Design and Implementation of RFID based Staff Monitoring System

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ABSTRACT

In current days, there have been rapid growth in the number of wireless applications based on Radio Frequency Identification (RFID) systems and have been successfully applied to various areas such as diverse as transportation, health-care, agriculture, and hospitality industry. In this paper, design and implementation of staff monitoring system using RFID technology. The main objective of RFID technology is to monitoring staff attendance accurately and effectively. The attendance system plays a major role in schools and colleges is documented manually. But, this process requires lots of time. The proposed system uses a RFID wireless technology. Each and every staff is provided with an RFID tag, which includes an inbuilt IC for storing and processing the information. RFID Technology is used in schools, colleges, office and stations for different purposes to automatically keep a track of staff.The systemalso be developed by using GSM (Global System for Mobile communication) technology.

Keywords: Attendance system,8051 MICROCONTROLLER, GSM,RFID staff Attendance Systems.

I. INTRODUCTION

Now a days, most of the educational institutions, administrators are worried about students and staff irregular attendance. The one of the solution of this for Attendance system problem can be overcome by using Radio Frequency Identification (RFID) technology. This technology can be used to take attendance for staff in school, university and college. It also can be used to take attendance of number of workers present in industry, company or other places. It has uniquely identifyRFID tag type of ID card for each staff,students or workers. The RFID process can make easier, faster and secure as compared to ordinary or manual method. Staff or workers only need to place their ID card on the RFID reader and their attendance will be taken immediately. With actual time capability of the system, no. of attendees taken will be more precise since the time for the attendance taken will be recorded.RFID based Staff Attendance monitoring system uses emerging technology that eliminates the problem faced in manual attendance entry and will prove to be more reliable and accurate. The technologyuses radio waves to transfer data from an RFID tag, through a reader. It consists of a RFID tag and RFID reader.

The RFID reader consists of an antenna and transceiver. The reader is continuously senses its range of operation. Whenever a tag enters its field of operation, the RFID reader transmits

electromagnetic waves using antenna to communicate with the tag's antenna. The antenna can receives the data from the reader, activates tag and reflects back the incident electromagnetic waves with RFID tag information. The transceiver in the reader receives data and passes them on to the controllers. The system can be connected to the computer by using either RS232 or Universal Serial Bus (USB) port. It can stores the data of attendance information inside the database. The RFID based staff monitoring system is design in Arduino software and implemented by using RFID and GSM technology.

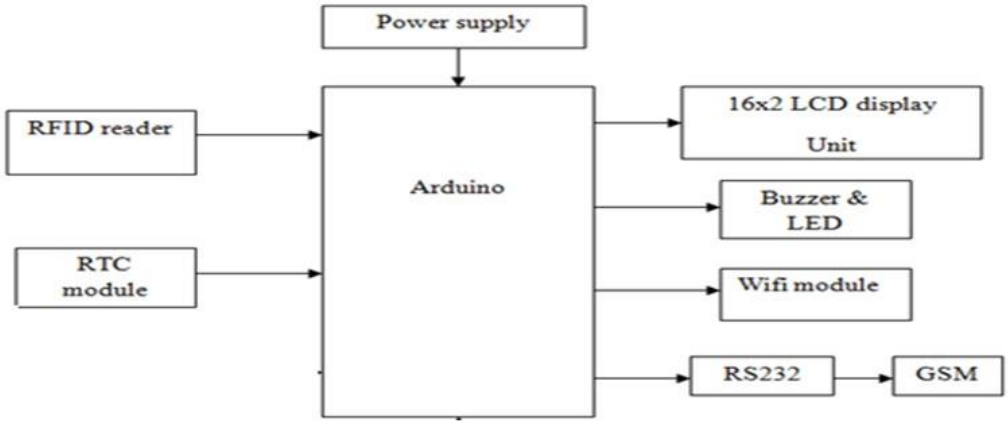

Figure.1. Block Diagram of RFID

II. RFID TECHNOLOGY

Radio-frequency identification (RFID) is a technology that uses electromagnetic fields to automatically identify and track tags that attached to objects or persons using wireless communication. The RFID tags contain electronically-stored information. It can be classified in to two categories such as passive tags and active tags.

The passive tags can collect the energy from a nearby RFID using radio waves. Whereas Active tags can have a local power source (such as a battery) and operating range in hundreds of meters from the RFID reader.RFID technology is one method of automatic identification and data capture.The data can beread through the human body, clothing, utensils, toys, non-metallic materials, etc. by using RFID technology. Now a days RFID tags are used in many industries such as automobile, transportation,hospitals and university. Cryptography methods for untraceability, tag and reader authentication, and over-the-air privacy. Specifies a digital signature data structure for RFID and barcodes providing data, source and read method authenticity.

III. RFID Tag

RFID Tag is an IC that has electronic unique code. In RFID technology, tags are attached to all objects or persons for identification purpose.RFID tags are connected to an antenna that can be built into various kinds of tags such as hang tags, labels, security tags and industrial asset tags. The RFID tag chip contains memory which stores details of information about staff. It can be scanned and tracked by anywhere using RFID readers. The term"UNIQUE" refers to every code word of the tag and is independent of other code word. The tag acts as a Key that is capable of opening a particular locks .The information sequence is a numeric serial, which can be stored in the RFID memory. Each tag can store 2Kbyte of information about every staff. The tag memory is either permanent or recordable, which can be again programmed electronically by the reader number of times. Generally it can be classified into three types of RFID tags like active, semi-passive and passive. Passive tags are passive in nature i.e. they don't have any battery source. The electromagnetic field generate the electric power to the RFID reader. They do not have any active transmitter.

Figure 2. RFID Tags

IV. RFID Reader Module

An RFID reader is a network device. It consists of an antenna that sends power as well as data commands to the RFID tags. RFID Reader is a scanning device that uses that identify the tags using antenna that are in the specific zone or area.RFID transmits signals at specific frequencies ranges. RFID readers are usually ON all the time. The antenna continuously transmits radio energy in the form of waves or signals and awaiting any tags that enter their field of operation. EM 18 RFID reader is a device which is capable of reading and stores the information or data inside the RFID tags. The EM-18 RFID reader module is shown in fig.2.

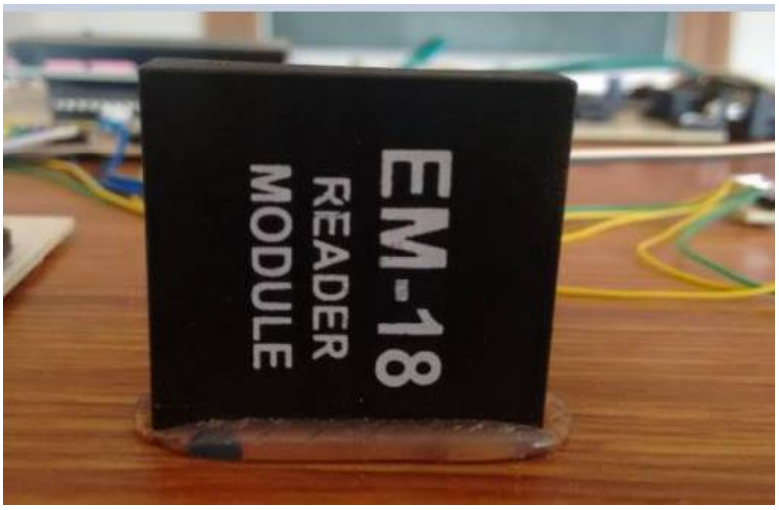

Figure.3. RFID Reader Module

RFID tags can be classified into two types such as

1. Active reader and

2. Passive RFID reader.

V. GSM MODULE

Global System for mobile communication (GSM) is a special type of modem which can accepts a SIM card. It can operates like a mobile phone. GSM modem is connected to personal computer. GSM can sends the SMS,commonly referred to text message. It is a service for sending short messages to mobile devices with maximum characters up to 160. Mobile devices include Cellular Phones and Smart phones. “Arduino SMS” app is installed in mobile. It is connected to Arduino through Bluetooth interface. When staff is not enter into the class, this modem sends SMS.

Figure.4.GSM Module

IV. RESULTS AND DISSCUSSIONS

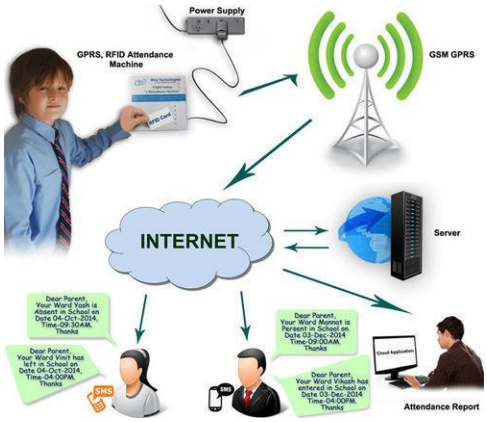

Figure.5. Flow chart for Attendance system using RFID technology

Figure.6.Attendance system based on RFID technology on 8051 Micro controller.

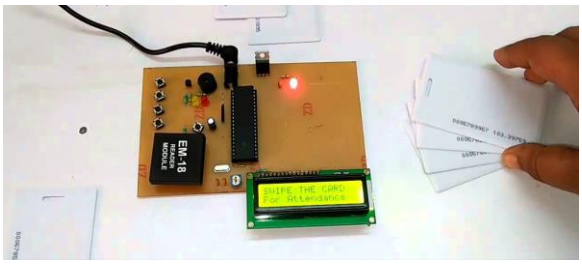

Figure.7.Hardware implementation of Attendance system using RFID technology.

Figure.8. Attendance system based on GSM technology on 8051 Micro controller.

VII. CONCLUSION

The design and implementation of a RFID wireless technology based automatic attendance gadget that's the intention and goal of this paper changed into effectively carried out. This technology gives an effective and more user oriented of taking attendance when compare to the tutor attendance. The RFID technology based attendance system may be implemented in any academic organization. As the RFID technology evolves in various sophisticated applications will use the capability of RFID to receive, store and forward data to a remote sink source. RFID has many applications as can be imagined. In this paper, we have utilized the versatility of RFID in implementing functional and automatic student course attendance recording system that allows students to simply fill their attendance just by swiping or moving their ID cards. A low cost RFID technology Based staff attendance system has been successfully designed and implemented on Arduino and GSM module. The technology provides several advantages such as instead of taking attendance in class or staff entering in to a class. It provides attendance automatically. It is low cost, low power and less amount of time is required. So, it is very flexible and gives accurate information can be carried to the class for taking the attendance.

VIII. FUTURE SCOPE

Further improvement can be undertaken on this project for better enhancement: A webcam can be integrated into the system to monitor the person who swaps the card, thus avoiding the problem of a person scanning in for another person. The attendance system can be enhanced to biometric technology which is a full proof technique that captures a person’s unique biological or physical features and prevents unauthorized activities

IX. REFERANCES

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