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EASY GO "Automated Fare Collection System"

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Abstract:-The paper presents a comfort tension free and easy way of travelling. For this we are introducing an automated fare collection system which involves the combined usage of smart cards and GPS technology. This helps to reduce manpower in the field of public transportation. The smart card can be used for entering and leaving the bus. Public transportation poses a higher risk of safety and security since there happen to be more passengers in a single bus. As a developing country, the problem becomes worse in India because of the lack of suitable and integrated approaches. So here the buses will be fitted with panic button alarms in an effort to protect women from sexual violence on public transport. For ensuring the safety of the public, the moving pedestrian is detected using image processing. There is a separate stop announcement system which alerts the passengers prior to next halt.

Keywords:-Index Terms Radio-frequency identification (RFID), Global Positioning System (GPS), Public Transport System(PTS), Programmable interface controller(PIC).

I. INTRODUCTION

India's growing economy has witnessed a rise in demand for transport infrastructure and contributes 6.4% to the GDP of the country. In Indian cities buses take up over 90% of public transport and serve as an important mode of transport. From a social perspective, public transport is the only means of transport for the poor, it also provides greater access to education, health care and recreation. The rising levels of congestion and pollution found in most of the cities can be attributed directly to the rapidly increasing number of private cars in use. To reduce this existing lifestyles in our cities, attempts must be made to inspire people to bring down the usage their private cars and public transportation more.

Convenience is the next advantage most buses run on a set schedule that you can expect your commuting time around. You do not require any longer roaming throughout for parking or sitting in traffic. You just simply get off the bus when you arrived at your destination. Some people may say that buses take longer than driving, but if you consider that driving is a kind of wasting of time, then, you should better spend reading or relaxing while leaving the process of driving to someone else. Public transport can preserve the environment. Also public transportation has good accessibility in big cities. The use of public transportation could thus save both money and time lost in traffic jams.

Some conventional ticketing systems presently under use are the ticket, which could be a token, a paper ticket or online bus ticketing. Faulty planning of transport systems is a major cause of its relatively poor public transportation. In this paper we are implementing a model which can overcome the drawbacks in current scenario by a suitable and integrated approach.

The rest of the paper is organized in to six sections. Section II is problem definition. Section III is existing system. Section IV is proposed model. Section V is system architecture. Section VI is result and conclusion.

II. PROBLEM DEFINITION

The present conventional method of ticketing is monotonous. Since the volume of passengers is very high, manual ticket buying concept involves a lot of time, wastage of paper and manpower. This system is highly unsuitable in the case of safety and security when there is a huge rush of passengers. And also women safety in public transport is one of the key challenges across the globe. Lack of safe reliable and accessible transportation is critical for women

because it affects their access to work, education and opportunities. Accidents involving public transit vehicles like a bus can cause serious injury to multiple passengers. If you are injured while using public transportation, you face special legal issues when pursuing a personal injury lawsuit. When bus reaches a station, it's a big problem for many passengers to know the destination.

III. EXISTING SYSTEM

At the present stage we are using paper tickets for public transportation which is ejected from a handy machine. This machine is interfaced with a keypad and has tickets rolled inside in it. When a destination is selected ,corresponding details are printed on the ticket and then ejected out. This whole process needs manpower. There are three main disadvantages in the existing system. One of the major drawbacks is cash transaction which ultimately creates many other problems like availability of change. Another problem with the present system is no track of customer information is maintained, thus for a more populated country like India it becomes an issue of major insecurity. There is no provision for the passengers to know about the destination.

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IV. PROPOSED MODEL

To obviate the limitations of the conventional ticketing system an automated fare collection (AFC) system methodology is proposed. All the passengers are provided with smart card. The smart card is rechargeable and this can be used in two ways; the first one is by entering the destination, in this the user can directly enter the desired destination. Secondly the user can swipe the card while entering and leaving the bus. Depending on the distance travelled, the money will be deducted from the card. Smart cards are capable of providing the authentication, identification, application processing and data storage. These smart card can be used for the passenger identifications. Every passenger carries a smart card. The smart card has the information such as user identification number, available balance and status register .These smart cards should be capable of recharging, so that the passenger can use it again and again. Combining GPS technology and smart cards we can design a complete bus ticketing system. An automatic bus-stop announcement system is also provided which works on GPS technology. It has a very clear display and the sound redirected by it is of fine quality. Buses will be fitted with panic button alarms in an effort to protect women from sexual violence on public transport. The buttons will be placed in every specified places and when pressed, send an emergency alert to the control room at a local police station. The buses will be slow down when approaching pedestrian crossing until he has become aware that he may do so without endangering the safety of persons. A microcontroller is used to control the entire system. GPS and smart card reader are interfaced with the microcontroller. It can be further connected with liquid crystal display and key board for interface.

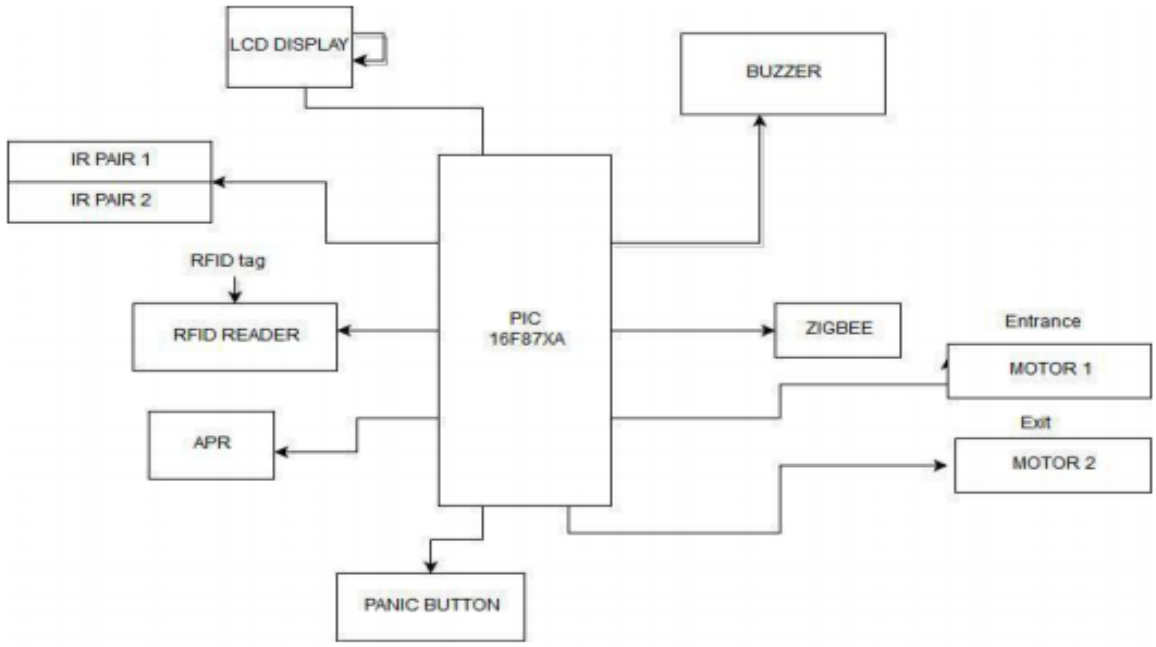

Fig1:- Block diagram

V. SYSTEM ARCHITECTURE

The major constituents of this Automated fare collection system are:

- Microcontroller-PIC16F87XA Comparator-LM358
- IR pair-IR LED, PHOTO DIODE
- Motor Driver-1293D
- DC Motor
- Zigbee
- LCD Display
- RFID Reader
- APR

A. Fare Deduction

Every time the unit is switched on, it will give a welcome note with mode selection. Then the user has to swipe his/her smart card. The modes are selected via keypad interfaced. Either the user can directly enter the destination or he/she can swipe the smart card while entering and leaving the bus.

- When he/she enters the destination the already saved kilometers are identified and accordingly money will be deducted. When smart card is swiped while entering
- and leaving the bus, the distance is calculated using GPS and money will get deducted.

B. Stop Announcement

An automatic bus stop announcement system is also provided which works on GPS technology. It has a very clear display

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and sound redirected by, it is of fine quality. This is implemented using APR module connected to PIC.

C. Ensuring Security

Bus will be fitted with panic button alarms in an effort to protect women from sexual violence on public transport. The buttons will be placed in every specified places and when pressed, send an emergency alert to the control room at local police station. Not only women, in dangerous situation anybody can press the panic key and make aware the authorities about emergency.

D. Pedestrian Detection

Moving pedestrian is detected using image processing. The bus will slow down when approaching pedestrian crossing until he has become aware that he/she is safe.

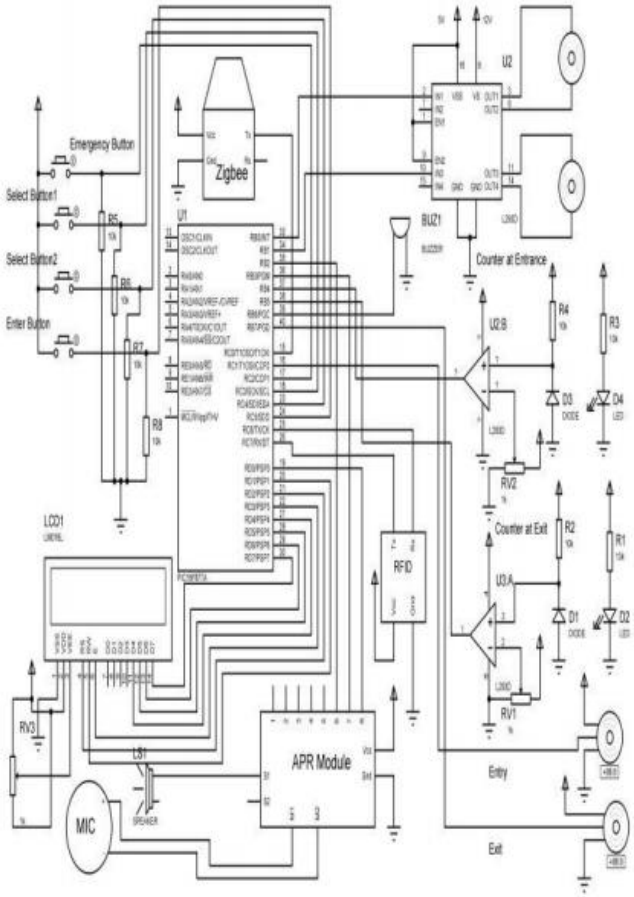

Fig 2:- Circuit diagram

VI. RESULT AND CONCLUSION

By implementing this paper as a real time project many drawbacks mentioned early can be rectified. The time taken by the microcontroller for computation will be in few microseconds, so time consumption is reduced. This paper described a methodology for calculating destination of each passenger from AFC system data. Nowadays almost everyone has ATM card or credit card this system can be upgraded by changing the program for using ATM card or credit card instead of smart cards

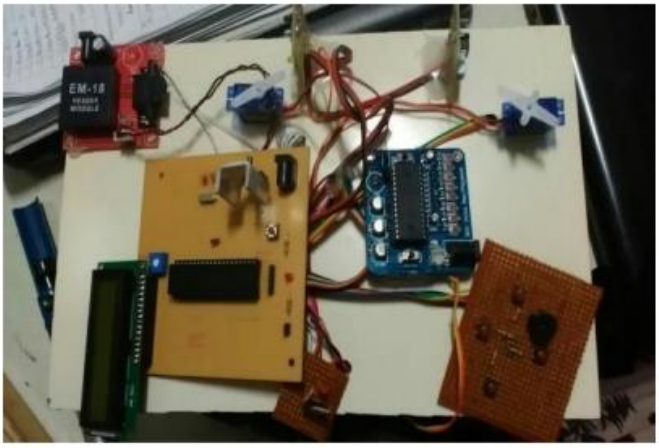

Fig 3 :- Design Circuit

VII. ACKNOWLEDGMENT

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