RADIO FREQUENCY IDENTIFICATION FOR STUDENT ATTENDENCE TRACKING

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Abstract: In recent years, there have been rise in the number of applications based on Radio Frequency Identification (RFID) systems and have been successfully applied to different areas as diverse as transportation, health-care, agriculture, and hospitality industry to name a few. In this paper, an attempt is made to solve attendance tracking system using RFID technology and to automate student attendance tracking using RFID tags in an educational institute environment. The application of RFID to student attendance tracking is developed and deployed in this study is capable of eliminating time and paper work during manual collection of attendance and an opportunity for the educational administrators to capture appropriate attendance scores for further managerial decisions.

I. INTRODUCTION

 In most of the institutions, tracking student's attendance is one of the major issues, because attendance plays important criteria for evaluating a student's hall ticket generation for exams and final grade evaluation in each semester. This brings the idea of having some automated method to track and record student's attendance. Therefore, automated computer-based student attendance management system is required to assist the faculty and the lecturer for this time-consuming process. An attempt is made in this paper to solve student's attendance tracking problem using RFID technology. This technology facilitates automatic wireless identification using electronic passive tags with its respective readers. RFID technology is wireless identification that using electromagnetic fields [1]. For this project, RFID based student's attendance management system can provide a better convenient method to take attendance, also it can be easily accessed by the lecturers by logging onto the system and most importantly, real-time reports can be generated in the form of grid view. Thus, this application of RFID is capable of saving the time wasted during manual attendance taking procedure [2].

The invention relates to Radio Frequency Identification (RFID) systems and particularly, to an RFID system designed to continuously track articles and personnel as they move a system for tracking mobile tags. Cell controllers with multiple antenna modules receive and process the response, and determine the presence of the tags by proximity and triangulation. The cell controllers send data from the antenna to a host computer. The host computer collects the data and resolves them into positional estimates. Data are archived in a data warehouse, such as an Access [3].

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Data are archived in a data warehouse, such as an Access. Historically, human-activity tracking techniques have focused on direct observation of people and their behavior with cameras, worn accelerometers, or contact switches. A recent promising avenue is to supplement direct observation with an indirect approach, inferring people's actions from their effect on the environment, especially on the objects with which they interact [3].

II. IMPLEMENTATION

Radio Frequency Identification (RFID) [1] is an automatic identification method, relying on storing and remotely retrieving data using devices called RFID tags or transponders. So the RFID is a wireless identification. An RFID system comprises of two main parts namely an RFID Reader and an RFID Tag. RFID has the following main components as shown in Fig 1.

 RFID Tag / Transponder

 RFID Reader

 RFID Antenna

 PC /Database [2]

An RFID system consists of a tag, which is made up of a microchip with an antenna, and an interrogator or reader with an antenna. The reader sends out electromagnetic waves. The tag antenna is tuned to receive these waves. FID reader is the device capable of extracting or reading information stored inside RFID tags. Each RFID tag will have unique ID or serial number which makes it suitable for distinguishing among products. FID systems use radio waves to transmit information from an integrated circuit tag through a wireless

communication to a host computer. These systems consist of three components that are the tag (transponder), the reader (interrogator) and the host computer (controller).
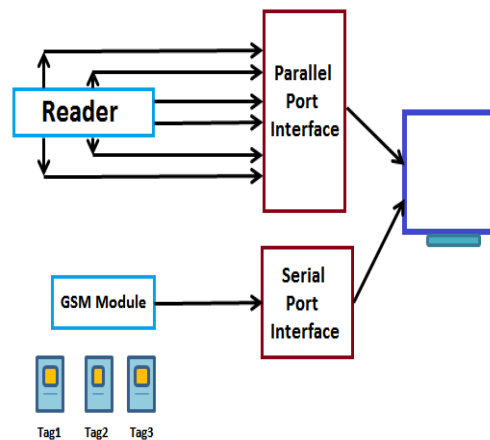
Figure 2.1: Network Diagram

There are two types of RFID tags, either passive or active. Active tags frequently identify the signal coming in range and moving out of range. Hence it can offer a greater read distance but they have a limited lifespan. On the other side passive tag can identify once the signal comes in range, but it will never identify once the signal moves out of range. Here we use passive tags. When an RFID reader is in the vicinity of the passive tag, it will broadcast information to the reader. They have shorter read distances.

 The reader communicates with the tags in its wireless range and collects information about the objects to which tags are attached. Compared to other automatic identification technologies, like optical barcode systems, RFID has several advantages, such as tag data can be read automatically without line of sight from a range of several meters [2].

RFID is a radio communication standard much like Bluetooth, Wi-Fi and other networking technologies. It's different in that it operates at very slow speeds and short range of few centimeters. Unlike Bluetooth, no paring is needed because of its low power, no battery in the device being read.

Once the RFID tag comes in the range, the reader will detect the tag and the tagid. Each student have a unique card and an id associated with it.In fact each student have a unique tag id.

The reader can detect the presence of a tag with the help of the GSM module [7]. Once it detects the presence of the tag, synchronizes through the parallel port interface. The interface is actually the software that is developed. It will take the reader id and the time (this is to

track which course or subject) and sends to the back end database. This will make a data base entry to the system with course and student details. The data can be used to calculate overall attendance percentage. The data will be provided in grid view in the system.
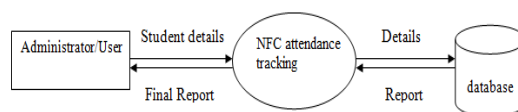
Figure 2.2: Data Flow Diagram

We are using the RFID technology. The RFID tags are distributed to the students in college after registering their college ID, Photo and Detailed Information .The students has to carry his/her ID whenever he/she is coming to the class. The attendance of the students will be tracked while they enter the class by tapping the RFID Tag via RFID reader. The RFID tag once read will be registered online in the server recording student attendance. Thus, we are reducing the paper work and make the system more reliable and easy.
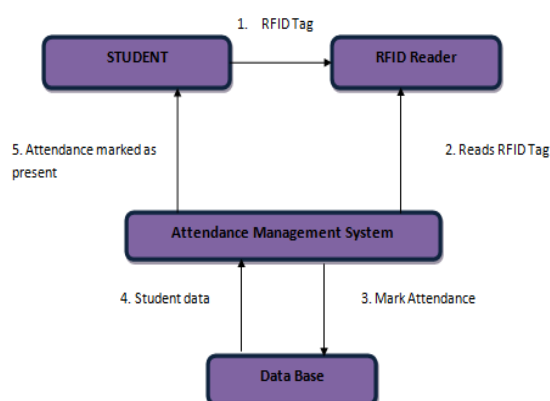
Figure 2.3: Functional Design

This can be used in Enterprise level organizations, Colleges, universities. Improve your performance to maximize productivity and decrease costs. Developments in networked and mobile technologies now provide us with more methods than ever for supporting children in their transition between home and school. The teacher will upload attendance on the server after the lecture. Then it will be saved on the database. Student can achieve a final report after the end of the semester, make payments etc. In this project we propose a system that uses distributed NFC Technology over Ethernet and we demonstrate how to automate an entire students' attendance registration system by using NFC tags in an educational institution environment [8].

This software is developed such that total appearance of the product to make it more user friendly. The operator will be provided with login id and password. General users with basic computer skills can use this software. This software is developed such that total appearance of the product to make it more user friendly. The operator will be provided with login id and password. General users with basic computer skills can use this software.

There are a lot of advantages for the system. The configuration required for RFID is easily available. The Project operation is very systematic that the integration of components required for the project is easy. There exists a single system that controls the operation. It uses tags with low power consumption requirements, allowing the lifetime a powered tag to approximate the lifetime of the tag battery itself. The RFID tags are available for less cost with a long life. Some of the listed advantages are that radiations emitted are not harmful [4], installation of the software is easy, user friendly language. The antenna modules connected to cell controllers and are omitted for simplicity, Maintenance is not frequent

But going more deep in to the system, there are some disadvantages. The RFID battery may go down in 2 years. There can be possibility of proxy are fair as the Tag may be swiped by his friends. Processing data requires Specific hardware and specific software programs. The cost of the software equipment, personal required can be prohibitive for small production. The circuit used for RFID reader is complex

The circuit used for RFID tag is complex. Extra power source is required for the tag to transmit. PC is an interface, Hence chance of software failure. Sometimes there is chance of collision of the signals of 2 different tags, but this problem can be solved in the higher version. This project works on software so there is a chance of errors in program.

III. CONCLUSION

In the near future, your technological world might be overtaken by Radio frequency, not the corn field that's across the road. We're talking about Radio frequency [5] communication (RFID), which gadget manufacturers, retailers and many other organizations hope will bring powerful new features to smart phones and much more. RFID is a type of radio communication standard, much like Bluetooth, Wi-Fi and other networking technologies. It's different in that it operates at very slow speeds and only at a short range of just a few centimeters.

In this paper we are referring to RFID Technology for attendance management system. The Cards are distributed to the students in college after registering their College ID and Detailed

Information. The student has to carry his / her ID whenever he/she is coming to the class. The teacher inside the class will take the attendance of the students while they are entering the class by taping the Card via a RFID enabled reader. The card once read will be registered online in the server recording student's attendance. Thus, we are reducing the paper work and make the system more reliable and easy.

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