Smart Attendance Management System (SAMS)

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Abstract:

Nowadays, world is turning more towards automation for reducing human efforts and is striving to make the process smart and reliable. The idea of wireless attendance management system using fingerprint recognition is a smart way of marking attendance which is more secure and time efficient as compared to already existing attendance systems involving considerable manual effort. The proposed system records attendance without allowing any chances of proxy attendances by the students. The system includes terminal fingerprint acquisition module and attendance management module in computer which is configured with the Zigbee module as the transmitter and receiver node. The device can be mounted at any location or handheld and circulated among the students in the institution.

*Keywords***: Fingerprint, ZigBee, handheld.**

Introduction:

The management of attendance record is one of the basic and crucial processes in any organization. The objective of this paper is to analyze and develop a portable student attendance system used in educational institutes. It also focuses on designing a user-friendly attendance system which incorporates security criteria for the stored data [1]. This project efficiently executes this process with the use of ZigBee technology and Fingerprint identification. ZigBee technology at the transmission and reception node consumes low power and yields high performance at a low cost. Fingerprint acquisition module is used for fingerprint collection and matching with the pre-recorded ones stored in the database memory. Attendance management can reinforce discipline in the institution and tackles forgery of attendance, so it is a necessary measure for institutes to operate easily. The paper emphasizes more on using fingerprint as the biometric because of its uniqueness and reliability [2].

Prior Survey:

The paper on Automation of attendance using RFID has developed a wireless system to detect and maintain the attendance of a student and locate a student. For, this the students ID (identification) card is tagged with an Radio-frequency identification (RFID) passive tag which is matched against the database and only finalized once his fingerprint is verified using the biometric fingerprint scanner [3] .The paper to Maintain Student Record in college database using RFID presented a novel concept to improve upon the processes in university environment using RFID technology. A system is implemented for the automation of time and attendance using RFID systems. The system is comprehensive, effective and efficient, thus can help in automating the students' administration.[4]. Another paper has An Effective Approach Using Combination of Electronic Identity Card (EIC) Systems and Fingerprint Authentication for Automated Student's Attendance Program In the academic institutions especially in professional institutions; attendance is a very important criterion which is used for various purposes. Thus, there is a need for a system that would eliminate all of these trouble spots. Our ACAMS using finger print would provide the needed solution. In this attendance management system, the developed software facilitates access to the attendance of a particular student in a particular class.[5]. This Proposed system has a small handy hardware, a remote server and software components for acquisition of data manually or from sensors electronically. It could be used in doing survey's, closed loop control monitoring systems in industries, hospitals, attendance management system of schools and colleges etc. This paper presents a design and framework for taking attendance in schools and colleges, for making troublesome process of taking and compiling of attendance simple and efficient. As its targeted users are educational institutes where there is a requirement of affordable, user friendly, portable, energy efficient and secure automated system.[6].
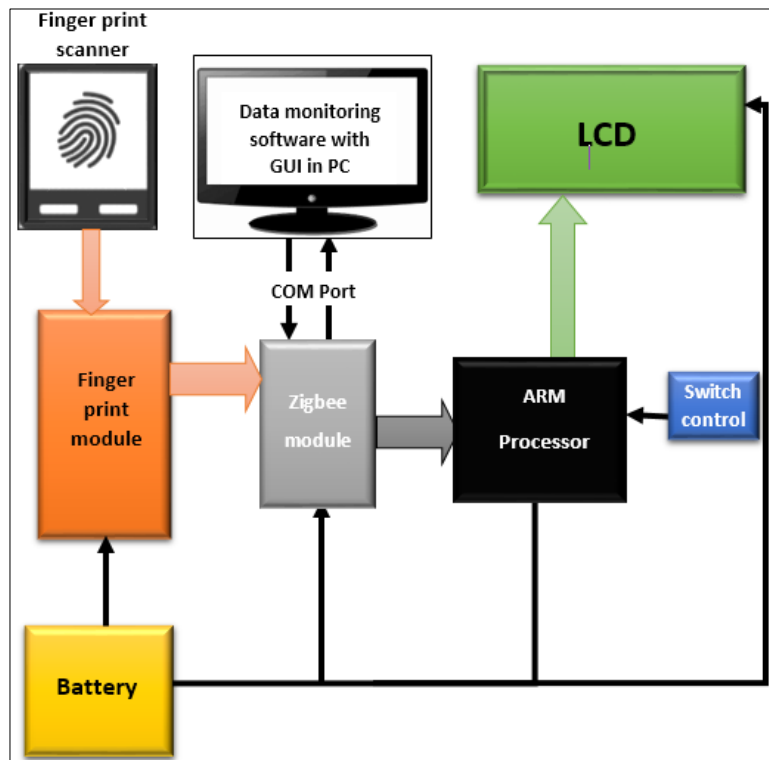
Proposed idea:

Fig.1 Block Diagram of the system

To overcome the disadvantages of the conventional method of attendance the following system is proposed which is smart and automated consisting of Hardware and Software modules. The procedure of using the system is visualized as the Teacher bringing a Handheld Device to the class. He/she will scan the finger or will give this device to the student and start teaching. Every student will place his or her finger on the scanner of the device and all those who are present will get the attendance for that class/lecture. The data of students present will be sent to the computer through the ZigBee module and accordingly the attendance of particular student would be marked for a particular lecture/subject[7]. This data can be further be processed and the report of each and every student lecture wise, subject wise, date & time wise can be viewed.
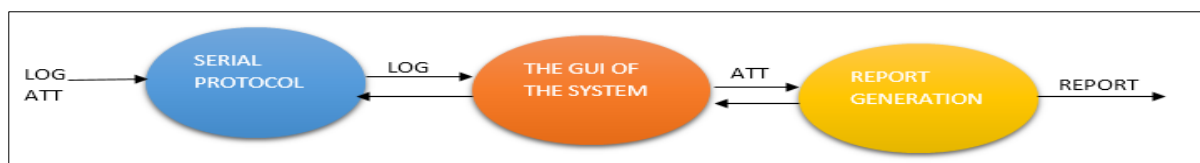
Data flow

The system consists of enrollment and attendance mode wherein first mode sets the device to scan the finger prints of all the students and store it in the database as records for future matching and processing. This whole process consists of 4 levels as mentioned in the figures.
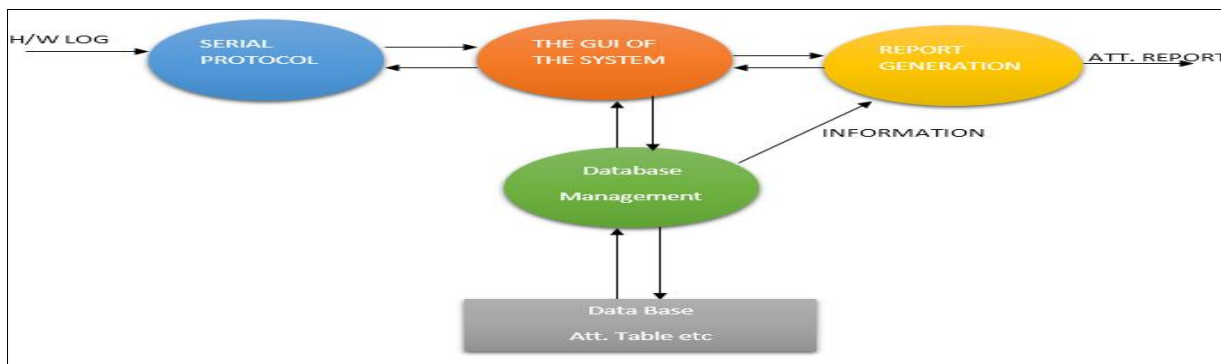
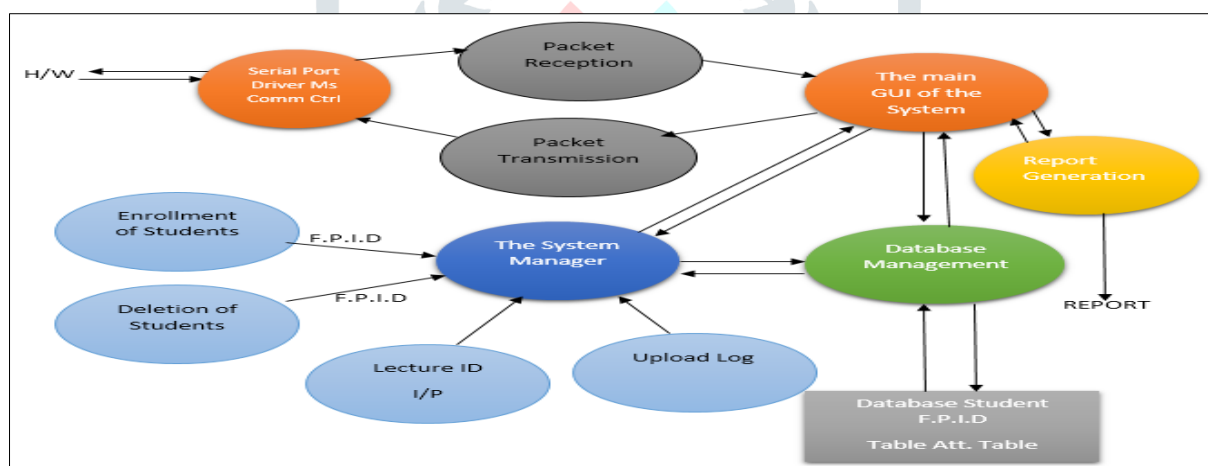LEVEL 0
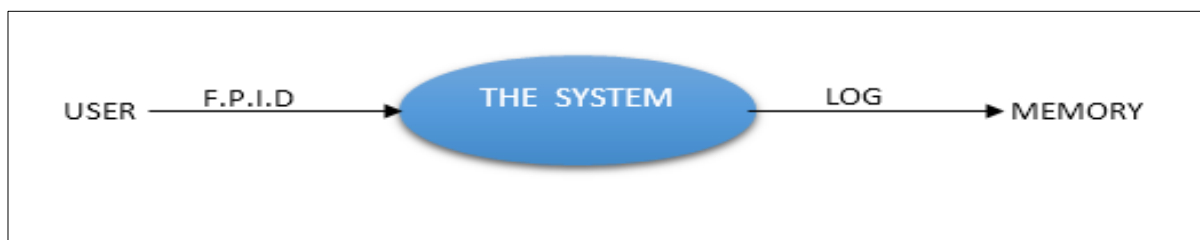
LEVEL 1

LEVEL 2

LEVEL 3

Fig.2: Complete flow of working attendance in level 0, level 1, level 2 and level 3.
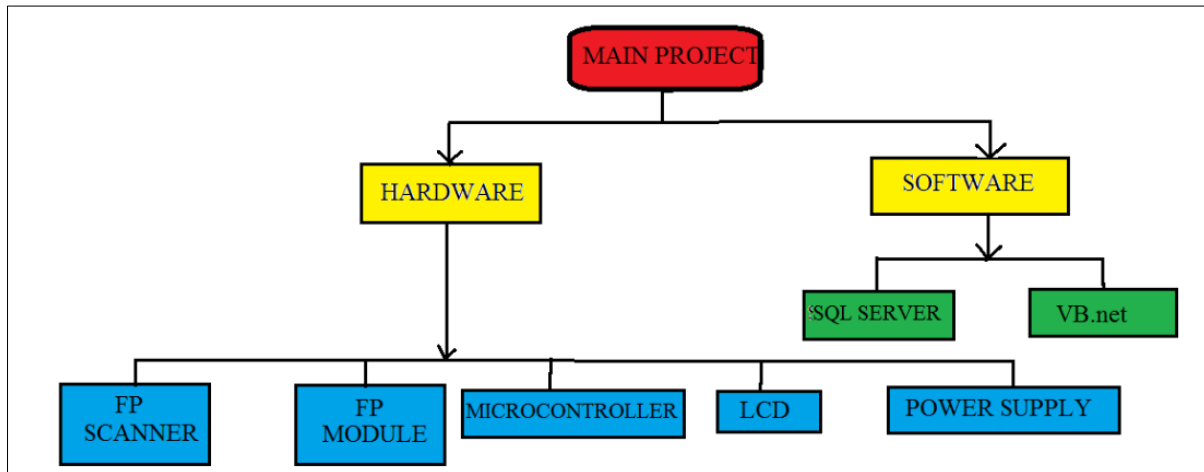
Handheld device

Fig.3 Main sections of the project

The project consists of main modules hardware and software as shown in above fig 3. with the ARM processor LP2128 as the heart of the system with all the other interfaces connected to it. The GUI is created on VB.net and database management using SQL server.

Advantages over traditional method

- This system automates attendance procedure handheld device which can take attendance without intervention of the teacher, device can be passed during lecture time students can place their finger and mark attendance PC application helps manage attendance.
- Unlike normal attendance procedure in educational institutes which consumes more time .
- There are less chances of false attendance methods in corporate environment.
- This monitors low power utilization and its portable.
- Secured system as the fingerprint is an unique biometric entity[8].

Conclusion

This system along with allotted servers forms one complete system for managing attendance in schools and colleges. It presents a design and framework for taking attendance and thereby simplifying troublesome process of recording and management of attendance. This prototype is not only user friendly, low power consuming design, efficient and upgradable to other type of data acquisition system but also is easy to install like in biometric and RFID devices which are wall mounted.

Reference
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