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RESEARCH ARTICLE

RECOMMENDATION SYSTEM TO INCREASE TAXI DRIVER'S BUSINESS.

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Manuscript Info	*Abstract*
  *Corresponding Author **Shaikh Nazneen N.**	There are many options available for travelling from place to place within town, city. These options are like Buses, Trains, Metro, Taxies, etc. One of the popular options is TAXI. Among all options, Taxi is more popular due to convenience. Though it is more popular, Taxi drivers are not getting that much money in this business. To earn more money they only accept long trips and this creates trouble for passengers. For long trips taxi drivers have to roam around city, while roaming most of the time they do not get passenger for long time and waste time and fuel. Due to this they do not earn more money. Here is solution for them, i.e. a recommendation system which helps them to find passenger easily and increasing their profit. This is mainly created for taxi drivers.

Introduction:-

Taxicab, also known as a taxi or a cab, is a type of vehicle for hire with a driver, used by a single passenger or small group of passengers, often for a non-shared ride. A taxicab conveys passengers between locations of their choice. This differs from other modes of public transport where the pick-up and drop-off locations are determined by the service provider, not by the passenger, although demand responsive transport and share taxis provide a hybrid bus/taxi mode[1]. A taxi is important transportation type in cities because its not like other public transportation systems. Passenger decides where to go by which rout. But sometimes taxi system also creates some issues like if a passenger is waiting for taxi since long time and one more passenger gets taxi immediately just because they walked few meters. Or sometimes what happen you are trying to catch taxi from your place and while walking towards road from your place you see some vacant taxies are going, you are very near still you can not catch those taxies and after that you have to wait for long time for next taxi. This is very much irritating for passengers. These are some situations where passengers are suffering but in some ways even taxi drivers have same kind of issues. Imagine two taxies are coming from two different lane and one passenger is waiting for taxi, here only one who will come earlier to passenger will get next trip and other one have to wait for next passenger. These are some issues with traditional taxi system.

Everything is changing as time going on. In transportation system there are many changes happened by the time. Now a days we do not have to wait for too long to catch up taxi. A new system of booking taxies for trips is available now. In this latest system we just need to book a taxi from starting location to end point using some applications. Examples of this system are: OLA, MERU, TAXIFORSURE and many more[2].

Taxi locations can be read using GPS system available now days. The Global Positioning System (GPS) is a space-based navigation system that provides location and time information in all conditions [3]. Taxi with GPS System helps to identify their location in city.

There are many options for taxi business but each of them has their own problems. And the solution to these problems is efficient taxi recommendation system. With the help of this application taxi drivers can decide where

exactly they are suppose to go to find passenger and passenger can book taxi from their location. And in this way taxi drivers will get more business and hence increase in their revenue. This is main objective of this application.

Related Work:-

Many researchers have done lot of research in this area to increase mobility of taxies in city as well as to increase business of taxi drivers. And some research is done to help passenger to get cab easily. Few of them are studied here.Jing Yuan et al. [4] presented a direction system for drivers to help them to reach particular place as soon as possible. For this they used GPS system to get information about source location of trip and destination of same trip. In our system, we are also using GPS system to track taxi driver and passengers, this will help in fast service. Y. Yue, Y. Zhuang et al. [5] focused on clustering techniques for identifying locations where taxi is in demand, so that no. of trips get increase resulting in more income. Similar work is done by Junghoon Lee et al. [6] to find out nearest place where vacant taxi drivers can get passenger depending on some previous data.

Luis Moreira-Matias et al. [7] proposed an online taxi stand option for taxi drivers in their research. According to that theory if taxi drivers know where they want to stand to get more passenger then waiting time will get reduce by some amount. In that approach only waiting time is reduced by some amount but that not ensures increase in revenue. Here in our case we are suggesting them information related to current trip and upcoming trip too. Another work done in this area by Nicholas Jing Yuan et al. [8]. They proposed a system which helps taxi driver to find passenger and passenger to find place where they can probably get taxi for trip. This system helps passenger to get taxi but not from the location they want. Passenger will get recommendation about location where they can get taxi. In our system we are trying to overcome this issue because it may not be possible for passengers to travel till some other spot to get taxi.

All the above mention systems are developed either to help only taxi drivers and on other side some systems are able to help only passengers. But here in our system we are trying to help taxi drivers to increase their revenue. At the same time we are providing some facilities to passengers such as passengers will get notifications about confirmation from taxi driver and waiting time for trip. Though this system is mainly design for increasing profit of taxi driver we are trying to attract passenger towards system by providing facilities. And this will help in increasing passengers for our taxi drivers.

Problem Statement:-

Strategic Planning is important in any business to make more and more profit. Taxi driving is also one kind of business. In this case drivers must think about right location for getting passengers. If they know where exactly they should go to get next passenger then their waiting time will get reduce. Once waiting time is reduce by some amount it may be possible for them to take more trips than previously. And ending day with more profit in hand. As well as when taxi drivers are roaming around the city to find passenger of their choice and convenience, they waste fuel and increase pollution. This extra fuel consumption decrease their day to day income by some amount. Keeping this thoughts in mind we are planning to create something that can help taxi driver to increase revenue.
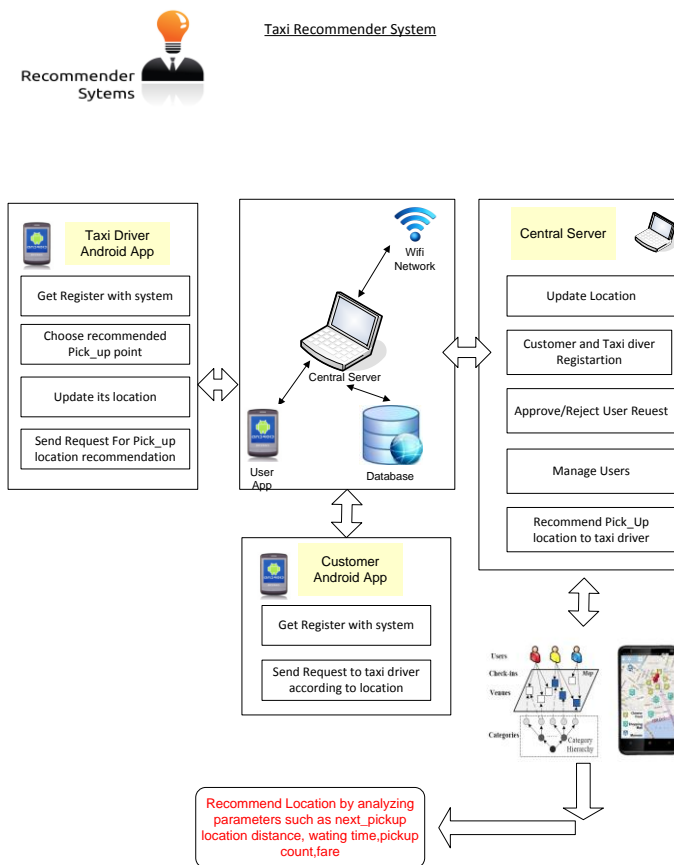
System Model

Taxi Recommender System

Recommender Sytems

**Fig. 1:-** System Structure.

Application Details:-

There are three users of system like admin, taxi driver and passenger. Every user has to register first before using system. After registration process finished, user can login to system to use all features of it.

Features available for passengers are they can book taxi from any place they want at any time. They will get confirmation once their request is accepted by any of taxi driver. They can check whether trip is stated or not and after completion of trip the request will get deleted from their account.

Taxi drivers can see how many request are there in system currently. Based on their own conditions they can accept any one of request. In that list the one request which is on top is recommended to taxi driver by system because based on algorithm that request will give more profit to driver. Still accepting request is completely depends on driver. After accepting request, driver have to start the trip once passenger board into taxi and at the end of trip close trip is to be done to see fare and total km. Taxi drivers can see their day to day business by bar chart which shows two bars. One bar is for without recommendations and one is for with recommendations. By this they will analyze what exactly they suppose to do for next day.

Result:-

In this section some screen shots of system are provided for better understanding of application flow.
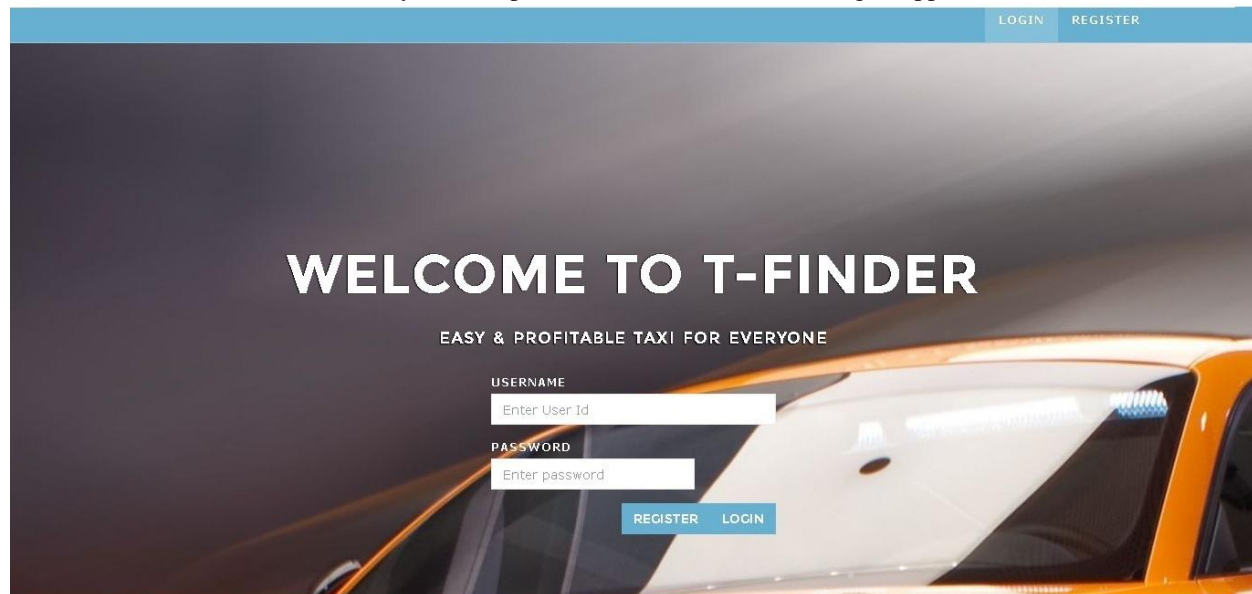
This is the main screen which each user will see on their mobile phones. That is home screen for application. From this user can login if already register or register to system if new user.
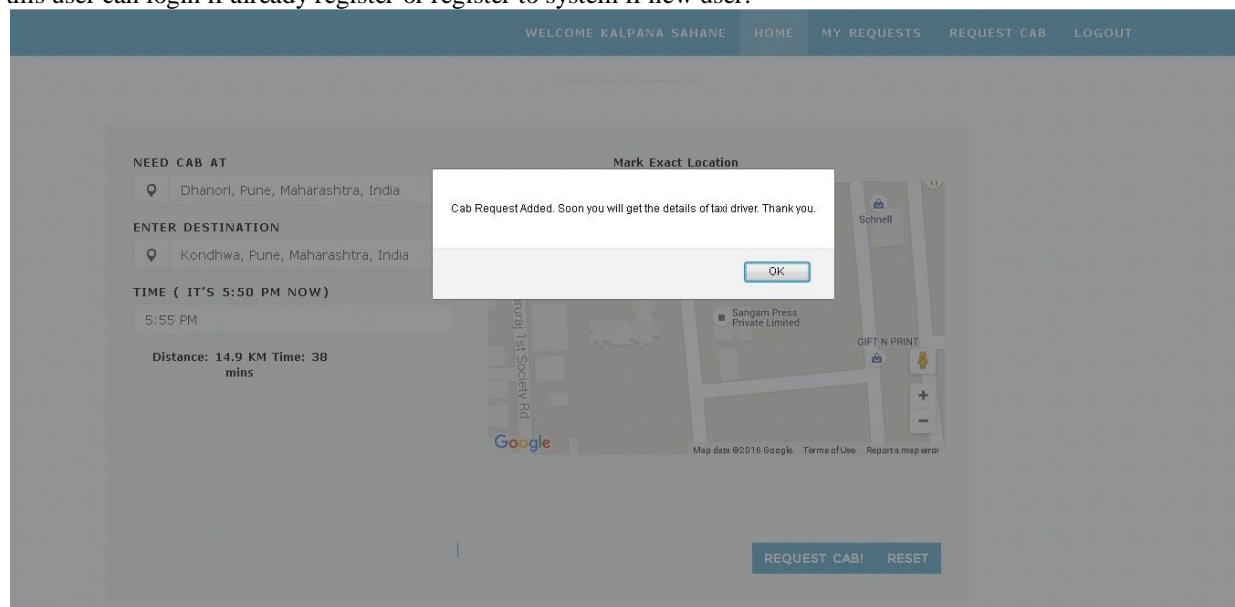
This screen shot shows two processes one is what exactly passenger need to enter for cab request and what message passenger will get after successful cab request.

Once the request is raised by passenger that will appear. Here in pending cab request list on taxi driver's application. The one which is in yellow is recommended to driver by system. Because compare to other requests available at that time the yellow one is giving more profit to driver.

When trip is closed by driver, total fare will be displayed on screen and total km travel to complete this trip.

| WELCOME TDRIVER TDRIVER | HOME | CAB REQUESTS▾ | REVENUE REPORT | LOGOUT |

REVENUE REPORT

⌄

Sr.No	Taxi Driver Id	No of Trips	Revenue	Tfinder Revenue	% Increase
1	3=shahadeo katore	1	125.0	478.0	282.0
10	29=nisar patel	1	69.0	288.0	317.0
2	5=Rajesh agrawal			301.0	9.223372036854776E16
3	6=rajesh agrawal			389.0	9.223372036854776E16
4	13=Rajesh agrawal	1	349.0	389.0	11.0
5	16=Sagar Golhar	1	301.0	566.0	88.0
6	18=Rishi Dange	1	218.0	301.0	38.0
7	21=gokul deshmukh			262.0	9.223372036854776E16
8	23=test test	1	171.0	242.0	41.0
9	24=tdriver tdriver	1	201.0	263.0	30.0

10 items found, displaying all items.1

This is revenue report generated by system depending upon driver's data for trips. In this one column is Revenue that is without recommendation and one is Tfinder Revenue that is with system recommendation.

| WELCOME TDRIVER TDRIVER | HOME | CAB REQUESTS▾ | REVENUE REPORT | LOGOUT |
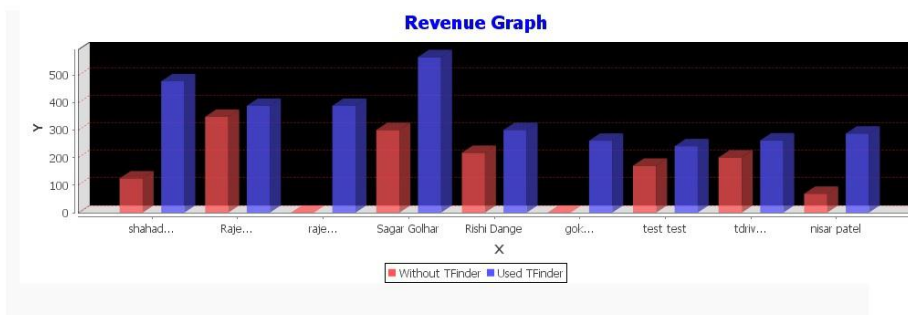
Graphical representation of above data just to understand more about income of taxi driver's.

Conclusion:-

In this paper a system is implemented to increase profit of taxi driver by providing them some recommendations about which trip is giving more profit to them. So that they can decide which trip they want to accept. As well as system is giving facility for passenger to book cab whenever they want from any place.

References:-

1. http://en.wikipedia.org/wiki/Taxicab.
2. http://gadgets.ndtv.com/apps/reviews/get- meru-ola-taxiforsure-and-othercabsfrom- one-app-684273
3. https://en.wikipedia.org/wiki/Global_Positioning_System
4. J. Yuan, Y. Zheng, L. Zhang, X. Xie, and G. Sun, Where to find my next passenger, in Proceedings of the 13th international conference on Ubiquitous computing, New York, NY, USA, 2011, pp. 109118.
5. Y. Yue, Y. Zhuang, Q. Li, and Q. Mao, Mining timedependent attractive areas and movement patterns from taxi trajectory data, in the 17th International Conference on Geoinformatics, 2009, pp. 16.
6. Junghoon Lee , Inhye Shin ; Gyung-Leen Park Analysis of The Passenger Pick- Up Pattern For Taxi Location Recommendation, Fourth International Conference on Networked Computing and Advanced Information Management, 2008.
7. Luis Moreira-Matias, Ricardo Fernandes, Joo Gama, Michel Ferreira, Joo Mendes- Moreira, Lus Damas, " An Online Recommendation System For The Taxi Stand Choice Problem," IEEE Vehicular Networking Conference (VNC),2012.
8. Nicholas Jing Yuan, Yu Zheng, Liuhang Zhang, and Xing Xie T-Finder: A Recommender System For Finding Passengers And Vacant Taxis, IEEE Transactions On Knowledge And Data Engineering, October 2013.