



National Conference on Advances in Engineering and Applied Science (NCAEAS)

29th January 2018

Organized by : Anjuman College of Engineering and Technology (ACET) Nagpur,

Maharashtra, India, In association with

International Journal of Scientific Research in Science and Technology



“Real Time Taxi Ridesharing”

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ABSTRACT

The Project is designed to create a Real-time taxi ride Sharing Application. It works by accepting a real-time ride requests from the passengers sent through smartphones and schedules proper taxis to pick them up via ridesharing. The monetary constraints of the application are to provide benefits for both passengers and taxi drivers, passengers pay less amount compared with no ridesharing and get compensated if their travel time is lengthened due to ridesharing, taxi drivers will make money for all the detour distance due to ridesharing. The application is also significant to social and environment benefit, e.g., saving energy consumption and satisfying people's commute, plays important role in reducing traffic ratio. Fare isn't that costly.

Keywords: Taxi-sharing, real-time taxi-sharing, ride sharing.

I. INTRODUCTION

Taxi play a very significant role in daily basis. Taxi plays important role in transportation between public and private sectors, delivering thousands and millions of people to different locations in urban areas. However, many people spend a long time on roadsides due to much higher demands of taxi than the number of taxis in peak hours of major cities.

Increase in the amount of taxis for the people appears to be a clear solution. But it carries some non-good effects, e.g., bringing more traffic on the surface of the road thus, resulting more energy consumption, and it also cause reduce in taxi driver's income (considering the fact that demands of taxis would be lesser than number of taxis during off-peak hours). To deal with this issue, we propose a real time taxi-sharing application that receive taxi

passengers' real-time ride requests sent from smartphones and schedules proper taxis to pick up them via taxi-sharing with time, capacity, and monetary constraints (the monetary constraints guarantee that passengers pay less and drivers earn more compared with no taxi-sharing is used).

In this application, taxi drivers autonomously determine when to join and leave the service using an App installed on their smartphones. Using the same App, passengers submit their real-time ride requests. Each ride request consists of the origin and destination of the trip and based on the distance travelled by them the cost is computed. If the taxi is ridesharing then, the amount is distributed amongst the passengers.

II. OBJECTIVE AND SCOPE

- ✓ It provides real time taxi ride sharing at low cost or reasonable cost.
- ✓ Reducing the traffic ratio i.e. minimum
- ✓ Traffic on the road.
- ✓ Transportation facility will be available everywhere.
- ✓ Safety of Rider /person.

III. PROBLEM DEFINATION

Taxi is an important transportation mode between commercial and private transportation, delivering thousands of millions of passengers to different locations. However, the number of taxi is much less than its demand in peak hours of major cities, due to this many people stand at roadside waiting for the taxis. Multiple taxi statues can satisfy a ride request, but the goal is usually to find the optimal taxi.

A variety of functions have been used in the existing literature, where a cost function has been combined with multiple factors such as travel distance increment, travel time increment and passenger waiting time, is the most common.

IV. DYNAMIC TAXI RIDE SHARING

The problem with the earlier taxi ridesharing system was that people spend more time on road for taxi and their might be some chances of not getting a taxi for travelling. Increasing the taxi ratio seems an obvious solution but, it advances the road traffic, increase the energy consumption and create a non-good environment. Arrival of the taxi at peak time is also a taxi sharing system problem, to address these issues we have created a real-time taxi ride sharing application that accepts passengers real-

time ride requests sent from smartphones and schedules proper taxis to pick up them via taxi sharing with time, capacity, and monetary constraints. Though real-time taxi-sharing has been studied in several previous works, our work demonstrates three major advantages. First, our problem definition is more realistic by

considering three different types of constraints. Some existing works did not consider time window constraints and none of these previous works explicitly monetary constraints. Second, we analysed the computational cost of each component of the system, proposing a spatio-temporal index and a taxi searching algorithm, which significantly improve the system efficiency. Third, simulation results presented here is more convincing as we evaluated our system based on the real data and at a much larger scale than most previous works did.

V. SYSTEM ARCHITECTURE

The System consists of two participants - Driver and Rider. Both of them can access the ride sharing system through the ride sharing application installed in their mobile device. To participate in the ride sharing, both of them have to register for the first time using their mobile application. This registration and login process is affected by the registration service and the user account data is stored in the Accounts profile database. Apart from the login data, the accounts profile database also comprises of other details such as the user address, Phone no, number of seats and the car type in case of a driver.

The process begins with the rider registering his ride through the mobile application. The ride registration data comprising of source, destination address and start time of the ride. The rider after

login searches for the ride through his mobile application. The ride request is processed by the ride sharing service. The filtered search result is presented to the rider along with the driver details and cost. After the rider selects a driver, rider request is passed on to the driver's mobile application by the ride sharing service. After the driver's approval, driver send confirmation message on rider's mobile phone and rider are enabled to communicate through the ride sharing application. Once the ride starts, ride tracking service starts tracking the ride using the GPS data from the user's mobile device. This data is temporarily stored in the accounts profile database to provide assistance in case of an emergency.

After the completion of the travel, rider provides the rating and comment for the driver which is processed by the riding service and stored along with driver's profile data in the accounts profile database. The cost of the of rider is calculated based on the distance and cost propose by driver.

Figure 1 shows the flow graph of real-time taxi ride sharing at the rider's end. The rider or the passenger first has to registered to an application by using their smartphone only after that they are able to get the service of taxi sharing system. The rider should enable the GPS at the background for the reliable service. After enabling the GPS, the rider will choose the destination and scan taxi using smartphone.

The rider selects a taxi and the request is passed on to the driver's mobile application. After the driver's approval, driver send confirmation message on rider's mobile phone and rider are enabled to communicate through the ride sharing application. After the completion of the travel, the cost of the of rider is calculated based on the distance travel and cost propose by driver.

VI. DATA FLOW GRAPH

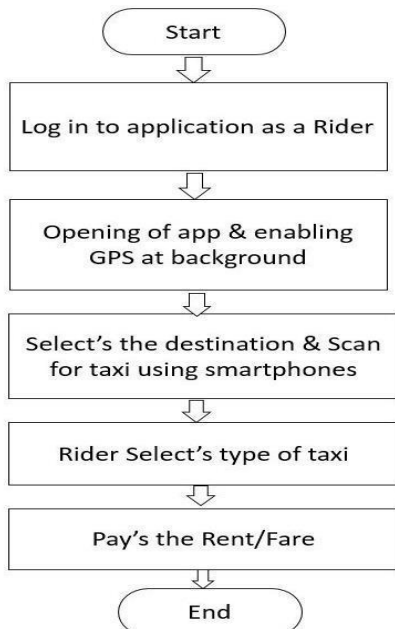


Figure 1. At rider's end

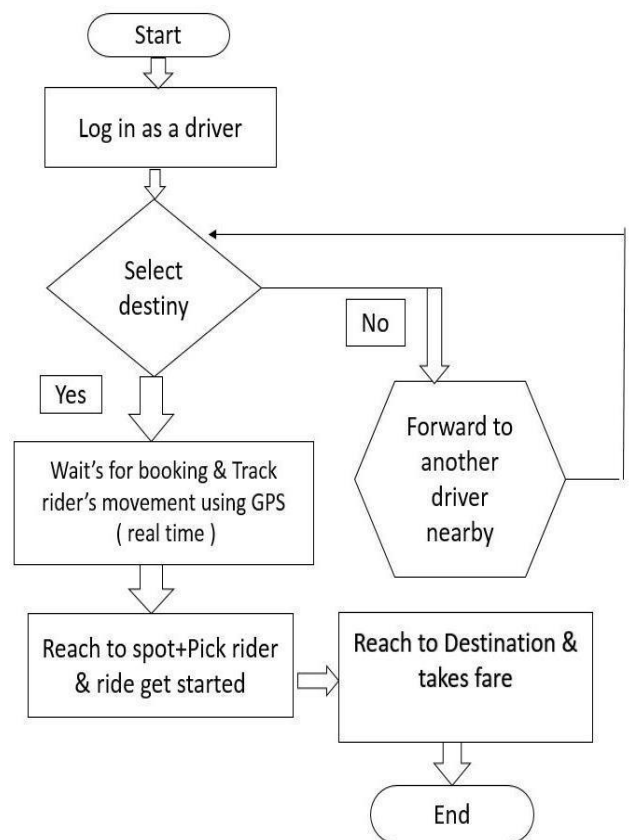


Figure 2. At Taxi driver's end

IX. REFERENCES

Figure 2 shows the flow graph at taxi drivers end. The taxi driver also has to register to an application by using smartphone installed in their mobile device. Once the rider has login and searches for the ride through his mobile application, the ride request is processed by the ride sharing service. If the taxi is available near-by to the rider, then the driver will accept the ride request. Otherwise the driver will forward the request to another taxi drivers. Cost is calculated based on the distance travelled by the rider.

VII. CONCLUSION

Real time taxi-ride sharing application is very effective way to minimize pollution and the congestion of vehicles in cities. Travelling can be done in eco-friendly way. It provides an opportunity to meet new people on daily basis. System saves the total travel distance of taxis when delivering passengers. Our system can enhance the capability of delivering passengers and can satisfy their needs. The system can also save the taxi fare for each individual rider while the profit of taxi drivers does not decrease compared with the case where no taxi sharing is conducted.

VIII. FUTURE WORK

In this system, the basic concept of taxi ride sharing through real-time request generation and its acceptance in future work involves refining the ridesharing model by introducing social constraints, such as gender preference, habits preference (e.g. some people may prefer co-passengers who do not smoke) and may also use social networking sites for real time request.

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