DIGITAL TICKETING AND ANNOUNCEMENT SYSTEM

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Abstract: Public transportation system is integral part of everyone in Indian cities. Current public transport services are congested, unreliable, untimely and uncoordinated in India. This makes everyday commute rather a bad experience for both consumer i.e. passenger as well as service provider. In order to improve public transportation system there is need of some system which may provide information to passenger as well as organize a system wherein system could be less chaotic to say the least. The aim of this project is to rectify this very problem by enabling passengers for making more informed decisions by providing number of seats taken as well as a announce system by which they get informed about upcoming stations. Most important of them all it provides them services of digital payments by which they could pay commuting fare which is really important in today's day and age.

Keywords: Transportation; Commutes; IR sensor; Counting RFID module; Ticketing; Text Speech module; Announcement; Digital Ticketing; passengers; digital payments; services; information.

1. Introduction

Digital Ticketing & Announcement System explained that a system that uses the same RFID-based location information give the navigation indications depending on his current location. Collected data can be used to predict bus moment timing in order to provide better service. By using smart card instead of RFID with GPS, we can find the location of the passenger enter and exit. Using the location we can find the distance travelled and amount. A microcontroller can be used to program this system by interfacing GPS and smart card. By implementing this system the usage of loose cash can be reduced and efficient ticketing can be implemented. The existing passenger is with the RFID tags and the buses are provided with RFID reader.

This system provides information about seat availability in the bus using an IR sensor. Passenger has to enter the destination using keypad and according to that the fare will be allocated for that destination. The data of all the stops on the route will be informed to the passenger as soon as the stop comes by using speaker. The name of the upcoming stop will be displayed on the LCD. The passengers would be able to make digital payments using a RFID tag. This will enable them to go cashless which very well could improve their risk of cash getting stolen. Public Transport System (PTS) remains the major source of income in most of the developing countries like India. But PTS now faces severe malfunction and various security problems. First, there is a lot of confusion between the passengers regarding fares which lead to quarrels and corruption. In addition to this, nowadays there is a severe security crisis in PTS due antisocial elements.

The user friendly automated ticketing system suggested in this prototype model will not only automatically deduct the passenger's fare according to the paths covered but also detect the passenger's identification. In most of our cities the commonly used mode of public transportation is roadways this is quite evident by the manifold increase in number of vehicles on our roads, especially buses. Indisputably buses run by local governments provide convenient. Most affordable and reasonably safe commute considering the fact that a majority of working women feel that city buses provide them the best mode of transportation.   This is possible by use of RFID cards and switches, and can be used to make the transaction and travelling very precise. This paper basically deals with the identification and ticketing of the passengers travelling by the bus. Also possible future extensions of this system in areas such as Internet–of-Things (IoT).The idea of using RFID in PTS was previously put forward by different personalities. But the system proposed here stays closer to a future ticketing system than anything else. With the advent of new systems to replace old system with smaller and more reliable systems are expected to come into existence. RFID has been an emerging technology in recent years. RFID technology can be effectively employed in number of applications due to its penchant for efficiency. As for its application, it's been a widespread tool for both tracking the transit transports.

2. Related work

M V Guru Kumar.Cheedella, Ch.Adi Babu et al [5] 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. G. Nagavasudha, K. Yogithabali et al [9]By executing this paper as a continuous venture numerous impediments of ordinary ticketing framework in transportation framework are overcome by our present casing work which is a streamlined execution approval for traveler travel utilizing brilliant cards. Mr. Anoop M M1, Ms. Geethu Nandanan2,Mr. Christy Mathew3, et al[2] This system also provide accident detection this improves the better recovery and reduce the causality rate in an accident. Automated announcement system in bus depot is an attractive feature of this system this system uses rfid tags and readers for the detection of buses which are entering in the depot. PT.Manikandan, P2PG.Kalaiyarasi, P3PK.Priyadharshini, P4PR.Priyanga, et al [7] In this paper "GPS based automatic bus fare collecting system

using electronic Ticket" explained that a system that uses the same RFID-based location information give the navigation indications depending on his current location; provided that the user has indicated beforehand the places he intends to visit. Md. Foisal Mahedi Hasan, Golam Tangim, Md. Kafiul Islam, Md. Rezwanul Haque Khandokar, Arif Ul Alam, et al [4] The paper based 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.[14]. R.Aravind Prasanna, S.Baskar, M.Hariharan #R.Prasanna Venkatesan# S.Swaminathan, et al [10] In the paper "Personal Navigator for a Public Transport System using RFID Ticketing". Roomana Hasan1, V. L. Kolhe2, et al [3] The proposed bus ticketing system is based on new Bluetooth Low Energy (BLE) technology. BLE is the power version of Bluetooth that was built to enable Internetof-Things (IoT).

3. Proposed system

The proposed system is to enable passengers to make digital payments for daily commute as well as to provide them information of seat availability in the bus and to make public transportation system more of an interactive experience.
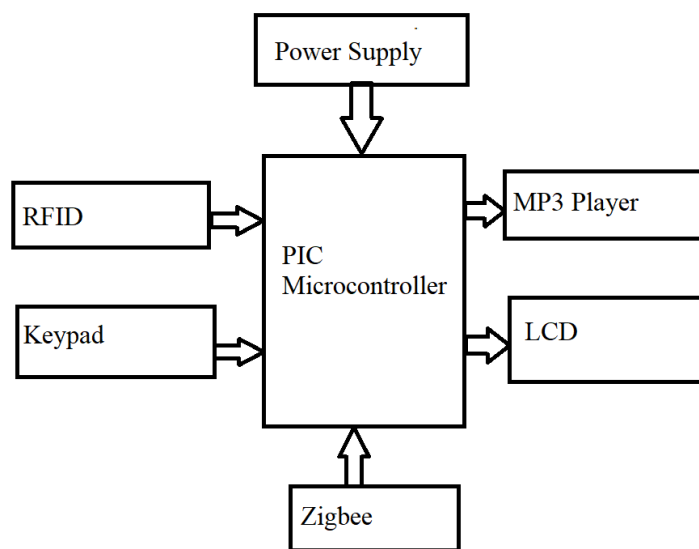
4. Block diagram of system and description

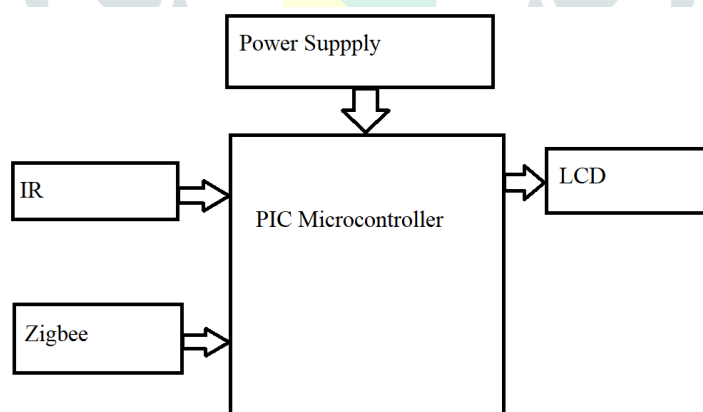*Fig.1 Block Diagram of Digital Ticketing & Announcement System*

Fig.2 Block Diagram of Digital Ticketing & Announcement System

4.1 Microcontroller PIC 18F4520:

PIC (peripheral Interface Controller) is the world's smallest microcontroller that can be programmed to carry out a vast range of tasks. These programming and the simulated process of this microcontroller can be done by a circuit-wizard software. PIC microcontroller is an IC and its architecture comprises of CPU, RAM, ROM, timers, counters and protocols like SPI, UART, CAN which are used for interfacing with other peripherals. Applications of microcontroller include industrial purpose. The advantages of using this microcontroller include low power consumption, high performance, support hardware and software tools such as simulators, compilers, and debuggers.

PIC microcontroller's CPU is not different like other microcontroller CPU, which includes the ALU, controller unit, the memory unit, and accumulator. ALU is mainly used for arithmetic and logical operations. The memory unit is used to store the commands

after processing. The control unit is used to control the internal & external peripherals, and the accumulator is used to store the final results and further process.
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Features:
1. Program Memory Type: Flash
2. Program Memory Size (KB): 32
3. CPU Speed (MIPS/DMIPS): 10
4. SRAM Bytes: 1.536
5. Data EEPROM/HEF (bytes): 256
6. Digital Communication Peripherals: 1-UART, 1-SPI, 1-I2C1-MSSP(SPI/12C)
7. Capture/Compare/PWM Peripherals: 1 CCP, 1 ECCP
8. Timers: 1 x 8-bit, 3 x 16-bit
9. ADC Input: 13 channels, 10-bit
10. Temperature Range (C): -40 to 125
11. Operating Voltage Range (V): 2 to 5.5
12. Pin Count: 40

4.2 Zigbee module

Zigbee is an IEEE 802.15.4-based specification for a suite of high-level communication protocols used to create personal area networks with small, low-power digital radios, such as for home automation, medical device data collection, and other low-power low-bandwidth needs, designed for small scale projects which need wireless connection. Hence, Zigbee is a low-power, low data rate, and close proximity (i.e., personal area) wireless ad hoc network.The technology defined by the Zigbee specification is intended to be simpler and less expensive than other wireless personal area networks (WPANs), such as Bluetooth or more general wireless networking such as Wi-Fi. Applications include wireless light switches, home energy monitors, traffic management systems, and other consumer and industrial equipment that requires short-range low-rate wireless data transfer.

4.3 IR sensor

The Basic concept of IR Pair Sensor which is used as customer detection is to transmit an infrared signal. IR sensor also detects the motion of the customer.IR pair consist of IR transmitter and receiver, IR transmitter is nothing but the one type of the LED, generally called IR transmitter.IR transmitter and receiver is placed straight to each other, so the transmitted IR rays are captured by the IR receiver. But when passenger crosses the IR pair i.e. IR transmitter and receiver pair, the IR rays received will be interrupted. This infrared transmitter and receiver called as the IR TX-RX pair.

4.4 RFID Module

The Radio-frequency identification (RFID) is a wireless technology that uses low frequency radio signals ranging from 3 kHz to 300 GHz in order to transfer small bits of data between RFID devices. An RFID device consists of two fundamental components: tags and readers. The communication between the reader and the tag is achieved via the transmission of electromagnetic waves
RFID Tags: The RFID tags are used as a smart card. Tags can be classified based on their power source and maximum range as active, passive and semi- passive. Now an active and semi- passive tags have internal batteries, which increases the cost of the tag. In addition, semi- passive tags require an advanced internal hardware. Hence, its use is not viable. Which is gives the information about the passenger. We are using the active tag which has battery life. The RFID has either fixed or programmable logic data which sense the sensor. Tags store and process information stored in it

      RFID Reader: 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 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. A reader is used to magnetize the tag and decode the information from the tag. A reader emits radio frequency signal which interacts with the tag. This energizes the pin or bar code producing its own magnetic field with a unique interference pattern which corresponds to a unique number which is read by the tag.

4.5 Text to Speech Module

A text-to-speech (TTS) system converts normal language text into speech; other systems render symbolic linguistic representations like phonetic transcriptions into speech.

Synthesized speech can be created by concatenating pieces of recorded speech that are stored in a database. Systems differ in the size of the stored speech units; a system that stores phones or diphones provides the largest output range, but may lack clarity. For specific usage domains, the storage of entire words or sentences allows for high-quality output

4.6 Keypad
A keypad is a set of buttons arranged in a block or "pad" which bear digits, symbols or alphabetical letters.

4.7 Relay
The relay is the devices that open or closes the contacts to cause the operation of the other electric control. It detects the intolerable or undesirable condition with an assigned area and gives the commands to the circuit breaker to disconnect the affected area. Thus protects the system from damage.

4.8 16x2 LCD
LCD (Liquid Crystal Display) screen is an electronic display module and find a wide. LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on.A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data.

4.9 Buzzer
One that buzzes; specifically: an electric signaling device that makes a buzzing sound. A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke

4.10 Power supply
This block contains step down transformer, a bridge rectifier, a filter capacitor and a voltage regulator. Single-phase AC power supply from the mains is step down to lower voltage which is again rectified DC is filtered and regulated to circuit operating range with capacitor and regulator IC respectively

5. Software (Algorithm and flowchart)
The Keil development tools for ARM offer numerous features and advantages that help you quickly and successfully develop embedded applications. They are easy to use and are guaranteed to help you achieve your design goals.

5.1 Software Components:
Software Packs can contain device support including drivers, CMSIS libraries, and middleware components.

1. Device Family Pack (DFP): contains CMSIS system/start up, drivers, and flash algorithms for a microcontroller device family.
2. CMSIS: contains the generic CMSIS components (CORE, DSP Library, and RTOS implementation).
3. MDK Professional Middle ware: contains the middleware libraries that are part of MDK Professional.

The Keil Software PIC18F2520 development tools are programs you use to compile your C code, assemble your assembly source files, link and locate object modules and libraries, create HEX files, and debug your target program.

5.2 Algorithm for

1. Start
2. Power supply ON
3. Initialize LCD controller, text to speech module
4. Vehicle starts from first station
5. Compare input the switch (key press), "YES or NO"
6. Display current station
7. Text to speech announce the name of it
8. Passenger count using IR sensor.
9. Count to be displayed on LCD display
10. Compare the key press, "YES or NO"
11. If "YES" go to step no. 6
12. If "NO" stop the vehicle.
13. Stop

5.3 Flowchart for
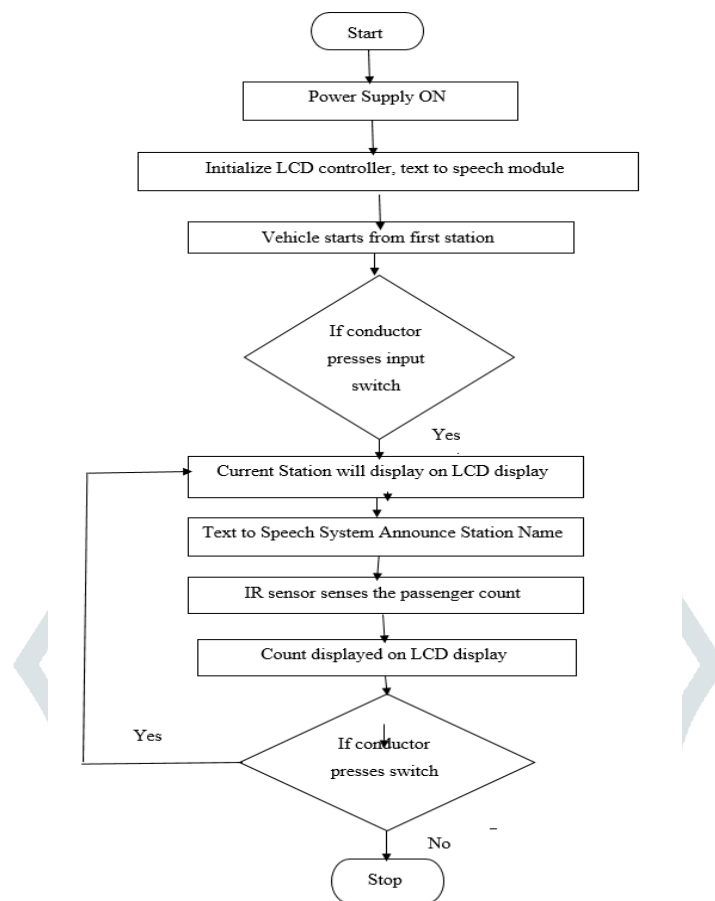
6. Results:

7. Conclusion:

This project has presented an automated, reliable, transparent and convenient system for ticketing in Public Transport System. RFID cards can be reusable and its more convenient as compared to paper conclusion based ticketing system. Additionally number of passengers accessing the bus can also be monitored and that information utilized to improve their service. This is more economical, reliable and   user friendly system for public

Finally, we wish thank our friends and our family to being supportive for us, without whom this project would not have seen the light of day.

Every work is an outcome of full proof planning, continuous and organized effort. This work is combination of all the three put together sincerely

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