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RFID Technology Based Student Management System Using IOT Application

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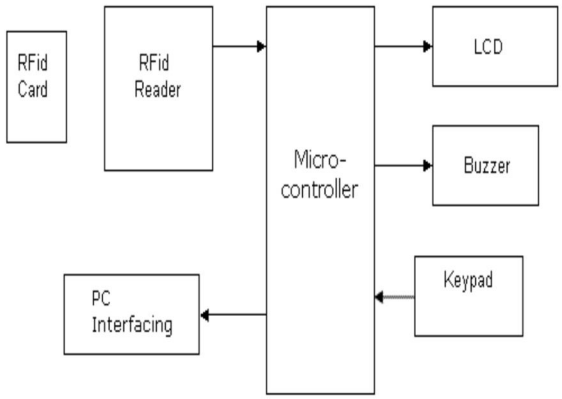
Abstract: ***Radio frequency identification (RFID) is a rapidly growing technology which allows productivity and convenience. RFID is a new generation of Auto Identification and Data collection technology which helps to automatic business process and which allows identification of large number of tagged Student Details using radio waves. This paper proposes RFID Based College Institute Student Identification all applicable (Attendance,Marksheet,Fee)Management System that would allow fast transaction flow and benefits by adding properties of traceability and security. This system is based on RFID readers and passive RFID tags that are able to electronically store information that can be read with the help of the RFID reader. This system would be able to issue via RFID tags and also calculates the corresponding Student database using PC Maintain based IOT System Through the Student Details Sent Parents Mobile Number SMS or MAIL and Alert System.***
keywords— RFID,Passive tags, Marksheet,SMS

I. INTRODUCTION

Radio Frequency Identification is an automated identification technology used for retrieving from or storing data on to passive Tags without any physical contact [1]. In this system primarily comprises of RFID Tags, RFID Reader, Middleweight and a Back-end database. Passive Tags are universally identified by an identification sequence, governed by the rubrics of Globalize Tag Data Standards. A tag can either be passively activated by an RFID reader or it can actively transmit RF signals to the reader [3]. The RFID reader, through its antenna, reads the information stored on these tags by vicnity. The readers effective range is based on its operational frequency, is designed to operate at a certain frequency. The operational frequency of the readers ranges from 125 KHz – 2.4 GHz [5]. The Middleweight encompasses all those components that are responsible performance of the system [2, 9]. The Back for the transmission of germane information from the reader to the back-end management systems [8]. The Middleweight can include hardware components like cables and connectivity ports and software components like filters that monitor network -end database stores individual tag identifiers to uniquely identify the roles of each tag. The database stores record entries to individual tags and its role in the system application. This system is interdependent on its core components to achieve maximum efficiency and optimum performance of the application. Due to its high degree of flexibility, the system can be easily adopted for applications ranging from small scale inventory cabinets to multifarious and highly agile supply chain management systems

II. EXISTING SYSTEM



A. Working

Radio Frequency Identification is an automated identification technology used for retrieving from or storing data on to passive Tags

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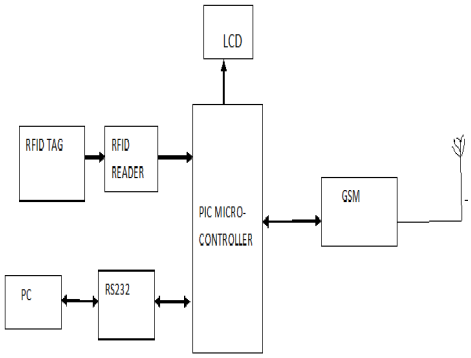
B. Disadvantage of existing system

It is mainly used for a single purpose ie, attendance system.
So the requirements of this system is used only minimum space
The maintenance is only for attendance so the time should be lost

III. PROPOSED SYSTEM



A. Block diagram detail peration

Most RFID systems consist of tags and readers. Tags are attached to an individual to be identified. Each tag has its own “read-only” internal memory depending on the type and application. This memory is to store personal information, of an individual such as unique Identification features. Each Student Hall is assigned with the Reader in order to read the contents of the tag specified in the ID cards provided, it generates magnetic fields that enable the RFID system to locate the individual(via the tags) that are within its range. If the data in the tag is matched with the data in program memory, then the result is displayed as “FOUND” along with his/her name, designation, IN Time and OUT Time in the LCD display provided. If data is not matched, then it displays as “NOT FOUND”. The high frequency electromagnetic energy and the corresponding signal generated by the reader triggers the tags. The frequency of the signal generated could be up to 50 times per second. As a result communication between the tags and reader is established. In other words, in order to control this problem, low pass filters are used. Several protocols manage the communication process between the reader and tag. When the reader is switched on protocols begin the identification process. If the reader is on and the tag arrives in the reader fields, then it automatically replies to the reader by modulating the reader’s field. The reader performs these operations one by one on each tag.

B. Pic micro controller

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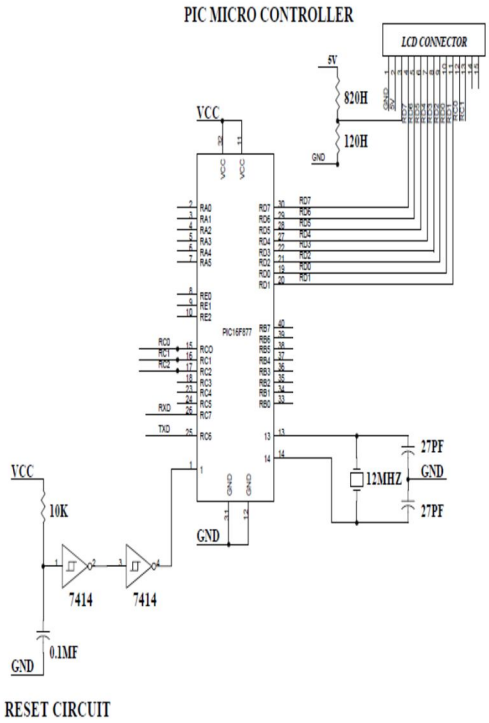


RESET CIRCUIT

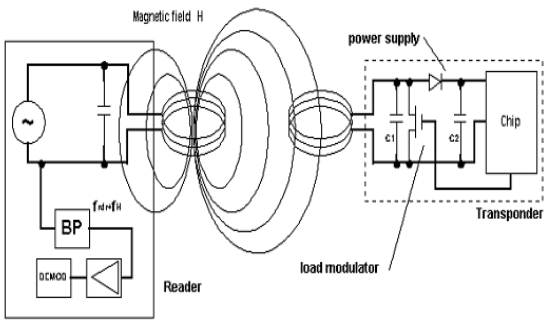
Rfid Reader An RFID reader is a device that is used to interrogate an passive RFID tag. The reader has an antenna that emits radio waves; the tag responds by sending back its data. a number of factors can affect the distance at which a passive tag can be read the range. the frequency used for identification, the antenna gain, the orientation and polarization of the reader antenna and the transponder antenna, as well as the opportunity of the tag on the object to be identified will all have an impact on the rfid system's read range.

rfid tag: most passive rfid tags that contain at least two parts. one is an integrated circuit for storing and processing information, modulating and demodulating a radio-frequency (rf) signal, and other functions. the second is an antenna for receiving and transmitting the signal. there are

generally three types of rfid tags: active rfid tags, which contain a battery and can transmit signals separately, passive rfid tags, which have no battery and require an external source to provoke signal transmission, and battery assisted passive (bap) rfid tags, which require an external source but have significant higher forward link capability providing greater range.

passive tag :passive tags are those energized by the reader itself, they contain no power source, typically have very long lifetimes (near indefinite) a drawback over active tags is the read range, typically 2cm (1in) to 1.5m (4.5 ft), a strong positive is individual tag cost. rfid passive tag is composed of a integrated electronic chip and a antenna coil that includes basic modulation circuitry and non-volatile memory.

C. How to work rfid



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Inductive Coupling Inductively coupled transponders are always operated passively. This means that all the energy needed operation of the microchip has to be provided by the reader.The RFID reader's antenna coil generates a strong, high frequency electron-magnetic field, which penetrates the cross-section of the coil area and the area around the coil. Because the wavelength of the frequency range used less than 135 kHz: 2400 m, 13.56 MHz: 22.1 m is several times greater than the distance between the RFID reader's antenna and the transponder. The electron-magnetic field may be treated as a simple magnetic alternating field with regard to the distance between transmitter and antenna. A small part of the emitted field penetrates the antenna coil of the transponder and particular distance away from the coil of the reader. By induction, a voltage is generated in the transponder's antenna coil. This voltage is rectified and serves as the power supply for the data-carrying device (microchip). A capacitor is connected in parallel with the RFID reader's antenna coil, the capacitor of which is selected such that it combines with the coil inductance of the antenna coil to form a parallel circuit, with a resonant frequency that corresponds with the transmission frequency of the reader. Very high currents are generated in the antenna coil of the RFID reader by step-up in the parallel resonant circuit, which can be used to generate the required field strengths for the operation of the remote transponder. The antenna coil of the transponder and the capacitor to form a ordered circuit tuned to the transmission frequency of the RFID reader. The voltage at the transponder coil reaches a maximum due to step-up in the parallel circuit. As described above, inductively coupled systems are based upon a transformer-type coupling between the primary coil in the reader and the secondary coil in the transponder. This is true under when the distance between the coils does not exceed 0.16 times wavelength, so that the transponder is located in the near field of the transmitter antenna .If a transponder (i.e. the frequency of the transponder corresponds with the transmission frequency of the RFID reader) is placed within the magnetic field of the reader's antenna, then this energy form the magnetic field. This power consumption can be measured as voltage drop at the internal resistance in the reader antenna through the supply current to the RFID reader's antenna. The switch is on and off of a load resistance at the transponder's antenna therefore effects voltage changes at the reader's antenna and that has the effect
of an amplitude modulation of the antenna voltage by the remote transponder. If the switch is on and off of the load resistor is controlled by data, then this data can be transferred from the transponder to the RFID reader. This type of data transfer is called load modulation. To save the data in the reader, the voltage measured at the reader's antenna is rectified. This represents the demodulation of an amplitude-modulated signal.

IV. SYSTEM REQUIREMENT

A. Hardware requirement

Minimum RAM:-1GB
Hard Disk:-128 GB
Processor:-Intel Core i3
RFID Card
RFID Reader
PIC Microcontroller

B. Software requirement

Operating system: Windows XP
Front-End Language: VB.Net
Back-End: SQL Server

C. Advantages

This system is fully automated and it does not require any human interaction.
It is used for multi-purpose systems i.e, attendance, assessment and fee details etc...,
It gives benefit of viewing attendance and other details on the spot on LCD /computer.

V. CONCLUSION

RFID Technology can replace the manual system that transformation of information can be delivered without a hitch.
This system will ease of school/college to monitor the student.
The ystem can reduces manpower.

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A. Future enhancement

We can voice announcement system to this project. so whenever user logs in, we can announce message like, “Your attendance has been logged in” or “Your card is invalid”.

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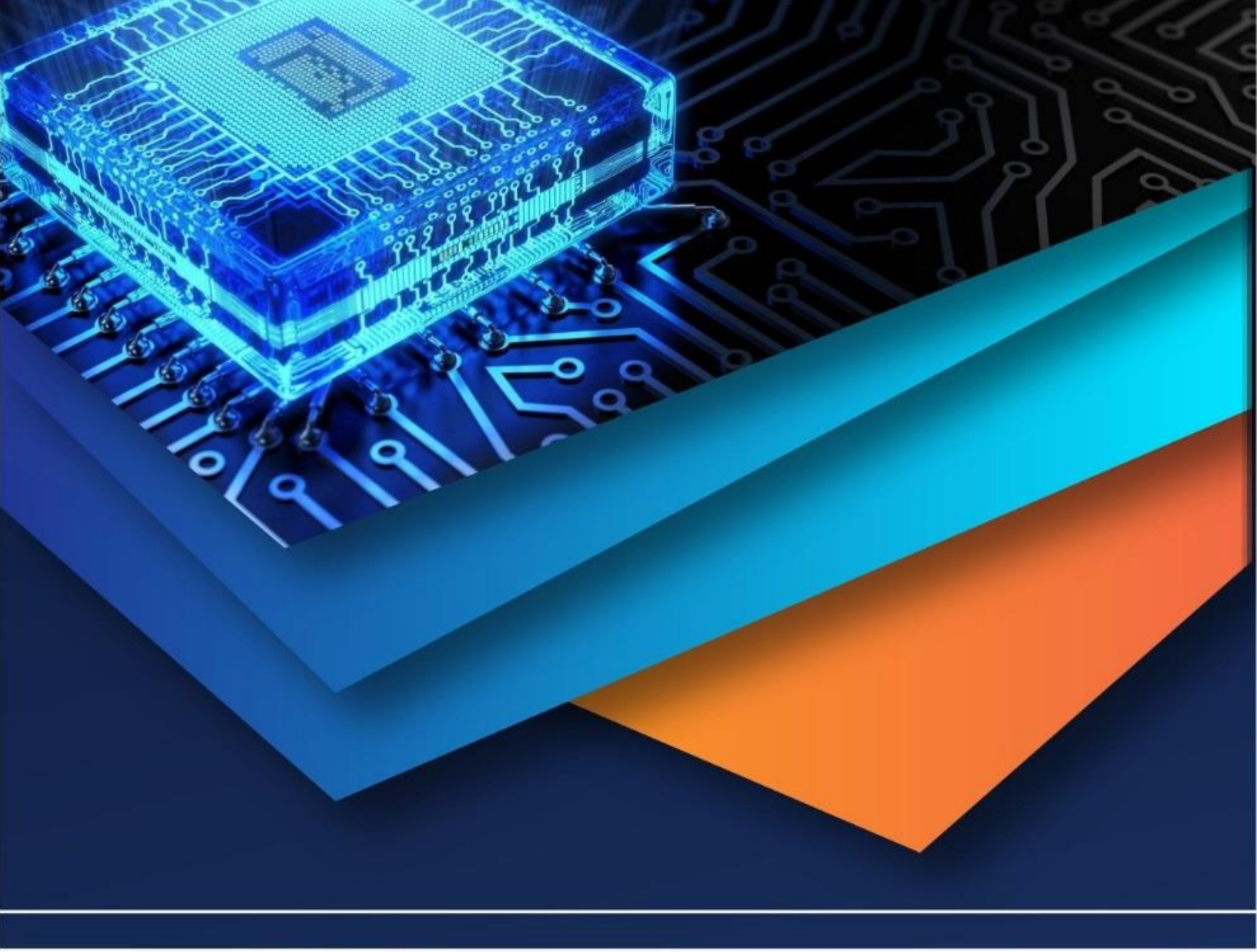

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