CityTour Bus Locator and Bus Booking Mobile Application

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Abstract—The public bus transportation system has the direct impact on economic development of the country. Scheduling, tracking and monitoring of the public bus transportation is one of the major issues for any public transportation sector. Currently, there are many vehicles tracking systems available using Global Positioning Systems (GPS) technology. At present, bus passengers are unable to gather enough information which would lead up to a stress-free bus ride. Under current conditions a passenger has to wait in the bus stand without having any prior idea about the buses. 'CityTour' application assists passengers and the conductor to use bus service in more stress-free, well-organized and a suggestive manner. "CityTour", is the cross-platform application implemented with the sole purpose of addressing these problems a passenger has. The application will predict the next Bus's arrival time, seat reservation and a rating which will give an indication regarding the quality of the service offered. Bus conductor has a say in whether a passenger gets a seat or not. 'CityTour' application enables the "real-time" passenger bus communication that would lead to a better collaboration and make their day-to-day work easier for both the parties.

Keywords—**public bus transportation, estimated time, bus tracking, bus seat reservation.**

I. INTRODUCTION

Around 93 percent of population in Sri Lanka use buses as their day-to-day transport medium. To get to know the next bus's arrival time, vacant seating facilities, and the quality of the service presented by a particular bus are some of the concerns a passenger may have before getting into a bus. 'CityTour' application will be useful for everybody involved with a bus ride. The project is to use the available technologies and create a system which will make day-to-day passenger-bus intercommunication easier. The system consists of two main mobile applications which will be used by the passengers and the conductor. 'CityTour' application assists passengers and the conductor to use bus service in more stress-free, well-organized and a suggestive manner. The application will predict the next bus's arrival time, seat availability and a rating which will give an indication regarding the quality of the service offered. Bus conductor has a say in whether a passenger gets a seat or not. Complications that arise in situations involving these two parties will be reduced.

This software mainly focuses on making the bus rides more user friendly. The system will enable passengers to get an estimated time for the arrival of the transport; for the benefit of these passengers the application will give them a better idea about what is to be expected from the bus they have selected using the reservation system available. This application will also have an interface for the bus counterpart in order to give them a say in reserving seats. These would be achieved by using multiple platforms which the application would be developed in. "CityTour" is a system that semi automates the bus travelling process. This is the best solution for overcoming problems faced by the passengers. This system will give a better way to make decisions more efficiently and effectively. Those decisions would factor to satisfy both the passengers, drivers and conductors than they would expect. By giving the ratings the system will also give a motivation to the passenger's choice of traveling method.

II. MATERIALS AND METHODS

Quite number of projects has been attentive to the development of GPS based transportation systems, which would minimize a user's work. The web application system "CTA | Bus Tracker" [1] is a fine example that makes people to take transportation decisions easily. It takes the current location of the bus that a user requests and shows it in a map, so the user could time his/her arrival at a stop. A New Smart Parking System Infrastructure and Implementation [2], The Research and Implementation of China Railway Ticketing and Reservation System (TRS) [3], "The impact of online reviews on hotel booking intentions and perception of trust" [4], are some similar reservation systems. They are real time desktop application systems that use sensors to check reservation availability. Smart parking only considers the major cities for the application. These systems do not give exact information about the reservation, only the location is provided to the user. These systems have to use a particular database as a server. All these systems have a similar way of letting the user to select their desired seating accordingly. However, these systems do contain heaps of unwanted information that is not worthwhile, and they may cause the systems to crash.

The researches mentioned on above sections describe about the systems that are similar to the system that is implemented. This project is unique because the system will let the passenger know the condition of the bus and the quality of service offered by a bus. It also enables the passenger to reserve a specific seat he/she desires, and the application will be implemented for multiple platforms. Other systems, unlike "CityTour", usually do not track busses in real time, which would give out an accurate estimate of arrival time. Since the application allows an ongoing user to rate and comment regarding the facilities given out by a bus, the other users who might travel in the

same bus in the future could take it into consideration because the rating system of the application would give out an assessment of the bus. Questioning people through a simple questionnaire on different levels who are currently involved with the system helped in finding requirements to build the new system. Questionnaire has been given out to passengers from different areas to obtain diverse opinions from them.

III. Calculation and Results

When considering passengers opinions, suggestions through questionnaire, CityTour application system was primarily designed for only any bus route as a commencement stage for the application to be developed with its unique features. With the versioning of the system, effective new features will be added to the application. This hybrid mobile application contains Time Estimation, Alert Service, Location Tracking, Seat Reservation functionalities to the users. When two or more users can come into a clash if they reserve the same seat at the same time. Then the option would be given out to the bus conductor to sort it out according to the first come first serve basis. When a user selects a bus he/she easily find out the bus location via Google Map. Also, it shows the distance, estimated time in between the bus and the user. If the user cancels the reservation it will also be indicated in the conductor's mobile.

IV. Conclusion and Discussion

The system was built to make it convenient for both passengers and bus drivers. Although the priority was always given to the passenger over the bus when it came to more significant issues. The main consideration was to offer services with effectiveness, which the other similar applications failed to provide.

The system was developed with the sole purpose of convenience for everyone involved with a bus ride. Though the primary goal of this research was to search the location of the nearest bus and also provide options such as booking seats for the passenger. The rating system gives the passenger a more described version of the service he/she can expect. Although the passenger is the one benefitting mostly from the application, the bus crew were not ignored. The bus crew can choose to confirm or cancel a requested reservation as they desire. This makes the project more appealing to the users and it will make their life easier in the process.

This application is mainly preferred for luxury bus services as there is a less hassle when it comes to services. If a bus driver/conductor wishes to use the application for their profession they should consult the App. development team to sign them up for the application. Both passengers and bus crew will not need a vast technological knowledge or language skills to operate the application.

V. Limitations

- The user's phone should be GPS connected.
- The application must be updated with the addition of new buses along with the bus numbers as well as the bus timings and new routes.
- When mobile platforms get updated in the future, the application will also be altered accordingly to its new features and requirements.

VI. Future Works

If any data mining project started to collect and analyse these data after the application has been running for some time and a considerable amount of collective data is available, it will be beneficial in the near future to the Sri Lanka transport services as the data will give out informative suggestions regarding where to provide improved bus transport in the country. After the application gets proper funding, more routes with additional busses will be added later onwards in the application.

Inside the bus the conductor uses this mobile application. If for some reason, the conductor misplaces the mobile it will be a problem when it comes to check the booked seats. Therefore, as a solution for the future, it is better to have a permanent digital device mounted inside the bus with easy access to the conductor. After the booking, if the user can do payments for the booked seats using an online portal it will be beneficial to both parties. It will also have to include a refundable process for any cancellations of the bookings. Since the application is initially developed for Luxury and Semi-Luxury type busses, it is hoped to be developed for use in normal bus services as well. In order to achieve this, it is expected to have a suitable bus transportation system that runs in a particular manner or the system has to be enhanced and developed with a lot of improvements and carefully analysed routine.

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