

# Standalone Attendance Monitoring and Projector System

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**Abstract**— SAMP Stands for Standalone Attendance Monitoring and Projector System. It involves four parts, Portable Projector System, Attendance Monitoring System, Remote File Transfer, Online Notice Board. Raspberry Pi is used as central computer, Raspberry Pi has onboard HDMI port which can be used to connect to the projector. Various Linux based Operating System can be installed on PI, RC522 RFID module is interfaced with Pi using SPI communication and data of attendance is logged into SQL database, Raspberry Pi is used as ftp server to transfer file remotely between Raspberry Pi and any computer in network. Raspberry Pi is used as webserver to host html pages, which can be used to host notices.

**Keywords**—Raspberry Pi, MFRC522, Projector, WIFI, FTP.

## I. INTRODUCTION

An attendance recording system's basic function is to keep a record of the time at which the individual of a particular firm report to an organization and leave. The traditional method of maintaining an attendance register makes the job very tedious, time consuming and prone to human errors. Furthermore, in schools, it is very difficult to verify one by one student in a large classroom. This paper describes a method for Attendance System using RFID.

For presentations one has to carry a computer along with projector when he/she has to show information on PPT, carrying whole computer along with projector is a bulky task so in this paper we have designed a system in which we would be using a central minicomputer which would be doing both tasks of RFID based attendance as well as portable projector. As well as coordinator do not need to carry documents ex. ppt's on Pen drive etc. He can remotely copy documents from his desktop to the mini computer.

Many universities in the world depend on wooden notice board hanging on the wall to display announcements. We consider that information or notice is a important key for knowing the updates of the campus. The aim of system is to host notices online which can be viewed on any device connected inside the network.

## II. ATTENDANCE MONITORING SYSTEM

### A. Need

In today's educational system, regularity of students is main concern. Poor attendance leads to students in defaulter list. It is very difficult to verify student one by one in a large

classroom. Also in corporate world, employees are expected to come on time. The traditional paper pen method is time consuming and waste lot of resources.

### B. Implementation of attendance monitoring in our system

We are designing a system in which MFRC522 module i.e. RFID module, which uses SPI communication protocol is interfaced with Raspberry Pi. Raspberry Pi has on board SPI port, which needs to enable for the first time which can be done from Raspberry Pi preferences<sup>[4]</sup>.

Now in our project we are going to monitor the attendance, we will be reading tags with the help of RFID interfaced with Raspberry Pi. And logging the data in SQL database. The reason for choosing SQL database is if I log my data in SD card, due to power failure our any other condition the chances of data getting corrupt is very high, hence we choose SQL database on local server.

### C. Algorithm

1. Interface RFID with Pi using SPI
2. Create Database of student
3. Whenever tag is detected write the TAG ID along with date and time in database
4. When TAG is not read date is continuously displayed on screen.

## III. PROJECTOR SYSTEM

### A. Need

As lecturer has to carry a whole computer along with projector when he has to show information e.g. PPT, documents etc., carrying whole computer along with

projector is a bulky task so we would be using a central minicomputer which will be replacing the bulky CPU.

### B. Implementation

#### 1. Installation of Operating System on Raspberry Pi

- We need to Download the image file of OS we want to install.
- Raspbian is the one of the Linux distribution.
- After downloading the image file over internet, we have to extract the contents inside the image file in to SD card.
- Now after copying the contents in SD card, insert the SD card in Raspberry Pi and power it.
- The OS will begin to install.
- After the installation of OS, Raspberry Pi will boot in command mode and will ask for user name and password.
- The default User Id: pi and Password: raspberry
- To switch to graphical interface we have to enter command startx.
- Raspberry Pi can be configured to boot always in GUI by changing the settings.

#### 2. Connection for Projector

- Raspberry Pi Comes with onboard HDMI connector which is used to connect Raspberry Pi to projector. HDMI to VGA cable is used to connect to Projector with VGA port.
- Raspbian OS is installed on Raspberry Pi.
- which comes with pre-installed libre office, which can be used to view and edit doc files, PPT, excel sheets.

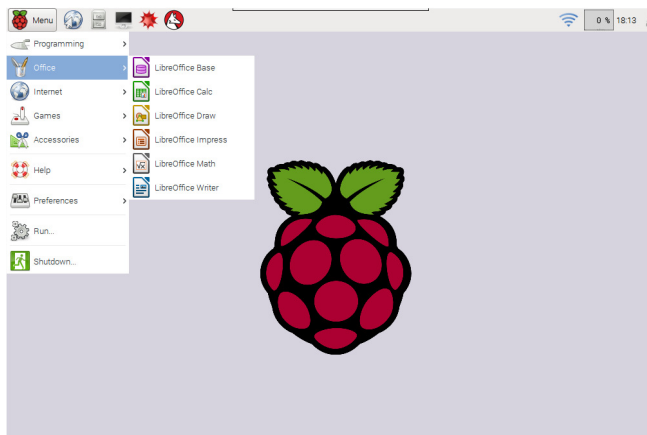


Fig 3.1 Raspbian OS interface

The figure above shows applications available in Raspbian. Which can be used for viewing and editing documents as well as presenting them as required.

## IV. REMOTE FILE TRANSFER

### A. Need

Employee do not need to carry documents e.g. PPT on pen drive etc. User need to remotely copy documents from his desktop to the Mini Computer without and need of any external hardware in between.

### B. Implementation

It is useful to be able to remote control your Raspberry-Pi using the mouse and seeing just what you would see on the screen of the Raspberry-Pi as well as transferring the files remotely<sup>[1]</sup>.

VNC (Virtual Network Connection) is a software that provides FTP on Raspberry Pi. There are a number of VNC server applications and the one we are going to use is called “tightvncserver”.

We can install the VNC server software using command prompt in Raspberry Pi. Enter the following command into your command terminal:

```
Sudo apt-get update
```

```
Sudo apt-get install tightvncserver.
```

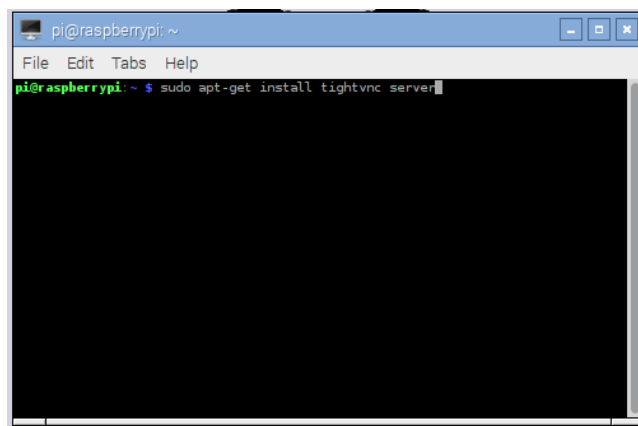


Fig 4.1 Installation of VNC server

Now to we need to configure some settings to start VNC server on boot.

We will provide the address of VNC server application in auto start directory.

To copy files between Pi and remote computer and FTP software e.g. FileZilla can be used.

## V. ONLINE NOTICE BOARD

### A. Need

A notice board is a place where people can leave public messages, for example, to advertise things, announce

events, or provide information. Notice boards are often made of a material such as cork to facilitate addition and removal of paper messages or it can be placed on digital devices such as computers, phones. So people can leave and erase messages for other people to read and see. In the current scenario the notice/ advertisement boards are being managed manually [2]. There is a long process involved in order to put up notices on the notice board. This wastes a lot of resources like paper, printer ink, and man power and also brings about loss of time.

**B. Implementation**

We have installed apache webserver on raspberry pi which has enabled us to use raspberry pi as webserver. Apache is a popular web server application you can install on the Raspberry Pi to allow it to serve web pages. On its own, Apache can serve HTML files over HTTP, and with additional modules can serve dynamic web pages using scripting languages such as PHP[3].

Install the apache2 package by typing the following command in to the Terminal:

```
sudo apt-get install apache2 -y
```

By default, Apache puts a test HTML file in the web folder. This default web page is served when you browse to http://localhost/ on the Pi itself, or http://192.168.1.101 (whatever the Pi's IP address is) from another computer on the network.

The following page is appeared when user enters the ip address in the browser.

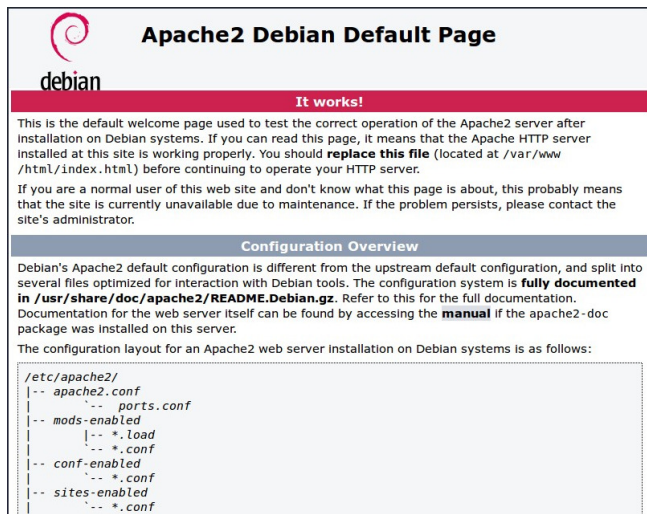


Fig.5.1 Apache2 Web Page

We can edit this page and enter our data or important notices by navigating to the directory and changing the context.

For navigating to direction enter following in terminal  
 cd /var/www/html  
 for accessing the html file which is requires to edit to enter notices enter following in terminal  
 nano index.html  
 window will open, where we can type the notices as shown in figure.

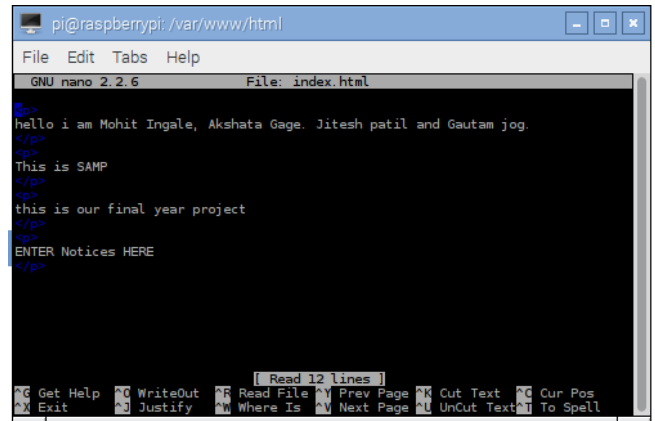


Fig. 5.2 Nano notepad editor to edit notices

Now to Browser and enter URL, the IP address of the pi 192.168.0.101 you will see following.



Fig 5.3 Online notice

**VI. PROPOSED MODEL**

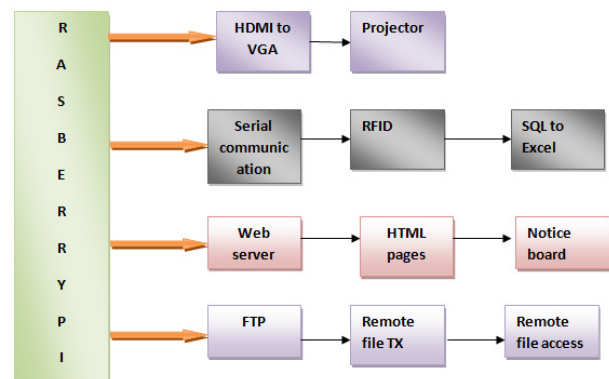


Fig 6.1 Proposed Block Diagram

We will be using Raspberry Pi as minicomputer with a Linux operation system installed on it. Raspberry pi organization has developed an operating system named Raspbian for Raspberry pi. The Raspberry Pi will be connected to internetwork in the college. FTP will be used to share files between the computer and Raspberry pi. To connect the Raspberry Pi to projector we will be using HDMI to VGA convertor. Open office will be installed to display the PowerPoint, Word files etc. A RFID reader will be interfaced with the PI which will be collecting data and storing the record in database (SQL or excel). Serial Communication will be used to interface RFID with the Pi. The database of the attendance will be saved using SQL and converted to excel so that it can be viewed easily. The record will be available to the coordinator at any instant of time. Using FTP, the record of attendance can be viewed from the computer remotely. A Web server will be setup on raspberry pi which will be used to create and host html pages, the notices will be posted on the html pages and these notices can be viewed remotely on website as well as display.

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