

Automation in Ticketing system for a Modern Transport

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Abstract - In today's scenario, the ticketing system is more sophisticated. It has many demerits. People are waiting in long queues for getting tickets especially in public mode of transportation. This leads to inessential wastage of time and energy. This paper presents an automated system for ticketing in the Public Transport System (PTS) that relies on passenger identification. This is a user friendly system, which will automatically identify the passenger and debits the passenger's fare according to the distance travelled. The Radio Frequency Identification (RFID) cards are used to make the identification of passenger and GPS is used to calculate the distance travelled and to make the transaction very precise. The cards being reusable and rechargeable, they are much more convenient as compared to the paper based ticketing system. This method of ticket fare collection is most innovative way till now.

Key Words: RFID Reader, RFID Card, GPS, LCD Display, Modern Transport

1. INTRODUCTION

Public Transport System (PTS) remains the main supply of financial gain in most of the developing countries like India. But PTS now faces severe malfunction and various security issues. First, there is a lot of confusion between the passengers regarding fares which lead to confrontation. Additionally to the current, these days there is a severe security crisis in PTS due to delinquent components. The user friendly automated ticketing system suggested in this paper will won't solely deduct the passenger's fare in step with the space traveled however conjointly sight the passenger's identification. This is often attainable by use of RFID cards and GPS, and can be used to make the transaction and travelling very precise.

1.1 PROPOSED METHODOLOGY

GPS is the latest technology utilized in various fields such as navigation, tracking and also in some of surveillance application. Here we are progressing to use this GPS to calculate the distance travelled by the passenger. GPS module can be configured to generate the latitude and longitude of the current position of the vehicle. The position of the vehicle can be monitored continuously using this GPS module.

RFID cards can provide identification, authentication, data storage and application processing. These RFID cards can be used as passenger identifications. Every passenger carries a card. This card has the information such as user identification number and accessible balance. These RFID cards are capable of the recharging, so that the passenger can use it again and again.

Combining GPS technology and RFID cards we can design a complete automated ticketing system. A microcontroller is used to control the entire system. GPS and RFID card reader are interfaced with the microcontroller. It can be further connected with liquid crystal display for user interface. Every time when the passenger enters the vehicle he needs to sweep his card in the RFID card reader. The card has a unique identification number and balance details.

2. HARDWARE DESCRIPTION

The controlling device of the whole system is a Microcontroller. GPS receiver, RFID card and card reader, LCD display are interfaced to the controller.

A. MICRO CONTROLLER

The ATmega16A being a low-power CMOS 8-bit microcontroller is based on the AVR enhanced RISC architecture. The ATmega16A achieves throughputs approaching 1 MIPS per MHz permitting the system designer to optimize power consumption versus process speed, by executing powerful instructions in a single clock cycle.

B. GPS

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

C. RFID SYSTEM

Radio frequency identification (RFID) uses radio waves wirelessly. In an RFID system, the RFID reader reads the RFID tag which contains the tagged data of the object. The RFID tag generates a signal containing the respective information which is read by the RFID reader, which in turn may pass this information to a processor for processing the obtained information for that particular application. An RFID reader consists of an antenna, a transceiver and a decoder, which sends periodic signals to inquire about any tag in vicinity. On receiving any signal from a tag the reader passes on that information to the data processor.



D. LCD

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

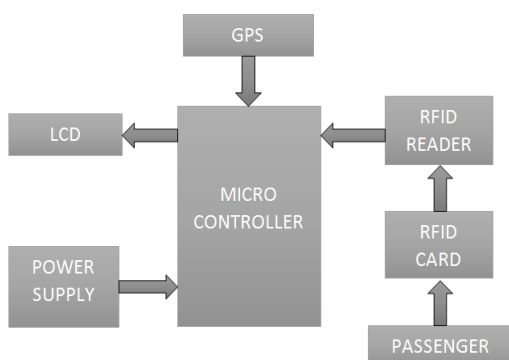


Fig -1: Block Diagram of Proposed System

3. WORKING PRINCIPLE

When an individual boards the vehicle, he needs to swipe the RFID card to the RFID card reader present at the entrance of the vehicle. When the tag is placed before the reader attached to the bus, the tag will get energized revealing relevant information to the reader. The reader will accept the card if the card has required credit to travel that distance. The data acquired by the reader will be stored in its internal memory. The location coordinates i.e, latitude and longitude at that instant given by GPS receiver will be stored against his RFID card number in the microcontroller. When he exits the bus, he need one more swipe of RFID card which gets the location coordinates of exit point and the microcontroller calculates the distance travelled. According to the route distance between departure & destination, the fare will be deducted from the RFID tag. The cost can be deducted according to the distance travelled by the public transport vehicle. The travelled distance and the fare will be displayed on the LCD screen. Also, the amount will be deducted from the passenger account.

4. CONCLUSIONS

The system is totally automatic so it reduces the human efforts. The cards being reusable, they are rather more convenient compared to the paper based ticketing system. With the use of GPS technology, the travelling and transaction becomes very precise. Any unwanted events can be avoided as all the person carrying RFID tickets are monitored every time they travel.

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