Online Attendance Management System Using RFID with Object Contradict

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Abstract: Educational institutions proprietors in our country and the complete world are concerned about regularity of student attendance. Student taken as a whole academic performance is affected by it. The predictable method of taking attendance by calling names or signing on paper is extremely time consuming, and hence inefficient. Radio Frequency Identification (RFID) based attendance system is one of the answers to address this problem. A system that can automatically capture student's attendance by flashing their student card at the RFID reader and save all the mentioned difficulties. A system that has been built using the web-based applications such as JSP, MySQL and Apache to cater the recording and reporting of the students' attendances. NetBeans IDE 6.1 is used for developing the overall system. We have proposed the system in this paper using C#. Microsoft Visual Studio is used for the system designing. Also, the issue related to fake /false attendance from beginning to end the RFID system has been addressed, we eliminate it by using a special object counter for the leader count.
Keywords: Student attendance, RFID, Visual Studio Online Monitoring.

1. Introduction

Attendance Management System is the easiest way to assist the faculty and the lecturer for this time-consuming procedure. The most common means of tracking student attendance in the classroom is by put into effecting the students to manually sign the attendance sheet, which is normally passed around the classroom while the lecturer is performing the lecture. For instance, lecturers with a large class may find the aggravate of having the attendance sheet being passed around the class and the manual signing of attendance by students are burdensome and most likely entertain them from teaching and getting full attention from the students. Besides, as the attendance sheet is passed around the class, some students may accidentally or knowingly sign another student's name. The first case directs to a student missing out their name, while the latter leads to a false attendance record. Another issue of having the attendance record in a hardcopy form is that a lecturer may lose the attendance sheet. In terms of attendance analysis, the lecturer also has to perform manual calculation to obtain the students attendance percentage, which normally consume a lot of time. RFID technology which stands for Radio Frequency Identification, can be a powerful tool in assisting to manage student's attendance throughout the working day and also enhance classroom security. RFID technology has been applied to solve problems where it is necessary to take automatically record the movements and locations of students in a classroom of institutes/university environment. RFID, which is an automatic identification technology used for retrieving from or storing data on to RFID Tags without any physical contact. RFID systems have been widely used in many different application areas, such as: product tracking through manufacturing and assembly , control of inventory, parking lot access and control, container tracking, ID badges and access control, equipment tracking in hospitals, etc. An RFID system primarily comprises of RFID Tags, RFID Reader, Middleware and a Backend database.
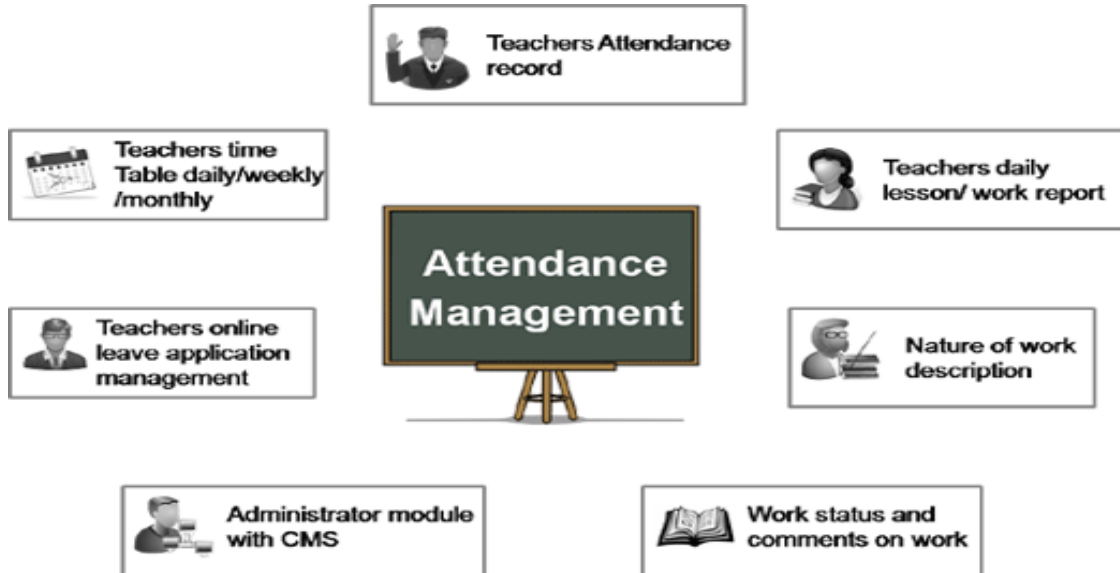
2. Radio Frequency Identification System (RFID)

RFID is a technology that is used to accumulate information automatically by radio frequency data communication between a mobile object and an RFID reader to identify, categorize and track them. RFID tags can be read from a number of meters away and away from the line of sight of the reader. RFID systems have been generally used in many different application areas, such as: product tracking through manufacturing and assembly, control of inventory, parking lot access and control, container tracking, equipment tracking in hospitals etc. An RFID system primarily comprises of RFID Tags, RFID Reader, Middleware, Antenna and a Backend database.

2.1 RFID Reader and Tag: A tag consists of a microchip that stores a unique series identifier that is useful in identifying purposes individually. The sequence is a numeric serial, which is stored in the RFID memory. Tags are designed particular to its applications and environment. RFID tags are of three types which are passive, semi-passive and active tag. Tags that are initiated by the reader are known as Passive tags, whilst those do not require external instigation are called Active tags. A Semi-Passive tag exists, which has the features of both Active and Passive tags. The Each tag type has its distinct characteristics The RFID reader sends a rhythm of radio energy to the tag and listens for the tag's response. The tag detects this power and sends back a response that contains the tag's serial number and possibly other information as well. It transmits this data to the Middleware for further processing. The reader attempts to interrogate the tags at varying frequencies. The reader also contains built in anti-collision processes, which allows the reader to read multiple tags concurrently.

Features of Types of Tags

Features	Type of Tag		
	Passive	Active	Semi-Active
Read Range	Short (up to 10 m)	Long (up to 100 m)	Long (up to 100 m)
Lifespan	Up to 20 years	Between 5-10 years	Up to 10 years
Battery	No	Yes	Yes
Cost	Cheap	Very Expensive	Expensive
Availability	Only in field of Reader	Continuous	Only in field of Reader
Storage	128 bytes read/write	128 Kbytes read/write	128 Kbytes read/write

2.2 Middleware: The middleware is an interface involved to manage the flow of data from the reader and to transmit it competently to the backend database management systems. Data from tags is required to go through software (middleware) that can filter, convert, correct and relay it to the proper systems. The middleware can reside on a reader or a server.

2.3 Antenna: The antenna is middling through which the tag and reader communicate with each other. It antenna can activate a tag and transfer data by emitting wireless desires implementation of RFID in student management will provide extra capabilities like high efficiency and overall simplicity in management of the system. The objectives of the research should be obviously organized to successfully develop the system.

2.4 Backend Database: A database is described as an organized collection of data and modified to our system, our database primarily deals with the storage of relevant data recorded by the reader and communicated by the middleware.

3. Proposed System

Expansion of the system will be based on troubles be addressed and which can meet the needs of the organization. The proposed system provides solution to trouble through coordinated hardware and software design handshaking information communications between RFID tag and RFID reader. This system is based on active RFID tag. All RFID readers are raised in the central of each class room and connected with the class room computer which is connected with the existing campus LAN infrastructure. Software running on main server receives events, which having tag id, date, time, and class room location etc. This information passes through middleware which gives the filtering operation. The system operation is expressed as below:

Step1. Track all RFID tags in class room and object counter count the number of persons in class room.

Step2. If tracked RFID tags count is equal to object counter count then send RFID tag data to middleware through LAN.

Step3. Using middleware perform the filtering operation to remove unwanted field and extract class room id, course id and student id.

Step4. Search student tags id in permanent database with tracked RFID student's tags.

Step4.1. Search class room id, if found go to step 4.2. else go to step3.

Step4.2. Search course id, if found go to step 4.3. else go to step3.

Step4.3. Search student id, if found go to step5. else go to step3.

Step5. Compare detected student's tag id's date and time with class time table and if match found than go to step6 else go to step 3.

Step6. Check person type and mark the presence.

Step7 Repeat step 3 to step 6 for all tracked RFID tags.

4. Advantages of System

This system is fast, completely automated, flexible, reliable, accurate, does not needed physical site of contact, reducing paper based work, saving the time of attendance call, authentic attendance, no proxy attendance, cannot artificial data, students would have a reason to go to class, easy way to let parents know if a child is hopping class. With this system, percentage of student attendance will increase because there will be no alternative attendance. Student's Attendance weight-age is also calculated in order to verify their eligibility to sit in exam.

5. Conclusion

The study has identified and give detailed the key benefits of RFID technology. The Student Attendance System using Radio Frequency Identification technology with object counter will significantly progress the current manual process of student attendance recording and tracking system, especially in a university environment. The system encourages a fully-automated approach in capturing the student attendance and monitoring the student in the university campus. The attendance taken is protected and accurate. The system is user-friendly with easily accessible controls and communication ports. Attendance can be stored and retrieved easily. It can easily integrate with other campus activity such as RFID book library, automatic payment system in canteen etc. This system does not required additional cost; it is one time investment and having long life.

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