



Keywords

GSM,
Electronic Notice Board,
Fingerprint Based Attendance
System

Received: April 30, 2017

Accepted: July 20, 2017

Published: September 20, 2017

Design and Development of Smart Student Management System

Rakib-Ul Hasan, Md. Akibul Azam, Md. Rifat Rahman,
Abdullah-Al Mamun, Md. Saniat Rahman Zishan

Department of EEE, American International University-Bangladesh, Dhaka, Bangladesh

Email address

rahirakibulhasan@gmail.com (Rakib-Ul H.), akibul.azam58585@gmail.com (Md. A. Azam),
rifat12rahman@gmail.com (Md. R. Rahman), mkajol80@gmail.com (Abdullah-Al M.),
saniat@aiub.edu (Md. S. R. Zishan)

Citation

Rakib-Ul Hasan, Md. Akibul Azam, Md. Rifat Rahman, Abdullah-Al Mamun, Md. Saniat Rahman Zishan. Design and Development of Smart Student Management System. *International Journal of Modern Education Research*. Vol. 4, No. 5, 2017, pp. 21-26.

Abstract

This project is consisted of two parts. One is fingerprint based student attendance system and another one is notice board. For fingerprint based student attendance system fingerprint module is used which mainly takes fingerprints to match and makes an attendance report. Bluetooth module is used which provides the wireless communication. It also sends the attendance report to PC. In this system no one can give proxy. Its construction is small that's why for the user it's easier to carry. To reduce the clumsiness of notice board wireless electronic notice board is developed. Not only in educational intuition but also it can be used in anywhere such as super shop, offices etc. It's mainly consists of two parts, one is transmitter and another one is receiver. In transmitter module, there is a Liquid Crystal Display (LCD), microcontroller and transmitter. In receiver module mainly the Global System for Mobile (GSM) is used, it always checks whether message is received or not. If any message is received than it will display on Liquid Crystal Display (LCD).

1. Introduction

The conventional method of taking attendance by calling names or signing on paper is very time consuming. Also, in this traditional system there are opportunities to give proxy of the absent students. Also most of the Universities use old type's notice board where lots of notices are posted in the board which sometimes become clumsy and also there is opportunity to post the unauthorized notices. The main purpose of this project is to make the attendance taking system more secure and efficient. By using fingerprint attendance system, the possibility of giving proxy will come to end and it will be less time consuming than traditional method. The electronic notice board allows accessing or notifying the class instantly via mobile through SMS. Fingerprints offer a dependable method for individual ID. That is the key clarification for fingerprints having supplanted different techniques for setting up the characters of people hesitant to concede past captures. The English Judge Sir William James Herschel, Boss Officer of the Hooghly area in Jungipoor, India started utilizing fingerprints as a part of July of 1858. He utilized first unique mark on local contracts. On an impulse, and without thought toward individual distinguishing proof, Herschel had Rajyadhar Konai, a neighborhood businessperson, inspire his imprint on an agreement [1]. Other unmistakable human attributes, for example, facial elements, tend to change with age, however fingerprints are generally steady. Notwithstanding wounds or surgery bringing on profound scarring,

or sicknesses, for example, uncleanliness harming the developmental layers of rubbing edge skin, finger and palm print highlights have never been appeared to move about or change their unit relationship for the duration of the life of a man. In 1882, Gilbert Thompson of the U.S. Geological Survey in New Mexico, used his own thumb print on a document to help prevent forgery. This is the first known use of fingerprints in the United States [1]. In 2010 Pallavi, Vermaand, Namit and Gupta did a project about fingerprint attendance system. In this project they were using microcontroller, finger print sensor module. A GSM module was used for sending data to the student's parents [2]. In 2011 Rishabh Mishra and Prashant Trivedi students from Computer Science and Engineering department of National Institute of Technology Rourkela, Rourkela-769 008, Orissa, India did a project about wireless student attendance system. A web address was created for saving data. It was mainly controlled by the server [3]. In 2015 students of Dept. of ECE, Sambalpur University Institute of Information Technology, Odisha, India had did a project about fingerprint attendance system [4]. In July 2015 students from Department of Electronic Engineering, Mandalay Technological University, Mandalaydone did a project about RFID and Fingerprint Reader based student attendance system. Both RFID and fingerprint sensor was used and both were connected with pc. They also created a server, which mainly controlled the database [5].

The notice board is a big board put at vital positions which notification and notices are being set on it. As these notifications are being put on the loads up, a portion of the old notification are not evacuated and with time the notice barricades get loaded with pertinent and immaterial notice messages, as an aftereffect of this, a man won't not take alert of any new notice being shown as the individual feels he can't experience the worry of perusing through the entire notice load up hunting down applicable takes note. Clearly creating DNB program would help in dispersing data much simpler between various individuals from the college [6]. In

2007 three students from Covenant University implemented digital notice board using server. For making server JAVA language was used [7]. In 2007 a student from University Malaysia Pahang, Fauzal Naim Bin Zohedi developed a project about wireless electronic notice board. In his project there were two parts, transmitter and receiver. In transmitter part microcontroller, encoder and LCD matrix were used and receiver part there were also microcontroller, decoder and dot matrix [8]. In May 2013 two students from SASTRA University, Thanjavur, Tamil Nadu, India implemented digital notice board using power line communication. For making this project PLC (Power Line Communication), PLC Modem, PIC 16F877A Microcontroller, LCD were used. For making the notice board connected with PC, power line modem was used [9]. In June 2014 four students from K. V. G College of Engineering did a project about wireless electronic notice board using server. In their project a web address was created for controlling the notices. The notice board was mainly controlled by the server and connected with the server [10].

2. Block Diagram

Figure 1 and 2 shows the block diagram of smart management system.

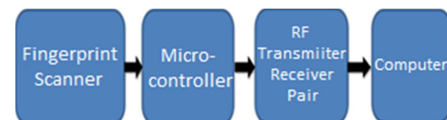


Figure 1. Block Diagram of Fingerprint based Students Attendance System.

As figure 1 shows for the fingerprint based attendance system Fingerprint scanner (5V TTL), Microcontroller (AT Mega 8A), RF transmitter are used. At first fingerprint scanner will scan the fingerprint then it will send the data to microcontroller and then the data will be saved to the computer through RF transmitter receiver.

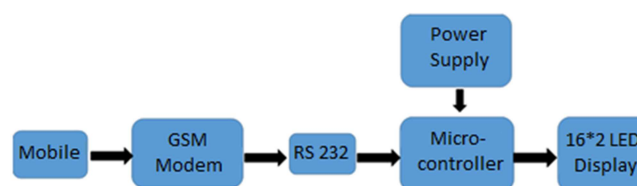


Figure 2. Block Diagram of Electronic Notice Board.

From figure 2, it can be seen that when any comment will come from the mobile, it goes through the GSM Modem then through the microcontroller. The notices will be showed in the Light Emitting Diode (LED) Display. The comment will come through the RS232 to the microcontroller. A power supply will be connected with the microcontroller.

3. Simulation

For the simulation purpose PROTEUS 7.8sp2 is used. The

whole circuit for our project in this software and for coding MicroC pro is used.

3.1. Simulation of Finger Print Attendance System

The finger print attendance system is a simplest system to take attendance. By this system attendance of a whole class can be easily taken. Data is saved in PC. The circuit below is designed to show how in this system the attendance is taken and saved.

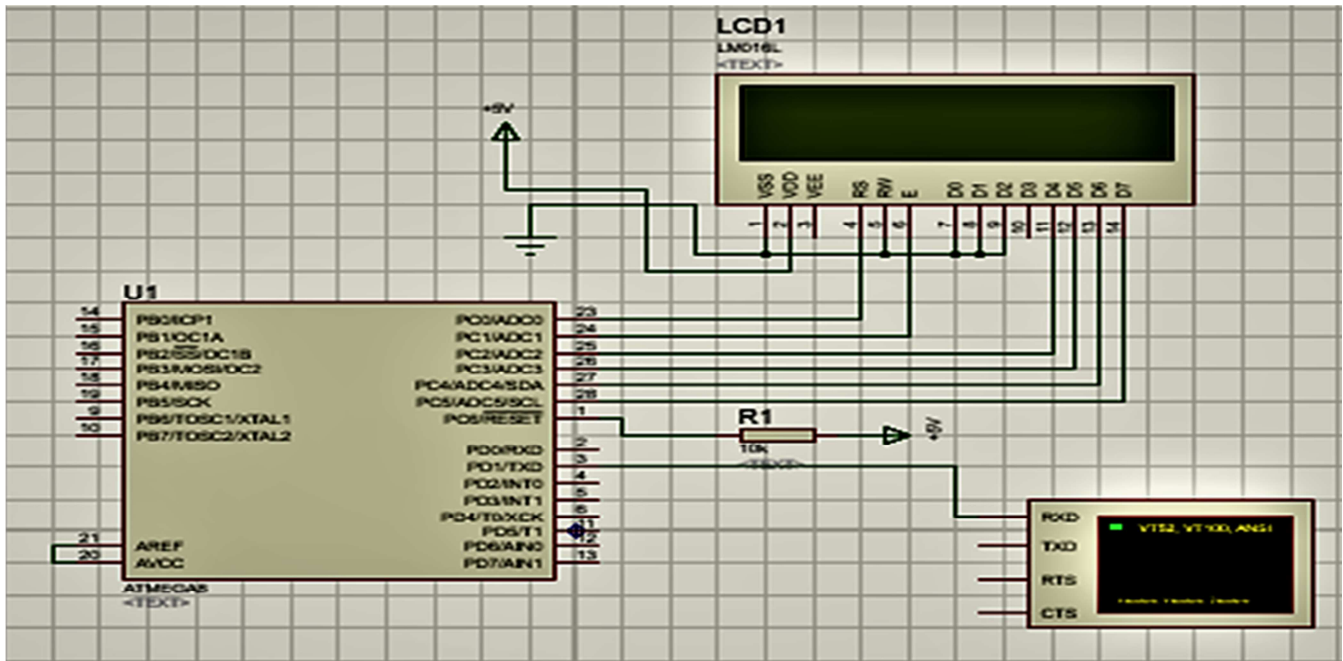


Figure 3. Operating mode of Switch output (Finger Print).

Figure 3 shows microcontroller is connected to the finger print module and another part is connected to the LCD display which shows if the device is receiving the data or not.

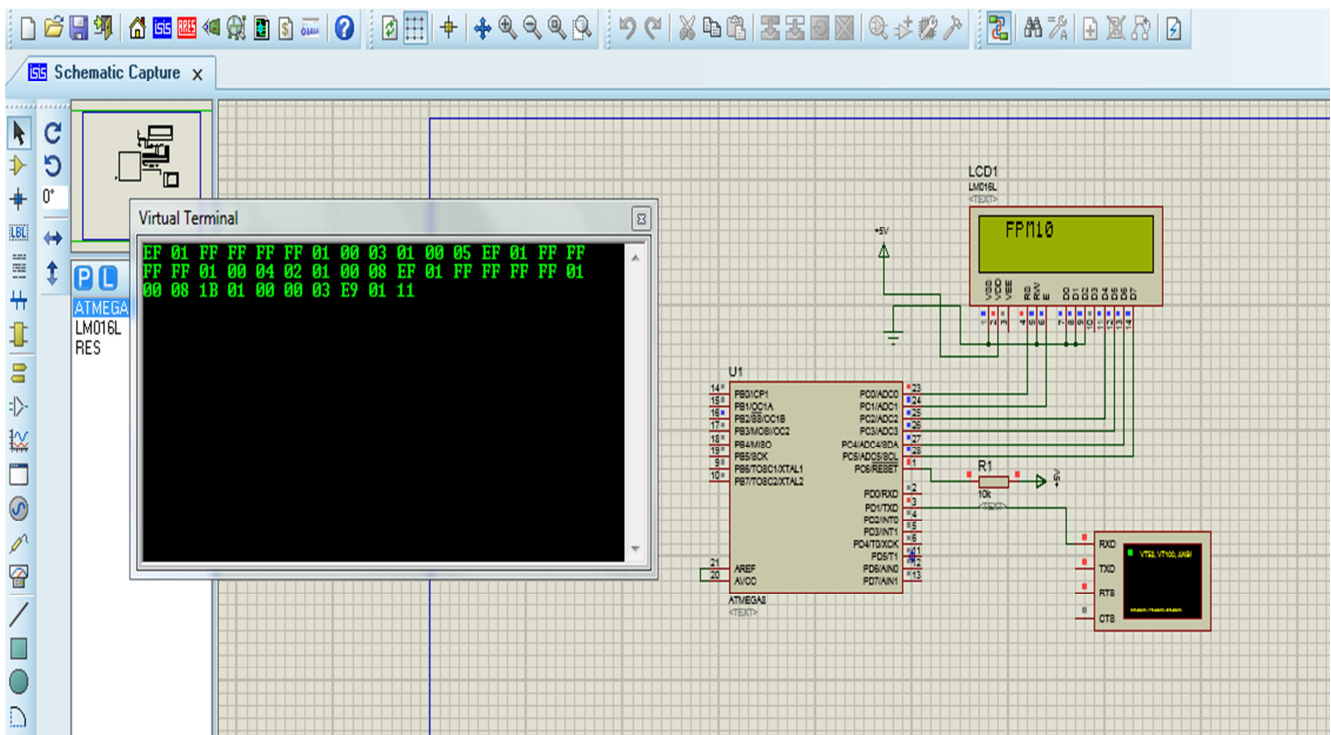


Figure 4. Command of Switch output (Finger Print).

In microcontroller if Co pin is being high then microcontroller will give command to fingerprint sensor to scan. Then the fingerprint sensor will search, if it matches with the saving databases or not. If it matches, then the fingerprint sensor will give command to the PC through Bluetooth Module.

3.2. Simulation of Electronic Notice Board

Electronic notice board is a simplest process to show notices through a cell phone. The circuit below shows how command is given to the notice board by GSM module.

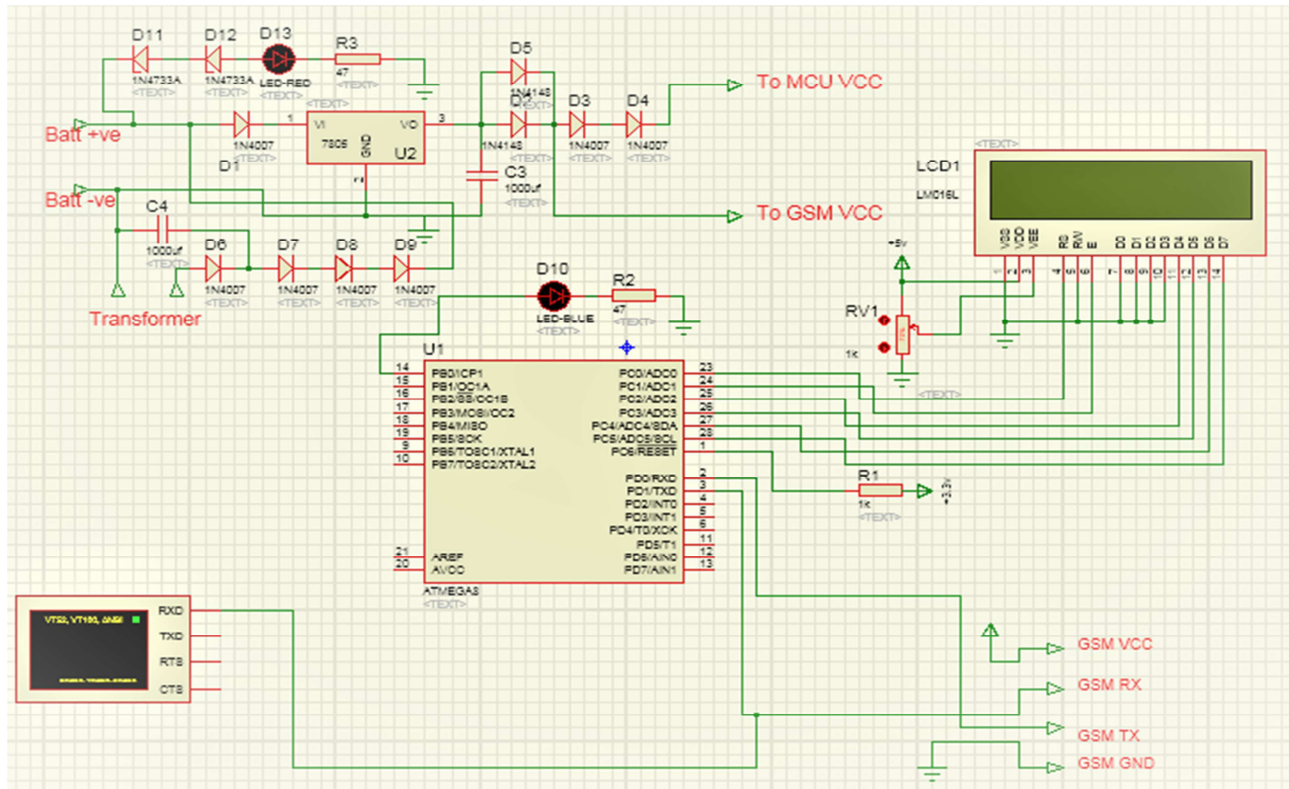


Figure 5. Operating Mode of GSM Module (Notice Board).

In this part, the microcontroller is connected to the operating system and another part is connected to the LCD display which shows if the device is receiving the data or not. There are also three diodes and an indicator connected to the microcontroller.

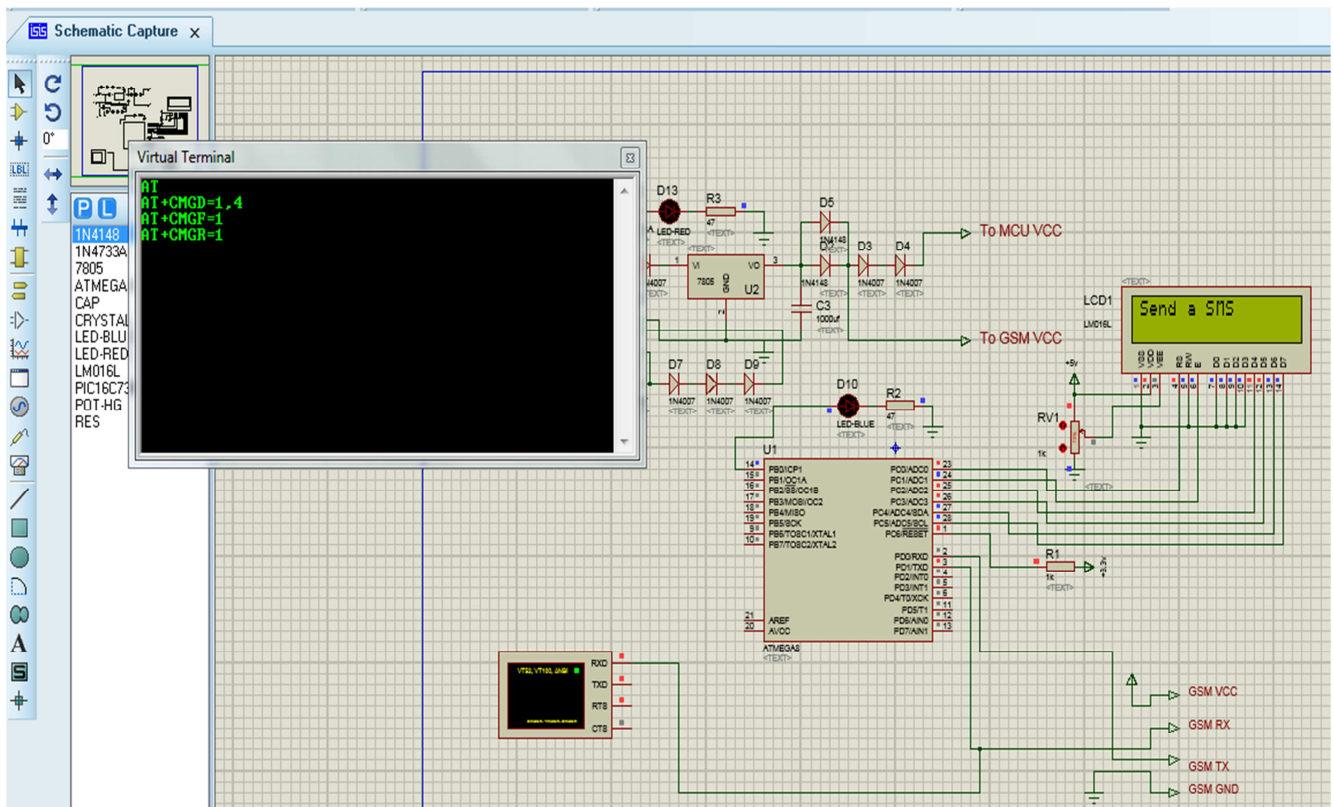


Figure 6. Command for GSM Module (Notice Board).

If 6-8 volt is given through input, output is 5 volts. But GSM module have logic level of 3.3 volt. To matches the logic level, 3 diodes are used in series connection. Every diode has 0.7-volt voltage drop. There is an indicator to show there is power or not. The microcontroller will check if any message come or not. If it gets any message it will show it to the display.

4. Implementation

4.1. Implementation of Finger Print Based Attendance System

This projection was operated in “Settings musical manner or Admin modality”. In this mode data was entered into the database of finger print sensor. For this impressions of finger-mark were taken. This can be done once or whenever a new incoming has to be added in the system. Then this project has to be used in “Normal mode or Hunting mode”. In this mode the system compares the fingerprint comment received at its optical scale with the previously stored fingerprint from its newsbreak remembering. If the entree matches with the memory board then it gives out ok signal along with the identity operator number of that soul. But if the submission does not match with the memory then it gives out computer error signal.

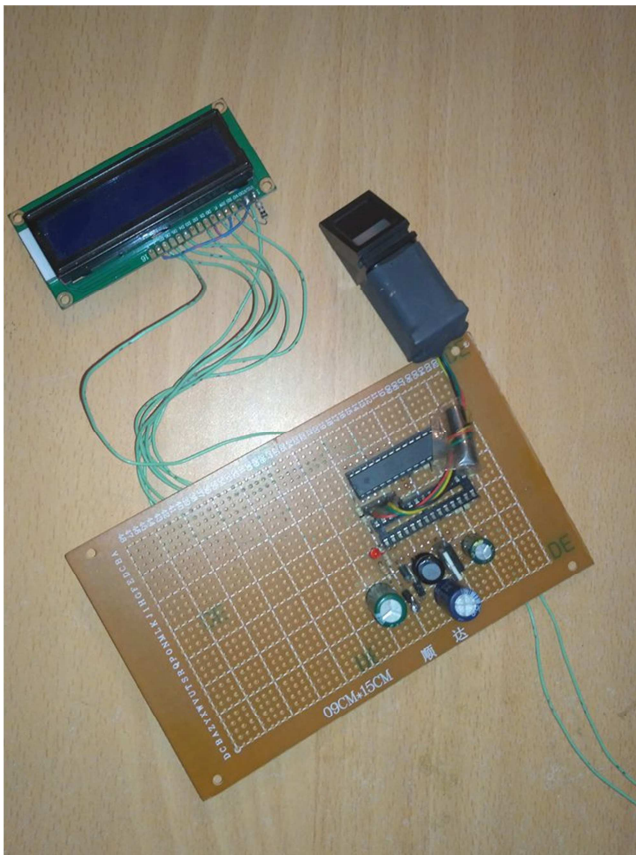


Figure 7. Finger Print Attendance System.

On entering a situation, an employee/student places his/her

finger breadth on the scanner, otherwise called the prison term attendance twist. Recognizing the presence of a finger, this device automatically CAT scan the finger and sends the captured information to the software package running on the data processor. Once the CAT scan fingerprint data matches with the recorded fingerprints stored in the database to identify employees, the device generates a success strait. This indicates transcription of the in clip of that employee with date and time. The same process is repeated when the employee parting the office and records his/her out time.

4.2. Implementation of Electronic Notice Board

To shuffle the posting 9 senses of board, easy to use and more technically advancement, prototype of receiving set notice board is used where the message is displayed by simply sending the message through cadre phone. These display organizations are very accurate and easy to control and cheaply available and the most important thing is that they can be operated on low Elf (Up to 12 Voltage). A GSM is used here for the wireless notice board to send the info or message to display. The briny target of this undertaking is to save meter and provide selective information urgently on display for the customers. It can be used for multiple aim like live share market news and display of important information for student and for teacher in educational institutes. In this electric circuit GSM module and a 16x2 LCD display is used for receiving message and display message respectively. When anyone wants to show any information or message, then sender sends a SMS to GSM Module. Then Adriano reads the GSM module and send it to the LCD. This project can be improved by using a larger display module.



Figure 8. Electronics Notice Board.

Developed program was dumped into the 8051 microcontroller utilizing streak enchantment. The circuit was interfaced according to the circuit graph. 5V DC was given to the 8051 microcontroller. The SIM space was embedded in the GSM module. The message was sent to the GSM module utilizing a cell phone. The restrictions of the remote

electronic notice board mostly incorporate LCD must have the system to get the message remotely.

5. Discussions and Conclusions

Despite an intense research in this field, many issues related to student management system still remain unanswered and provides researchers a vast field to explore in future, especially in certain areas. Wireless finger print attendance system is one of the most frequently used methods. This developed student management system is very simple, cost effective and easy to use. This project will be more usable for any kind of any office as well as educational institutions if a website is created for storing and updating attendance. Then data can be stored in a larger scale for a longer duration. Bluetooth module can be replaced for further improvement.

This project mainly comprised of development of smart student management system. The developed fingerprint based attendance system can save time as well as reduce the possibility of giving proxy. The fingerprint of the students has been stored in PC. Students can give his attendance through fingerprint scanner if the fingerprint match then it will count otherwise it does not show any result. Attendance data has been saved in PC. Moreover, by using the developed digital notice board a proper authority can easily give any important notice via MOBILE and it will be displayed in LED. By implementing this developed project university as well as students can be highly benefitted.

References

- [1] (2016) The History of Fingerprints–Onin. Website [Online]. [Cited 01 December 2016]. Available: <http://www.onin.com/fp/fphistory.html>
- [2] Pallavi Verma, Namit Gupta, “Fingerprint Based Student Attendance System Using GSM”, International Journal of Science and Research (IJSR), ISSN (Online): 2319-7064, March 2010.
- [3] (2016) Student Attendance System Based On Fingerprint. Website [Online]. [Cited 01 December 2016]. Available: ethesis.nitrkl.ac.in/2214/1/thesis.pdf
- [4] Pallavi Devendra Kumar Yadav, Sumit Singh, Prof. Shashank Pujari, Pragyan Mishra, “fingerprint attendance system”, International Journal of Scientific & Engineering Research – IJSER, ISSN (Online): 2319-7064. March 2015.
- [5] Moth Moth Myint Thein, Chaw Myat Nwe and Hla Myo Tun, “RFID And Fingerprint Reader based student attendance system”, INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH VOLUME 4, ISSUE 07, July 2015.
- [6] Victor Chukwudi Osamor, Olatobi S. Aloba and Ifeoma P. Osamor, “From wooden to digital notice board”, International Journal of Electrical & Computer Sciences IJECS-IJENS Vol: 10 No: 02, April 2010.
- [7] Victor Chukwudi Osamor, Olatobi S. Aloba and Ifeoma P. Osamor, “Digital notice board using server”, International Journal of Electrical & Computer Sciences IJECS-IJENS, Vol: 10 No: 02, Nov 2011.
- [8] FAUZAL NAIM BIN ZOHEDIJ, “Wireless electronic notice board written”, International Journal of Scientific & Engineering Research –IJSER, ISSN (Online): 2319-7064, Nov 2011.
- [9] R. Pudumai Nayagi, R. Seethalakshmi, “Digital notice board using power line communication” International Journal of Engineering and Technology, RESEARCH VOLUME 3, ISSUE 05, JULY 14.
- [10] Anushree S P, Divyashree V Bhat, Moonisha G A, and Venkatesh U C, “Wireless electronic notice board using server”, International Journal of Science, Engineering and Technology Research (IJSETR), Volume 3, Issue 6, June 2014.