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Automatic Bus Ticketing System Based on Travelled Distance and SMS Alerting

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Abstract: ***The Automatic Bus Ticketing System Based on Travelled Distance and SMS Alerting is a revolutionary system developed to automate the conventional bus ticketing procedure. This system improves the ticketing process and improves passenger comfort and productivity through the implementation of modern technologies like GSM (Global System for Mobile Communications) and RFID (Radio-Frequency Identification). The long lines and cash transactions are avoided as a result of the project's replacement of manual ticketing methods. An RFID card with an established balance is provided to every traveler. The card is scanned while getting on and off the bus, and the price is automatically subtracted depending on how far you've gone. Real-time balance updates are provided by an LCD display, and the passenger also receives SMS alerts with transaction and remaining balance data.***

I. INTRODUCTION

Cities have been the beating heart of the nation’s growth. With scale and speed of expansion the cities are turning into smart city and this astonishes people and allows them to live in it in a secure fashion with cities assets. Public transportation is people’s primary mode and commuters travelling every day from one point to another loose lot of time and energy. This paper addresses the challenges the commuters face when travelling in public bus by allowing them to travel cashless. The system is set within the City standards and the results should allow everyone to travel safely, comfortably and with affordable price. The services are modernised with implementation of latest technology, RFID, the travelling depends on it and allows passengers to travel more freely. The credit transaction takes place at the end when the passenger reaches the destination and the system also allows the driver to have count on the number of passengers travelling. This project would be the attractive travel choice for everyone Mobility has become the essential part of human life. From the circumstances immemorial, everybody voyages either for sustenance or relaxation. A nearly related need is the vehicle of raw materials to an assembling unit or finished goods for utilization. Transportation assumes a noteworthy part in the improvement of the human development. For example, one could easily observe the solid relationship between the development of human settlement and the nearness of transport offices. Likewise, there is a solid connection between the nature of transport offices and way of life, on account of which society puts an awesome desire from the transportation facilities. As such, the answer for transportation issues must be diagnostically based, monetarily solid, socially sound, ecologically delicate, for all intents and purpose worthy and manageable. On the other hand, the transportation arrangement ought to be sheltered, quick, agreeable, advantageous, practical and eco-accommodating for commuters. In the silicon city Bangalore, the customary arrangement ofpublic transport is based on paper based that ultimately prompt turmoil among public,framework misfortune, corruption and above all the traffic jam which leads to huge wastage of time. What‟s more, having no administration expert to take control or keep an eye over the entire situation, the private divisions are making an imposing business model, taking controlover the general population transport and despotic bring up in transport reasonable. The ticketing system using RFID can be made implemented to take care of the overarching issues. Despite the fact that the GSM based framework can be planned, we propose the RFID based tickets for its minimal effort, simple activity, compactness, toughness, unwavering quality and being considerably more easy to use. Likewise the rapid RFID labels and detectors make the following arrangement of a running transport just an easy breezy. Public carrying RFID based electronic tickets will approach any transport administration of the city. The information will straightforwardly be exchanged to the server fundamental database and the proportional credit will be put away in the respective transport account.

A. Problem Statement

In India, a large portion of the population relies on buses for daily commutes, but the traditional bus ticketing system is inefficient, time-consuming, and prone to errors. Manual ticketing requires passengers to wait in long queues, leading to delays and inconvenience, especially during peak hours.

Additionally, the reliance on cash transactions introduces challenges related to handling change, potential fraud, and financial mismanagement. Students, who frequently travel by bus, face additional difficulties in managing their passes and renewing them manually. There is also a lack of real-time balance tracking and automated alerts, which further complicates the travel experience. Passengers are often unaware of their remaining balance until it's too low to board, causing delays and frustration. Given these challenges, there is a clear need for a modern, automated system that can streamline the ticketing process, reduce manual intervention

B. Objectives

1) Automated Ticket Generation – Eliminate manual ticketing and reduce human errors by automating the ticket generation process.
2) Distance-Based Fare Calculation – Automatically calculate fare based on the distance travelled by the passenger.
3) RFID Card Integration – Use RFID cards for cashless ticketing, replacing physical money with a digital wallet system.
4) Student Pass Facility – Provide RFID-based student passes with validity checks for free or discounted travel.
5) Balance Management and Alerts – Automatically deduct balance from RFID cards and send low-balance alerts via SMS.
6) SMS Notifications – Send real-time SMS updates on ticket generation, balance deductions, and pass validity.
7) Cashless Payments – Enable digital payments through RFID card recharges, promoting a cashless transaction system.

II. LITERATURE SURVEY

1) Paul Hamilton and Suresh Sankaranarayanan (2013)

Proposed in this paper consists of a RFID which is used for recording the timings of the buses and it is done with the help of sensors situated in the traffic stop lights, intersections and other places. This timings will be send to the person's mobile phone whose RFID is used for getting the bus timings and also the persons details is also stored in the RFID for future details

2) Arun Das .S .V and K. Lingeswaran (2014

Proposed in this paper consists of a smartcard which contains the information about the users and Global Positioning System (GPS) is used to track the locations, so that the distance can be calculated ad the amount is debited from the smart card.

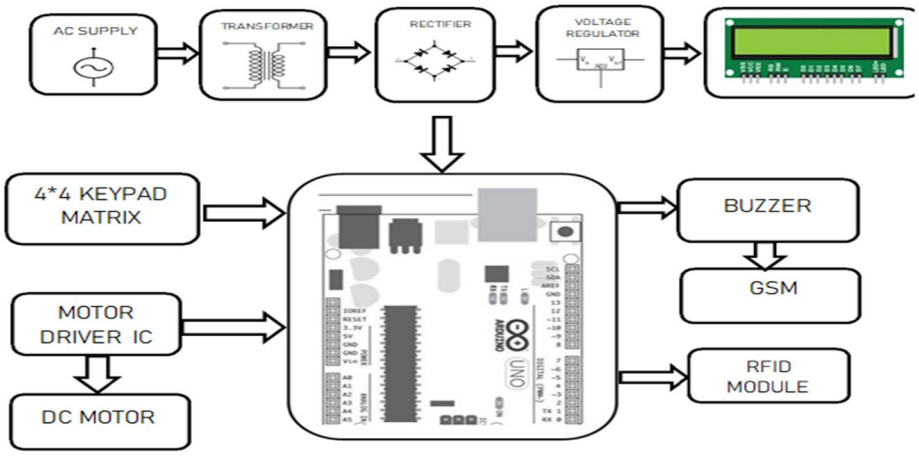
3) Paul Hamilton and Suresh Sankaranarayanan (2014)

Proposed in this paper consists of RFID,Global Positioning System (GPS) and LCD.The location of the buses are identified by the GPS and the arrival time of the buses are send to the bus stops where it is displayed using LCD's. The RFID is also used for tracking of the buses.

4) T. Manikandan, P.G. Kalaiyarasi, P.P. K. Priyadharshini, P. R. Priyanga (2015)

Proposed in this paper consist of slot sensors, GPS, Global System for Mobile Communication (GSM), RFID and microcontroller. The sensors are used for calculating the distance and counting the number of passengers travelling in the bus and the amount is debited from the RFID.The accident notification is also send to the nearest hospital with the help of GPS and GSM.The RFID can be recharged in a nearby bus depot or in other shops using a keypad and a LCD.

III. BLOCK DIAGRAM



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IV. WORKING

Power supply is used to supply purpose. It consist following parts .here transformer is used , they are capable of either increasing or decreasing the voltage and current levels of their supply, without modifying its frequency, or the amount of Electrical Power being transferred from one winding to another via the magnetic circuit. Output of transformer given to the input of rectifier. Bridge rectifier circuit is used here. it is a common part of the electronic power supplies. Many electronic circuits require rectified DC power supply for powering the various electronic basic components from available AC mains supply. A Bridge rectifier is an Alternating Current (AC) to Direct Current (DC) converter that rectifies mains AC input to DC output. A voltage regulator provides this constant DC output voltage and contains circuitry that continuously holds the output voltage at the design value regardless of changes in load current or input voltage. ARDUINO requires dc voltage supply. so output of power supply gives to the input of ARDUINO controller. This system uses buzzer . The ARDUINO controller controls all the system. The main program of the this system is written in arduino: programming language and which is created by C Programming Language. In this project we have used four different cards for the different users and here we use phone to received different SMS.

V. COMPONENTS USED

A. Hardware Requirement

1) ARDUINO UNO
2) RFID MODULE
3) GSM 900 MODULE
4) 4X4 KEYPAD MATRIX
5) LCD DISPLAY
6) MOTOR DRIVER IC
7) DC MOTOR
8) BUZZER
9) TRANSFORMER 10.BRIDGE RECTIFIER

B. Software Requirement

1) PROTEOUS
2) BLUETOOTH CONTROLLER 3. ARDUINO ID
3) EAGLE

VI. CONCLUSION

The Automatic Bus Ticketing System Based on Travelled Distance and SMS Alerting represents a significant advancement in modernizing public transportation. By integrating RFID technology, GSM modules, and automated fare calculations, this system streamlines the ticketing process, eliminates manual errors, and promotes cashless transactions. Passengers benefit from a faster, more efficient boarding experience, enhanced transparency through real-time notifications, and the convenience of managing their travel expenses digitally. The inclusion of a student pass facility further adds to its social value, ensuring accessibility for students. This project not only improves operational efficiency but also aligns with the vision of smarter, more sustainable urban transport systems, paving the way for enhanced commuter satisfaction and modernized public transit solutions.

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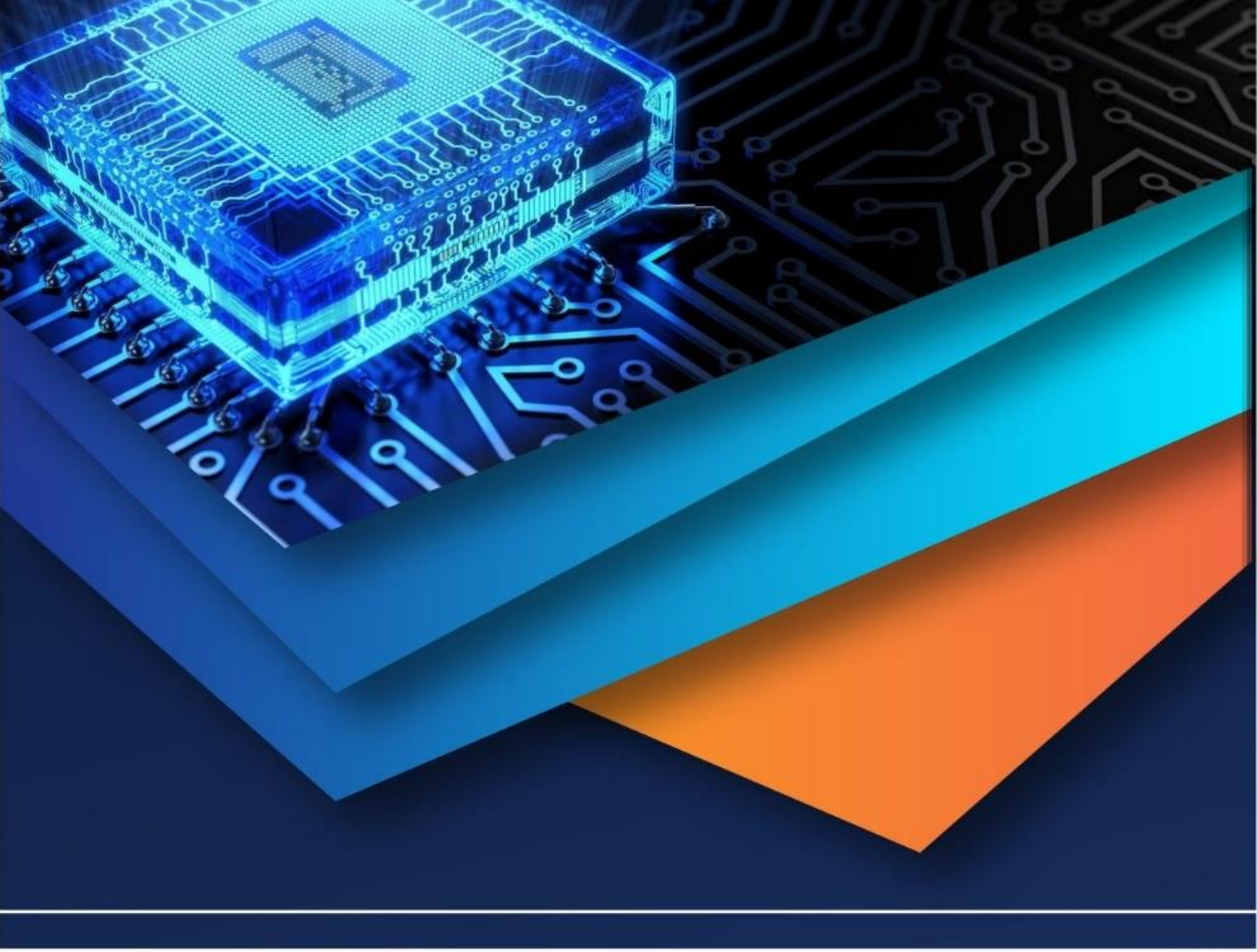

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