reviewing the history.
- It helps in reducing traffic congestion as number of vehicles on the road can be reduced significantly.

3. THE CARPOOL ANDROID SYSTEM

3.1 System Architecture

The System architecture shown in Figure 1 show how the system actually works on 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.

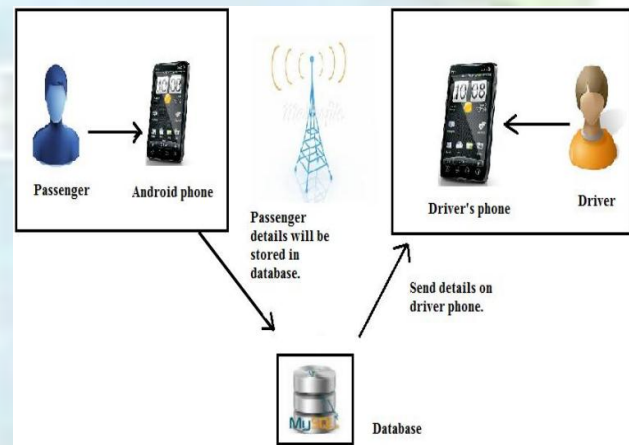


Figure 1: System Architecture with internet access.

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.

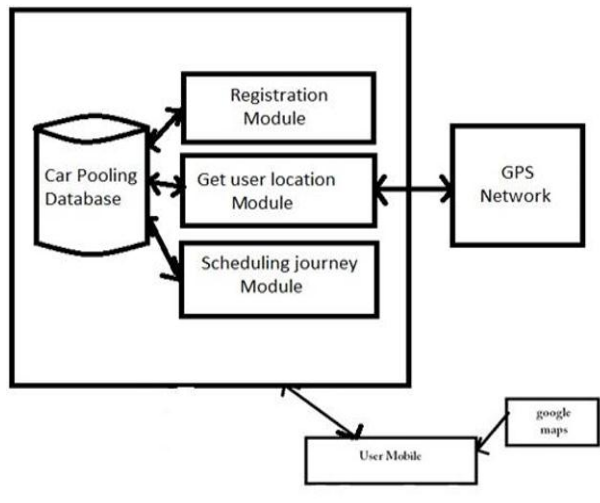


Figure 2: Actual Working of Application

Thus the above Figure 2 shows the actual working of the application. The database plays an important role as it is automatically updated and processes all activities.

3.2 System Design

We are giving a detailed description of how exactly the user and passengers will interact and also some usecases diagram and also class diagram. The passenger or the driver has to register themselves if they are using the application for 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.

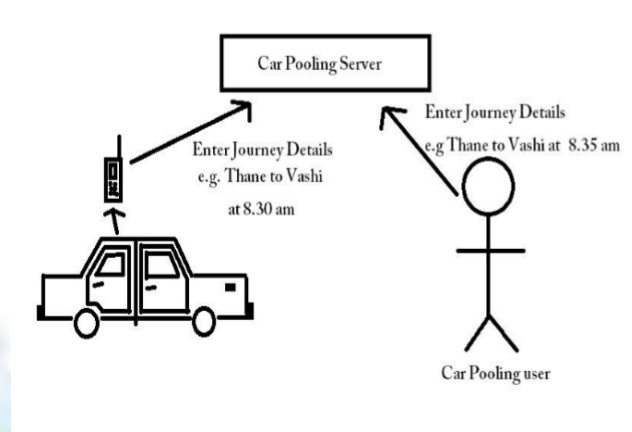


Figure 3: Start of Journey Situation

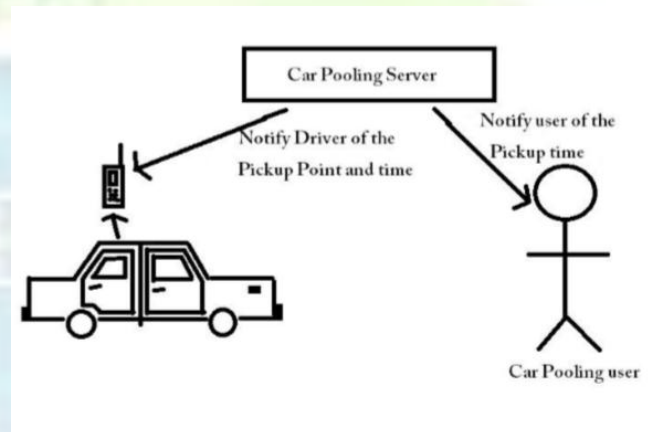


Figure 4: Once the request is accepted

4. WORKFLOW OF SYSTEM

4.1 Sequence Diagram

Initially user is made to fill all mandatory fields filled in registration form. Once the user clicks submit, the username is verified. If the username is already present, then the user is again taken back, so that he can change the username. If the username is not present then it checks for password and remaining mandatory fields. If any of the mandatory field is left empty or filled incorrect, then the user is informed to enter the correct values. Once all these verifications are succeeded, then the registration is done. User Login to the system by entering username & password, the submit it, verify it & then grant access.

After the corporate employee successfully logs into the system, once registered a user can login through their mobile and perform various functions like.

- Schedule Drive i.e. user will book his drive.
- Check car schedule i.e. user can check schedule of the booked car.
- User can post his/her offer/s so desired car poolers can have look on it.
- User can check the profiles of person who are carpooling with him/her for security purpose.
- After the ride users will rate the passenger/drivers for future reference and for security.

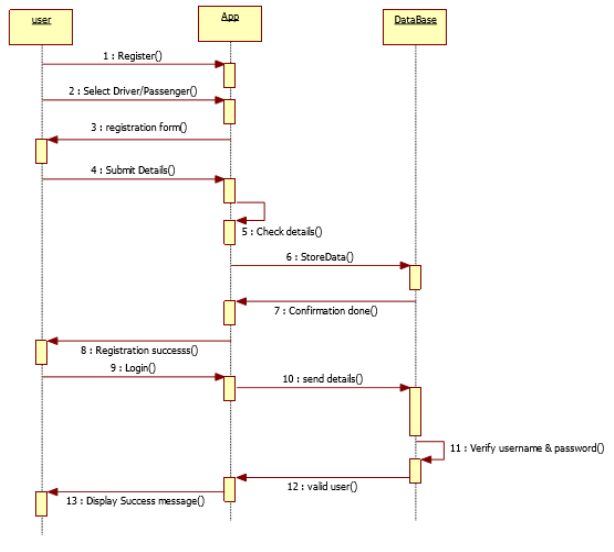


Figure 5: Sequence Diagram for Passenger and Driver Login

5. CONCLUSION

Carpooling system is very effective means to reduce pollution and the congestion of vehicles in cities. It also provides an eco-friendly way to travel. It also provides an opportunity to meet new people. As today most people prefer private vehicle to travel due to delay caused in public transport system and luxuries provided by private vehicles. Pre-registration ensures that only identified people get into the vehicle so that trust can be established. The people registered are allotted specific days on which they should take their private vehicle, so that no inconvenience is caused to its registered passengers for daily commute. Thus the proposed carpooling system will be effective in reducing environment pollution.

6. FUTURE SCOPE

- Bike can also be used in future for pooling.
- Pooling system can be for transportation goods in sharing manner (Truck Pooling).

- At the moment, the routes are decided by the driver according how he thinks best. But the path obtained from this may not always be the shortest path. Thus we could have algorithms like the Dijkstra's algorithm or Algorithmic concepts like Dynamic Programming to calculate the shortest path between source, destination and all the recipients. Thus, optimization on this front can be obtained.

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REFERENCES

- [1]. Dr Scott Le Vine, Dr Alireza Zolfaghari, Professor John Polak, "Carsharing: Evolution, Challenges and Opportunities", 22th ACEA SEP-2014.
- [2]. Yu-Tso Chen and Chen-Heng Hsu, "Improve the Carpooling Applications with Using a Social Community Based Travel Cost Reduction Mechanism" International Journal of Social Science and Humanity, Vol. 3, No. 2, March 2013.
- [3]. Luk Knapena,, Daniel Kerenb, Ansar-Ul-Haque Yasara, Sungjin Choa, Tom Bellemansa, Davy Janssens, Geert Wetsa, "Estimating scalability issues while finding an optimal assignment for carpooling", The 4th International Conference on Ambient Systems, Networks and Technologies.
- [4]. Prathibha Joy "What's stopping people in Bengaluru from carpooling?", in The Times of India, 11 November 2014.
- [5]. Shrishti Garg "Carpools: Driving into greener pastures Carpooling not only helps save fuel

but also contributes to the environment”, in
The Business Standard, June 3, 2014.

- [6]. Sweta, Sushmitha Reddy I, Maddipatla Mounika, Priyanka Agrawal, Pallavi G. B, “A Survey to Justify the Need for Carpooling”, International Journal of Soft Computing and Engineering ISSN: 2231-2307, Volume-5 Issue-2, May 2015.

- [7]. “Just too many vehicles in Bengaluru”, in The Hindu, October 30, 2015.

