

Real Time Pollution Monitoring with Vehicle Traffic Management in Pollution Control

Bodake Pratibha A.

Department of computer Engineering
Sir Visvesvaraya Institute of Technology
Nashik, India

Sadgir Rachana B.

Department of computer Engineering
Sir Visvesvaraya Institute of Technology
Nashik, India

Shelke Akanksha S.

Department of computer Engineering
Sir Visvesvaraya Institute of Technology
Nashik, India

Lakariya Pooja S.

Department of computer Engineering
Sir Visvesvaraya Institute of Technology
Nashik, India

Abstract: *Carpooling commonly called as car-sharing or ride-sharing. Using carpooling concept people can share cars that are travelling to same destination. Carpooling and Ride sharing applications depend normally on an architecture that includes two multimedia user mobile devices and a server that collects the rides available and the ride requests. The Carpool is an android application which will provide the best way to share rides by creating and browsing or searching rides by using this application. With the help of this application number of vehicles on road will be reduced. Thus this application will help to reduce the problems of traffic jams. Fuel combustion also will be reduced. Application also helps to control the pollution and maintains green environment. Carpooling has become a practical, cheap and stress-free way to move around. This project presents the requirement, design and implementation of an enterprise-class application for carpooling following a Model-View-Control model. The added features, compared to available applications, are different kinds of trips, a check-in system and social media integration. The two kinds of trips are single trips, which are trip between two cities, and frequent trips which are the ones that commuters do every day. The check-in system enables users to check in meetings points and notify all users about that. Users can also share their activities on the application thanks to social media integration. The application is designed to be scalable, extensible, highly available and with a good performance.*

Keywords: *ZIGBEE, PUC, MY SQL, SIAM and vehicle pollution monitoring*

I. INTRODUCTION

With the increase of environmental concerns and the bottleneck of roads, carpooling has gained a lot of popularity when it comes to environment-friendly and cheap ways of travelling. Carpooling is when two or more persons share a ride in one of their personal cars. Carpooling reduces pollution since we have less cars on the road. It's also economic since the travel expenses are shared among the riders. Travelling alone may be stressful, so having other persons with you on a trip minimize the stress and is also the occasion to socialize and make the trip funnier. Finding people to share a ride with is the challenge of carpooling as it is difficult to find a person going to the same place as you at a given time. The purpose of this project is to develop an application that tries to overcome the demerits of the other available applications. The application is to be generic, which means that it may work for any carpooler in any country in the world. Also, it is socially enabled by its integration to Facebook and possibly to other social media. KwiGo, which is the name chosen for this application, is also a real-time application: any person taking part of a trip can check-in the meeting point to let the other persons now he/she has arrived to the meeting point. The main objective of the work presented throughout this report is to develop an enterprise-class server that represents the backbone of the application and ensure its compatibility with multiple platforms including web, Android and iOS. Moreover, an example of a client Android application is developed for the users to access the services of the application from handheld devices and serve as a companion during travelling. Transportation is a bigger issue in our world today. Carpooling is a solution to the problems of traffic jams, pollution, and extra use of fuel. Our application is an attempt to create a system which is user friendly and provides an opportunity to share cars. The service will allow users to offer and request ride sharing journeys using their Android enabled phones[10]. The main problem in

carpooling is how to find out who travels to the same destination as yours every day or who is interested in carpooling. Carpooling allows a large number of passengers and drivers to be matched with each other automatically and instantly wishing to travel same destination. Using this developed android application car owner can create a ride by giving information like source, destination, starting time of journey, available seats etc. And ride seeker will be able to search and browse the rides by providing inputs like source, destination, and time. The dynamic Carpooling system relies on the information from two users i.e. ride creator or car owner and ride seeker.

II. LITERATURE SURVEY

One of the major forms of road transport consists of the personal passenger car. These cars are generally used with only a single rider. An over abundance of cars creates various problems which include increased traffic, increase pollution, parking congestion and many more. Car sharing aims at solving this problem by targeting the empty seats in the private cars. Employees of the same area or the students going to the same school can carpool. This can be done as the know each other and can communicate. But when going on an intercity trip you are not aware if some other person also intends to make the same journey. Thus the applications helps you in seeing people and journey schedules and make an informed decision about do you wish to travel alone or save money and travel with a safe company[11] As real-time ridesharing projects have been successfully initiated, the potential benefits of ridesharing are expected to be substantial in reducing fuel consumption, carbon emissions, and traffic congestion. For customers, ride sharing can also reduce travel costs for driving and parking. In 2013 Yan Huang, Ruoming Jin [8] had introduced the problem of large scale real-time ridesharing with service guarantee on road networks. Where in, servers and trip requests were dynamically matched while waiting time and service time constraints of trips are satisfied. They have proposed two basic algorithms: a branch-and-bound algorithm and an integer programming algorithm. India being the second populous country in the world, having population about 1.1 billion with an overall density of 336 people per square kilometer. Indian public transport supports various mode of transport such as transport by land, water, air. More than 30% of Indian population is car owners. Traffic is mainly high during rush hours within the cities. In order to reduce traffic congestion, a real time ridesharing is proposed. Real-time ride sharing is an extension of carpooling to best suite one's preferences using the data collected from social networking.

III. RELATED WORK

In recent years, the problems of global warming and the energy crisis have aroused widespread public concern. One recommended solution for reducing the harmful factors leading to such problems is cab pooling. Our application is an attempt to make a system which is user friendly and provides an opportunity to share cars. We intent on making an application which would be help the users to upload, view and register for journeys both small distance. While building this application we found problems in current scenario as follows: 1. Increase traffic 2. Increase pollution 3. Increase in fuel price So. They proposed a system known as social community based car pooling (SCC) model which use result of CRS analysis model. With this model traveling cost will be reduced. In this paper Carpool is android application that provides advanced searching techniques. This will help user to minimize the cost involved in repetitive distance traveling by sharing car and cost required for traveling. After analysis based on collected data result found that carpooling can save approximately 40% of total fuel cost needed to travel. This application will successfully overcome the weakness of old application which can be accessed only by the driver and not the passenger which result in inflexibility and also is less expensive and anyone can afford it on their Smartphone.

IV. PROPOSED SYSTEM

The users will have our build carpooling android application installed in their android smart phones. The carpool process will be started by registering the users. Then users will be able to generate and share rides. These ride generation and ride browsing processes involves following tasks.

A. Creating Ride

Step 1: Car owner will enter the source, destination, starting time and available seats as input to the android application.

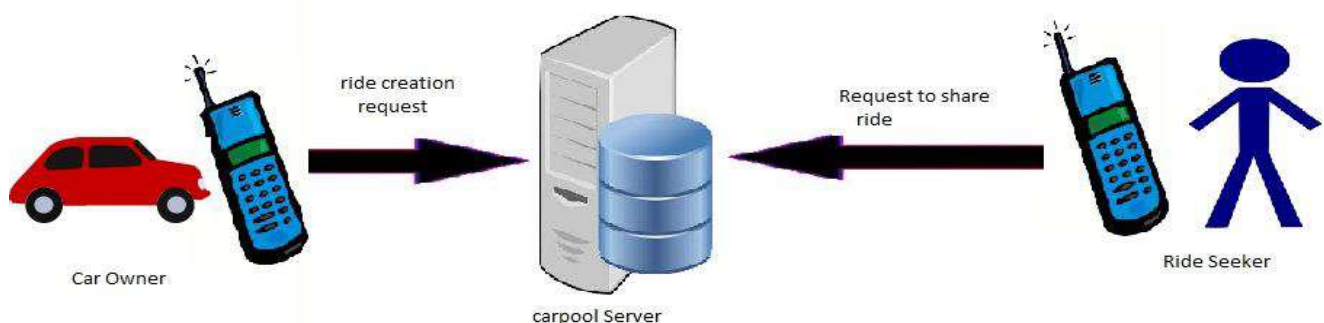


Fig. Initial carpool initiation

Fig. 1 Initial Carpool situation

Step 2: This ride generation request will be transferred to the carpool server.

Step 3: Now server will check for existence of route between entered source and destination and will validate the other input information.

Step 4: Now ride is created and ride seeker have ability to search and browse this ride.

B. Browsing ride

Step 1: Ride seeker will enter the source, destination, starting time as input to the android application to search and browse for rides.

Step 2: This ride browse information will be transferred to carpool server.

Step 3: Now server will validate all inputs specified by the user.

Step 4: After validation the server will show available rides to the ride seeker. Ride seeker can send a request to anyone of these ride creators.

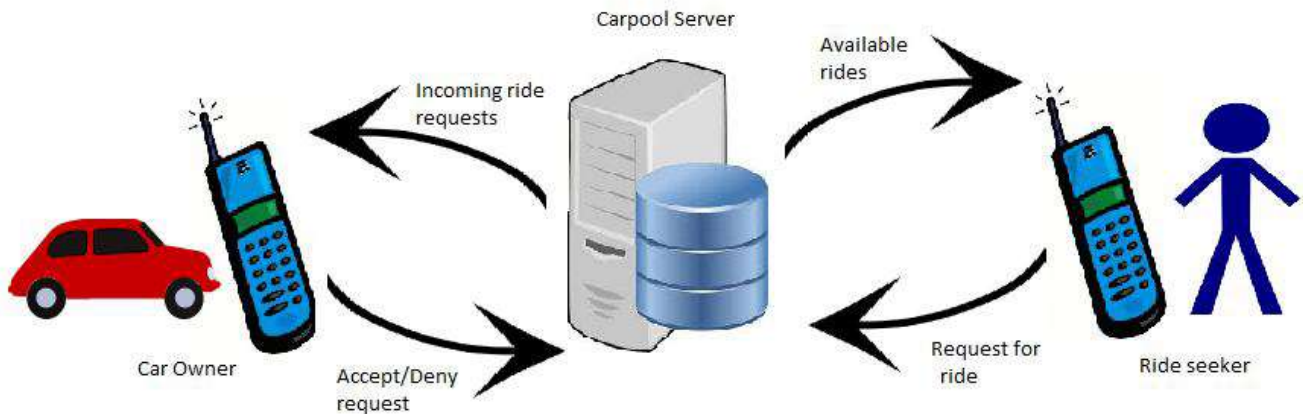


Fig: Carpool requests

Fig. 2 Carpool process overview

V. MATHEMATICAL MODEL

The functionality of the system is represented using following 5-tuple format of Finite State Machine.

$(\Sigma, S, s_0, \delta, F)$

- Σ is the set of input alphabets (a finite, non-empty set of symbols).
- S is a finite, non-empty set of states.
- s_0 is an initial state, an element of S .
- δ is the state-transition function.
- F is the set of final states, is a subset of S .
- $\Sigma =$ username, password, login-ID, source, destination, available seats.

INPUTS AND EXPECTED OUTPUT

Table I Inputs And Expected Outputs

On Page	Input	Expected Output
Login page	<ul style="list-style-type: none"> User ID Password 	Redirect to main page
Ride Creation page	<ul style="list-style-type: none"> Source Destination Start Time Available Seats 	Ride should be validated and created by carpool server
Browse Ride Page	<ul style="list-style-type: none"> Source Destination Start time 	Carpool server should show the corresponding rides on same route to ride seeker
Notification Page	<ul style="list-style-type: none"> Accept or deny ride 	Corresponding ride seeker should be notified with the result through server

CONCLUSION AND FUTURE WORK

This paper Explain 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 all over world (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 jam in densely populated cities such as Mumbai and Delhi. building an android platform for ride-sharing will be of more portable and ease of use. We descibded 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 describe how to add rides and send joining request for it. Carpooling system is very effective mean to minimize 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. Preregistration makes sure that only pre registered user gets into the vehicle who wants to join ride so that trust can be established.

REFERENCES

- [1] Yu-Tso Chen and Chen-Heng Hsu, "Improve the Carpooling Applications with Using a Social Community Based Travel Cost Reducti Mechanism", *International Journal of Social Science and Humanity*, Vol. 3, No. 2, March 2013.
- [2] Kum Kum Dewan and Israr Ahmad, "Carpooling: A Step To Reduce Congestion (A Case Study of Delhi)", *Engineering Letters*, 14:1, EL_14_1_12 (Advance online publication: 12 February 2007).
- [3] 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 (IJSCE)* May 2015.
- [4] Deepak B. Nagare, Kishor L. More, Nitin S. Tanwar, S.S.Kulkarni, Kalyan C. Gunda, "Dynamic Carpooling Application Development on Android Platform", *International Journal of Innovative Technology and Exploring Engineering (IJITEE)* February 2013.
- [5] Swati.R.Tare, Neha B.Khalate, Ajita A.Mahapadi, "Review Paper On CarPooling Using Android Operating System-A Step Towards Green Environment", *International Journal of Advanced Research in Computer Science and Software Engineering* April 2013
- [6] Arpita Dixit, Shweta Bora, SonaliChemate, Nikita Kolpekwar "Real-Time Carpooling System for Android Platform
- [7] Jaeyoung Jung* Assistant Research Scientist, Ph. D. Institute of Transportation Studies University of California, Irvine Email: jaeyoungj@uci.edu ,R. Jayakrishnan Professor Institute of Transportation Studies Department of Civil and Environmental Engineering University of California, Email: rjayakri@uci.edu ,Ji Young Park Associate Research Fellow, Ph. D.Office for convergence Technology The Korea Transport Institute 315, South Korea Email: parkjy@koti.re.kr " Design and Modeling of Real-time Shared-Taxi Dispatch Algorithms ." Submission data: August 1, 2012
- [8] Yan Huang ,Ruoming Jin,FavyenBastani , Xiaoyang Sean Wang Computer Science and Engineering, University of North Texas lhuangyan@unt.edu Computer Science, Kent State University 2jin@cs.kent.edu , Massachusetts Institute of Technology 3fbastani@mit.edu ,Computer Science, Fudan University 4xywangCS@fudan.edu.cn "Large Scale Real-time Ridesharing with Service Guarantee on Road Networks" arXiv:1302.6666v1 [cs.DS] 27 Feb 2013
- [9] "Real time carpooling system", N.V.Pukhovskiv, R.E.Lepshokov, Ostfold University College.
- [10] Miguel A. Vargas, Jose I. Walteros, Andres L.Medaglia, 'Car Pooling Optimization: A case Study in Strasbourg(France)', Proceedings of the 2008 IEEE Systems and Information Engineering Design Symposium, University of Virginia, Charlottesville, VA, USA, April 25,2008.
- [11] "Implementation of GPS Enabled Carpooling System", Smita Rukhande, Prachi G, Archana S, Dipa D, Dept. Of Information Tech., Mumbai University, Navi Mumbai City, Maharashtra, India , *International Journal of Advances in Engineering & Technology*, Nov 2011.