

# An Attendance Monitoring System Using Biometrics & GSM Technology

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**Abstract** - Biometric time and attendance system is one of the most successful applications of biometric technology, serves an alternate for traditional manual signing process. We designed and implemented a reliable, scalable and cost effective Biometric Attendance System over GSM technology by which we can avoid human interaction to update the data. In the proposed system the primary part is enrolling the user fingerprints into the memory. At the time of verification if the user is already an enrolled person then the proposed system will provide the attendance to the user or else it will give the result as invalid user. The results however show that fingerprint biometric identifier was found suitable for the employee attendance management system of the organization.

**Index Terms** - Biometrics, GSM module, ARM7 Board, Finger print, Web browser.

## I. INTRODUCTION

In many organizations and institutions attendance is very important for various purposes like prepare the payroll based on number of days or follow for students and organization employees. The problem with existed system is that, taking the attendance manually is the complex task and inconvenient. If the number of employees is less, then the existed system will work but in very big organizations numbers of employees are more as usual then the problem will come to maintain such a huge data. To avoid those complex situations we propose the system with GSM technology. This system will also provide the successful up gradation of in time and out time of the employee.

## II. HARDWARE DESIGN

The hardware of the proposed system consists of the following modules.

- ARM7 Board
- Fingerprint Scanner
- GSM Module

In the block diagram of the proposed system fingerprint scanner, GSM module, ARM7 are the main components. Here fingerprint scanner will collect the data and stored in the RAM. At the time of enrollment ARM controller will verify the data with the given fingerprint, if the user is already enrolled then the timing information is going to update into the browser.

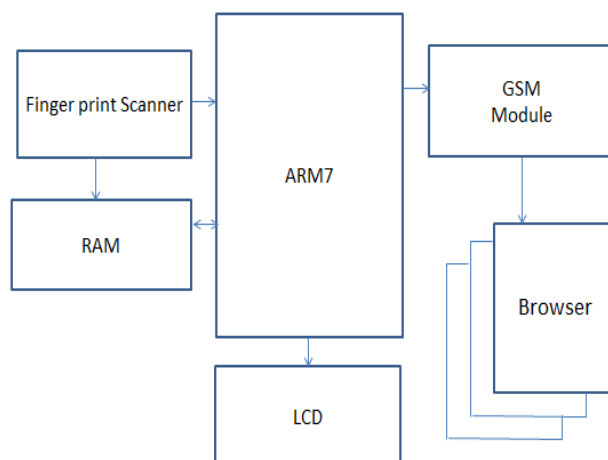


Fig 1: Block Diagram

### A. ARM7 Board



Fig 2: ARM7 Board.

Here we have used the ARM7 board (LPC2138). Tasks like fetching the fingerprints from the memory, sending the timing information to the GSM module will be done by the ARM processor.

### B. Fingerprint Scanner:

Here we used the fingerprint scanner which can able to take the human fingerprints and stores into memory. Any biometric system does have three main components.

- **Sensor** that detects the characteristic being used for identification.
- **Computer** that reads and stores the information
- **Software** that analyzes the characteristic translates it into a code and performs the actual comparisons.

### C. GSM Module (SIM900) :

Whenever the user is verified as the valid person at the end terminal that timing date i.e. login and logout times should be update into the browser for that reason we should need a GSM module which can give the timing information to the browser.

## III. WORKING

Any Biometric system mainly consists of two major stages

- Enrolment or Registration stage
- Verification or Identification stage

- **Enrolment or Registration Stage:-**

Here in the enrolment stage user should have register him as the employ. That registration process will be done with the help of fingerprint scanner. Fingerprint module is connected with the ARM7 board. We have 4 keys here for increasing and decreasing the employee number, enter and exit keys. Those can be enabling with the help of ARM ports.



Fig 3: Enrolling

Whenever user put the finger on the module, it senses and captures the details of the finger and stored in the memory for the reference. We know that no two humans have the same fingerprints. Like this we can add employee's fingerprints as much as we have.



Fig 4: Getting Image from Fingerprint module



FIG 5: FINAL STAGE OF ENROLMENT

- **Verification or Identification Stage:-**

After the enrolment stage, fingerprints of all employes are stored in the memory. At time stage of verification employ put the finger on the fingerprint module then it captures the finger and sends the data to the microcontroller, here microcontroller will verify the given fingerprint with the already stored fingerprints. If the user was already registered one it gives the messages as person identified. Then with the help of GSM module we can send the login time and login date to the browser. Similarly logout time and logout date will also send to the browser.

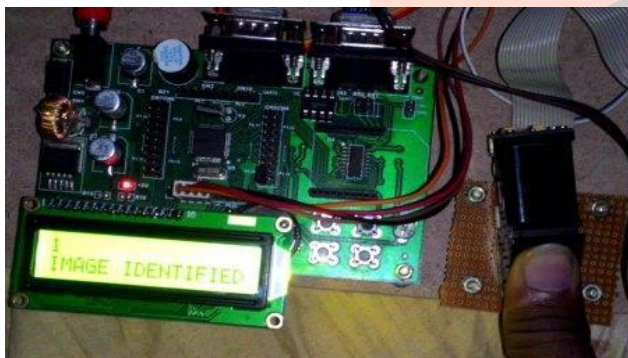


Fig 6: Identification



Fig 7: Login Time and date.

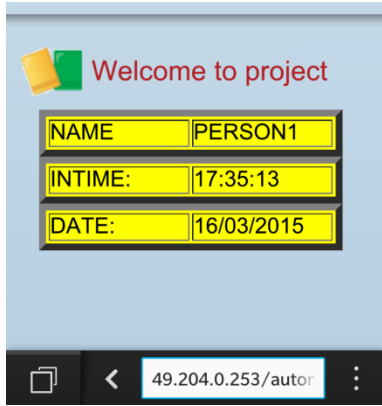


FIG 8: LOGIN TIME AND DATE IN BROWSER



FIG 9: LOG OUT TIME



FIG 10: DATA SENT TO GSM

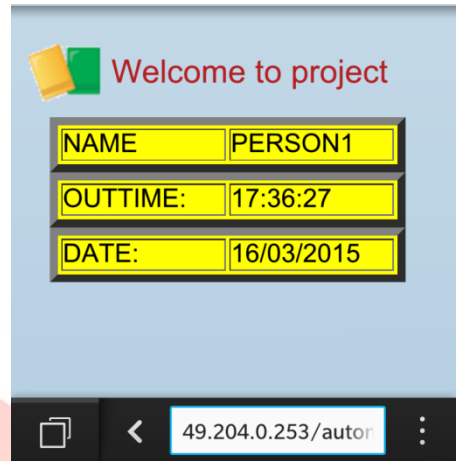


FIG 11: LOGOUT TIME AND DATE IN BROWSER

If we put the wrong figure or we didn't put anything on the module it gives the message as invalid user.



FIG 12: NO PERSON



FIG 13: INVALID USER CASE

#### IV. RESULT

The module collected all the employees fingerprints and stored in the memory. If the person is identified as the valid, the in time and out time of the employ was sent to the browser without any user interaction with the help of GSM module. If the user was not registered and it gave the messages as Invalid person.



Fig 14: System Architecture

## V. CONCLUSION

This system can be useful in the organisations and universities which have thousands of people. It is very useful to avoid human interaction to update the attendance data into the browser that can be done easily with the help of GSM module.

## VI. ACKNOWLEDGEMENT

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