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Automatic Ticket Vendor Using Smartcard

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ABSTRACT
The Smart Card based ticketing module which swaps the card to the smart hand held device for the transaction purpose. The smart ticketing device will automatically deduce the amount for the travel from the smart card account. The same smart card can also be used for shopping purpose to pay bill for the purchase purpose. Every time the user makes use of the smart card for doing any transaction then the usage details of the smartcard will be send to the user via SMS using the GSM Modem. Once the smart card run out of money then the user can recharge it accordingly so that they can make use of the amount for further transaction purpose.
Keywords : GSM, IR sensor, PIC microcontroller, smartcard

I. INTRODUCTION

This research paper is based on the concept of automatic ticket vending machine by using RFID and Zigbee technique. In order to ensure the passenger 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. This is similar to the ATM card. This automatic ticket vending machine consists of display which shows the availability of buses for all destinations. 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. 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 system based booking for easy usage. Voice talking GPS proposed in the transport make the passenger to identify their departing location.

[1].Ammar Hatem, *et al* 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 Ben 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.

[2]. Md. Foisal Mahedi Hasan, *et al,* the paper titled as" RFID-based Ticketing for Public Transport System: Perspective Mega city Dhaka", which portrays about the public 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.

[3] Ameer H. Morad,*et al* 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 anyone. The device based on GPS (Global Positioning System), the raw data for location coordinate where
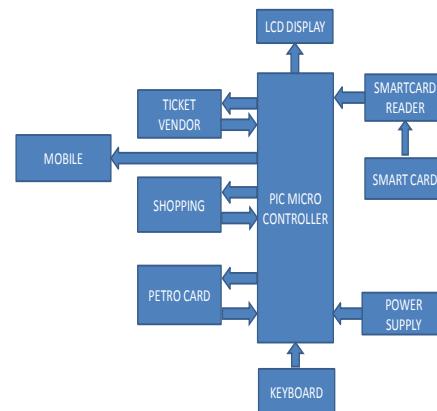
the blind people stands is detected by GPS receiver, processing these data by PIC microcontroller to calculate real coordinate related with current position, then translate it to specific voice message which are presorted in voice recorder and the blind person hears voice message through the headset. 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 anything 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.

[4].Dhruba Ningombam, *et al, 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 paper describes 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 Global Positioning System (GPS). The GPS outputs MEA (National Marine Electronics Association) sentence that contains information about current location including 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.

II.   TICKETING SYSTEM:

 RF (Radio Frequency) communication occurs by the transference of data over electromagnetic waves. By generating a specific electromagnetic wave at the source, its effect can be noticed at the receiver far from the source, which then identifies it and thus the information. Initially RFID tag read by RFID reader, so EM waves is in contact and distance calculation is powered automatically amount is reduced when EM waves get uncontact. GPS module has many configurations. For each configuration it will transmit different data such as time, date, latitude position, longitude position, velocity etc. Here it is enough to extract time and date for ticketing. Smart card should have enough memory space for storing the passenger details.LCD display is used display the available amount in RFID tag passenger, who is travelling.

2.2. Block Diagram

(Fig.1 automatic ticket vendor using smartcard)

2.3 Blok Diagram Disription
2.3.1. Microcontroller PIC16F877A

PIC 16F877 is a 40-pin 8-Bit CMOS FLASH Microcontroller from Microchip. The core architecture is high-performance RISC CPU with only 35 single word1 instructions. Since it follows the RISC architecture, all single cycle instructions take only one instruction cycle except for program branches which take two cycles. 16F877 comes with 3 operating speeds with 4, 8, or 20 MHz clock input. Since each instruction cycle takes four operating clock cycles, each instruction takes 0.2 micro seconds when 20MHz oscillator is used.

It has two types of internal memories: program memory and data memory. Program memory is provided by 8K words (or 8K*14 bits) of FLASH Memory, and data memory has two sources. One type of data memory is a 368-byte RAM (random access memory) and the other is 256-byte EEPROM (Electrically erasable programmable ROM). The core feature includes interrupt capability up to 14 sources, power saving SLEEP mode, and single 5V In-Circuit Serial Programming (ICSP) capability. The sink/source current, which indicates a driving power from I/O port, is high with 25mA. Power consumption is less than 2mA in 5V operating condition.

2.3.1. GSM:

GSM networks operate in a number of different frequency ranges (separated into *31T*GSM frequency ranges*31T* for 2G and *31T*UMTS frequency bands*31T* for 3G). Most *31T*2G*31T* GSM networks operate in the 900 MHz or 1800 MHz bands. GSM-900 uses 890–915 MHz to send information from the *31T*mobile station*31T* to the *31T*base station*31T* (uplink

2.3.2. Smartcard system:

Smartcard is wirelessly, using radio waves. In an smartcard system, the Smartcard tag which contains the tagged data of the object generates a signal containing the respective information which is read by the RFID reader, which then may pass this information to a processor for processing the obtained information for that particular application. An RFID reader consists of an antenna, transceiver and decoder, which sends periodic signals to inquire about any tag in vicinity. On receiving any signal from a tag it passes on that information to the data processor. These tags can be either active or passive. While the active tags have on chip power, passive tags use the power induced by the magnetic field of the RFID reader. Thus passive tags are cheaper but with lower range (<10mts) and more sensitive to regulatory and environmental constraints, as compared to active tags.

2.3.3. Transmitter and Receiver:

In IR transmitter and receiver, IR transmitter is nothing but one type of LED, generally called IR Transmitter. Initially IR transmitter and receiver is placed straight to each other, so the transmitted IR ray are received by IR receiver. But when passenger crosses the IR transmitter and receiver, the rays received will be interrupted. This infrared transmitter and receiver is called as IR TX-RX pair and cost less than 10RS.

2.3.5. Liquid crystal display (LCD):

Liquid crystal displays (LCD's) have materials, which combine the properties of both liquids and crystals. These modules can be interfaced with a 4-bit or 8-bit microprocessor /Micro controller. The LCDs used exclusively in watches, calculators and measuring instruments are the simple seven-segment displays.

III.   CONCLUSION

By implementing this project as real time project, many disadvantage in ticketing system is rectified and the implementation of advanced system as automatic ticket vendor. Fare is debited from RFID tag where tag is rechargeable one. But, this Process can made better by implementing the rechargeable RFID tag as ATM card (or) debit card just by changing the program. So bus fare will directly debit amount from bank.

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