

SMART BUS PASS AND FINGER PRINT SCANNER FOR STUDENT/EMPLOYEE USING RFID TECHNOLOGY

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Abstract:

The project "**RACEMS**" is to automate and log on to various day-to-day activities and to provide instantaneous information required in effective management of any given institute. The major disadvantage of the existing system is that it consumes more human power and is more time consuming. The need is to save time and human power this system (**RACEMS**) serves well for it.

Keywords- Radio Frequency Identification, RFID tags, RFID readers, Finger print device, Intelligent transportation systems.

1. INTRODUCTION

RACEMS which is used to administrate the college assets, transports, etc., automatically. The main aim of the project is to reduce the complexity in maintaining the records of the vehicles that enter and exit the college campus. Now a day's all the colleges and other institutions prefer punctuality. This can be monitored using the RFID (Radio Frequency Identification) tags that are placed in the vehicle. This tag is read using the RFID reader a device that is kept at the entrance gate By punching the employee's finger on finger print device which is attached inside of the bus/cab, we can easily calculate the count of the employee and their concerned details inside of the bus/cab and we can also avoid the Signature rules in MNC's companies.

2. LITERATURE SURVEY

As we approach the end of the first decade of the 21st Century, research pertaining to Radio Frequency Identification (RFID) has increased. Radio frequency identification (RFID) is not a new technology. Radio frequency identification is a technology that uses a few simple components. Monitoring students of University Tun Hussein Onn Malaysia (UTHM) movement around the campus is difficult especially for lecturer hall and laboratory access control. By using RFID technology, it is easy to track the student thus enhances the security and safety in selected zone. The application of active RFID in a student monitoring system is to improve faculty and UTHM management system to monitor particular group of students' whereabouts. This paper describes about an ongoing research which is currently in the stage of data collection to measure its implementation in terms of effectiveness. The focus of the paper is to discuss about the development of the system which is called Student Monitoring System Using Active RFID (SMOSA). The criteria of SMOSA are selected based on range, frequency, and technical aspects which are suitable for this project environment and availability of the component. The latter two are especially interesting, as essential privacy questions in these fields, like "What data is collected?" and "How is data secured during transmission?" apply to RFID as well. Road Traffic Congestion Monitoring and Measurement using Active RFID and GSM Technology by Koushik Mandal, Arindam Sen, Abhijnan

Chakraborty and Siuli Roy (2011). System includes Active RFID tag, Wireless Router, Wireless Coordinator, GSM modems, and Monitoring Station software. Wireless devices collect data from Active RFID tags, these devices are mounted at roadside. Monitoring station collects all data through GSM, and reply to corresponding traffic signal. Limitations: Involvement of various communication devices makes implementation costly. Wireless communications have their own drawbacks. A Monitoring Station needs to be setup.

3. METHODOLOGY

3.1. RADIO FREQUENCY IDENTIFICATION (RFID)

Radio frequency identification (RFID) is the wireless use of electromagnetic fields to transfer data, for the purposes of automatically identifying and tracking tags attached to objects. The tags contain electronically stored information. Some tags are powered by electromagnetic induction from magnetic fields produced near the reader. RFID is one method for Automatic Identification and Data Capture (AIDC). There are basically two main processes: Check In and Check Out.

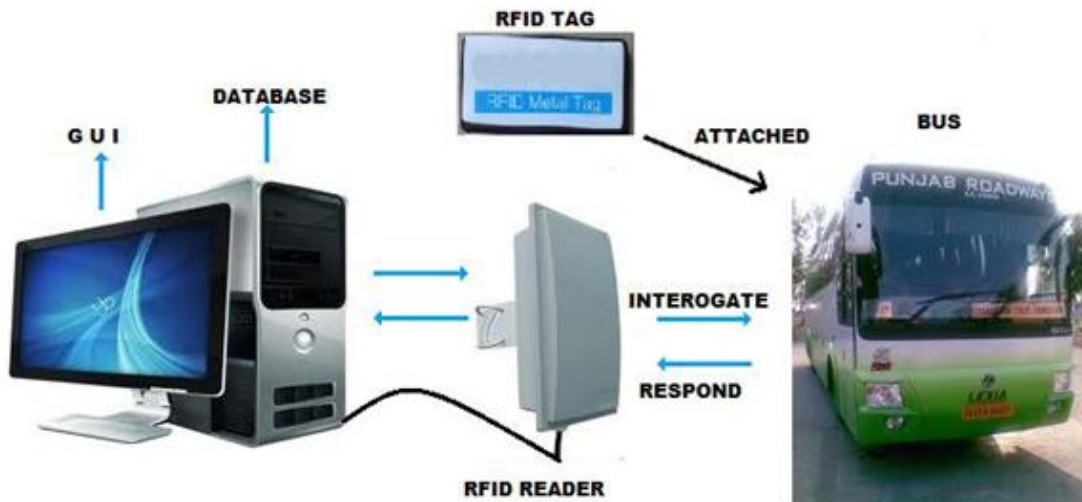


Fig.1. General structure

Check-In Process: When a bus will enter the bus stand then reader will read the tag attached to it. If record of the bus already present in the database then simply makes an entry of bus in Entry table otherwise system will store the bus information in database.

Check-Out Process: This process will be done at the exit gate. There are two readers placed at the OUT-Gate. So when a bus exists the bus stand through OUT-Gate its tag will be scanned by the reader.

3.2. RFID TAG

A radio-frequency identification system uses tags, or labels attached to the objects to be identified. These are small electronic components having Antenna and Silicon chip further which consists of receiver, transmitter, memory and processor. Generally, RFID tags are attached to the items and scanned using handheld or static RFID reader. Now system can get the information of item without touching it physically. There are three types of tags based on the capability

1) Passive Tags

- 2) Active Tags
- 3) Semi-Passive Tags.

Tags work on radio signals so they have different types of working frequencies. On the basis of these frequencies RFID tags can be passive, active or battery-assisted passive. An active tag has an on-board battery and periodically transmits its ID signal. A passive tag is cheaper and smaller because it has no battery; instead, the tag uses the radio energy transmitted by the reader. RFID tags contain at least two parts: an integrated circuit for storing and processing information, modulating and demodulating a radio-frequency (RF) signal, collecting DC power from the incident reader signal, and other specialized functions; and an antenna for receiving and transmitting the signal. The tag information is stored in a non-volatile memory. The RFID tag includes either fixed or programmable logic for processing the transmission and sensor data, respectively. An RFID reader transmits an encoded radio signal to interrogate the tag. The RFID tag receives the message and then responds with its identification and other information. This may be only a unique tag serial number, or may be product-related information such as a stock number, lot or batch number, production date, or other specific information.

3.3. RFID READER

RFID systems can be classified by the type of tag and reader. A **Passive Reader Active Tag** system has a passive reader which only receives radio signals from active tags (battery operated, transmit only). The reception range of a PRAT system reader can be adjusted from 1–2,000 feet (0–600 m), allowing flexibility in applications such as asset protection and supervision.

3.4. BRIEF DESCRIPTION OF PIC COMPONENTS

PIC 16F877A microcontroller: IC PIC 16F877A is an 8 bit micro controller with 8k x 14 bit flash program memory, 368 bytes of RAM and many others extra peripherals like ADC, USART, timers, compare, capture and pulse width modulation modules, and Analog comparators. It is based on the reduced instruction set computer (RISC) architecture. The microcontroller processes the sensor output to compute the temperature in degree Celsius. The internal ADC of the micro controller is used to convert the analog output of the sensor into its digital equivalent value. The internal ADC of the microcontroller has eight channels of analog inputs and gives 10 bit digital output. **The LCD module:** A 16 x 2 LCD based on HD44780 controller is used for displaying the temperature. The control lines EN, R/W, and RS of the LCD module are connected to pins RB3, Ground and RB2 of Port B of the microcontroller respectively. The commands and data to be displayed are sent to the LCD module in the nibble mode from Port B of the microcontroller. The higher four bits of the LCD (D4 through D7) are connected to the higher nibble of Port B (RB4 through RB7).

3.5. FINGER PRINT

Finger print module is an input device used for Fingerprint processing which includes two parts: fingerprint enrollment and fingerprint matching (the matching can be 1:1 or 1:N). When enrolling, user needs to enter the finger two times. The system will process the two time finger images, generate a template of the finger based on processing results and store the template. When matching, user enters the finger through optical sensor and system will generate a

template of the finger and compare it with templates of the finger library. For 1:1 matching, system will compare the live finger with specific template designated in the Module; for 1:N matching, or searching, system will search the whole finger library for the matching finger. In both circumstances, system will return the matching result, success or failure.



Fingerprint Verification

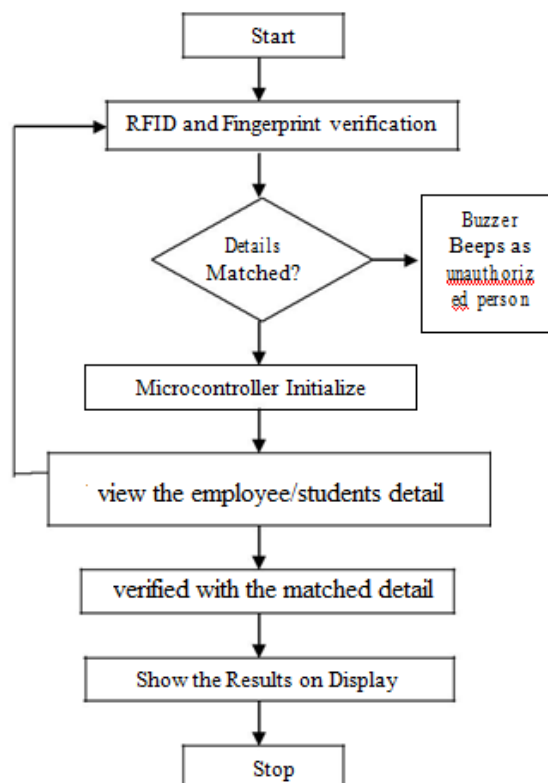


Fig.2. Flowchart of Proposed system

4. PROPOSED SYSTEM

Radio Frequency Identification (RFID) is a data collection technology that uses electronic tags for storing data. RFID is an automated form of identity verification. Other examples of such forms are and scanner. RFID is superior because RFID tags hold more data than bar codes. A major differentiator is the unique serial number in the RFID's Electronic Product Code (EPC) because it allows tracking of individual items. The proposed system has been mainly developed to overcome the drawbacks of the existing systems.



Fig.3. Output analysis

The proposed system is a client server application to provide service for the institution. So the time consumption problem is got ridden since we replace human works by automation. The transport entries are recorded using this application automatically once they cross the entrance gate this makes the records more prominent and accurate. Transport department of the institution is given the privilege to change

CONCLUSION

We would like to conclude by saying that this project has helped us earn knowledge in many areas of real time environment. The requirements of the project as discussed have been fulfilled and drawbacks of the existing system have been overcome. The main purpose of this project was to overcome manual note-making procedures in the college environment. Using RACMS this purpose has been successfully achieved. RACMS application uses user friendly interfaces, which makes it easy for anyone to access it with ease provided they have access rights. It is easy to navigate, store and retrieve data using RACMS. Time is an essential factor and thus by using RACMS time can be saved and put to better use. All the objectives have been successfully achieved by the system. The bus information were successfully scanned and saved in the tag and database. Further study can be done to enhance the performance and security of the system.

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