

REALTIME BUS TRACKING SYSTEM USING MOBILE TECHNOLOGY

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Abstract - This Realtime Bus Tracking System Using Mobile Technology proposes the development of a bus tracking and ticket booking system that allows passengers to track the live location of buses in real-time, calculate ticket fares base distance and book tickets online. The project will require the integration of live GPS data from the buses, a real-time tracking system, a fare calculation algorithm, and a ticket booking system. The tracking system will use mapping tools such as Google Maps API to display the live location of the buses, while the fare calculation algorithm will take into account the distance between the passenger pickup and drop-off points to calculate the fare. The ticket booking system will allow passengers to book tickets online and receive a booking confirmation and unique ticket ID. The project will require knowledge of programming languages such as Python, JavaScript, and HTML/CSS, as well as experience working with APIs, web development, and databases. Additional features such as user accounts, payment integration, or a mobile application can also be added based on specific requirements. The system real-time tracking feature allows passengers to track the live location of buses, obtain estimated arrival times, and plan their travel accordingly. This feature provides passengers with accurate information about bus locations, which helps them avoid waiting for long periods at bus stops. Additionally, the fare calculation feature enables passengers to calculate ticket fares based on the distance travelled, eliminating the need for manual fare calculation and reducing the chances of errors. This feature also eliminates the need for passengers to queue up at ticket counters, thereby reducing the overall waiting time and congestion at bus stations Overall, the proposed system provides a comprehensive solution to the common problems faced by passengers during their commute, such as uncertainty about bus arrival times, long waiting periods and difficulties in purchasing tickets.

Keyword: *Real-time Bus Tracking, Ticket Booking System, GPS Technology, Google Maps API, Fare Calculation Algorithm, Online Ticket Reservation, Web-based Application, Mobile Technology, System Architecture, Data Flow Diagram, User Accounts, Payment Integration, Mini Project, Passenger*

Experience, Live GPS Data, Mapping Tools, Integration Testing, User Interface Design, Web Development, Database Management.

1. INTRODUCTION

The world is advancing at an unprecedented pace, and technology is making our lives easier in every possible way. The transportation sector has seen a tremendous change with the advent of modern technologies. Bus tracking and ticket booking systems are becoming increasingly popular as they offer passengers a convenient and hassle-free experience. In this context, this mini project proposes the development of a bus tracking and ticket booking system that enables passengers to track the live location of buses, calculate ticket fares in real-time and book tickets online. The project aims to create a system that utilizes the live GPS data from buses to track their live location on a map, making it easier for passengers to know when their bus will arrive.

A real-time tracking system using mapping tools such as Google Maps API will be developed to show the live location of the buses additionally, the project will include an algorithm that calculates the fare based on the distance between the passenger pickup and drop-off points, which takes into account discounts or promotions that may be applicable.

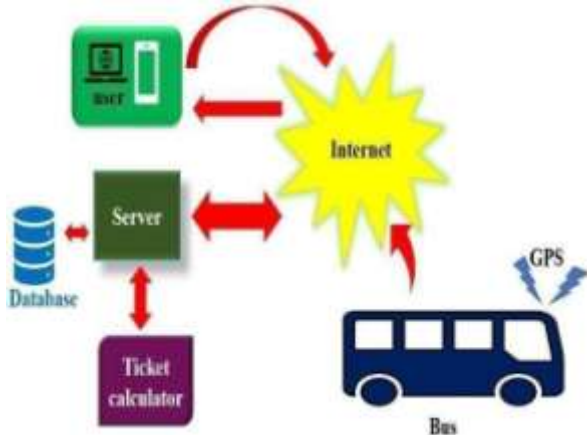
The system will also enable passengers to book tickets online and receive a booking confirmation and unique ticket ID, making it easier for them to board the bus without any hassle. To develop this project, we will need to use various programming languages such as Python, JavaScript, and HTML/CSS. We will also need to have experience working with APIs, web development, and databases.

2. SYSTEM ARCHITECTURE

A real-time bus tracking system using mobile technology requires a well-designed architecture that integrates multiple components, from GPS devices and mobile applications to central servers and network infrastructure in fig 1.1 By leveraging the latest advances in mobile and data analytics technologies, such a system

can provide commuters with real-time information about bus locations and arrival times, improving the overall user experience and making public transportation more accessible and convenient.

Fig1.1BUS TRACKING ARCHITECTURE



3. EXISTING SYSTEM:

The existing transportation system lacks real-time bus tracking, live ticket calculation, and online ticket booking features.

- Traditional methods often involve manual processes for ticket purchases, limited information on bus locations, and challenges in estimating arrival times.
- The absence of a modernized system may lead to inconveniences for passengers, such as uncertainty about bus arrival times, long waiting periods, and difficulties in purchasing tickets efficiently.
- The proposed project aims to bridge these gaps by introducing a comprehensive bus tracking and ticket booking system that leverages GPS technology and online platforms to enhance the overall passenger experience.

4. PROPOSED SYSTEM:

Proposed system for mini project that can track a bus live location with live ticket calculation and ticket booking. The proposed bus tracking and ticket booking system will be a web-based application that will utilize live GPS data to track the live location of buses. The system will use mapping tools such as Google Maps API to display the live location of buses in real-time.

Passengers will be able to see the location of the bus they intend to board, and get an estimate of the arrival time of the bus at their pickup point.

The system will have an algorithm that calculates the fare based on the distance between the passenger's pickup and drop-off points. The algorithm will take into account any discounts or promotions that may be applicable, and will provide the passenger with a fare estimate before they confirm the booking.

ADVANTAGE:

- Convenience for passengers
- Efficient fare calculation
- Real-time tracking of buses
- Reduced wait time
- Better management of operations

5. ALGORITHM

The algorithm for the proposed bus tracking and ticket booking system can be outlined as follows:

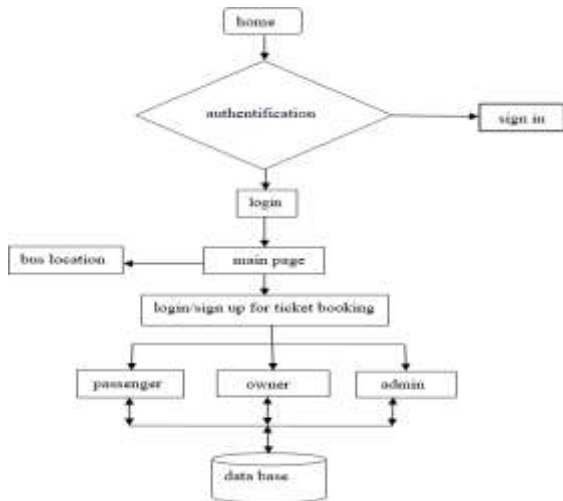
- **User Registration:** Users register on the system by providing necessary details. Unique user accounts are created for each registered user.
- **User Login:** Users log in to their accounts using valid credentials.
- **Bus Tracking:** GPS data from buses is collected in real-time. Mapping tools like Google Maps API are used to display the live location of buses. Users can interact with an interface showing the bus location, estimated arrival time, and any delays or route changes.
- **Fare Calculation:** An algorithm calculates the fare based on the distance between the passenger's pickup and drop-off points. Discounts or promotions are considered in fare calculation.
- **Ticket Booking:** Users select the desired bus, journey date, and check seat availability. Payment options, including credit/debit cards, digital wallets, and net banking, are provided. Upon successful payment, users receive a booking confirmation with a unique ticket ID.
- **Notification:** Users receive notifications or alerts with updates, such as booking confirmations and any changes in bus schedules.
- **Data Flow:** Bus location data, estimated arrival time, and fare details are continuously updated and displayed to users.

- System Security: Measures are implemented to ensure the security of user data and transactions. Access to sensitive information is restricted to authorized users.
- Integration Testing: The system components are tested together to ensure seamless integration and functionality.
- User Experience Enhancement: Continuous improvements are made to enhance the overall user experience and address any identified issues.

6. DATA FLOW DIAGRAM:

Data flow diagram is flow carries the current location data of buses, which is received by the tracking system and stored for further processing Estimated Arrival Time Data.

Fig1.1BUS TRACKING DATAFLOW



This flow provides the estimated arrival time of a bus at a specific location Data flow diagram is flow carries the current location data of buses, which is received by the tracking system and stored for further processing Estimated Arrival Time Data This flow provides the estimated arrival time of a bus at a specific location.

7. CONCLUSION:

In conclusion, the Real Time Bus Tracking System Using Mobile Technology is a web application that aims to provide an efficient way to track the live location of buses, calculate fares in real-time, and allow users to book tickets online.

- This project requires specific hardware and software requirements such as a dedicated server, GPS-enabled mobile devices, reliable internet connectivity, payment gateway integration, and a responsive design framework.
- To develop this system, a suitable operating system, web server software, database, PHP framework, GPS tracking library/API, and payment gateway integration must be used.
- Additionally, a code editor, version control software, and a development environment are required for coding and debugging the PHP web application.
- The project must be designed with scalability, performance, and security in mind to ensure a successful and secure implementation.
- It is recommended to consult with experienced developers or IT professionals to ensure the right hardware and software setup for this project.

In conclusion, a real-time bus tracking system using mobile technology has many benefits for both public transportation providers and passengers.

8. FUTURE ENHANCEMENT:

There are several future enhancements that can be made to a real-time bus tracking system using mobile technology to further improve its functionality and user experience. Some of these enhancements include:

- Real-time notification: users can receive real-time notifications on the estimated arrival time of the bus, delays, and other important information.
- Route optimization: the system can suggest the optimal route for the bus to take, taking into account traffic conditions and other factors, to ensure faster and more efficient travel.
- Multiple payment options: allow users to choose from a variety of payment options such as credit/debit card, mobile wallet, and net banking.
- User ratings and feedback: users can rate their experience and provide feedback on the quality of the service, which can be used to improve the system.
- Multilingual support: the web application can support multiple languages to cater to users who speak different languages. Real-time traffic updates: the system can provide real-time traffic updates to help users plan their journey better.

9. REFERENCES

1. Deb, S., Chakraborty, C. (2020). "A comprehensive survey on real-time bus tracking system using mobile technology".
2. Goyal, A., Rathore, S. (2017). "Real-time bus tracking system using GPS and mobile application".
3. Jain, R., Jain, V. (2019). "Development of real-time bus tracking and fare calculation system".
4. Jayalakshmi, K., Sivasankari, G. (2018). "A study on real time bus tracking system using mobile technology".
5. Kumar, R., Nigam, A. (2019). "Real-time bus tracking and fare calculationsystem using GPS and mobile application".
6. Lingareddy, N., Priya, T. G. (2017). "Real-time bus tracking and ticket reservation system using GPS and GSM".
7. Choudhury, S., Mishra, P. (2018). "Real-time bus tracking system using GPSand GSM".
8. Mandal, M. K., Banerjee, S. (2018). "Development of real-time bus trackingsystem using GPS and mobile technology".
9. Nair, A., Sreenath, P., Rajan, A. (2020). "Design and implementation of a real-time bus tracking system using GPS and mobile application".
10. Negi, A., Verma, A. (2019). "Real-time bus tracking and ticketing systemusing GPS and mobile application".
11. Patel, H., Bhavsar, D. (2018). "Real-time bus tracking system using GPS andmobile technology".
12. Prakash, P., Saran, M. (2019). "Real-time bus tracking and ticket bookingsystem using GPS and mobile application".