

# Smart Notice Board using Android Application

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## Abstract

Notice boards are a common thing in any institution or public utility places like schools, colleges, bus stations, railway stations, malls etc. Notices are important when it comes to offices and educational purpose as notices are used to convey important messages. But sticking various notices in our day to day life is a difficult process. The process of updating the notice board is tedious and time consuming. A separate person is required to take care of all this notice display. The main aim of this project is designing a wireless system using LCD monitor based message display controlled from an Android mobile phone. The proposed system makes the use of wireless technology to communicate from Android phone to display board. The system has a provision for displaying notices in form of text, images, video, web page, documents etc. This project will allow the user to use the android application to update the notices. . This project takes the help of an onboard computer which is commonly termed as Raspberry Pi. This automatic control system used in this project saves the notices for future use. The wireless notice board is modified in order to display notices in any format and provide the user with flexibility as well as over the barrier of distance.

**Keywords:** notice board, wireless, LCD, raspberry pi, automation, Android application.

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## I. INTRODUCTION

Nowadays people are surrounded by various technologies to communicate. Inventors are making sure that there is no stone unturned in order to make our life easier and better. Notices are one of the important ways of communication. This paper deals with similar situation. The aim of this project is to design a small, simple and user friendly notice board which displays the message sent from mobile application. This will help the users to easily keep track of the system. Displaying notices on the notice board is a difficult task. It is a total waste of time and requires manpower. Hence this proposed system will display a notification to multiple users at a same time by using android application. It has fast delivery system and less time is required to update notices. Plus, low cost and minimum resources are required. This notice board will provide hazard free notice updates on our cell phone.

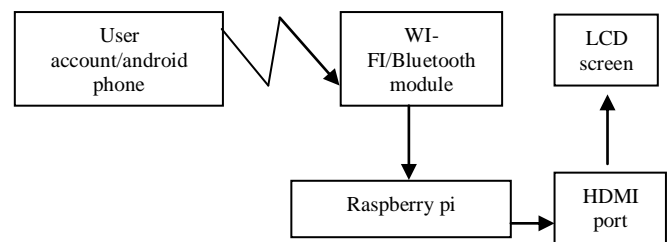


Figure.1. Block diagram of smart notice board using android application

Above figure shows the representation of smart notice board using android application in which user account block represents the user or the admin carrying the user ID and password. The user account and the display screen must be connected to same Wi-Fi. Raspberry pi is an onboard computer, interfaced with LCD screen using an HDMI to VGA converter. The first step is installing OS in Raspberry pi. Tools required to install Raspberry pi are SD card of 32 GB,

Laptop/ PC, Raspberry pi model B2. Next step is to burn the Raspbian in SD card and adjust the screen of LCD display and also set proper setting required for LCD display. Followed by rebooting the LCD display and select one of the languages required for programming. Next step is formatting the memory .Go to command as given below in figure

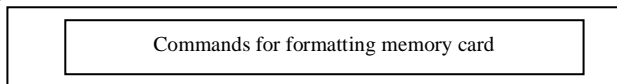


Figure.2.Formatting in SD card

The above given figure represents the command which is used to format SD card and burn a new code. Hence after formatting it displays the size of SD card on the disk drive. We will save program of Raspbian and dumped it in the SD card in Win 32 desk window. Secondly create the web page to display the notices. This is done by writing the HTML skeleton and using python language. After this, the task is to assign the functionality. One of the most important parts of this project was designing the application this process was initiated and completed by using MIT app inventor. The hardware and software used is LCD Screen, Raspberry pi kit, HDMI to VGA converter, Micro SD card 32 GB class10, Python, Raspbian (operating system), MIT app developer. The most important component of this project is raspberry pi which is used for providing interface between wifi connectivity and monitor. Raspbian is a free operating system which is a set of basic program that makes raspberry pi run. Raspbian operating system is still under active development. Now connect the raspberry pi with monitor / LCD display using HDMI to VGA converter. Provide power supply to monitor and raspberry pi. Raspberry pi needs 2A 5Volts supply. When the project is run the mobile application allows user to click on the button which leads user to the notice updating access. Once the user clicks on button, user needs to enter the correct password and ID set by the admin. After entering the correct password create a playlist, which will be seen in the asset and when user needs to display the playlist he/she can set

the time and the notice will be displayed. At a time many notices can be displayed in form of text, document, image, video, WebPages, web link, YouTube links.

## II. WORKING

### A. Raspberry pi

Raspberry pi 2 model B was developed by raspberry pi foundation of Broadcom University of Cambridge in UK in series of small single board computer .It is an model of Linux operating system in February 2012. Raspberry pi is a general purpose desktop computer and power required is also less. Raspberry pi has a Broadcom BCM43438 processor of soc.sd ram of 1 gb. In a model B Ethernet port is built in using SMSC LAN 9514 chip. It is equipped with 2.4 GHz WI-Fi 802.11n and for the power source it has micro USB and gpio header of 5v supply. CPU of the specifications of 1 × ARM1176JZF-S 700 MHz It has USB 2.0 of 4 ports. It also has video input of MIPI camera interface connector .power rating of 700 ma and 3.5watt. For on board storage it has micro SDHD storage card an on board network of USB adapter on USB hub. It is of size 85.60 mm × 56.5 mm (3.370 in × 2.224 in), excluding protruding connectors. It has weight of 45g. It also has gpio port for input output connection.

It has a port supply up to 1200 ma. It also has a SD card slot used as a hard drive. Broadcom quad processor of BCM43438 Soc. It also has 10/100 Ethernet port and 40 gpio pin for the power supply of raspberry pi used a micro USB charger. It has gpio pin to connect different sensor for OTG connection it has Rc video out. It has USB ports to connect mouse keyboard. To connect monitor it has HDMI port. It also has Ethernet jack to connect jack to the internet. The name Raspberry pi is adopted from a fruit named raspberry and pi from python language. Initially raspberry pi was designed for the kits but later project development on the basis of raspberry pi was started. It is used as a headless mode also it can be called as a new storage device. Raspberry Pi 3 Model B was released in February 2016 with a 1.2 GHz 64-bit quad core processor, on-board Wi-Fi, Bluetooth and USB boot capabilities.

### B. SD card

SD card stands for SanDisk drive. It is used to store media. It has various types depends on the size of a card full card, micro card, mini card. SD cards are also giving the name according to its space example: SDHC of 4 to 32gbytes, SD card of up to 4gigabytes, and SDXC card up to 32gbyte to 2terabytes. It also has types of class giving the speed of SD card: Class 2 with a speed of 2megabytes/sec, Class 4 with a speed of 4megabytes/sec, Class 6 with a speed of 6megabytes/sec, Class 10 with a speed of 10 megabytes/sec.

### C. HDMI to VGA converter

HDMI also called high definition multimedia interface was developed as it brought more resolution in digital system. HDMI is used to interface raspberry pi with monitor. Earlier different cable were used for audio and video the number of wires used for interfacing increased but now they are replaced by HDMI cable as an advance version of interfacing. The special characteristics of HDMI cable is that it works on Digital signal. . There are three types of HDMI cable are simple HDMI, Mini HDMI and micro HDMI. Simple HDMI are used for interfacing of TV projector monitor .Mini HDMI is used for interfacing of camera. Micro HDMI is used for a phone. HDMI has both audio and video signal. There are various version developed of HDMI are HDMI 1.4. Released in 2009 bandwidth of 10.2gbps resolution at 4k at 24 Hz multi channel Audio system .and stereoscopic 3d .16 bit color support. HDMI 2.0.Bandwidth of 48 gbps 21:9 widescreen and all the features of HDMI 1.4. VGA is a video graphics array developed in 1987.

VGA is used to connect pc. It works only on analog signal. It has resolution of 2048\*1536 pc. VGA Port is mostly used to connect the CPU with monitor. Cable length of VGA cable is limited as the length of Cable is increased then loss of analog signal occurs. In an vga cable analog signal area provided hence they are converted from analog to digital for The reception of signal in any device result in loss of signal quality. An HDMI to VGA converter is a cheap cable. It connects HDMI signal from a computer to a VGA connection. HDMI to VGA converter sends

multimedia video and audio signal on same channel. As the VGA cable is used for transmission of video signal. Both HDMI and VGA is used combine to transmit to transmit both video and audio signal.

### D. LCD screen / Monitor

The most important elements required for display is light and color. LCD or liquid crystal display has a property of crystalline molecules. It may also be called as twisted pneumatic crystalline display. It has a higher resolution of 2048\*2048. It is interfaced with raspberry pi and used to display notice.

### E. Development Flow

The paper deals with a smart notice board operated using android application which is developed by using on board computer known as raspberry pi. Raspberry pi is interfaced with the display screen in this project LCD screen followed by development of android application. Android app is developed using MIT app developer.

The flow chart given below provides a brief overview of the development flow of the project undertaken in this paper. It shows how this project is made and what techniques are used in it.

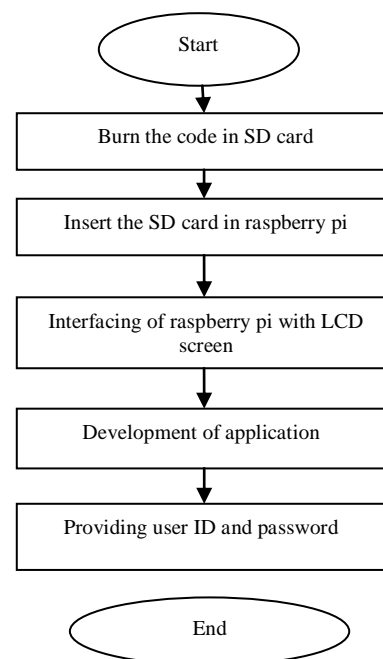


Figure.3. Processing of Notice Board

The above flow chart represents the development flow of the project. At the beginning format the SD card and burn the code to operate raspbian operating system. Raspbian is a Debian optimized a free operating system for the hardware of raspberry pi. This OS or operating system is used to run raspberry pi and has a set of basic program. It is a light based Linux operating system. It can also be called as raspbian pixel. it is an raspbian jessie pixel with 1.43gb. It also has loops which have a no of window to be operated. As the latest version of raspbian files is developed it is located on the raspbian window with special feature in it. Tool's required for installation raspbian are an SD card, Laptop, Raspberry pi, HDMI to VGA converter.

### III. METHODOLOGY

In order to display notice in form of text, video, image etc. the following steps must be followed. Interface raspberry pi with the LCD screen with the help of HDMI to VGA converter. Apply power supply to LCD and raspberry pi. Make sure that the application user and LCD display shares same Wi-Fi. Enter the correct password and user ID to use the application. Create a new playlist or use previously saved playlist in asset. Set the duration of the message to be displayed.

#### A. Interfacing of raspberry pi with LCD display

The Raspberry Pi has an HDMI port which can be connected to a monitor with an HDMI cable. Monitors with a DVI port, HDMI-to-DVI cable or an HDMI cable with a DVI adapter are used. Take into consideration that the DVI standard does not support audio. A monitor which supports VGA only, an HDMI-to-VGA adapter is used. VGA does not support audio. Raspberry Pi has a composite out port for connecting analog devices, but the type of connector changes depending on the model. The basic Raspberry Pi used an RCA connector, and a standard RCA composite video lead will work. Other models (Raspberry Pi B+ and later) combine the audio out and composite out on to the same 3.5mm jackplug. This demands a particular type of lead, with audio left on the tip, audio right on ring 1, ground on ring 2, and video on the sleeve. This

is the same as leads used on the Zune, and on Apple devices.

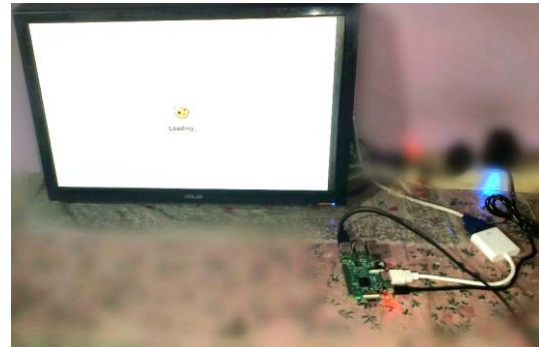


Figure Interfacing of Raspberry pi with LCD screen

The above figure shows interfacing of raspberry pi with LCD screen using HDMI to VGA converter.

#### B. Development of Application

The code running on this operation system is written in python language and the application uses python as well. Python is a general purpose language. It is a high level programming language as well. It may also be a machine dependent language and text based interaction. It used in Console app, Desktop application, Web app, Mobile app, Machine learning .Most popular developed application are Google, you tube, Instagram, Mozilla Firefox, Dropbox quora . It is a very simple and straight forward. It is also a case sensitive language. , object oriented and dynamical type languages. Feature of python language include large library, automatic memory management, interpreted language, emphasis on code reliability. The Massachusetts Institute of Technology (MIT).It allows newcomers to computer programming to create software applications for the Android operating system (OS). It uses an interface which is graphical. It is very similar to Scratch and the Star Logo TNG user interface. This function allows users to drag-and-drop visual objects to create an application that can run on Android devices. In creating App Inventor, significant prior research in educational computing was taken into consideration. App Inventor and the projects on which it is based are informed by characterization by creation of non presentational geometric object using industrial materials. It highlights that programming can be a



vehicle for engaging powerful ideas through active learning.

App Inventor also supports the use of cloud data via an experimental Firebase component.



Figure.4.code written in MIT app inventor

The figure represents the code developed to create android application. It interprets that when button1 is clicked activity starter1 is executed. The button1 represents the red button which appears in the android application. When this button is clicked the web page appears which allows the user to choose the playlist and display the notice saved in it.

The flowchart given below represents the operations performed to use the android application. First the LCD screen is enabled and phone is initialized. Both the devices must be connected to the same network.

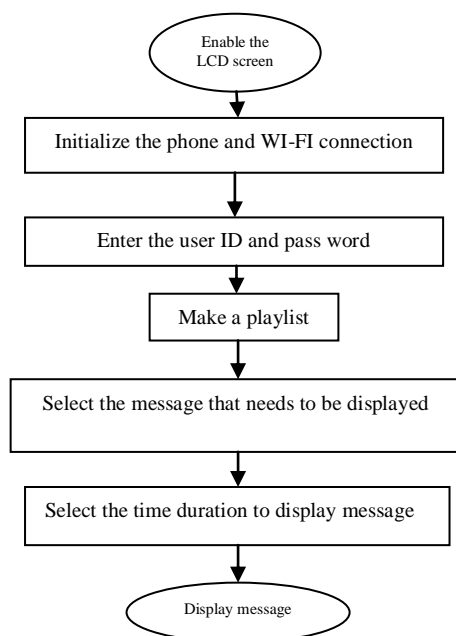


Figure.4.Operation of Project

In order to use the proposed project above flowchart is followed. The first step is to provide power supply to LCD screen which is interfaced

with raspberry pi. The user needs to install the android application created and operate it. Insert the correct user ID and password. Create playlist of the text, document, images, videos, web page, web link or any other multimedia which needs to be displayed on the notice board. Set the duration for which the notice needs to be displayed. Thus the notices are displayed on LCD screen through android application.

#### IV. RESULT

When the android application is used a pop up appears which asks the user password and ID.

If correct password and ID is entered then user is allowed to use the application.

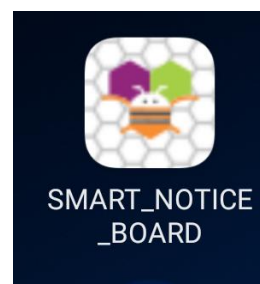


Figure.5.Android Application

Above figure shows the appearance of the android application.



Figure.6.Android application

Above figure shows the button which links to the web page when clicked.

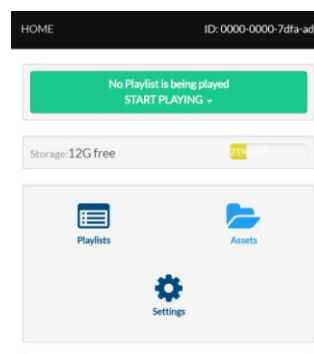


Figure.7. Web page

The above figure shows web page design. It allows the user to make playlists and save images, video, web link, text, document etc. used to display as notice. The duration of the notices is set by the asset.

The figure below shows the playlist in which time table is chosen to be displayed on LCD display. When the option of playlist is clicked a number of previously displayed notices are seen in form of a list. A new message could be chosen or one of the previously displayed notice.

When the button is clicked to display the notice in form of examination time table the notice is displayed which can be seen in figure.9.

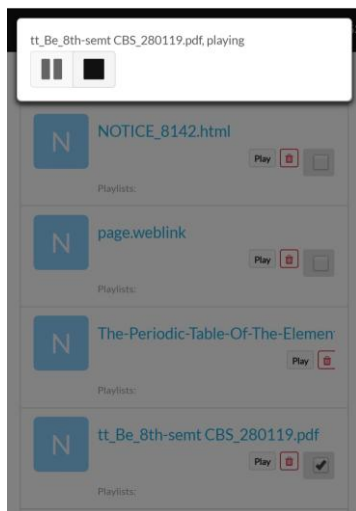


Figure.8. Playlist Display

Above figure shows the list of previously displayed notices and currently chosen notice to be displayed.

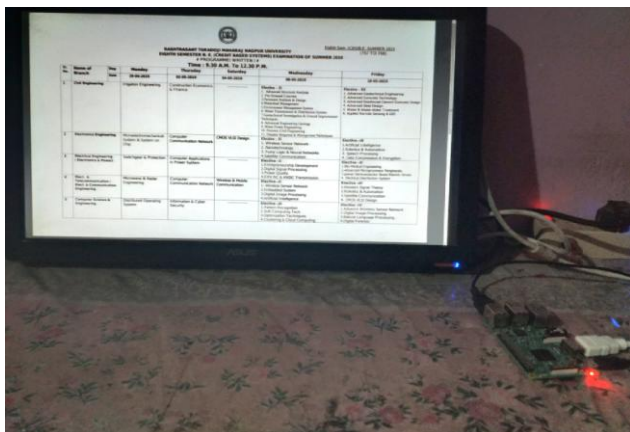


Figure.9. Displayed Notice

Above figure shows the displayed notice. The notice displayed here was in PDF form.

## V. CONCLUSION

At this time when everything around humans are digitizes, it would be a bummer if people have to rely on traditional notice board. Updating notice board using paper and glue is time consuming. If there is a need to update the notice then a new hard copy is made. On top of it if the notices need to be updated on daily basis then it is very tedious task. A separate person is assigned to take care of this notice display. Now day's electronic notice boards are also in use in which cable connections are done which make it complex. Wireless operation provides fast transmission over long range communication and due to fast transmission space, resources and time is saved. Data can be sent from remote location. User authentication is provided. Notices in form of multimedia data can be seen whenever we want to see. Although raspberry-pi is a tiny device, it works efficiently in digital notice board connected with soft wares. Hence Web server can provide user with real time actual data which can be used application.

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