

# RADIO FREQUENCY IDENTIFICATION BASED WIRELESS ATTENDANCE SYSTEM

<sup>1</sup>MISTRY TAPASVEE, <sup>2</sup>SHAH KHANTIL, <sup>3</sup>HIMANSHU PARASHAR, <sup>4</sup>A.B.PATIL

<sup>1,2,3,4</sup>Dept. of E&TC, Bharti Vidhyapeeth College of Engg., Pune, India  
E-mail: Mtapasvee@yahoo.in, Khantily@gmail.com, abpatil@bvucoep.edu.in

**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. RFID technology facilitates automatic wireless identification using electronic passive and active tags with suitable readers. In this paper, an attempt is made to solve recurrent lecture attendance monitoring problem in developing countries using RFID technology. The application of RFID to student attendance monitoring as developed and deployed in this study is capable of eliminating time wasted during manual collection of attendance and an opportunity for the educational administrators to capture face-to-face classroom statistics for allocation of appropriate attendance scores and for further managerial decisions.

**Keywords-** RFID, Lecture, Attendance, Passive tag, Reader

## I. INTRODUCTION

The emergence of electronic paradigm for learning compared to traditional method and availability of almost all information on the information superhighway(Internet), nowadays have caused students to be less motivated to come to the lecture rooms than ever before. Laziness on the part of students, nonchalance to school work, extra social activities that have no importance in aiding the objectives of the institution and a lot more, may prevent students from attending lectures. Sequel to these, lecturers and administrators in most developing countries have had to come up with ways to ensure a healthy participation from students, and make sure that the student-lecturer interactive relationship is kept intact. This in some cases have come in simple forms like roll calls, while in more interesting cases, can be formats like surprise quizzes, extra credit in class, etc. These strategies are however time consuming, stressful and laborious because the valuable lecture time that could otherwise been used for lectures is dedicated to student attendance taking and sometimes not accurate.

In addition to all these challenges, the attendances are recorded manually by the tutor and therefore are prone to personal errors. There arises a need for a more efficient and effective method of solving this problem.

A technology that can solve this problem and even do more is the RFID technology. RFID is an automated identification and data collection technology, that ensures more accurate and timely data entry. RFID is not actually a new technology; it only quickly gained more attention recently because of its current low cost and advances in other computing fields that open up more application areas.

RFID combines radio frequency and microchip technologies to create a smart system that can be used to identify, monitor, secure and do object inventory. At their simplest, RFID systems use tiny chips called —tags that contain and transmit some piece of identifying information to an RFID reader, a device that in turn can interface with computers . The ability of RFID systems to deliver precise and accurate data about tagged items will improve efficiency and bring other benefits to business community and consumers alike in the not distant future. In this paper, we present an intelligent RFID based lecture attendance access and management system. The application of RFID Technology to student course attendance monitoring problem especially in developing countries in our proposition will lead to elimination or reduction of the quality time wasted during manual collection of attendance, creation of a student database management system that is not prone to errors or being manipulated by anyone and above all aids in better management of classroom statistics for allocation of attendance.

## II. VARIOUS METHODOLOGIES FOR ATTENDANCE SYSTEM

There are various techniques for taking and managing students attendance which are manual attendance systems like roll call and storing those attendances in paper. This will lead towards time consumption and waste of paper apart from this there will be some hum errors which will give false record of attendance.

There will be also problem of proxy attendance. These problems can be eliminated by using RFID based wireless attendance system where all work is automatic. The attendance taken can be stored in microcontroller memory or in external memory interfaced to the microcontroller.

### III. WHAT IS RADIO FREQUENCY IDENTIFICATION?

RFID technology is based on the concept of magnetic coupling, which is the principle that current flowing in one circuit can induce current flow in another circuit through a magnetic field generated in the space between the circuits. In passive RFID, there are two major components: the reader and the mobile tag. The reader has two main functions: the first is to transmit a carrier signal, and the second is to receive a response from any tags in proximity of the reader. A tag needs to receive the carrier signal, modify it in some way corresponding to the data on the card, and retransmit the modified response back to the reader. In modern passive RFID devices, the tag consists of a small integrated circuit (that performs the modulation) and an antenna. The benefit of passive RFID is that it requires no internal power source; the circuit on the tag is actually powered by the carrier signal. Thus, the carrier signal transmitted from the reader must be considerably large so that the response can be read even from the card.

As shown in the above block diagram RFID systems are classified according to the properties of the data carrier called a transponder or tag. The two major classes of RFID transponders are active and passive. Active transponders contain a battery or are connected to an external power source. Active transponders are capable of longer communication distance and can perform data collection tasks even when no reader is present.

### IV. REQUIREMENT AND SELECTION OF MICROCONTROLLER

Microcontrollers as the name suggests are small controllers. They are like single chip computers that are often embedded into other systems to function as processing/controlling unit. For example the remote control you are using probably has microcontrollers inside that do decoding and other controlling functions.

They are also used in automobiles, washing machines, microwave ovens, toys ... etc, where automation is needed. Embedded system means the processor is embedded into the required application.

An embedded product uses a microprocessor or microcontroller to do one task only. In an embedded system, there is only one application software that is typically burned into ROM. Example: printer, keyboard, video game player Microprocessor - A single chip that contains the CPU or most of the computer Microcontroller - A single chip used to control other devices .

#### - MICROPROCESSOR VS MICROCONTROLLER:

#### Microprocessor:

- CPU is stand-alone, RAM, ROM, I/O, timer are separate
- Designer can decide on the amount of ROM, RAM and I/O ports.
- expensive
- versatility general-purpose

#### Microcontroller:

- CPU, RAM, ROM, I/O and timer are all on a single chip
- fix amount of on-chip ROM, RAM, I/O ports
- for applications in which cost, power and space are critical

### V. BLOCK DIAGRAM OF RADIO FREQUENCY IDENTIFICATION BASED WIRELESS ATTENDANCE SYSTEM

Fig.1 shows the basic block schematic of RFID based wireless attendance system .Here, microcontroller and RFID module(Tag and receiver) are main component.

When any valid tag is detected by RFID receiver it will give interrupt to the microcontroller by which microcontroller will take the attendance respective to the rdif tag. This data will be stored either in microcontroller's data memory or into the external memory which is interface with the microcontroller. This external interface of memory is not shown in the figure. Power supply of +5 volt is supplied to the microcontroller.LCD is interfaced to the microcontroller for isplay of ID number whose attendance is being marked.There is MAX 232 IC for connecting the PC with microcontroller.

Description in detail:

It contains following blocks

- 1) RFID Reader: Full form of RFID is "Radio Frequency Identification". Wireless communication is used between RFID tags and RFID Reader. Reader does not require line of sight communication with tags. It means that Reader detects the RFID tag even if there is some object between Card and Reader. Thus it is a non-contact type of reader. The Radio frequency used in our reader is 125 kHz which is a Low Frequency (LF). RFID reader interfacing with microcontroller is done using serial port. RFID reader will communicate with microcontroller using serial communication. When RFID tag comes in the range of Reader module, then RFID reader detects RFID card. And at that time RFID reader sends out a series of alphanumeric unique codes on the serial port. So while adding the employees/student card number in the program memory. First we need to store this series of alphanumeric code into program memory and later on this unique series of codes will be compared with the incoming

card number. RFID card reader module requires 9 volt power supply and output is given on DB9 connector port.

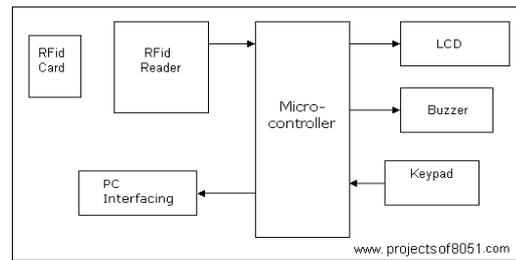


Fig.1 Basic block schematic.

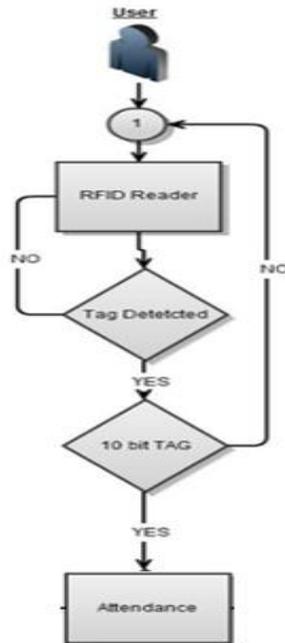


Fig 2. System flow diagram

**VI. FUTURE SCOPE**

Such application of RFID tag and Microcontroller can be implemented where taking and keeping the trace of attendance necessary. Future scope of such application is as below.

- Can be combined with GSM module through which the data can be sent to the respective person’s mobile via sms.
- It can be connected to the respective firm’s website via gateway.

**CONCLUSION:**

Here we studied about the radio frequency identification technique. by combining it with microcontroller we can make different applications like attendance system, door lock ,etc.

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