REAL-TIME BUS TRACKING AND PASSENGER INFORMATION SYSTEM FOR MSRTC

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***Abstract*- The "Real-Time Bus Tracking and Passenger Information System for Maharashtra State Road Transport Corporation (MSRTC)" is a cutting-edge technological solution designed to revolutionize the public transportation experience. In a world where efficiency, accuracy, and real-time information are paramount, this system stands as a beacon of innovation.The system offers real-time tracking capabilities, allowing passengers to monitor the exact location of MSRTC buses in real-time through intuitive mobile applications and web interfaces. Leveraging GPS technology, this feature not only ensures accurate tracking but also enables precise predictions of bus arrival times at designated stops. Passengers gain access to comprehensive route information, including stops, schedules, and landmarks, enhancing their ability to plan journeys effectively.The RealTime Bus Tracking and Passenger Information System for MSRTC stands as a testament to the power of innovation, ushering in a new era of smart public transportation.**

***Key Words*: Real-Time Bus Tracking,Passenger Information System GPS Integration,Mobile App, Data Securit**

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INTRODUCTION

In the bustling urban landscape of Maharashtra, where millions rely on public transportation for their daily commute, the need for an efficient, reliable, and passengercentric system is paramount. To address this demand, the "Real-Time Bus Tracking and Passenger Information System for Maharashtra State Road Transport Corporation (MSRTC)" emerges as a groundbreaking solution poised to transform the way people travel within the state. Historically, public transportation systems have faced challenges related to punctuality, route optimization, and passenger convenience. Traditional schedules often led to unpredictable wait times, causing inconvenience to passengers and inefficiencies in operations. Recognizing these challenges, the MSRTC embarked on a mission to enhance the entire public transportation experience for its commuters. The Real-Time Bus Tracking and Passenger Information System for MSRTC is an integrated approach that leverages cutting-edge technology to provide real-time tracking and dynamic information dissemination. By integrating GPS technology, robust software solutions, and user-friendly interfaces, the system aims to offer precise, real-time information to both passengers and transport authorities

1.Enhanced Passenger Experience:The primary objective of this project is to significantly enhance the experience of MSRTC passengers. By offering real-time bus tracking, accurate arrival predictions, and detailed route information, passengers can plan their journeys effectively, reducing wait times and ensuring a seamless travel experience. 2.Operational Efficiency:For MSRTC authorities, the system offers tools for optimizing bus routes, analyzing travel patterns, and improving operational efficiency. Real-time data analysis facilitates better decision-making, enabling the authorities to respond proactively to service disruptions and optimize resources. 3.Safety and Accessibility:Ensuring passenger safety and accessibility for all individuals, including those with specific needs, is a key focus. Real-time tracking enables efficient

emergency response, while detailed accessibility information helps passengers choose buses that cater to their requirements.

1. PURPOSE

Public transportation in many countries is being used as a means of transport for travelling and accordingly people would prefer this public transportation to be scheduled properly, on time and the frequency be increased for commuters to make good use of it. It has been found that quite an amount of research work has been carried out, in this sector, by way of using technology in the public transportation systems towards the tracking of passengers when they board and exit buses

Key objectives and purposes of a farmer chatbot include:

1. Real-time GPS Tracking: Each MSRTC bus is equipped with GPS tracking devices, allowing for the continuous monitoring of their locations. This data is transmitted to a central server.
2. Mobile Application: Passengers can download a dedicated mobile application that provides access to real-time bus locations, routes, and schedules. Users can track the bus's progress on a map, receive alerts about delays or cancellations, and plan their journeys more effectively.
3. Web Interface: A web portal complements the mobile app, catering to passengers who prefer accessing information through their computers or tablets. It offers similar functionalities, including bus tracking, route planning, and ticket booking.
4. Automated Announcements: The system also includes automated announcements on buses, indicating upcoming stops and estimated arrival times. This enhances communication with passengers, especially those without smartphones.
5. Emergency Features: In case of emergencies, passengers can trigger alerts through the mobile app to notify authorities and fellow passengers, ensuring safety on board.

OBJECTIVE OF SYSTEM

- To improve overall passenger satisfaction by providing accurate and real-time information about bus locations, arrival times, and routes.
- To reduce wait times and enhance the convenience of public transportation, encouraging more people to use MSRTC services.
- To Provide passengers with real-time information about bus locations, estimated arrival times, and route details.
- To Enhance the overall experience of
- MSRTC passengers by reducing uncertainty and
- wait times.

LITERATURE SURVEY:

Authors "ManiniKumbhar, MeghanaSurvase, PratibhaMAvdhutSalunk" have implemented "Real Time Web Based Bus Tracking System" The proposed system reduces the waiting time of remote users for bus. A system is used to track the bus at any location at any time. All the current information is stored to the server and it is retrieved to remote users via web based application. This System is a web based system but nowadays people mostly tends to use Android apps since they are more portable and smart phones are used more widely in today's world. Also a web based system is inconvenient for a user to use on a regular basis while waiting for a bus at the bus stop.

Authors "M. A. Hannan, A. M.Mustapha,A.Hussain and H. Basri have implemented the system "Intelligent Bus Monitoring and Management System" The proposed system uses Artificial intelligence with the help of RFID module which is used in-order to reduce the manual work carried out in the Bau-Management & Monitoring System. In this a RFID is used to track a bus when it crosses the bus stop. Hence the exact location of the bus is not shown only an approximate location is shown based on the bus stops. In today's world. accuracy is very important and hence this was the limitation of this project.

Authors "Süleyman Eken, Ahmet Sayar have implemented" have implemented the system "A smart Bus Tracking System based on location aware service and QR code." In this paper, Bus tracking system, any passenger with Smartphone can scan QR code placed at bus stop to view estimated hus arrival times, current

location of the bus. The drawback in this project was that the user had to be physically present at the bus stop to scan the QR code

Authors "R.Maruthi, CJayakumari implemented the system "SMS based Bus Tracking System using Open Source Technologies." A bus tracker application to track a bus using GPS transceiver has been proposed in this paper. The objective of this work is to develop a system that manages and controls the transport using a tracking device to know the scheduled vehicle and the current location of the vehicle via SMS using a GPS tracking device.[4]

PROPOSED SYSTEM

- Driver can login into app by clicking Login button. After login he
- can able to start journey.
- Dashboard Module:
- After login driver can start journey by clicking START JOURNEY ,
- before that driver has to fill following details
- Bus Number (e.g. MH-12 bc 4012)
- Bus Rout Number (e.g. 72)
- Starting bus Stop (e.g. MANAPA)
- Destination bus Stop (e.g. Chinchwad)
- It wills continuously update status of bus to server (After every 1min).
- After start journey he can able to do following things

SYSTEM ARCHITECTURE

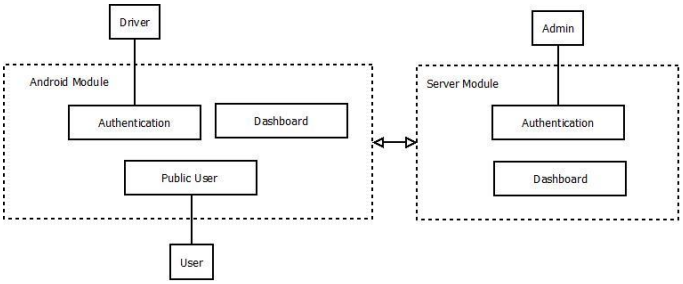

Fig -1: System Architecture Diagram

The Real-Time Bus Tracking and Passenger Information System for Maharashtra State Road Transport Corporation (MSRTC) aims to create a sophisticated and user-friendly solution that enhances the efficiency, accessibility, and safety of public transportation. The project encompasses the development and implementation of a comprehensive system providing real-time tracking of buses and dynamic passenger information services.

Real-Time Bus Tracking: Implementation of GPS hardware and software to track the real-time location of MSRTC buses. Integration of real-time tracking data with a centralized server for processing and analysis. Passenger Information Services: Development of user-friendly mobile applications (iOS and Android) and a responsive web interface for passengers to access real-time bus locations, arrival predictions, routes, and service updates. Integration of geolocation services to display bus routes and stops accurately on maps. Data Analysis and

Reporting: Implementation of data analytics tools to process historical and real-time data for route optimization, operational efficiency, and decision-making. Generation of reports and insights for MSRTC authorities to monitor system performance and passenger trends. Safety and Accessibility

Features: Implementation of real-time emergency response mechanisms, allowing immediate notification to authorities in case of accidents or security incidents. Inclusion of accessibility information, indicating buses with features like ramps and priority seating for passengers with specific needs.

ADVANTAGES

- Easy to used system

- Real-Time Bus Tracking and Passenger Information System

SYSTEM REQUIREMENTS

- **Software Used:**

1. Operating System: Windows XP and later versions Front End: HTML,CSS
2. Programming Language: Android and PHP
3. Tool: Netbeans IDE
4. Domain: Mobile
5. Algorithm: ML

- **Hardware Used:**

1. Processor – i3 or above
2. Hard Disk – 150 GB
3. Memory – 4GB RAM

ALGORITHMS

Timestamp x`: Current time as seconds in universal time.

◦ **nBits:** It is a target threshold of a valid block hash.

◦ **Nonce:** It is a 4-byte field, which starts with 0 and increases for every hash calculation.

◦ **Parent Block Hash**: 256-bit hash value that point to previous block.

CONCLUSION

The Real-Time Bus Tracking and Passenger Information System for Maharashtra State Road Transport Corporation (MSRTC) stands as a transformative solution in the realm of public transportation. By harnessing the power of advanced technology, this system not only addresses the challenges faced by commuters but also elevates the operational efficiency of MSRTC to new heights. In this project, technology and human-centric design converge to create a seamless, efficient, and reliable transportation system. The collaborative effort between technology developers, transport authorities, and commuters is pivotal in its success. As we move forward, the Real-Time Bus Tracking and Passenger Information System for MSRTC not only reshapes the present but also lays the foundation for a smarter, more connected, and passenger-friendly future in public transportation. It is a testament to innovation, efficiency, and the commitment to enhancing the lives of millions of commuters across Maharashtra

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