Biometric Access Control System Using IOT with login alert message

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ABSTRACT

In this paper design and implementation of secure biometric access control system using IoT is presented. The fingerprint based biometric access control system is now mostly used. Thesesystems used for security so that only the authorized persons are allowed to pass or forattendance measuring purposes. The Finger print based system has more secured and too many advantages. By connecting it to internet using IoT we can have advantages that monitoring is possible from anywhere in the world. But when it connects to internet security must be ensured. To increase security we can send message to tweeter account of person who is logged in.

Keywords: Biometric, IoT, Fingerprint Scanner, Wi-Fi.

I. INTRODUCTION

As we know there are certain places where access to only authorized person is allowed. Previously a manual authentication was used. But in today's digital world we use machines for authentication. There several technologies that can be used for this purpose like RF-ID, Magnetic Card, Iris scan, Fingerprint etc. The Fingerprint is very much popular because of its benefit over other technologies. Every person in this world has unique fingerprint. So it's easy to identify person by his fingerprint. Recently the internet of thing (IoT) has introduced too many advantages in electronics automation.The IoT based fingerprint access control system has advantage of being mobility. We can move it to anywhere only the requirement is internet connectivity. On successful verification user will get message. If someone else use his credentials then he can notice it as message come like successful login. So the system is become more secure as well as users also getting feedback messages.

II. RELATED WORKS

Divil Jain and Dr. P.S. Ramkumar has proposedand implemented the IoT Based Biometric Attendance System.

- Fingerprint scanner - R305 Fingerprint scanner is used here to capture and process the fingerprint image.
- C8051F380 Microcontroller - Silicon Labs C8051F380 acts as a core MCU which performs all input/output operations.

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- ESP8266 Wi-Fi module- ESP8266 12E Wi-Fi module acts as a communication module between C8051F380 and web server.
- Wi-Fi Router- Its used to send incoming data from ESP to web and vice versa.
- Web server - Used to store the attendance related information.
- Power Supply system- Provides power supply as per the requirements.

PiyushDevikar, AjitKrishnamoorthy has proposed system involves a biometric attendance system that integratesan ESP8266 NodeMCU breakout board and a fingerprint scanner. The fingerprint scanner processes the user's fingerprint to verify the student's attendance. NodeMCU uploads the attendance data to Google Spreadsheet using a service called PushingBox API.

AmbavarapuBhavana and M. Jasmine implemented the [4] 'Fingerprint Based Authentication System using ARM7'. They developed an authentication system using finger print and GSM technology. Finger prints of the users are stored in first and the verified at the time of use. If fingerprint is matched to the trained prints then access was accepted again through GSM OTP was generated automatically and then send to registered mobile number. If it was typed by keypad then LCD displays authorized person accessed. The main aim of this project is to provide the security to your bank locker or for your home. This is the multi way security. To do this author used fingerprint module, GSM module and keypad.

III. SYSTEM OVERVIEW

The proposed system implemented into basically two parts. Mobile Fingerprint scanner unit and second workstation computer/Laptop. These two units are connected by internet. Mobile Fingerprint scanner is portable can be place anywhere, only needs internet enable Wi-Fi connectivity.
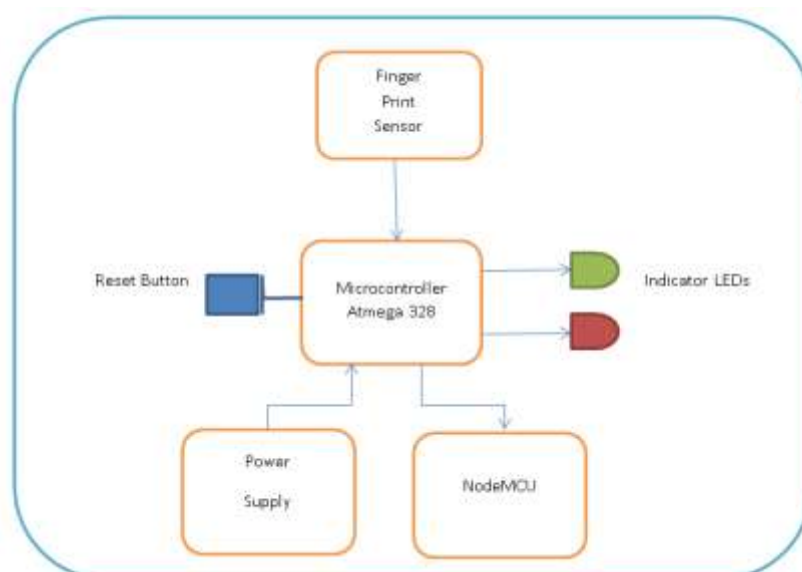

Fig. 1Block Diagram of IoT based fingerprint scanner unit

As shown in block diagram Fig. 1 the fingerprint scanner unit consist of 5v power supply, IoT module which is NodeMCU and fingerprint scanner GT-511C3, microcontroller Atmega328, Indicator LED, Reset button. The scanner unit is connected to cloud using Wi-Fi.If user scans his finger then system identifies him. The scanner unit uploads the specific code for identified person to cloud. We can connect number of scanner to cloud.

Fig. 2 Hardware implemented fingerprint scanner unit

At workstation computer receiver system consistsof ESP8266 based NodeMCU and serial to USB interface module as shown if Fig. 3. The nodeMCU is connected to cloud and it receives the data and codes for identified persons with time and date. The visual basic software interface is used to access information of registered users. Based on the code received from cloud the software shows the persons details with login time and date.
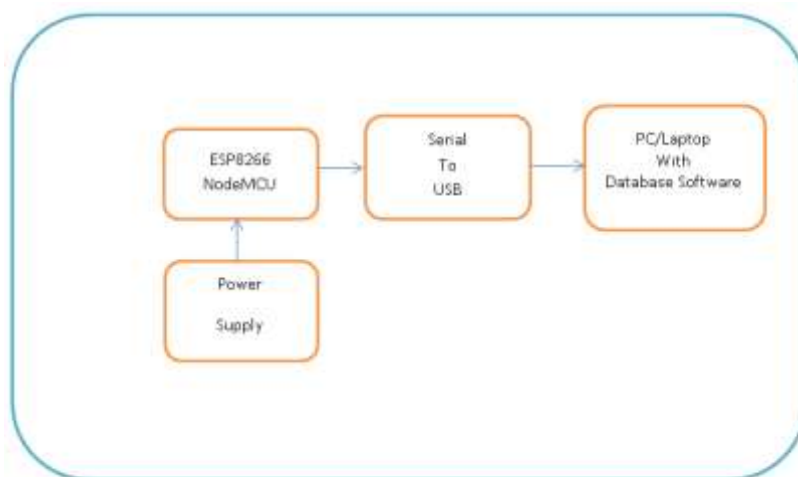

Fig. 3 Block Diagram of IoT based receiver for fingerprint sensor with PC interface

IV. RESULTS

The experimentation carried out on implemented hardware and observed the results. Firstly database was created by scanning user's finger and filled the information details. Then finger scanned and observed the visual basic window. After scanning finger visual basic window showing the logging details of user as shown in fig.4. It contains user's information with logging time.
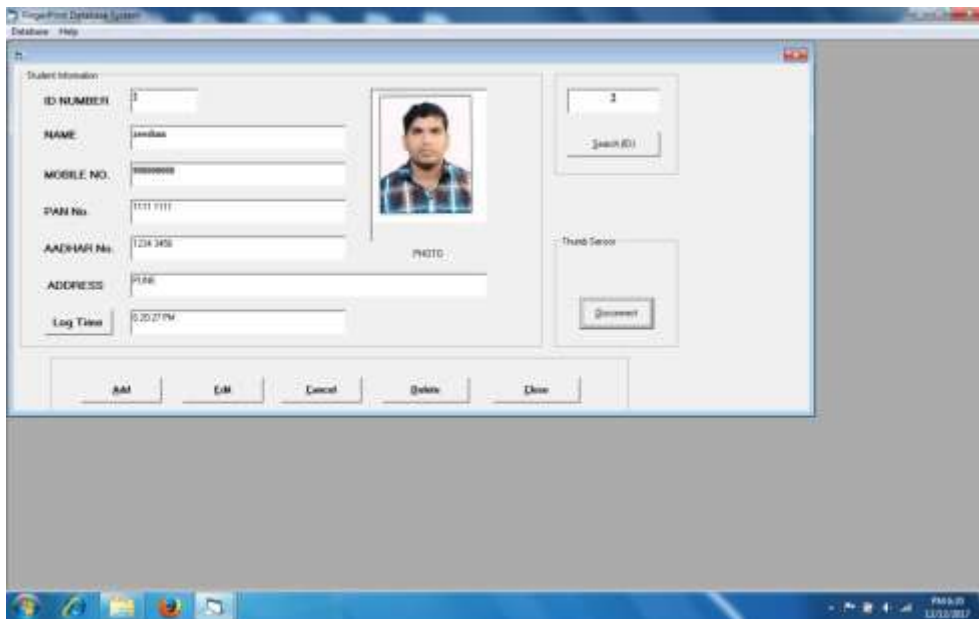

Fig. 4 Result obtained in Visual Basic form.

After login user received the message in his tweeter account. The message received immediately after login as shown in fig. 5.

Fig. 5 Message received after login

V. CONCLUSION

The IoT based biometric finger print scanner is portable. It is easy to use and works correctly. The data update speed depends upon the speed of internet. Login alert message make the user aware, as they gets the tweeter message. System is useful for attendance monitoring of employees who are working in remote locations. Only need is internet connectivity.The future development can be done by use of GPS to find the location at which user logged in.

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