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FINGERPRINT BASED HAND HELD TERMINAL FOR COLLEGE STUDENTS ATTENDANCE SYSTEM WITH NO PROXY

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ABSTRACT: *In today's world where we have automation in all the areas, there is one field where technology is not entered yet. It is the attendance system for college students. It is a very time-consuming system and so far, there is no initiative taken to introduce technology in this area. We have identified the complexities and brought latest technology for teachers to take the attendance of the student.*

I. INTRODUCTION

Fingerprint identification is the method by which impressions are made of the minute ridge formations and patterns found on the fingertips. No two persons have exactly the same arrangement of patterns, and the patterns of any one individual remain unchanged throughout life. Furthermore, while other personal characteristics may change, fingerprints do not.

II. BACKGROUND OVERVIEW

A. *Existing System*

For student's attendance in colleges, Teachers take attendance on Paper personally. Those papers are required to be maintained in file or a register is required to be made for it. Then the attendance is manually calculated and is submitted to the College Administration.

B. *Drawbacks of Existing System*

Proxy Attendance is the major disadvantage of existing system. A lot of work increases for the Teachers, apart from the Teaching curriculum. The data collected by the existing system is inaccurate.

C. *Proposed System*

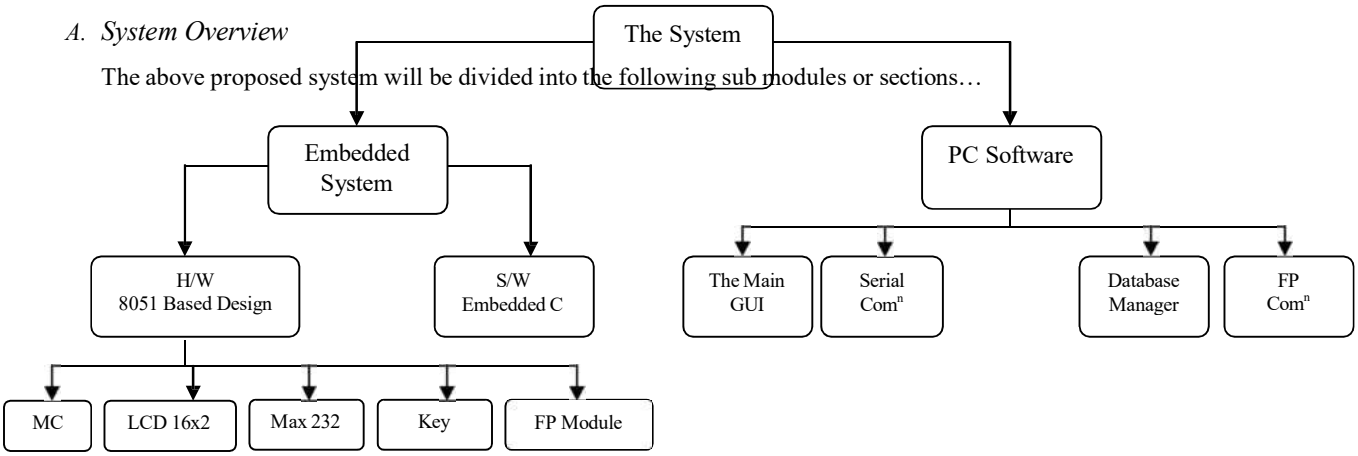
In our system the Teacher will bring a Handheld Device to the class and will follow the following steps…

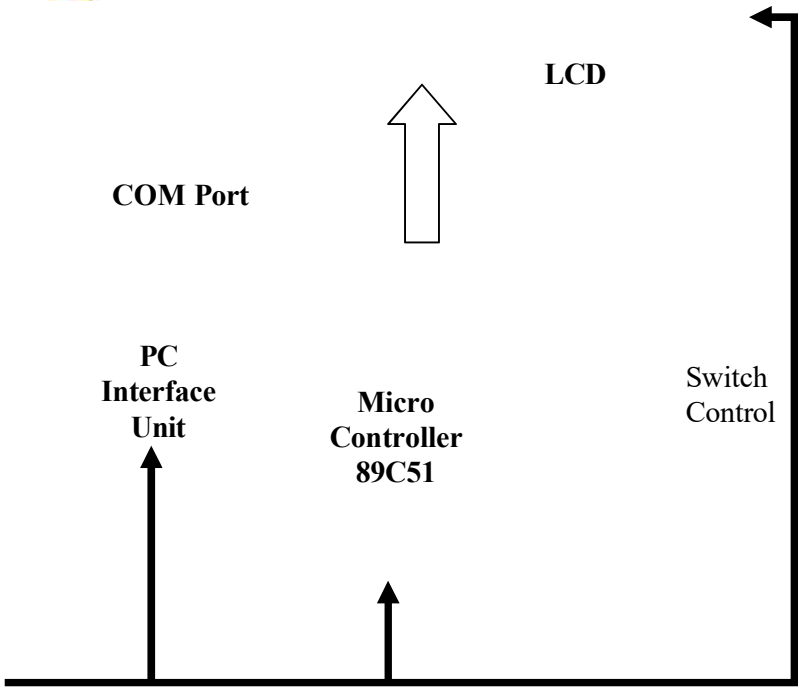
- Teacher will start the attendance procedure by enrolling his own thumb in the system,
- He will give this device to the students and start teaching,
- Every student will show their finger print on the scanner of the device and all those who are present will get the attendance for that lecture,
- Teacher will again place the same finger to close the attendance procedure,
- After completing the lecture the teacher will take this device to the Server PC to upload the students' attendances to the college database.
- The software at PC side will automatically mark the attendance of the respective Finger Print ID.
- At the end of semester the software can generate various types of reports for taking printouts.

III. THE PROPOSED SYSTEM

A. System Overview

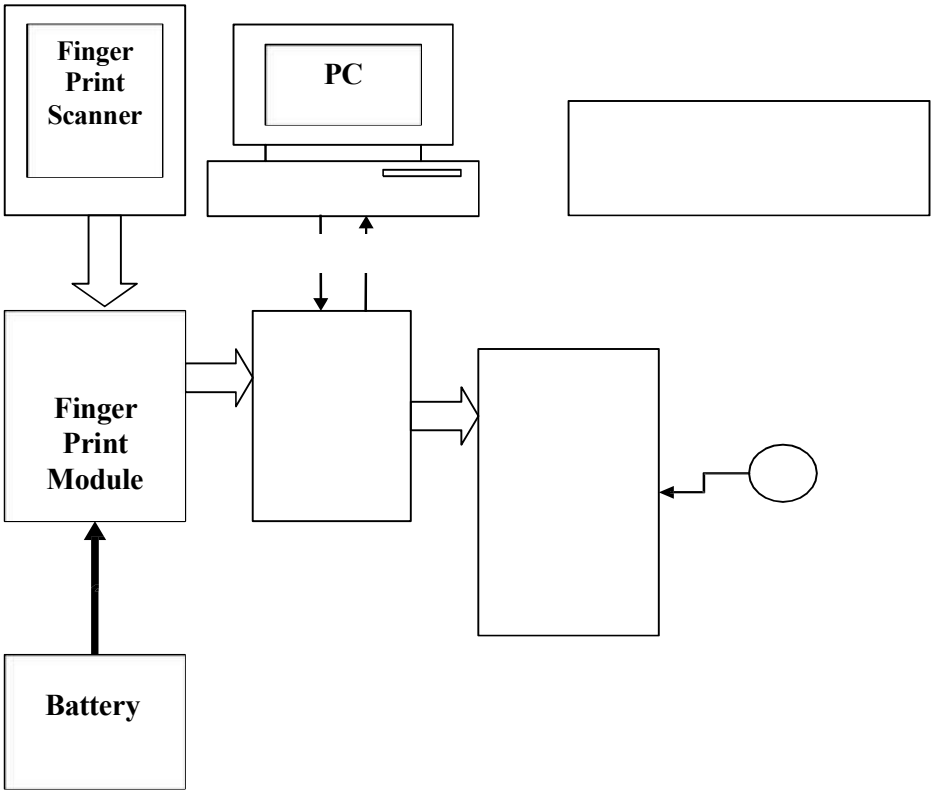
The above proposed system will be divided into the following sub modules or sections…





B. Block Diagram

The Block Diagram of the system is shown below...



C. Explanations of Blocks

The following are the brief explanations of the working principle of the various major blocks or sections used in the system…

- Microcontroller

  This unit is the heart of the complete system. It is actually responsible for all the process being executed. It will monitor & control all the peripheral devices or components connected in the system. In short we can say that the complete intelligence of the project resides in the software code embedded in the Microcontroller.

  The controller here user will be of 8051 family. The code will be written in Embedded C and will be burned or programmed into the code memory using a programmer.

  This unit requires +5VDC for it proper operation.

- LCD 16x2

  It is called Liquid Crystal Display. We are going to use 16x2 character LCD. This will be connected to microcontroller. The job of LCD will be to display all the system generated messages coming from the controller. LCD will provide interactive user interface.

  This unit requires +5VDC for it proper operation.

- MAX 232

  This section will be used to convert TTL logic into RS232 logic and vice-versa. In TTL---logic 1 is +5V and logic 0 is 0V. In RS232---logic 1 is -10V and logic 0 is +10V.This unit will provide interface that is required to communicate microcontroller with RS232 based devices using serial communication link. The MAX232 IC is dedicated for the logic conversion. This unit is also called as Logic Convertor OR Level Convertor.

  This unit requires +5VDC for it proper operation.

- Finger Print Module

  This Module consists of finger print scanner and finger print processing unit. The user puts the finger on the scanner when it blinks. The finger print impression is scanned and stored into the memory of the processing unit. Where multiple operations can be performed like enrolling new user, identifying the user etc. this module can store up to 100 users' finger template. This will be interfaced using serial communication link at 115200bps.

  This unit requires +5VDC for it proper operation.

- PC Serial Port Controlling

  Serial Port of PC is also referred as RS232 Port. The connector is of type 9 pin D-Type Male connector. Generally we will use only pin-2 (Rx), pin-3 (Tx) and pin-5 (GND) for any type of communication system.

  In the software part we can use any one of the following methods…

Using MSComm Control ActiveX - The MSComm control provides serial communications for our application by allowing the transmission and reception of data through a serial port. MSComm is used as a serial port software interface. MSComm provides us the software interface and insulates us from the functioning of the underlying hardware.

Using System.IO.Ports Namespace – this is part of .net framework. This is an intrinsic way of serial port communication. In this namespace we will use SerialPort Class. This class provides synchronous and event-driven I/O, access to pin and break states, and access to serial driver properties.

- Database Manager

A database management system (DBMS) consists of software that operates databases, providing storage, access, security, backup and other facilities. Databases are designed to offer an organized mechanism for storing, managing and retrieving information. They do so through the use of tables.

We can use any one of the following software & technology for database managing…

MS Access 2007 - Access allows us to manage our information in one database file. It is easy to use. It is portable as can be easily copied & paste to any other system and can run without installing the software.

MS SQL Server 2000 – it is rather complex at installation part and easy to use. The database developed on it can not be easily copied and paste on another system. Also it requires the software to be installed to use the database files.

D. *Features*

The Following are the prominent features of the above discussed system…

- NO Proxy at all,
- Accuracy in Attendance Data,
- Various types of Reports,
- Time Saver for teachers,
- Hand Held device for easy mobility,
- Increases Attendance of students,
- Increases college goodwill.

E. *Technology & Programming Languages*

As microcontrollers are the core of these days digital circuit design in industry, this system uses it for the centralized operation and digital processing. The technology used here is embedded technology which is the future of today's modern electronics.

The followings are the various Programming Languages & Technologies that are going to be used in the proposed system…

For Embedded System…

- Embedded Technology,
- 8051 Family Based Controller,
- Embedded C - Keil Compiler,
- Eagle Software for PCB Designing.

For PC System…

- VB.net 2008 Based Application Software,
- Serial Communication Protocol,
- SQLServer2000 Based Database,
- Crystal Reports,

F. *Project Development Methodology or Steps*

The following will be development steps so as to achieve the working Prototype Model of the above proposed system…

- Defining the Problem,
- Understanding the Need & Usability in industry and society (Market Analysis),
- Developing Block Diagram,
- Designing Circuits of individual blocks,
- Testing circuits in LAB & Finalizing,
- Developing PCB on PC,
- Getting the PCB printed from market,
- Soldering the components,
- Performing various Basic Experiments to test the PCBs,
- Developing Flowchart for the entire process,
- Writing actual Software Program,
- Compilation & Burning,
- Testing and Debugging,
- Developing Flowchart for PC Side Software,
- Developing Data Flow Diagram,
- Writing actual code.
- Finally Running the system and,
- Documentation.

IV. SCOPE & APPLICATIONS

Only the imagination can limit the applications of the above proposed system.

Though the following are some examples…

- college students attendance,
- employee attendance system in industry,
- teacher and staff attendance system for school & colleges,
- Others where attendance is a recurring process.

V. CONCLUSION

By the realization of the above proposed system one can learn many aspects of a digital electronics circuit. This will give the complete knowledge of designing microcontroller based system and developing embedded software.

We will also learn the software development strategies and various programming techniques for PC based applications.

VI. ENHANCEMENTS

A. *Limitations*

As generally all systems have some limitation, here are some listed for the proposed system…

- Only hundred different users can be enrolled at a time in the module memory,
- Only one lecture attendance at a time,
- Less battery backup time as more power consumption,
- Serial Port interfacing with PC.

B. *Drawbacks*

This system has certain drawbacks also as listed…

- The System will have no memory,
- Current attendance for one lecture must be uploaded before starting new one,

C. *Future Modifications*

There is always chance to improve the any system as research & development is an endless process. Our system is no exception to this phenomenon. The following improvements can be done…

- Costly FP module can be used to increase the memory of the module so that it can support up to 1000 users,
- Addition of SD/MMC memory can be done,
- Rechargeable battery for better system performance,
- USB interfacing can be done.

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