# Embedded System Based Automatic Ticket Vending Machine for Modern Transport System

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**Abstract**:     This research paper is based on the concept of automatic ticket vending machine by using RFID and Zigbee technique. In order to ensure the passenAger journey with no quarrels and mesh we employ this ticket friend solution that replaces the traditional paper ticketing by RFID tickets and vouchers, vended through automated machine using smart cards, which improves the convenience and security of transaction. Ticket friend solution through automated machine enables the passenger to predetermine the transport details.  In this automated system we replace the traditional ticket system by smart card that contains all details of the user including bank account information. which is similar to the atm card. This automatic ticket vending machine consists of display which shows the availability of buses for all destinations. The person can find out the destination place by pressing the buttons available on that machine with the help of zigbee. If the location is selected then the availability of buses along with the time is displayed. If the people confirm to go in certain bus, by using smart card the person can receive the tickets employing RFID technique and by showing the ticket in front of the bus the door opens automatically and after some predetermined seconds it gets closed. If the person is supposed to consume alcohol that is detected with the help of alcohol sensor and that person is not permitted inside the bus.Voice GPS is placed Inside the bus and the display shows the route map. For that PIC microcontroller is already pre-programmed to do the operations. By using this we can minimize manpower in buses and ticket counters, predetermining of the bus can be done to find the destination exactly, safe journey can be assured without any disturbance and systembased booking for easy usage. Voice talking GPS proposed in the transport make the passenger to identify their departing location.

**Keywords**: PIC microcontroller, RFID reader, Zigbee, GPS and alcohol sensor.

## I. INTRODUCTION

Ticket friend solution mainly proposed to overcome the tricky problems in traditional ticketing method like transferring tickets from one person to another, sharing of tickets, to avoid confrontation i.e. mesh between the supervisors and passengers and safer handling of data. This system introduce RFID technology which entirely eliminates the need of paper tickets. Ticket friendly machine holds the details about the events provided by promoters,so that consumer can purchase tickets in their personal account using smartcards, Time and money are precious every time we strive to find best way to avoid issues likewise. when it come to travel by the bus without carrying change, this proposed technique need only one identification card.[2]

        In transportation, smart cards would become the next fare payment media replacing or supplementing cash, tokens and passes. Smart cards or touch and go cards is a chip card that contains an embedded computerized chip which is either a memory or microprocessor that stores and transfer data which improves the convenience and security of any transaction and provides proof storage of user and a account identity. Once if the passenger insert the smart card to ticket friend machine the RFID reader in smart card contains pay mode terms, which check for the amount in the account. This payment system automatically recharges all pre-issued card with the amount preferred by the authorized person  and  also when the person used to scan the card. After receiving  details from RFID, Zigbee transmits the data of transport facilities through huge display. Zigbee is often used to transmit data over long distance by passing data through intermediate devices which provides a secure network process.

        Real time bus information system (RTBIS) may also employed  in this system that uses satellite technology to predict the time of bus which will arrive at a stop. RTBI

can be get from electronic displays at bus station and stops. The data's related to bus routes along with bus fares and seats available in the bus will be displayed on the display of the machine make the passenger to choose or book the tickets with more care. After booking the tickets, through GSM the data related to passenger booking will be received by the GSM existing in the bus that ensures the bus operator to get the details about passengers location. Simultaneously after the data is selected by the passenger, RFID reader prints the security code on the smart card. This card again become a gateway to enter into the bus, provided with smart sensing element. Once the code made by RFID is sensed then the door gets opened automatically. Here the counter is employed to count the seats entering into the bus along with this alcoholic sensing system is provided to ensure safer journey. Once the destination place is reached, that is intimated to the passenger through voice command from GPS system provided in the bus. One of the benefits of portable navigation system is voice guided directions and if we get into the bus GPS that has text to speech functionality, meaning the system will speak actual street names that may be useful to uneducated and blind peoples even better. [3]Having the audible prompts is not only helpful but also gives a nice safety feature. Since it allows us to spend more time looking at road instead of down at a paper map or screen and also this voice command with this capability, we can perform certain tasks with the sound of our voice for e.g.. we can dictate address, find points of interest and navigate home. RIBI and transit tracker gives real time arrival information for buses and trains so we have better idea when our destination is coming. It estimates when the next vehicle will arrive based on its scheduled speed and last reported location.[5] [11]

## II. LITERATURE SURVEY

Ben Ammar Hatem, *et al*[1] the paper titled as" Bus Management System Using RFID In WSN" which describes a novel approach to integrate RFID (Radio Frequency IDentification) in WSN (Wireless sensor network). WSN is used to support RFID identification process by extending the read range of an RFID system. Besides, by the use of the WSN we can monitor the environment of an object and optimize RFID reader's performance and energy. Then methodology to integrate RFID technology, wireless sensor network to form an intelligent bus tracking application is studied. The proposed system can monitor bus traffic inside spacious bus stations, and can inform administrators whether the bus is arriving on time, early or late. This information is then displayed on the different wireless displays inside and outside the bus station.

Md. Foisal Mahedi Hasan, *et al* [2]the paper titled as" RFID-based Ticketing for Public Transport System: Perspective Mega city Dhaka",which portrays about thepublic transport ticketing system, prevailing in the megacity Dhaka (Bangladesh),introduces severe malfunction in the system, malicious argument among public, corruption and most of all traffic jam. This paper actually suggests a much more public friendly, automated system of ticketing as well as the credit transaction with the use of RFID based tickets. The total system mainly acts to bring out the consistency among various bus agencies that will conclude in uniform access of passengers in daily rides through an automated server being updated every single time the passengers travel by carrying the RFID based tickets.

Ameer H. Morad,*et al* [3] the paper is titled as" GPS Talking For Blind People",In this paper, a device is designed to help the blind people to navigate the environment without asking any one.The device based on GPS (Global Positioning System), the raw data for location coordinate where the blind people stands is detected by GPS receiver, processing these data by PIC microcontroller to calculate real coordinate related with current position, then translate it to specific voice message which are presorted in voice recorder and the blind person hears voicemessage through the headset. Our design aims are to produce device that is more cheap by using little number of components and easy to use so that the blind person need not to do any thing just hearing the voice message. The device be practically tested by some blind people who are members of Abdallah Bin Maktoom blinds school in Jordan, they gives good opinion about device.

Dhruba Ningombam, *et al [4] the paper is titled as* " An Intelligent Voice Enabled Distance to Empty and Navigation System",which describes about the Recent years have witnessed a fast growth in automobile sector, leading to increased urge for an intelligent man machine interaction system for navigation. This paperdescribes the development and implementation of an intelligent speech agent based navigation system and distance to empty (DTE) calculation for autonomous land vehicle applications. This system, initially determines the current location using GlobalPositioning System (GPS). The GPS outputsNMEA (National Marine Electronics Association)sentence thatcontains information about current locationincluding longitude and latitude. The input to the system i.e.the desired destination is through voice command and outputs the following-(i) the road distance and the amount of fuel required, through speech, (ii)the altitude difference between the current location and the destination, which is further used to calculate the mileage variation with altitude and (iii) displays the route from the current location to the destination on a map along with the prediction whether the user will be able to reach the desired destination with fuel left in the automobile, how much distance it can travel with the remaining fuel and how much additional fuel is required to be filled up to reach the destination.
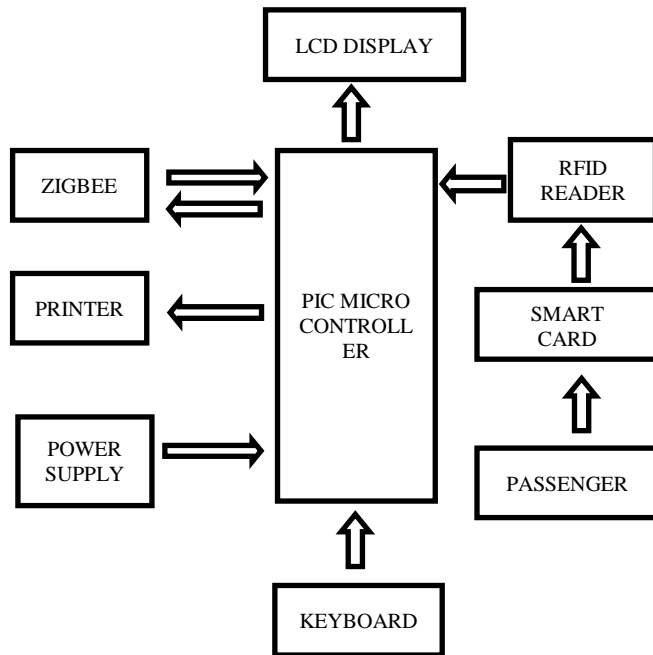
## III. HARDWARE DISCRIPTION

authorized person once when user scans his smartcard. Further it transfer the data to GSM which transfers the data to the promoters account. The entire system is controlled by PIC microcontroller.
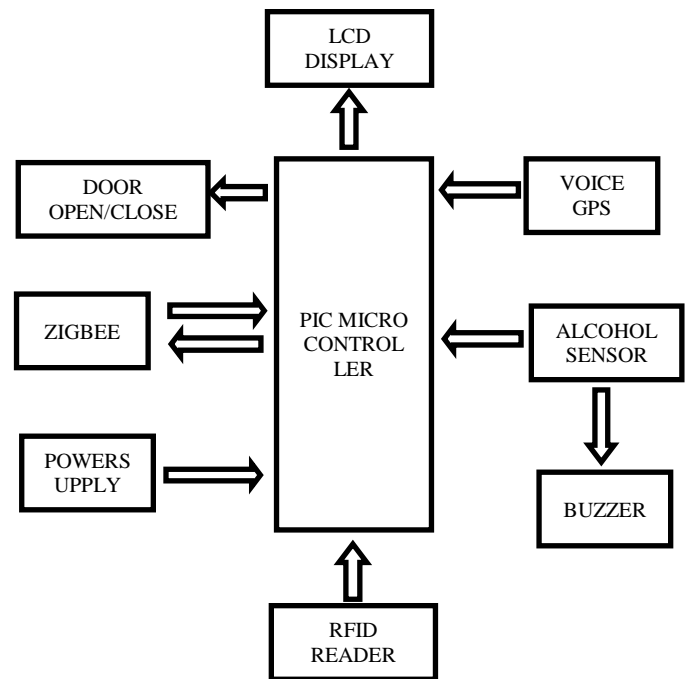


Fig.1. Block diagram for automatic ticket vending machine



Fig.2. Block diagram for Door open and Closing using RFID

Ticket friend mechanism employed in automatic ticket vending machine consists of smart card RFID reader, PIC microcontroller, ZIGBEE, GSM. This mechanism is utilized in bus stand or bus stops. Ticket friendly machine holds the details about the events provided by the promoters so that the consumers can purchase tickets in their personal account using smart cards. It is a type of chip or plastic card (an embedded computerized chip either a memory or microprocessor) that stores or transacts data which improve the convenience and security of any transaction. It also holds the user account identity. Once if the passenger inserts the smart card to the ticket friendly machine the RFID reader reads the user account. This happens only after the destination place is chosen by the passengers through the huge display. ZIGBEE transmits the data related to transport arrival at that instant of inserting smart cards. It also transfers the data and display it. ZIGBEE has a role mainly in the interconnection of wireless sensor with vehicles and infrastructure. Here the embedded middleware is used in mobility applications. It consists of real time bus information system which uses satellite technology to predict the time of bus arrives at a stop. RTBI can be obtained from electronic displays at bus station and stops. After this RFID reader in smartcard pay mode transfers to the bank. This payment system recharges all pre issued card with preferred by the

This above system is utilized in bus that consists of alcoholic sensor, voice talking GPS, ZIGBEE, GSM, display and PIC microcontroller. ZIGBEE plays a role of receiving the data which helps the driver to identify the location where the passengers preferred. Once the transport reaches the exact location with the help of smartcard(touch and go card) we can enter into the bus. We also implemented alcoholic sensor for safety purpose. If the passengers suppose to have any alcoholic consumption automatic door present in the bus will not get open. ZIGBEE in the ticket friendly machine transfers the data to the GSM related to the location booked by the passengers. GPS receives the signal from GSM and if the particular location is reached or crossed by the transport then through voice talking GPS the passengers can identify their destination place. The display present in the bus displays the name of the location they are in.

## IV.CONCLUSION

RFID reader integrated with WSN will benefit from communications and sensing capabilities. The mix of promoting this technology has been explored in this article to provide a smart solution, managing the bus schedule in the bus stations and offering helpful information to passengers. It is believed that by implementation of these

system problems such as underutilization of buses fleet and long waiting time at bus station will be reduced. So both passenger and bus station administrators will benefit from the system as Real time information are provided. An intelligent voice enabled GPS can easily and successfully accept the destination through voice command and determine the current location and destination. By implementing this modern transport system in actual practice, due to less manpower requirements, government can not only gain more benefits. But also, we can bring our national transport system towards global standards.

## ACKNOWLEDGMENT

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