

Smart Traveller- Proficient Taxi Business Application

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Abstract— For efficient taxi business based on GPS has become an important tool, the taxi fleet management system. It can be used providing useful information for taxi drivers to earn more profit by mining the historical GPS trajectories and also for the sake of fleet management. For next cruising location which could be a value added module of the fleet management system, we proposed a taxi recommender system. To provide the similar objective we investigated, three factors considered in different works, which are distance between the current location and the recommended location, for next passengers waiting time, and expected fare for the trip. In addition to these factors, based on drivers experience which is the most likely location we consider one more factor to pick up passengers given the current passenger drop off location. To capture the relation between the passenger get-off location and the next passenger get-on location, a location-to-location graph model, referred to as OFF-ON model, adopted. To estimate the expected fare for a trip started at a recommended location we also adapted an ON-OFF model, to evaluate the proposed system. A simulator simulates cruising behaviour of taxis in the dataset A real world dataset from CRAWDAD is used and one virtual taxi which cruises based on our recommender system.

Key words: CRAWDAD, Recommender, trajectory, Fleet

I. INTRODUCTION

Taxi fleet management system, due to the dramatic cost down of Global Positioning System (GPS) devices, based on GPS has become very popular for taxi companies. A taxi company is able to keep track time-stamped GPS trajectories of its taxi cabs by using this system. Furthermore, additional information, such as the status of a taxi, include waiting at a stand, cruising, occupied, off shift, can also be tracked. The GPS taxi fleet management used not only for the sake of fleet management and security, but also to provide useful information for taxi drivers to earn more profit by mining the historical GPS trajectories and status of taxis. As a consequence, lots of researchers devoted to the research on efficient taxi business, especially the recommender system for taxi drivers under different conditions and objectives. For a taxi driver, the most concerned topic is likely to be how to maximize his profit. A daily routine of a taxi driver may consist several pairs of cruising time and occupied time. That is, a taxi driver may cruise the road network searching for passengers for a while (which may include waiting at some taxi stands), and then pick up passengers and drive to the designated destination (occupied time). As the passengers get off the taxi, it starts cruising the road network again. It is at this moment that a recommender system used to help the taxi driver know where to cruise such that his profit can be increased. The purpose of this work is to recommend a good location for the taxi driver to cruise to such that he can earn more profit than cruise based on his own experience. Several factors considered for guiding a taxi driver cruising to a more

profitable location. First, distance between current location and the recommended location should be short to save time and energy. Secondly, when the taxi arrives the recommended location, the waiting time for next passengers should also be short. Thirdly, if the taxi driver is able to pick up passengers at the recommended location, the fare for the trip is preferred to be large. Most of the works have considered two of these three factors with different approaches to utilize the historical data. In this project, we consider all of these factors. In addition, by mining the relation between the passenger get-off and get on locations, we also consider a fourth factor. To capture the relation between the passengers get-off location A location-to-location graph, called OFF-ON model is proposed and the next passenger get-on location. With this model which is calculated based on the historical data, to pick up passengers when the taxi driver drop off passengers at a location, our recommender system is able to know which locations are with high probability. Thus, explore all of these four factors such that the proposed recommender system is effective. In additional, which one are more important than others, we also analyse, among these four factors.

II. EXISTING SYSTEM

For picking up of passenger which increases wastage of fuel, time and there will be creation of more unnecessary traffic in city, the vacant Taxi driver have to move from point to point. Where and how he gets more income time to time for the taxi driver has to keep himself his own record into mind.. Passengers also require taxi on time i.e. for long time for finding taxi for reaching their destination on time, they have to wait. Sometimes problem of misguidance of route for new passengers also arises. Before reaching destination Passengers also don't know average fare of trip.

A. Easy Taxi System Summary:

In this app, we can book a taxi as well as track it in real time. If any passenger lost any belongings in taxi then also for finding their belongings, passenger can track taxi. on booking a taxi , no extra charges will be applicable. This also provides payment. To contact each other, both taxi drivers and passengers have to create account in this app.

1) Advantages:

- Payment though credit card.
- Real time tracking of taxi.
- Passenger will also experience lower waiting time to get the taxi.

2) Disadvantages:

- Lack of accuracy in determining the location if poor GPS and internet connection.
- Requires an account.
- Waiting time not specified.
- Recommending profitable cruising location cannot analyse by this system.

B. CMS Mobile (Cab Management system) Summary:

For cab drivers, this system is user friendly. To a taxi driver closest to pick up point, this app assigns jobs. This app also provide driver with job details and direction at tap of his hand. GPS helps in tracking fleet all the time. Passengers can pay using credit card. In this application Passenger and taxi driver both have account, so that customers and taxi driver can contact to each other.

1) Advantages:

- tracking accurate to within 5 min.
- If driver has not fulfilled any of the legal requirement, it Automatic log off
- To send information of new or frequently visited places, Suggest position of interest (POI) option help driver.

2) Disadvantages:

- For the customer (passenger) benefit this application is not suitable.
- Chat option is not provided for communication between passenger and driver.

III. PROPOSED SYSTEM

The best user interface between the taxi driver and the passengers provide by Taxi recommender system. For increasing the revenue of taxi drives, this system is more useful. This give the analysis report to taxi driver due to that taxi driver will know how he gets more profit on the at particular time and particular route. Both have to compulsory fill registration details i.e. 1. Taxi driver 2. Passenger. Interface: Through the Central Server, the communication takes place between the Taxi Driver and the Passenger. The initialization of this communication takes place from the passenger side always who has to confirm the taxi.

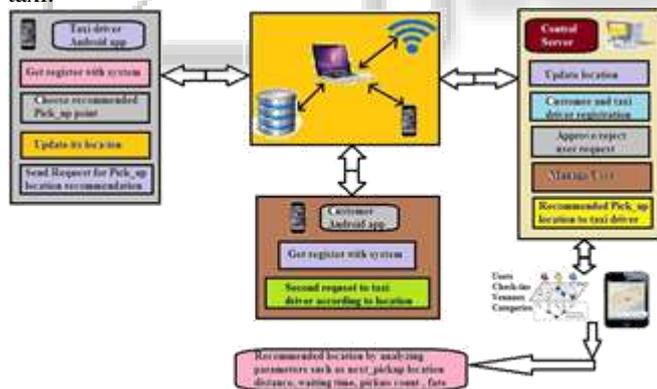


Fig. 1: Block Diagram of Smart Traveller-Proficient Taxi Business Application

IV. CONCLUSION

In this system, Spatio-temporal analysis is the main advantage which is not existing at all in any taxi booking system. In simulation part, to see his revenue and through which he gets his profitable location, we are plotting graphs which are helpful for taxi driver. For clustering maps and k-means algorithm for spatio-temporal analysis we use grid based clustering algorithm. Until our system reaches optimal goal i.e. maximize revenue, we adopt greedy strategy that adjust only one factor at a time. For all those who wish to

enhance this application this application will be beneficial by adding their views.

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