

# FINGERPRINT AND RFID BASED WIRELESS MONITORING SYSTEM

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**ABSTRACT:-**The technology is now finding lot of other applications such as identity management and access control. In this context, an automated fingerprint recognition system and identification of key challenges are described along with the research opportunities. Wireless fingerprint attendance system based on ZigBee technology. The system includes terminal fingerprint acquisition module and attendance management module through computer and it can realize automatically such functions as information acquisition of fingerprint, processing, wireless transmission, fingerprint matching, or attendance management. Considering the fact and topology for ZigBee network, a fingerprint acquisition module and a wireless alarm module were designed by using the fingerprint sensor or module respectively. The whole system is implemented wireless alarm through messages and internet in the GSM web. In order to achieve the simple and high real-time system or it can realized low-cost and high-performance wireless fingerprint attendance function, which provided a new wireless fingerprint attendance system for enterprises and institutions. IN proposed system the data of Fingerprint module and RFID module is directly transmitted to central monitoring system by wirelessly through ZIGBEE.

## I. INTRODUCTION:-

Normally, The Attendance management can reflect truly staff attendance, who provides references for competent authorities. Attendance management is one of the most basic and important management links. Currently, the magnetic card attendance system is widely used. This pattern not only Flexible but also practical. But it has some disadvantages. For example, the card is easy to lost and damage. The fingerprint has Avery lot of advantages, such as unique, permanent, good anti-fake and easy to use. So it is recognized increasingly by people. ZigBee technology is an emerging technology developed in recent years. Comparing with the some existing wireless communication technologies, ZigBee has advantages in low-power or low-cost. It is very suitable for application to wireless sensor networks. Aiming at the disadvantages for traditional wire attendance system, a design method of wireless fingerprint attendance system based on ZigBee technology is proposed. It achieves attendance management through fingerprint identification. At the same time, the system combines ZigBee wireless technology or attendance management. It realized low-cost, low-power and highperformance fingerprint information system acquisition, transmission and recognition function, which provided a new attendance way for enterprises and institutions. As a public network with wide coverage, GSM supports with real time transmission, lower operation costs and SMS service and internet access. So it can be widely used in wireless alarm of access control system.

## II. RELATED WORK

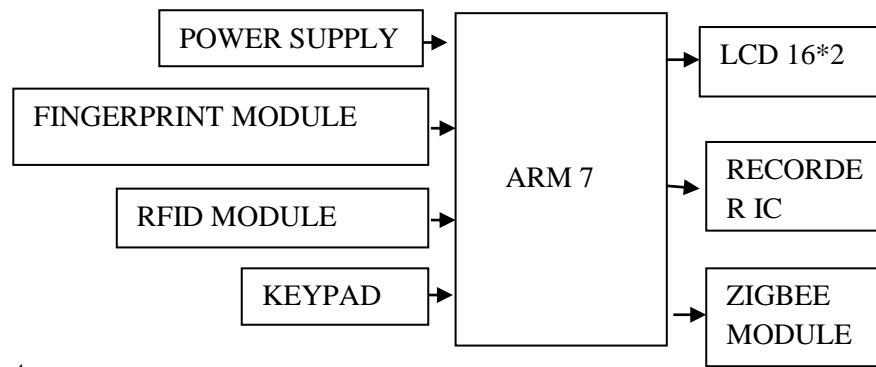
Sunidhi MB et.al describes that “Automatic information system has played a major role in growth, advancement and modernization of our daily process. The main purpose is to develop a safe and secure attendance monitoring system[1].

Amir Nizam Ansari et.al describes that various fingerprint matching systems have been proposed which emphasizes on minutiae information, local ridges, some studies are based on singularity point’s position, orientation, and relative distance detection, novel printing novel EESM-based fingerprint algorithm for indoor position [2].Ye Yalin et.al describes that in this scheme of ZIGBEE wireless sensor network combined with controller area network (CAN) bus is adopted in this system ZIGBEE substation is set at proper interval in mine laneways to acquire radio frequency Identification (RFID) position and gas thickness[3].

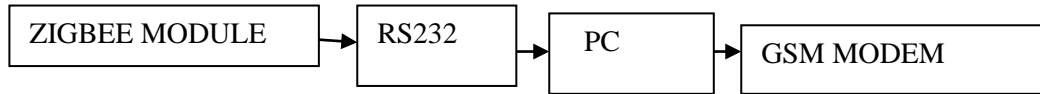
SudhakarRao and NuriaLiobart et.al describes that in this wireless body centric sensing has an important role in the fields of biomedicine, personal healthcare, safety & security, Body centric radio frequency identification (RFID) technology provides a wireless & maintenance free communication link the human body and the surrounding through wearable and implanted antennas[4].Jinsong Han et.al describes that the radio frequency identification system have become important platform to facilitates the automation for various ubiquitous application passive RFID tag provide numerous attractive features ,including remote and line of sight access ,low cost ,battery freedom[5].DevakaJaywardana et.al describes that the paper present measurement system for measuring dynamic acceleration of infrastructure remotely using semi passive radio frequency identification (RFID) tag [6].

## III. BLOCK DIAGRAM AND DESCRIPTION:-

### a) Attendance system



### b) Central Monitoring System



### a) Attendance module:

- **Finger print module**

The Finger Chip IC use for fingerprint image capture combines detection and data conversion circuitry in a single rectangular CMOS die. It can be captures the image of a fingerprint as the finger is swept vertically over sensor window. It requires no external heat, light and radio source. Most reliable biometric for uniquely identifying an individual. In spite of the some recent legal challenges in the USA, they still regarded as giving proof of identity beyond the reasonable doubt in almost all the cases. The majority of the biometric-based security systems in operation today are based on fingerprint recognition.

- **RFID reader:**

Here we are using interrupt based RFID protocol. The protocol name is Wigand. In this protocol the data is sent in the form of interrupts. So, we have to connect the 2 interrupts of ARM  $\mu$ c which are pin 17 (int0) and pin21 (int1).

- **ZIGBEE Module:**

ZigBee is a low-cost, low-power, wireless mesh network standard. The low cost allows the technology towidely deployed in wireless control and monitoring applications. Low power-usage allows longer life with smaller batteries. Mesh networking provides high reliability and more extensive range.

- **LCD 16\*2:**

LCD MODULE (2X 16 CHARACTERS)Dot matrix LCD modules are used for display the parameters and fault condition.16 characters 2 lines display is used. It has controller which interface both data's and LCD panel. Liquid crystal displays (LCD's) have materials, which combine the properties of both liquids and crystals. Rather than having a melting point, then they have a temperature range within which the molecules are almost as mobile as they would be in a liquid, but are grouped together in an ordered form similar to a crystal.

- **Recording IC:**

APR9600 true single chip voice recorder, non volatile storage, capability 40 to 60 seconds. The APR9600 device offers true signal chip recording. The device supports both random and sequential access of multiple messages. Sample rates which are user selectable, allowing designers to customize their design for unique quality and storage time needs.

- **ARM7:**

The ARM7 family are includes the ARM7-TDMI, ARM7-TDMI-S, ARM-720T and ARM7EJ-S processors. The ARM7TDMI core is the industry's most widely used for 32-bit embedded RISC microprocessor solution which can be optimized for cost and power-sensitive applications, the ARM7TDMI solution provides the low power consumption, small size, and high performance needed which is not only portable but also useful for embedded applications. The three-stage pipeline is use byARM7TDMI core to increase the flow of instructions to the processor. This allows multiple simultaneous operations to take place continuous operation of the processing and memory systems.

### b) Central Monitoring System:

- **RS 232:**

PC in general cannot directly communicate with peripherals that are available. The reason behind that is the difference in their working logic. PC works in positive logic. The microcontroller that is actually acts as the peripheral here works in negative logic. It becomes important that to change the logic between them when they communicate with each other. RS232 is very important standard serial interfacing with PC where logic is changed. PC communicates with peripherals through serial com1 and com2. GSM Module PC This unit contains software components such as the server and security System through which the area security can be not only controlled but also monitored.

- **GSM Modem:**

It is a hardware component that allows the capability to send as well as receive SMS to and from the system. The communication with the system takes place through RS232 serial port. Cell phone can be attached at the place of GSM hardware but it also limits the hardware functionality such as sending or receiving of SMS. Working of GSM module with GSM hardware tests are run in order to check hardware support. The system will call GSM modem and it will get activated. After activation the Modem will check for hardware support. If the hardware is lose or some other hardware problem then there will be error, resulting in communication failure and the application will be terminated. If hardware responds then the serial port will be opened for the communication and GSM hardware will allow transmission for SMS. The system will then connect and after connection establishment the system will be able to detect the intrusion andalso will alert user about the breach.

**Algorithm**

**Attendance system:**

- Start
- Initialize the LCD.
- Initialize I/O ports
- Initialize Fingerprint and RFID module.
- Call database entry.
- Display message put Finger on Fingerprint nodule
- Check that is put Finger on Fingerprint module
- Yes then Read Fingerprint data.
- No then go to step 6.
- Check Fingerprint data available in database.
- Check that Is Fingerprint match.
- Yes then Announce Thank You.
- No then Announce press Finger again and go to step 10.
- Put Fingerprint data on Concern faculty in memory.
- Send it to Central monitoring system.
- Go to step 5.

**Central Monitoring System:**

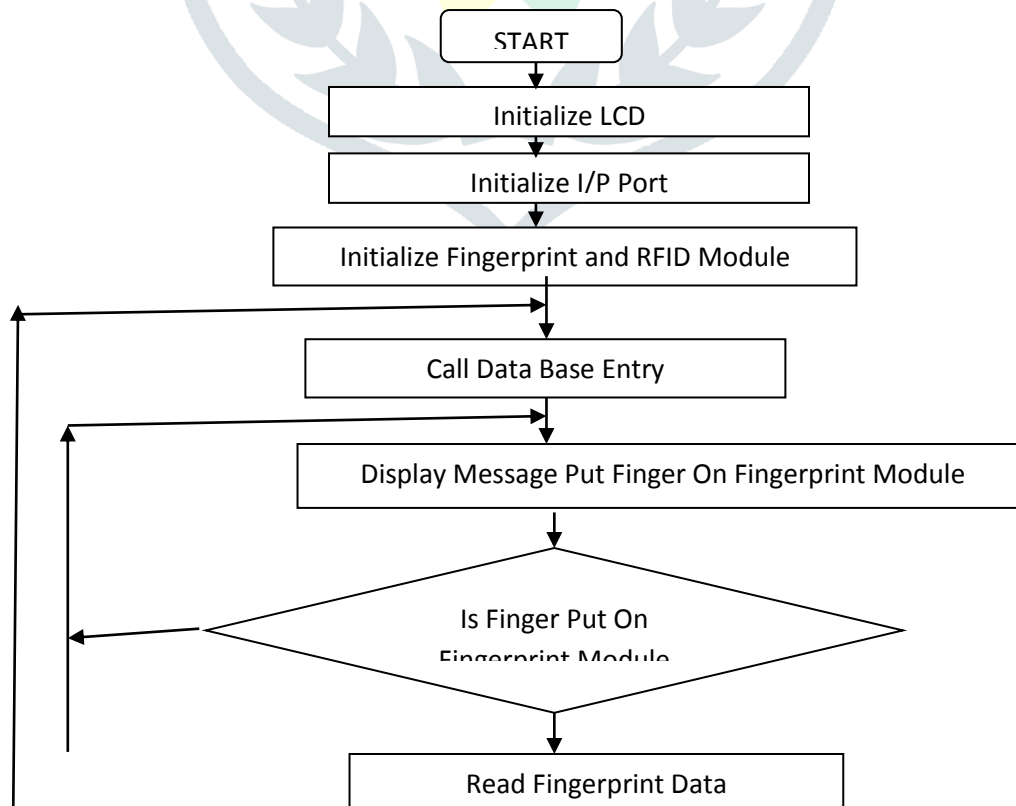
- Start
- Initialize GSM and ZIGBEE module.
- Check that data is coming from ZIGBEE or not.
- Yes then prepare database with details of employ and store data of concern employ.
- No then go to step 3.
- Check End of Month.
- Yes then send late mark to Employ.
- No then go to step 3.

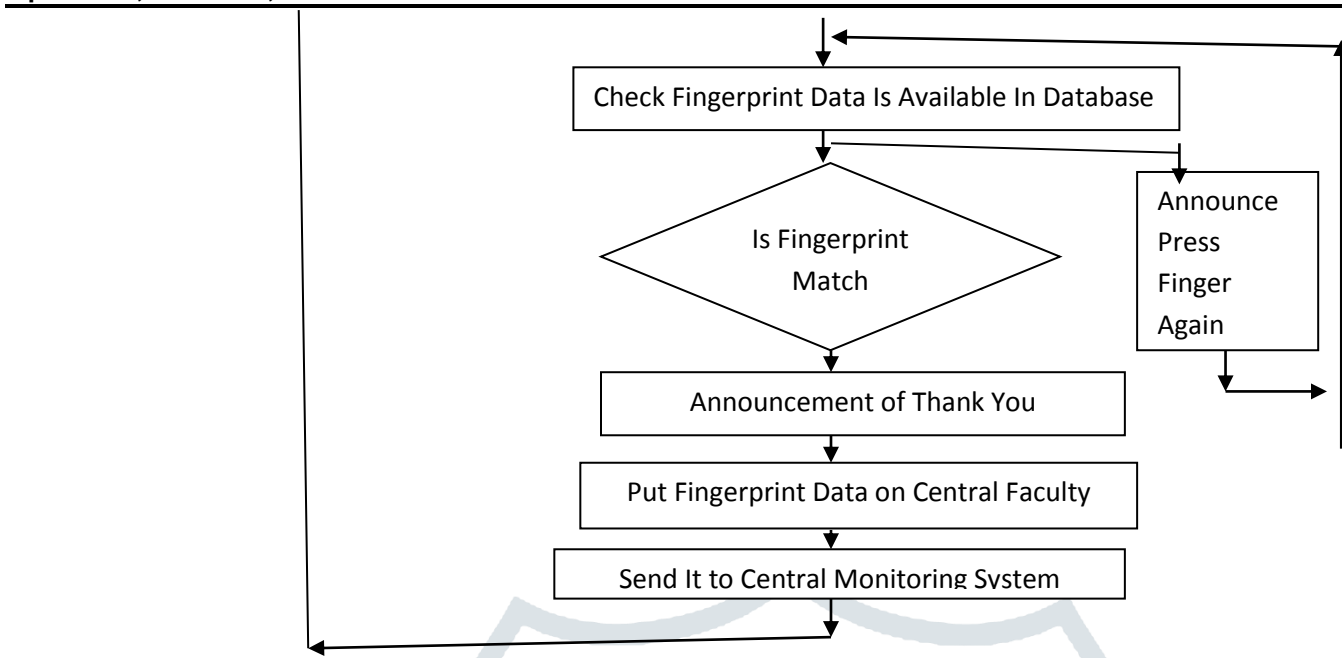
**Data Base Entry:**

- Start
- Press Finger on Fingerprint module.
- Check Is Finger match.
- Yes then store data base in Central monitoring system.
- No then go to step 2.

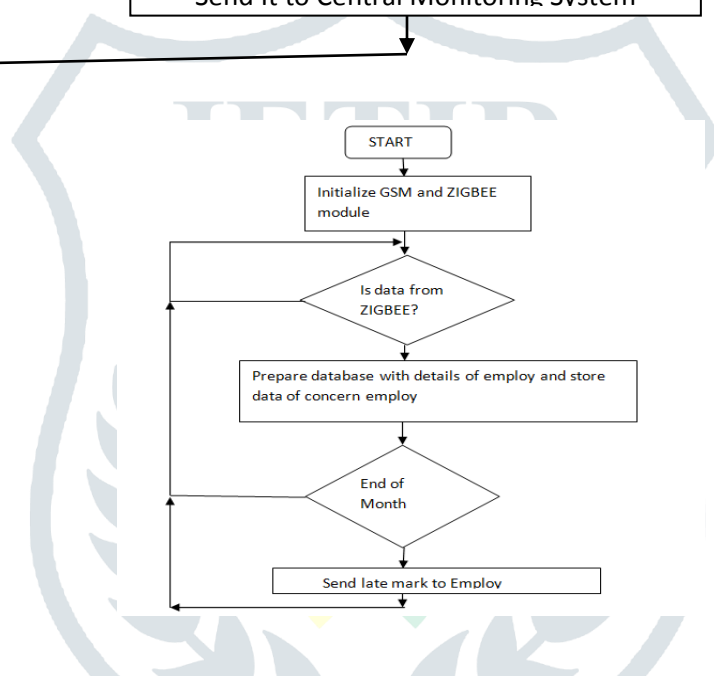
**Flowchart:-**

**Attendance System:**





Central Monitoring System:



Data Base Entry:

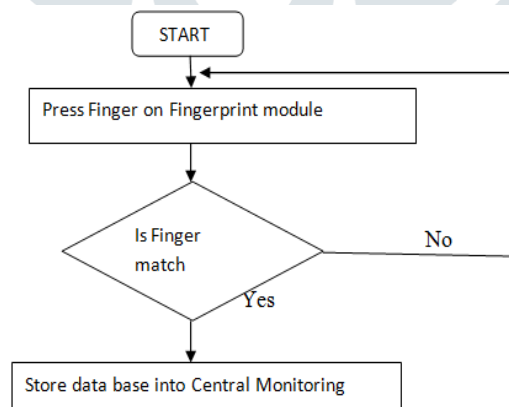


Fig.2 Flowchart of System

**Application:-**

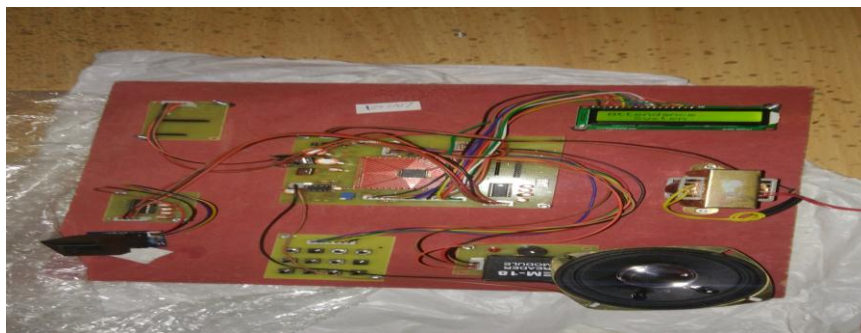
- school
- college
- offices

**Result:-**In this system we design the wireless attendance monitoring system to record the attendance. The employee information is recorded and display on LCD.

**Conclusion:-**Recording the attendance of students, teacher and other institutional staff is very hectic job in a college environment .a system is implemented here in order to make the system more secure. The attendance of the students is recorded by using fingerprint and RFID module technology. SMS alert services are introduce in these system. Finally by using Fingerprint module and RFID module we done attendance system

accurately. In this concept the data of Fingerprint module and RFID module transmitted wirelessly to central station at any time. There will be no time wastage. In previous system the data of Fingerprint and RFID module is transmitted at the end of month.

In this proposed system no need to measure attendance module and connect that to central monitoring system for recording purpose. We use ZIGBEE module for sending wirelessly.



#### REFERENCES:-

- [1] 2015 International Conference on Computer Communication and informatics (ICCCIC-2015) "A web enabled secured system for the attendance monitoring, real time location tracking using Biometric and radio frequency identification (RFID) Technology.
- [2] Amir Nizam Ansari "Automation of attendance system using fingerprint module and RFID, GSM modem with Net framework".
- [3] Ye Yalin "A Novel coal Mine Security Monitoring system based on ZIGBEE".
- [4] Sudhakar Rao, Nurio Liobart "Miniature implantable and wearable on body antennas towards the new era of wireless body centric system".
- [5] Jinsong Han Member IEEE, ACM "Gen print Generic and accurate physical layer Identification for UHF RFID Tags".
- [6] Devaka Jayewardene "Measurement system with accelerometer integrated RFID tag for infrastructure health monitoring".
- [7] Jun Zhang .Member of IEEE "UHF RFID Tag antenna based sensing for corrosion detection & characterization using principal component analysis".
- [8] Anwar Narzullaev "Wi-Fi signal strength database construction for indoor positioning system using Wi-Fi RFID".
- [9] J. Angeline Rubella "Fingerprint based licence checking for auto mobiles".
- [10] Benfano Soewito "Attendance system on Android smart phone".
- [11] T.S. Lim, S.C. Sim and M.M. Mansor, 2009 "RFID Based Attendance System", 2009 IEEE Symposium on Industrial Electronics and Applications (ISIEA 2009), Kuala Lumpur, Malaysia
- [12] Z. Yongqiang, L. Ji 2006 "The Design of Wireless Fingerprint Attendance System" International Conference on Communication Technology, ICCT '06, Handan, Hebei, China, 27-30 November 2006, pp. 1-4..
- [13] Cheng-Ming Jimmy and Li, Director, 2006 "An Integrated Software Platform for RFID-Enabled Application Development" IEEE International Conference on Sensor Networks, Ubiquitous, and Trustworthy Computing (SUTC'06).
- [14] Cheng-Ming Jimmy Li, 2006 "An Integrated Software Platform for RFID-Enabled Application Development", Proceeding of the IEEE International Conference on Sensor Networks, Ubiquitous, and Trustworthy Computing (SUTC'06).
- [15] Daugman J (1993). High confidence visual recognition of persons by a test of statistical independence. IEEE Trans. Pattern Anal. Machine Intel. 15(1993): 1148-1161.
- [16] Yan Hongwei, Pan Hongxia, 2009 "Remote Data Monitoring System Design Based on GSM Short Message Service" in IEEE International Symposium on Industrial Electronics (ISIE 2009) Seoul Olympic Parktel, Seoul, Korea.
- [17] C. G. Xie, "ARM-Based Automatic Fingerprint Identification System", Microcomputer Information, Vol. 25, No.1-4, 2009, pp. 292-294 4.
- [18] J.-M. Nam, S.-M. Jung, D.-H. Yang and M.-K. Lee, "Design and Implementation of 160 × 192 Pixel Array Capacitive-Type Fingerprint Sensor", Circuits, Systems & Signal Processing, Vol. 24, No. 4, 2005, pp. 401-413.
- [19] L. Zhang, "Based on DSP and RF Card Embedded Fingerprint Identification System Design and Implementation of [D]", University of Electronic Science and Technology of China, Chengdu, 2009.
- [20] F. Ding, "ARM-Based Fingerprint Identification System Research and Implementation of [D]", South China University of Technology, Guangzhou, 2007.
- [21] Z. M. Ma and Y. H. Xu, "ARM Based Embedded Processor Architecture and Application", Beijing university of Aeronautics and Astronautics Press, Beijing, 2002.