Project Synopsis
On
‘Where Is My Bus?’
Submitted as a part of course curriculum for

Bachelor of Technology
in
Computer Science and Engineering

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DECLARATION

We hereby declare that this submission is our work and that, to the best of ourknowledge and belief, it contains no material previously published or writtenby another person nor material which to a substantial extent has been acceptedfor the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgement has been made in the text.

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1. INTRODUCTION

A lot of time of transit users is wasted while waiting for a bus that matches their route. Their valuable time is wasted in waiting. While waiting at the stop they would definitely want to know about the location of their bus, and with that information they can take their further decisions. If the bus is far away from the bus-stop then they can take an alternative like an auto or Uber etc.

Sometimes we do not have the idea about how much crowded the bus is i.e we do not know if the bus arrives, whether there will be a place to sit.
A passenger would like to know that the bus he/she is waiting for has sufficient space. If yes then the wait would be worth, if no then again it will just waste the time of passenger

If a passenger has boarded the bus then definitely he/she would like to reach to the destination peacefully. The passenger would want that there should not be any theft, eve-teasing etc.

When it comes for paying for the ticket then we often see arguments related to the change. A passenger would like to have a cash-less method

2. Problem Statement

Through our mobile app we have provided a solution which will –

Reduce the waiting time of the people by tracking the location, route and timing of the bus. A passenger will thus know the expected arrival of the bus and based on that information he/she can plan the further actions whether
to wait or take an alternative.

Users can check for the available seats and can opt for the bus which is less crowded.

For the safety purpose of the users there is feature which will help them to report any emergency to dedicated phonelines like police or any guardian.

Cashless transactions are made available to users electronically through online payments. Thus, avoiding the arguments for change.

The app idea has come out by observing the problem faced by people who use public transport on a regular basis.

Objective is to provide a solution which will help users to save their time on bus stop and to give the best possible technical facility while using these transports

Facilities like -

- Bus Tracking
- Crowd Monitoring
- Cashless Payments
- Emergency reporting.

3. Literature Survey

1. Author - Keshavdas M

Title- How Does Real Time Bus Tracking Work?, (2014)

Summary

By using modern, GPS-enabled software systems combined with hardware like a tracking device installed within buses as well as apps installed on phones of users (e.g. drivers), a "real-time" bus tracking system can monitor the movement of buses on a map. Data such as the speed of the bus, the distance covered, the remaining distance to its destination, the number of scheduled stops (etc.) is received by Fleet managers in real-time. This helps them in taking any corrective action should there be any deviation or delays.

An important part of bus-tracking is the school-bus segment since it is greatly beneficial for parents and school authorities to be able to monitor the safe transit of their children.

What is a real time bus tracking system?

As the name indicates, a "real-time bus tracking system" tracks the movement and locations of buses traveling along various routes at different times and provides live data in "real-time" to a central control room. This helps Fleet Managers in the central location to monitor the progress of the buses i.e. whether they are traveling on pre-assigned routes, maintaining projected times, adhering to safety protocol while driving, making the prescribed number of stops (etc.).

Unfortunately, deviation from the planned routes and timelines are often necessitated due to issues like sudden traffic jams and inclement weather – these often cause delays and need buses to be re-routed. When such deviations occur – e.g. when a bus either breaches the route prescribed, or its geofencing parameters or is taking longer than expected – the system alerts the Fleet Managers, who can take the required corrective actions in a prompt manner.

2. *Author - Shubham Jain*

Title – "Working Of GPS" , (2014)

This paper is based on a bus tracking system, in which a GPS Tracking application is used to track the bus. The passengers are unaware of the information regarding bus timing and therefore waste their time waiting for the bus on their particular route. GPS technology is user-oriented, to receive the navigating instructions at any instant of time. Here, the location of the bus is received from the satellite and then with the help of cellular networks, it is further processed and sent to the web-server. The coordinates received are processed through Google Maps API. Google Maps API helps to collect data like latitudes and longitudes, locations, etc. The data received is processed in the user's device, to display the real-time information.

3. *Author – Sharmin Akter*

Title - "A Cloud- Based Bus Tracking System based on Internet of Things Technology" , (2019)

In this paper, a Cloud-based bus tracking system based on IoT is proposed. The combination of cloud computing and the Internet of Things enables monitoring the bus services, which need to be stored, processed, and assessed. This paper proposed a mobile application, through which the passengers can track the location of the bus and estimate the arrival time of the bus. It is also provided with the nearest stoppage from the current location. Therefore, passengers with no worry can utilize their waiting time by choosing the nearest route.

4. Author - Priyanka V. Narkhede

Title – "Bus Tracking System based on Location-Aware Services", (2018)

In day-to-day life, people travel from one place to another and most of the population use Bus as a medium to reach their destination. This paper mainly focuses on the problem with the buses, that the passengers do not know the exact timing of the arrival of buses. The location of the bus and routes taken by the buses could be easily tracked on a smartphone. Global Positioning System and Google Maps are used for navigation. An application based on the android is used, which includes information of all routes and bus details. The application is updated occasionally so that all the changes in bus routes and timings are noted. The user could merely request for the location of the bus, and the details stored in the database via a GPS device fitted on the bus can be retrieved whenever needed.

5. Author - Hock-Han-Tee

Title – "Cashless payments and economic growth"(2019)

A cashless transaction refers to an economic setting whereby goods and services are transacted without cash (Paul and Friday 2012), either through electronic transfer or cheque payment. The effect of cashless payment on an economy can be analysed by the Diffusion of Innovation Theory (DOI). The concept was first introduced by Roger in 1962 where he explained how innovation is diffused to members of a social system over time (Rogers, 1995). According to DOI, the adoption of a new idea or innovations is caused by interaction between individuals through interpersonal networks. In this context, diffusion is the spread of cashless payment where consumers seek improved and convenient transaction, while businesses seek new profit opportunities. The diffusion of cashless payment will result in the adoption of cashless transactions within the society or community, subject to the types of innovation adopters and innovation-decision process. Since the consequences of diffusion in cashless payment depend on how quickly the society is willing to adopt cashless payment through different stages of innovation processes, the consequences of the adoption of cashless payment differs in different society.

Electronic payments will replace cheque payments extensively but cash-based payment will persist to a substantial extent Although technological advancement has enabled improvement

and innovation in electronic payment system, from the basic ATM card transaction to online credit transfer, direct debit, card payments and cheques, security related issues, non-IT savvy users and phishing emails are some of the shortcomings of the adoption of cashless payments. The loss of money and the compromise of private information weaken the confidence of consumers to make payment electronically. Park (2012) studies more than 70 countries around the world, from the less developed Bangladesh to the developed United States for the period 2002–2004. They found that corruption in the banking sector could distort economic growth because the allocation of fund for private investment will be biased. Consequently, private investment will take its toll on economic growth.

4. Proposed Methodology

When a user will open our app then he will see onboarding screen

Those screens will tell about the features offered in the app and teach them how to use it

The new user can signup and OTP is used for security and authentication.

A user can see the list of buses available and their routes and can choose theirs accordingly.

Google direction API is used in the app.

The user can see the seat availability and choose accordingly.

An emergency report feature is available where a passenger can just shake their mobile phone and a call will be directed to a specified number. For this a react-native library is used which is ‘react-native shake’. This is really faster than just manually dialing phone number or searching for contact in mobile phone.

Firebase is used in the application.
It is a Backend-as a Service. It is used for authentication.

It is used for real time database. Some of the advantages of using Firestore over Realtime Database is its ability to handle complex and hierarchy-based data at scale, and its ability to run queries at a faster rate.

Tech Stack used :-

- **JavaScript**
- **React-Native**
- **Google Maps**
- **Firebase**

5. Expected Outcome

Existing system involves a lot of time wastage and chaos. If the app is used by significant amount of people the it can remove all the chaos and confusions at the bus-stop. Since most of the users are student or working professional then this app can save their time and prevents them from getting late for their work/college. This app can be a first step towards smart-city in s of our country and with the coming advanced technologies more changes and updations can be made in the app making lives of people more simpler.

We can further add online bookings in the bus which helps the user to ensure their seats in the bus.

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