Maintain Student Record in College Database Using RFID

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Abstract: The RFID system is also called as Auto-ID (Automatic Identification) System. Due to the low range possibilities and low cost, Radio Frequency Identification (RFID) systems are used in a variety of domain area to uniquely identify physical objects. The operation of RFID systems often involves a situation in which numerous tags are present in the interrogation zone of a single reader at the same time. The center of attention of our paper is to develop a system that would mark the attendance of student by using RFID tag. These RFID technology play a good role in student attendance marking so that reducing paper base-work of college staff, saving the time of attendance marking, authenticate the attendance, student can't make proxy of another student, student see their attendance or other information as per their need so there is no question of forgetting the data, teacher and parents know the detail record of student, college management can easily find out the preferred choices, interest, marks, record of students for instance. To implement this system, we will interface camera with RFID enabled system which will use Low Frequency (LF) RFID tags. On every detection, camera will capture photograph. Then authentication is processed by using image pattern matching algorithm. Such system will be cost and time effective and fast, fully automated, reliable, accurate.

Keywords: Radio Frequency Identification (RFID), Low Frequency (LF), Two Level Security, Automatic Authentication.

I. Introduction

Compare to Radio Frequency Identification (RFID) Technology traditional bar-code technology provide simple solution for Automatic Identification Data Collection (AIDC) technology in various industries applications. But these technology has few problem that is, each barcoded item required individual scanning thus limiting the scanning speed. When it is use by manual labor or automating the scanning process, the extra cost are incurred. That's the reason to overcome these problems today the RFID technology has been making inroads in various industrial applications. RFID system has good accuracy and security make it an ideal data collection and attendance marking platform for a variety of markets and applications including healthcare, manufacturing, warehousing, transportation and retail etc. Here we use RFID technology for collecting the information automatically by radio frequency transformation between RFID tag and Reader and marking the attendance of student. It is more vital for educational sectors to increase the speed of data collection and increase the lectures efficiency. To address these problems, any institution/school must use the RFID-based system that mark the attendance of the student. The important aspect of this paper is to show how RFID can potentially change the way we manage our lives and providing complete solution for a fully automated system. The rest of paper organized as follows: section (II) describes brief about Radio Frequency dentification (RFID), section (III) discusses the proposed system that is requirements and selection of RFID components, section (IV) discuss the Advantages of the system, section (V) discuss the conclusion and finally conclusion is discussed in section (VI).

II. Radio Frequency Identification (RFID)

There are many different types of RFID systems out in the market. They are categorized according to their frequency ranges. Some of the most commonly used RFID kits are as follows:

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

These frequency ranges mostly tell the RF ranges of the tags from low frequency tag ranging from 3m to 5m, mid-frequency ranging from 5m to 17m and high frequency ranging from 1m to 30m.

A basic RFID system consists of three components:
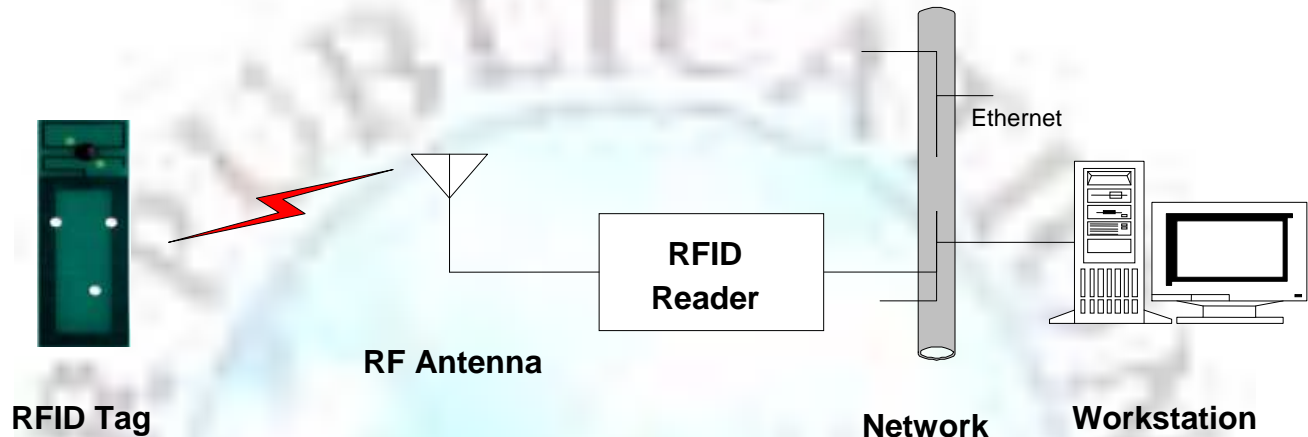
a) An antenna or coil
b) A transceiver (with decoder)

Fig 1: RFID System Architecture

Why RFID?

Now days, organizations prefer to have biometrics based authentication. But using biometrics applications is very costly and time consuming for the classrooms and organization. We can derive a time and cost effective solution for this problem using RFID (Radio Frequency Identification). Using feature provided by RFID to detect multiple individuals with very short amount of time and provide security with image pattern matching algorithm.

III. Proposed System

A. Overview

As we have mentioned above, RFID technology is able to identify individual entity in the short period of time, we are proposing the system that will prove to be handy in situations where security is important. This system will provide faster and secured authentication to the organization classes and premises and restricted area with more precision than earlier RFID based system.

B. Working Sequence

1] User will put tag in a range of reader.

2] Reader will identify tag and send id to the operator application.

3] Operator application will send id to the server by wireless network.

4] Server will process the data and save it in Database.

5] User will get the confirmation by message.

C. Implementation

In the proposed system consider a class in which RFID reader is placed at entrance. Each student will wear the tag as an I-card. At door individual has to come through an obstacle which will slow an individual and allow a person to enter at a time so the reader placed after the door will have sufficient time to identify an individual. The attendance of student will be marked for particular period of time after that the attendance will not be marked. So the students who come late will not get attendance

The reader is connected to the system in the class room. So as soon as reader identifies the student it will send that unique tag id to the system in the class room and camera will capture the photo. Then that system will send that id and photo to the server for authentication. Server will check the tag id of Student. Then the captured image will be compared with the image stored in database. Server will send the student information to the system in the class room. Hence teacher in the class room can authenticate a student by that information.
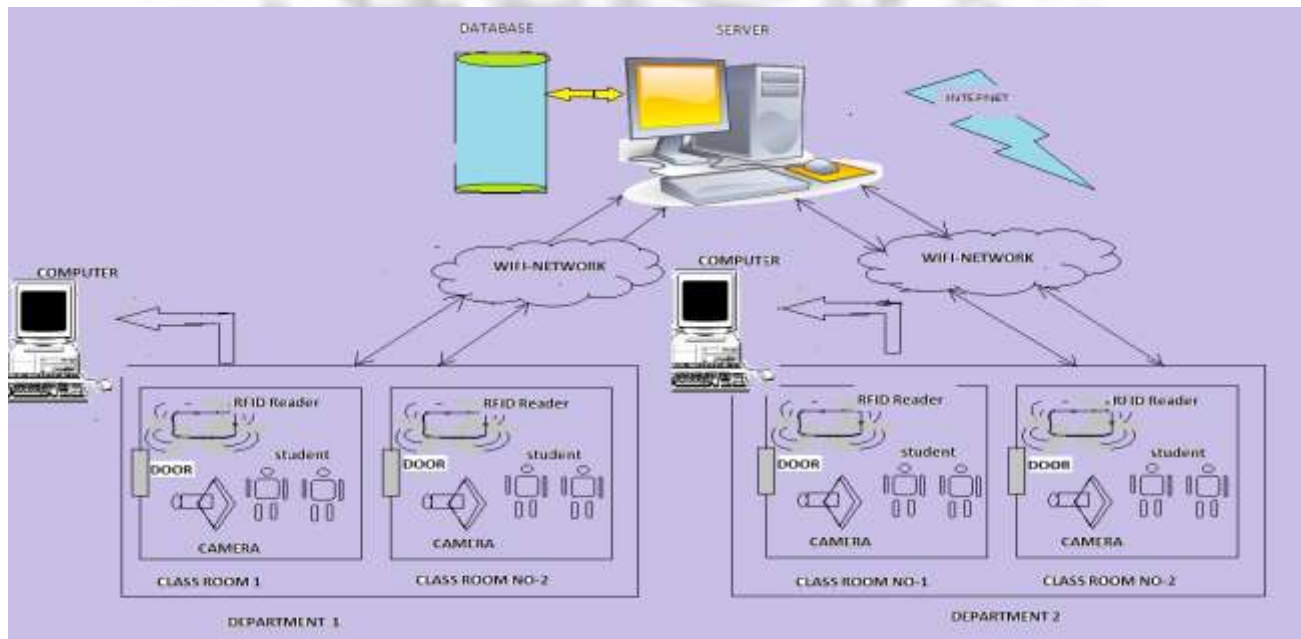
Fig 2: Student Attendance System Architecture

Student can also view his attendance on the website as that attendance will be uploaded on the website. Student attendance report and notice will be uploaded on website. In this system there will be an application which will be for checking daily attendance. Hence the higher authority like principle can check the strength of the various classes. This application will work by connecting to server using Wi-Fi.

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This system is very effective as the students it calculates attendance of all students. This system is very useful where class strength is very high. It will save time of lecturer for both taking attendance and maintain the record.

IV. System Technology Advantages

1] RFID system is fast and fully automated.
2] This System is reliable, accurate and does to required physical site of contact.
3] Reducing paper based work.
4] Saving the time of attendance call.
5] Authentic attendance, no proxy attendance.
6] Easy way to let parents know if a child is absent
7] Students don't have to carry Multiple cards.

Comparison of Different Automatic-Id Technology

System Parameter	Barcode	OCR	Voice Recog	Biometry	Smart Card	RFID
Max. distance between data carrier and reader	0-50cm	< 1 cm	0 – 50 cm	Direct Contact	Direct Contact	0-5 microwave
Reading Speed	Low 4~s	Low 3~s	Very Low > 5s	Very Low > 5-10s	Low ~4s	Very Fast ~0.5s
Unauthorized copying/modification	Slight	Slight	Possible	Impossible	Impossible	Impossible
Operating Cost	Low	Low	None	None	Medium	None
Purchase Cost	Very Low	Medium	Very High	Very High	Low	Medium
Degradation/Wear	Limited	Limited	-	-	Contact	No Influence
Influence of direction and position	Low	Low	-	-	Unidirectional	No Influence
Influence of covering	Total Failure	Total Failure	-	Possible	-	No Influence
Influence of dirt and damp	Very High	Very High	-	-	Possible	No Influence
Readability by people	Limited	Simple	Simple	Difficult	Impossible	Impossible
Machine Readability	Good	Good	Expensive	Expensive	Good	Good
Data Density	Low	Low	High	High	Very High	Very High
Data quantity	1-100	1-100	-	-	16 - 64 k	16 - 64 k

Conclusion

Thus we have studied existing system and found that there are some disadvantages in it. We will be replacing existing system with improved quality system. This will work faster and easier than existing system.

References

[1]. Paul R. Hartmann, "A Passive Saw Based RFID System for use on ordnance", proc. 2009 IEEE, RF SAW Inc., pp.6A.

[2]. Retrieved from: www.IBM.com./tgmc 2012

[3]. Retrieved from: www.ijetae.com, (ISSN 2250-2459, Volume 2, Issue 2, February 2012).

[4]. Bogdan Carbunar, Murali Krishna Ramanathan, Mehmet Koyuturk, Suresh Jagannathan and Ananth Grama, "Efficient Tag Detection in RFID System", Western Reserve University, Cleveland, OH 44106 IEEE, 2008.

[5]. Rajan Patel, Nimisha Patel, Mona Gajjar, "Online Students Attendance Monitoring System in Classroom Using Radio Frequency Identification Technology: A Proposed System Framework", ISSN 2250-2459, Volume 2, Issue 2, Feb. 2012.