RFID Based Attandence System

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Abstract: This project is developed by using Radio Frequency Identification (RFID) system and student card to get student attendance. Before this project, lecturers needed to use paper to get the student attendance. There were a lot of problems when using the paper as student attendance such as cheating. This project can help lecturers to reduce these problems by the design of an automatic attendance using RFID and student card. The project system runs by the process of getting the code of the student card to compare with the database in XAMPP Control Panel. Graphical User Interface (GUI) was developed using Net Beans IDE 8.1 to make the database easier to access.

Firstly, lecturer needs to fill forms in an interface like lecturer name, subject and subject code. This part is important because we need the information in this part to use in the next interface. In the next interface, lecturer needs to choose port and speed to make connection with RFID reader. After the reader is ready, process to get attendant will start. Students need to swipe their card on the reader and the code from the card will use to compare with database in XAMPP Control Panel. When the code is match with database, the student information like ID number and time will show on interface and that information will trigger into a list and it will lead to the opening of the class room door.

This list will use as a student attendance. In that list, all information like student name, ID number and time will be saved in the database of the server. If the code does not match with the database, it means that the student is in the wrong class or he (or she) is not yet registered for that course. When this happen, lecturer can register that student by using registering form and the information of that student will be update into database. This project will help lecturer taking the student attendance more easily and automatically. As a conclusion, RFID technology can be used in student attendance application.

Keywords: RFID MODULE, LCD , MICROCONTROLLER, COMPUTER SYSTEM

1. INTRODUCTION

RFID (radio frequency identification) is a new technology that incorporates the use of electromagnetic or electrostatic coupling in the radio frequency (RF) portion of the electromagnetic spectrum to uniquely identify an object, animal, or person. RFID tags are not an "improved bar code" as the proponents of some technologies would like you to believe. An RFID system consists of three components: an antenna and transceiver (often combined into one reader) and a transponder (the tag). The antenna uses radio frequency waves to transmit a signal that activates the transponder. When activated, the tag transmits data back to the antenna. RFID technology differs from bar codes. RFID can read the tag using RF, meaning that the RFID reader can be read from a distance, right through your clothes, wallet or purse. Besides the RFID tag consist of unique ID for each tag. The technology used in RFID has been around since the early 1920s. In our country, this technology is less frequent and the mostly use technology is the biometric systems using finger print. Our government less applies this technology by using RFID as I.C (identification card). In some places of our country, people prefer to use Barcode which is cheaper than RFID. Technology spread very fast and in few years, the possibility that RFID replaces the barcode system will just be a reality.

Nowadays, there are many of universities around our country and each of this university consists of student up to 10 thousand. To handle a large amount of student may be problem specially to get the attendance. Now, process to get attendance in majority universities still used the manual process.

The manual process means that when the class (or lecture) starts, lecturer will give a piece of attendance paper and students will check their name and then will sign on it. At the end of class, lecturer will take back the attendance paper and keep it as a record.

Normally, the attendance paper need much time to be signed by all students especially for classes with a lot of student. Students also forget to sign that attendance and they are assumed absent for that class. The problem also will happen when lecturer forget to bring the attendance paper to class. Students need to write their name on a piece of paper and sometimes student will take this opportunity to cheat during the process of getting the attendance. The suitable solution for this problem is to design a system that will record attendance automatically.

In this project, which is based RFID system is used to record student attendance automatically. This project will use

student ID card as RFID tag and a RFID reader. This RFID system will be integrated with a software. This method is more effective to prevent problems in the process of getting the attendance manually.

2.   PROPOSED SYSTEM

A radio-frequency identification system comprises hardware, known as interrogators or readers and tags also known as labels as well as RFID software or RFID middleware. RFID tags are of two major types, which include Active Tag and Passive tags. However, this system does not have an incorporate door unit which allows access to only registered users. Figure 2.1 show Mohd Firdaus base Attendance System Using RFID and Student card..
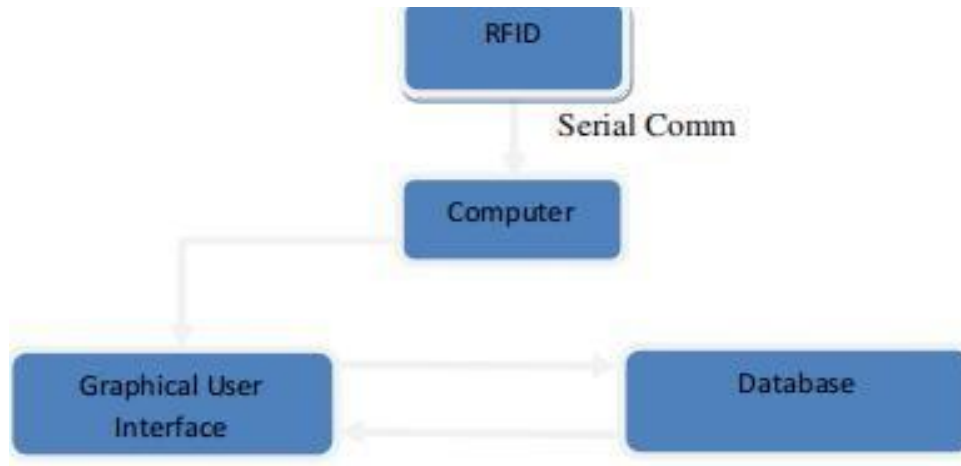
1.   Rfid tag :-

The tag, also known as the transponder, holds the data that is transmitted to the reader when the tag is interrogated by the reader. The most common tags today consist of an Integrated Circuit with memory, essentially a microprocessor chip. Other tags are chip less and have no onboard Integrated circuit. Chip less tags are more effective in applications where simpler range of functions is all that is required; although they can help achieve more accuracy and better detection range, at potentially lower cost than their Integrated Circuit-based counterparts. From here on out, we will use the term tag to mean Integrated Circuit-based tag. We will refer to chip less tags explicitly, when needed.

Rfid tag

2.   Lcd :-

LCD is an acronym which means Liquid Crystal Display. This is a device that receives digital information from the microcontroller and displays on its screen. It helps as an output interface (that is peripheral) for the microcontroller.

Lcd

3. Microcontroller :-

A microcontroller is a single chip microcomputer which consists of at least a microprocessor, program memory, data memory and input/output devices. A microcontroller is characterized by its integration, a lower electric consumption (that is some milliwatt when ON and some nanowatt when OFF).


Microcontroller

4. Rfid Rc-522 reader module :-

In this RFID based attendance system, the RFID reader is a device which is used in collecting the information or data from the RFID card or RFID tag. It is used for individual object and transfers the data from the RFID tag to RFID card reader through radio waves. The RFID reader does not scan all the RFID tag; it's only scanned the tags which is 3 to 300 feet. The RFID technology allows several items to be scanned quickly and fast identification of the specific objects.

Rfid reader

3. BLOCK DIAGRAM
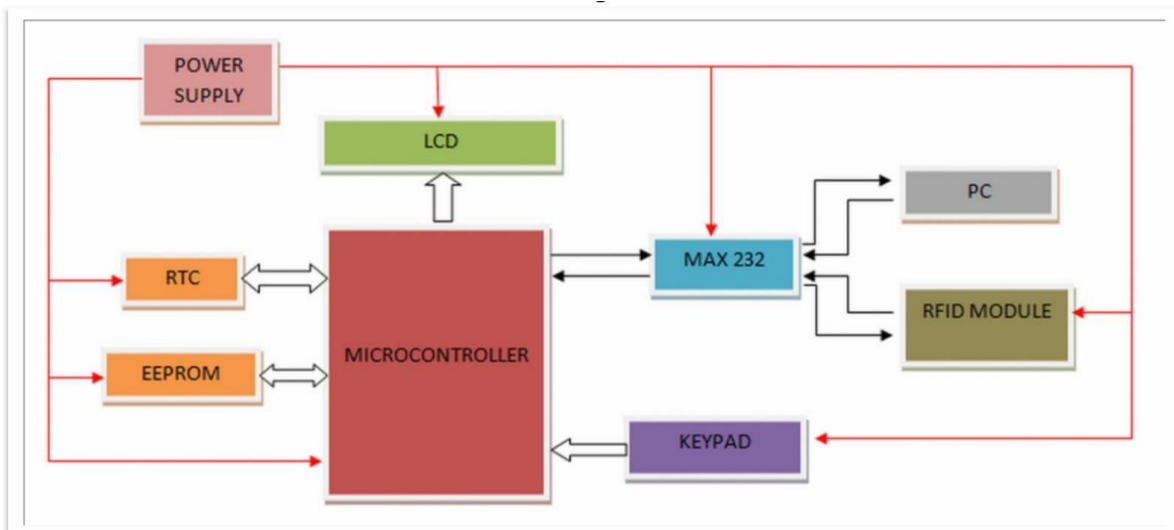
4 METHODOLOGY

A basic RFID system consists of three components:

a)   An antenna or coil
b)   A transponder (RF tag)
c)   A transceiver (with decoder)

They are available in following three frequency

1)   Low-frequency (30 KHz to 500 KHz)
2)   Mid-Frequency (900KHz to 1500MHz)
3)   High Frequency (2.4GHz to 2.5GHz)

The antenna emits radio signals to activate the tag and read and write data to it.

An RFID tag is comprised of a microchip containing identifying information and an antenna that transmits this data wirelessly to a reader.
The RF transceiver controls and modulates the radio frequencies that the antenna transmits and receives.

5.   WORKING & ARCHITECTURE
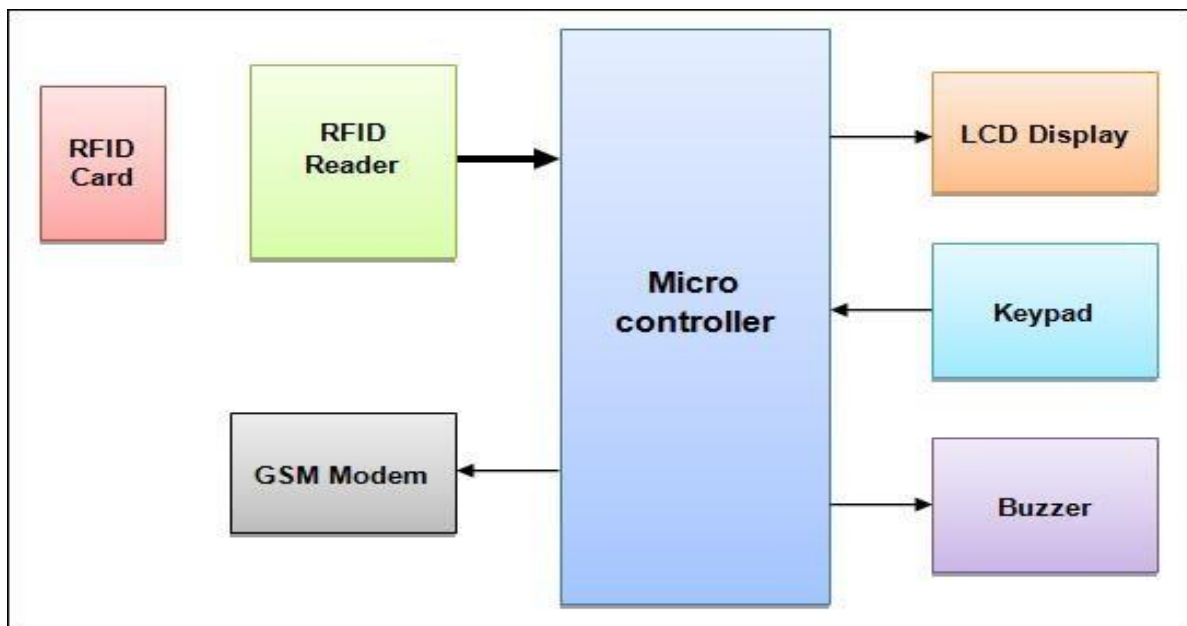
Read-only tags contain data such as a serialized tracking number, which is pre-written onto them by the tag manufacturer or distributor.
"Full "read-write" tags allow new data to be written to the tag as needed—and even written over the original data.Write once" tags enable a user to write data to the tag one time in production or distribution processes.

More automated reading: RFID tags can be read automatically when a tagged product comes past or near a reader, reducing the labor required to scan product and allowing more proactive, real-time tracking.

Improved read rates: RFID tags ultimately offer the promise of higher read rates than bar codes, especially in high-speed operations such as carton sortation.
Greater data capacity: RFID tags can be easily encoded with item details such as lot and batch, weight, etc
"Write" capabilities: Because RFID tags can be rewritten with new data as supply chain activities are completed, tagged products carry updated information as they move throughout the supply chain.
No "line of sight" requirements: Bar code reads can sometimes be limited or problematic due to the need to have a direct "line of sight" between a scanner and a bar code. RFID tags can be read through materials without line of sight.

6. APPLICATION

A) Electronic Vehicle Registration:-
With security of cars being major concern in many countries, RFID technology is being leveraged by government for vehicle registration . This helps detect stolen cars and in their retrieval.

B) Transport Payments:-
Government use RFID applications for traffic management, while automotive companies use various RFID tracking solutions for product management.

C) Car-Sharing:-
The Zipcar car-sharing service uses RFID cards for locking and unlocking cars and for member identification.

D) Payment by Mobile phone:-
When a microSD card is inserted into a mobile phone, the microSD card can be both a passive tag and an RFID reader. After inserting the microSD card, phone can be linked to bank accounts and used in mobile payments.

E) Toll Roads:-
The tags which are usually the active type, are read remotely as vehicles pass through the booths, and tag information is use to debit the toll amount from a prepaid account. The system helps to speed traffic through toll plazas as it record the date, time and billing date for the RFID vehicle tag.

7. FUTURE SCOPE

In order to achieve the objectives of this project, several scopes have been outlined. The main scope of this project is to verify the regulation for attendance. It also include database, monitoring and interface. Other scopes of this project are:

A) Administrators can update, add or delete students and lecturer's data view attendance recordand can block the use of the system.
B) Analyze student absences each semester according to the percentage absences from regulation of attendance

8. REFRENCES

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