Automatic Bus Ticketing System Based On Travelled Distance Using GPS and GSM

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Abstract— The present paper deals with advanced public transport system. A conventional bus fare system is one that requires urgent up gradation and the system has to be convenient for both the passengers and the bus personals. It proposes to have a smart card reader at the predefined entry and exit of the buses and the passengers are given smart cards. The passengers can pay the amount at a predefined place anytime and his card can be recharged depending upon the amount paid. A passenger is allowed inside after he inserts the card at the entry point and also there is a sufficient minimum balance at his card. Immediately the system notifies the passenger number from the card and makes a data entry. Further there is a GPS that keeps track of the distance traveled by the bus. This system gives data to the exit microcontroller that houses a smart card reader. At the exit point it reads the data from the smart card reader and the amount is deducted depending upon the distance traveled by the passenger. At the same time text message regarding travelled distance and total fare deducted is send to passenger through GSM module.

Key words: GPS, GSM, RFID tag and reader, Distance travelled

I. INTRODUCTION

Modern Gadgets, now-a-days, finds extensive use in our day to day life. These gadgets simplifies a task, helps to perform a job with less time and resources. Further they avoid manual errors and some even prevent people from committing them. In the megacity Pune, the conventional system of public transport is based on paper based bus or railway tickets that ultimately we have a severe malfunction of public transport and various security problems. Firstly, there is a lot of confusion between the passengers regarding fares which lead to corruption. Again having no government authority to take control or keep an eye over the whole scenario, the private sectors are creating a monopoly, taking control over the public transport and autocratic raise in bus fare. Another problematic issue in Transport Company is to employ one or two personnel for this purpose. They have to knock everybody for this purpose. It is very common practice for few people to travel without ticket or do not give proper fare. Sometimes there is a rough argument during the journey regarding fare. Also bus personnel have to monitor whether a person has purchased ticket or not.

To overcome this problem, RFID technology along with GPS system can be implemented in our project, “Automatic Bus Ticketing System Based on Travelled Distance Using GPS and GSM”. By using this automated system will save time, have a higher authoritative inspection and reduce chaos and this could be only possible by use of RFID tickets and GPS can be used to make the transaction and travelling very precise.

II. EXISTING SYSTEM

Now a day we use paper tickets for public transport which is ejected from a handy machine. This machine is interfaced with a keypad and the tickets are rolled inside it. When the destination is selected via keypad corresponding details are printed on the ticket using handy machine and then ejected out. This whole process needs manpower Major headings are to be column centered in a bold font without underline. They need be numbered. "2. Headings and Footnotes" at the top of this paragraph is a major heading.

A. Limitations

There are some disadvantages in the existing system. They are the passenger details are not known and for unusual passengers the destination points are unknown, knowing the details of the passenger is important in the case of any public issues then, the need of manpower that is every time when a passenger travels through the public transport a person is needed to issue the ticket. Frequent passengers know the actual destination but infrequent passengers do not know the actual destination where they must reach so they need a device which intimates their location.

So the above mentioned disadvantages are overcome by our proposed system.

III. PROPOSED SYSTEM

The paper aims in representing a system which automatically measures the distance travelled by a passenger in bus and debits the fare for travelled distance from the passenger account. This method of ticket fare collection is most innovative way till now.

It proposes to have a smart card reader at the predefined entry and exit of the buses and the passengers are given smart cards. A passenger is allowed inside after he inserts the card at the entry point and also there is a sufficient minimum balance at his card. Immediately the system notifies the passenger number from the card and makes a data entry. This helps in calculating the actual travelled distance and avoids the dependency on vehicle’s inbuilt distance meter.

This system gives data to the exit controller that houses a smart card reader. At the exit point it reads the data from the smart card reader and the amount is deducted depending upon the distance traveled by the passenger. The system can be placed at door and that can be in front of the driver or can have an assistant to just look if the cards are inserted properly and the passengers are following the rules.
IV. BLOCK DIAGRAM

![Block Diagram of Proposed System]

Fig. 1: Block diagram of proposed system

A. Description

1) Atmega328 Microcontroller

The controlling device of the whole system is a Atmega328 controller. ATmega328/P is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega328/P achieves throughputs close to 1MIPS per MHz. This empowers system designer to optimize the device for power consumption versus processing speed.

2) GPS

The Global Positioning System is a space age navigational system that can pinpoint your position anywhere on the globe. Automobile manufacturers are also offering moving-map displays guided by GPS receivers as an option on new vehicles, for use in planning a trip. GPS receiver received vehicle position latitude and longitude from satellite through GPS antenna. GPS receiver is interfaced with the controller.

3) GSM

GSM module is used to establish communication between a computer and a GSM system. Global System for Mobile communication (GSM) is an architecture used for mobile communication in most of the countries. GSM module consists of a power supply circuit and communication interfaces (like RS-232, USB, etc) for computer. The MODEM is the soul of such modules.

4) RFID System

Radio frequency identification (RFID) is wirelessly, using radio waves. In an RFID system, the RFID 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.

5) Liquid Crystal Display (LCD)

Liquid crystal displays (LCD’s) have materials, which combine the properties of both liquids and crystals. The LCDs used exclusively in watches, calculators and measuring instruments are the simple seven-segment displays. Parallel interface is done between LCD’s eight data pins and controller port pins. Two control pins of LCD are separately connected to the controller.

6) BUZZER

A buzzer or beeper is a signaling device, usually electronic, typically used in automobiles, household appliances such as a microwave oven, or game shows.

V. CONCLUSIONS

This project may rectify many disadvantages in ticket collecting system and the implementation of sending text message regarding travelled distance and total amount deducted. Fare is debited from the recharged amount. Cash is no longer necessary, contactless smart cards can be loaded with large amounts of money, passengers no longer need to carry the correct change. It will make the passenger comfortable to travel with this user-friendly system. But, this Process can made better by implementing the rechargeable RFID tag as ATM card (or) debit card just by changing the program. So, will directly debit amount from bank. Automated fare collection system for public transport using GPS is an innovative idea which reduces man power.

REFERENCES


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