TIME TABLE MANAGEMENT SYSTEM USING RASPBERRY PI AND BIOMETRIC MODULE

G. SARITHA, ASST. PROFESSOR,
V.SWARUPA (y15ec1296), SK.MASTHABI (y15ec1280), Y.MANIKUMAR (y15ec1300),
DEPARTMENT, CIET, LAM, GUNTUR, ANDHRA PRADESH, INDIA

Abstract – The main aim of this paper is to intimate staff about their class. Normally staff checks the time table every time to go to the class. By using this system can overcome this type of problems. In this system staff no needs to check the time table every time. Simply they will intimate their class through SMS before 10 minutes. Incase faculty will not attend to the class in time, automatically after 10 minutes message will be send to the HOD or TIME TABLE IN-CHARGE. Then he/she will take the necessary actions.
*Key Words***:** Raspberry PI, Biometric module, GSM,   timetable, Display, classroom

INTRODUCTION: In previous we had the same concept with RFID cards .The main aim of this project is to intimate staff about their class. In this system we use GSM modem to communicate the staff. This is a wireless technology, which shows the improvement in technology in a right way's .GSM (global system for mobile communication) normally the data required is been loaded in raspberry pi's memory i.e. SD card and the total schedule of the college is considered here. This is an emerging technology which is regularly in use, but data must be loaded. Normally staff check's the time table for every class; by using this system we can overcome these types of problems. Normally these are placed near the class room. By this system, staff - no need to check the time tables every time. Simply they are been intimated through SMS before 10 minutes. In case faculty will not attend for the class automatically after 10 minutes message will be sent to the head of the department, then he will take care of the issue. In this project we used RFID cards .by the usage of this RFID cards we face some problems like incase that RFID cards maybe forgot whole day attendance may get lost . To overcome this type of problems we implement same concept by using biometric module .in this project no need to carry any one with us .simply put thumb on that module it recognizes that thumb at that class time .then no SMS will be sent to the head of the department or time table in charge . In this project we use Raspberry Pi and there is a Biometric module. The data from the Biometric module is send to the Max232 and it transfers that data to the RPI. And RPI has another connection which is SD card for its OS. And the RPI sends the information to the respective persons through GSM. It will give alerts with the help of Driver and Buzzer before and after the time of the class.[6]

A**dvantages**

- Reduce Paper Work.
- Saves the time and effort
- No need to carry any card with us
- Substitute management
- Easy customization

Applications

- No more Paperwork
- No more Confusion
- It is Error-Free
- Increased Security and Confidentiality**.**
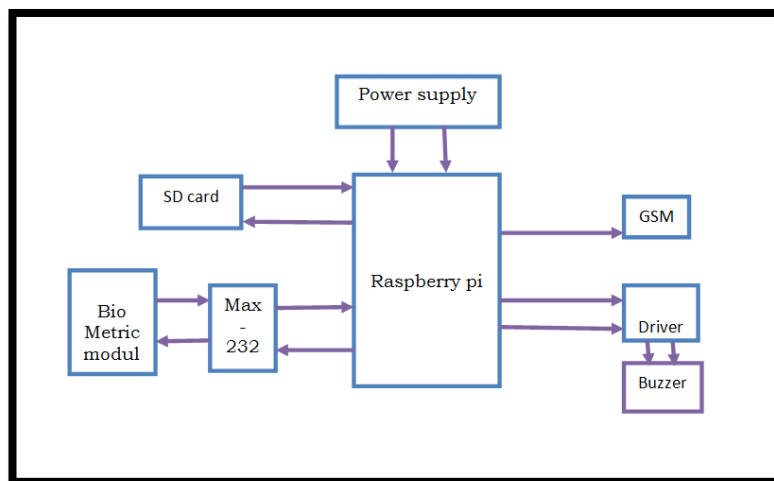
BLOCK DIAGRAM:

Figure1. Block Diagram for Timetable Management System using Raspberry Pi and Biometric Module.

The above Figure 1 shows that it can be used to know that whether the faculty member has come to class or not. If the faculty member doesn't come to class & swipe in time, the Biometric Module will sent a message to that particular faculty & HOD that particular faculty didn't come to class through RPI and sends information through Biometric Module. And send the messages to faculty before 5 minutes using GSM and Raspberry Pi. Buzzer will intimate which time the class will be start according to that time table .here max-232 is used for converting the data as serial data to parallel data and parallel data to serial data communication for better understanding of biometric module.
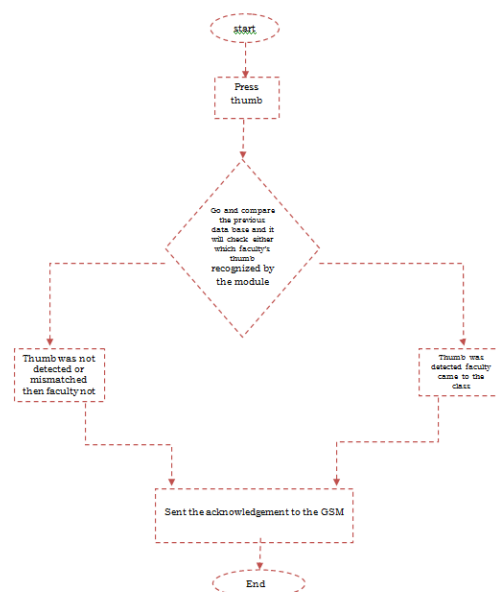
FLOW CHART

Figure: Flow chart for Time Table Management System using Raspberry Pi and Biometric module

The figure 2 shows that it can be used to know that whether the faculty member has come to class or not .if the faculty come and give thumb to the module in time no MSG will be sent to the HOD or time table in charge .in case the faculty not come to the class in time the SMS will be sent to the HOD or time table in charge .the initial step of this time table management system is to store the overall data base in the biometric module .it will be stored in module .it accepts the image of finger print and ridges and valleys of that finger print is stored in module as binary format . whenever the class will be started at that time the faculty will come and give thumb to the system it will compare the previous data base present in the module .it checks that finger print maybe compare either match or not with presented data .if it matches that faculty has come and attend that class .in case no finger print matches with existed finger print then signal will be passed to raspberry pi and it will send an acknowledgement to the GSM as no faculty will come to that particular class.

GSM MODULE:

Figure 2: Hardware GSM

GSM stands for Global System for Mobile Communication and is an open, digital cellular technology used for transmitting mobile voice and data services. It uses narrowband Time Division Multiple Access (TDMA) technique for transmitting signals [1]. TDMA is a technique in which several. Different calls may share the same carrier. Each call is assigned a particular time slot. A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. GSM Modem allows the capability to send and receive SMS to and from the system. The communication with the system takes place via RS232 serial port [2]. It works in frequency band 900MHZ or I800 MHZ, power voltage 3.4V to 4.5V and baud rate is 300 bps to 115 kbps, where between 1200 to 115 kbps is automatically configured [3]. With a tiny configuration of 40mm x 33mm x 2.85 mm, SIM900 can fit almost all the space requirement in your application, such as Smart phone, PDA phone and other mobile device. TheSIM900is designed with power saving technique, the current consumption to as low as 2.5mA in SLEEP mode. The OSS or operation support subsystem is an element within the overall GSM network architecture that is connected to components of the NSS and the BSC. It is used to control and monitor the overall GSM network and it is also used to control the traffic load of the BSS. It must be noted that as the number of BS.

RASPBERRY PI: The raspberry pi 3's four built in USB ports provide enough connectivity for a mouse, key board or anything else that you feel RPI needs but you want to add even more you can still use a USB hub. keep in mind ,it is recommended that you use a powered hub so as not to overtax the on-board voltage regulator .powering the raspberry pi 3 is easy. Just plug-in any USB power supply into the micro USB port .there is no power button so the pi will began to boot as soon as power is applied to turn it off simply remove power .the four built-in USB ports can even output up to 1.2A enabling you to connect more power hungry USB device

Figure3. Hardware Raspberry pi

The Raspberry Pi 2Model B is the third generation Raspberry Pi. More than 10x faster than the original Raspberry Pi B. Wireless LAN & Bluetooth have been added to this powerful credit-card sized single board computer which makes this ideal for connected & IoT applications. Same footprint & connections allow easy migration. The new 5V1 2.5A power supply is required as well as the NOOBS software rev.1.5m for the RaspberryPi2 Model B.

BIOMETRIC MODULE: Biometric identification from a print made by an impression of the ridges in the skin of a finger is often used as evidence in criminal investigations. Yes, now we can use the same biometric identification technique to build our own hobby projects like a biometric authenticator/access control system with the help of readily-available Fingerprint Identification Modules. Here is an introductory article to help you! Fingerprint processing includes two parts, fingerprint enrollment and fingerprint matching (the matching can be 1:1 or 1: N). When enrolling, user needs to enter the finger two times. The system will process the two time finger images, generate a template of the finger based on processing results and store the template. When matching, user enters the finger through optical sensor and system will generate a template of the finger and compare it with templates of the finger library.

PYTHON IDLE: IDLE is Python's Integrated Development and Learning Environment.
IDLE has the following features:
- Coded in 100% pure Python, using the tkinter GUI tool kit.
- Cross-platform: works mostly the same on Windows, UNIX, and Mac OS X.

- Python shell window (interactive interpreter) with colorizing of code input, output, and error messages.
- Multi-window text editor with multiple undo, Python colorizing, smart indent, call tips, auto completion, and other features.
- Search within any window, replace within editor windows, and search through multiple files (grep).
- Debugger with persistent breakpoints, stepping, and viewing of global and local namespaces.

RESULTS:
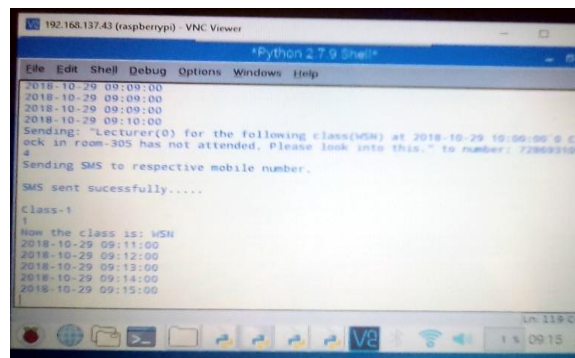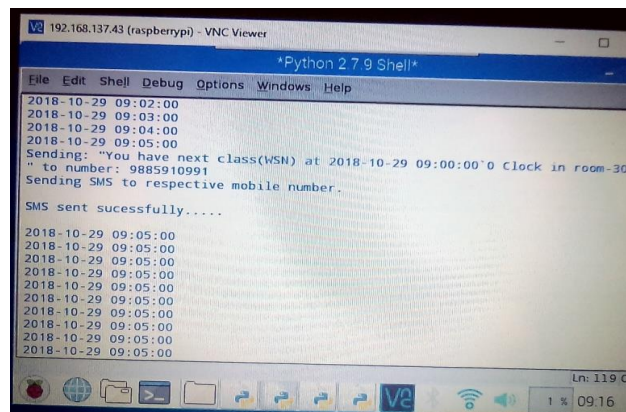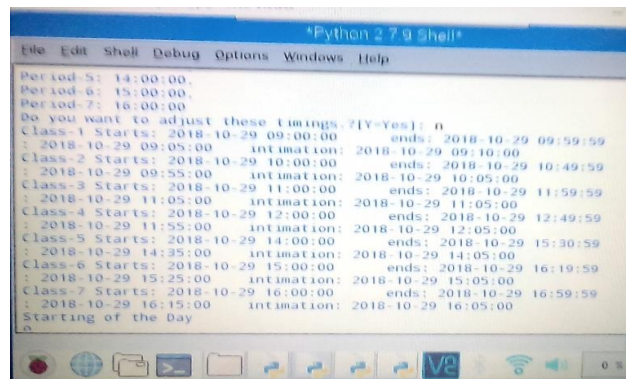
Conclusions: By implementing this method, we can eliminate manual work that means staff member need not check their time table every time for next class. Here, we are using Raspberry Pi, so that we can have many advantages over other boards like Arduino, Micro Controller etc. Raspberry Pi has many advantages and features.GSM is used to send the messages and through Biometric Module. We can know whether the faculty member attend the class in time or not with man. And Raspberry Pi can operate at low powers i.e. 5v.It has 4 USB Ports where as arduino has only one USB Port. We can store information through SD card. It has audio and video ports where as arduino does not have these type of facilities. Cost of all the components used in this project is less where as result is high.[3]

Future Scope: our approach of developing timetabling system was proved successful and practical as well as it demonstrated its suitability for solving college's lecture-course timetabling problem. We have also shown that how we can fit our timetabling system as rich internet application. From this timetabling system, we are able to obtain useful information for future work. Further development includes expanding algorithm for solving timetabling problem modeling and search technique, reducing execution time and enhancing graphical user interface. More research is needed to complete our interactive, automatic timetabling system. The method, techniques and concepts developed will be tested on more datasets and application.

REFERENCES

1. Zatin Singhal, Rajneesh Kumar Gujral "Anytime Anywhere- Remote Monitoring of Attendance System based on RFID using GSM Network" International Journal of Computer Applications, February 2012.

2. Tomas Zitta, Marek Neruda, Lukas Vojtech "The security of RFID readers with IDS/IPS solution using Raspberry Pi" ICCC, 2017.

3. Surendar Goud, Dhiraj Sunehra "Attendance recording and consolidation system using Arduino and Raspberry Pi" Signal Processing, Communication, Power and Embedded System (SCOPES), 2016.

4. Vamsikrishna Patchava, Hari Babu Kandala, P. Ravi Babu "A Smart Home Automation technique with Raspberry Pi using IoT" Smart Sensors and Systems (IC-SSS) 2015.

5. Anush Prasad, Aparna Ghenge, Sonali Zende "Smart ration card using RFID, biometrics and SMS gateway" Inventive Communication and Computational Technologies (ICICCT), 2017.

6. Jihong Yuh, Jiangchuan Liu, Lie Chen Yifei Zhu "Efficient group labeling for multi-group RFID systems" Quality of Service (IWQoS), 2017.

7. Madhura, Ragumala, M. Poojalakshmi, S. Shreeyas Pravin "GSM based annunciation system" ICIMIA, 2017.

8. Ch. Vijaya Lakshmi, L. Lavanya, P.A Lovina "Remote controlled automatic food processing system with GSM module" Signal Processing, Communication, Power and Embedded System (SCOPES), 2016.

9. Dhiraj Sunhera, Vemula Tejaswi "Implementation of speech based home automation system using Bluetooth and GSM" SCOPES , 2016.