

Wireless Digital Notice Board using Raspberry Pi

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ABSTRACT: Nowadays in schools and universities and in many other organisations like Hospital, Restaurant information is conveyed through large Notice Boards. The significance of notice boards or bulletin boards are immeasurable in many public places like Railway stations, bus stations and banks where people gather information through the data displayed in those boards. The major disadvantage of these notice boards are that it leads so many resources to waste including paper, printer and most notably man power and loss of time. The Electronic notice boards which were used in place of conventional notice boards had some major drawbacks too. Chiefly these electronic boards consists of wired systems which are not flexible and with the addition of so many wires, it gets tangled. To deal this problem, a wireless digital display is architected to display the latest information which can be maintained by the user from time to time. Here, wireless technology is used to transmit the information on to the digital display with the help of Raspberry Pi. In this an authorized user sends the image or video which contains the notice via personal computer using a client based server over the Wi-Fi network towards the Raspberry pi. Raspberry pi receives the notice and stores it in its memory. With the help of HDMI cables, the data or images can be displayed on the screen. The notice can be modified and altered according to client needs.

KEYWORDS: Raspberry Pi, LED Display, HDMI, Wi-Fi Adapter.

I. INTRODUCTION

A Notice Board or a bulletin board is a surface meant for the displaying of information for the public. It can also be used for advertising items that are for sale, and to announce events to the general public. Notice boards are often made of a material such as cork to facilitate addition and removal of messages, as well as a writing surface such as blackboard or whiteboard. A notice board which combines a pinboard (corkboard) and writing surface is known as a combination notice board. notice boards can also be entirely in the digital domain and placed on computer networks so people can leave and erase messages for other people to read and see, as in a bulletin board system.

Cork boards are generally used for the posting of notices and information so that people could read it. Notice boards are particularly prevalent at universities. When official boards are sparse in number, various other objects like trees and walls are used to post information. Internet forums are a replacement for traditional notice boards. Online notice boards are sometimes referred to as message boards. The terms notice board, message board and even Internet forum are interchangeable, although often one bulletin board or message board can contain a number of Internet forums or discussion groups.

Digital Noticeboard are a popular substitute for cork boards because they lack the problem of board deterioration from the insertion and removal of pins over time. To eliminate the drawbacks of a normal notice board, a digital board can be used. The Digital Notice Board are an ingenious way to get information across to customers, staff, visitors or students. The user can choose how to send their information, ensuring that their message is getting across to the right people, in the right place, at the right time. The user control the content and the delivery time for their message.

II. RELATED WORKS

A. DISPLAY MESSAGE ON NOTICE BOARD USING GSM

Author: Foram Kamdar, Anubhav Malhotra, Pritish Mahadik

This paper dealt with an Short Message service (SMS) based notice board assimilating the commonly used GSM to aid the communication of presenting data in notice board. The working is based on ATMEGA32 microcontroller which is programmed in assembly language. A SIM card with ASIM300 GSM modem is connected to the ports of microcontroller using AT commands. When the user sends a message through their registered mobile phone, it is received by the modem at the receiver end.

B. WIRELESS ELECTRONIC DISPLAY BOARD USING GSM TECHNOLOGY

Author: Jagan Mohan Reddy.N, Venkateshwarlu

This paper deals with the construction of SMS induced automatic display board which can succeed the conventionally used programmable electronic display and boards. It is put forward to receive and display toolkit which could be programmed and can be used later on from an authorized mobile phone.

C. DIGITAL NOTICE BOARD USING POWER LINE COMMUNICATION

Authors: Pudumai Nayagi R, Seethalakshmi R

This paper put forwards an application for automating any educational institutes by taking the place of conventional bulletin boards by digital notice boards. With an integrated database, updates will be frequent. Existing power lines are used by the system to send the data to a special node. It can also be broadcasted to different power line nodes. For each receiver, a specific address is assigned and it responds when an appropriate command is given.

D. DIGITAL NOTICE BOARD USING ZIGBEE

Authors: Ajinkya Gaikwad, Tej Kapadia, Manan Lakhani, Deepak Karia

This paper dealt with an system which would enable people to send or transmit data to a notice board using ZigBee. The notice boards can be accessed only by the authorized people i.e. the user with the help of Graphical User Interface (GUI). The system can be further enhanced with other wireless technology.

III. HARDWARE SPECIFICATIONS

A. RASPBERRY PI PROCESSOR

The operation of the devices controlled by Raspberry pi processor. The Raspberry pi processor is a single-board computer used for controlling the operation. It controls signal flow in transmitting and receiving signal from the devices. It contains 40 pins including input, output, power supply and ground pins. It contains pin group of power source, communication interface, input/output pins, Pulse Width Modulation, External interrupts. Power source pin contains +5V- power output, +3.3V- power output, GND pin. Communication interface pin group contains UART, SPI, TWI pins. Universal Asynchronous Receiver Transmitter (UART) is for interfacing other devices and sensors. Serial Peripheral Interface (SPI) is for communication with external boards or other peripherals. Two Wire Interface (TWI) is for connect peripherals. Input / Output pin perform multiple function. All the I/O pins are used for interrupt in the board. The Operating temperature of the board is -40 degree Celsius to +85 degree Celsius. It has the Operating voltage of 3.3V. It contains internal RAM of 1Gbytes and Flash memory of 16Gbytes. It also has the clock frequency of 1.2GHz. The special type connector in the board are Ethernet, Memory card slot, Display connector, Camera connector, Video output, Audio output and USB.

B. 16 GB MEMORY CARD

MicroSD is a small, compact drive used chiefly in digital cameras and mobile phones. Secure Digital is the actual amplification of SD. There are various types of SD Card based on their Storage capacity which range from 2GB to 1TB which further varies in sizes based on their respective capacity. Even though its about the size of a fingernail, it could store large amount of data. Furthermore there are adapters that are exclusively used for memory cards, so that they can be fit into devices that doesn't have proper slot. There are different formats among memory cards which leads to complexity when older device cannot employ the newer format, but in some occasions a external firmware can be downloaded.

C. SMART TV

A Smart TV is lot like a computer which can be connected to an internet source for via Ethernet or built in Wi-Fi. Smart TV's are chiefly used for entertainment purposes i.e. browsing the web, streaming videos and to catch up on Social medias like Facebook, Instagram, etc. Conventional Televisions can be converted into "Smart TV's" through installation of set-top boxes and special hardware's. For ease of access, Smart TV's can also be connected to many input devices wirelessly. Smart TV's also has some minor drawbacks like being a threat to personal privacy.

D. HDMI

HDMI can be abbreviated as High Definition Multimedia Interface. It is chiefly used to transmit Audios and Videos through a single cable. It is aided by modernized appliances such as Smart Televisions, Audio receivers and video game consoles. The major difference between other Audio/Video connections and HDMI cable is that it carries both the streams together.

IV. SOFTWARE SPECIFICATIONS

A. Screenly

Screenly is a software that helps the users to display videos, datas from webpage and pictures on large displays like TV screens. It is also used chiefly to display advertisements through videos or images. The software helps users to govern various screens through a single web interface which could only be accessed by the user. It could also be used to create playlists for various screens.

B. Google Docs

Google Docs is a free internet based application, where documents can be created, edited, stored or shared online. The files stored in Google Docs can be accessed from any device that has internet connectivity and a web browser to browse the web pages. It is associated with Google Inc. Works done in Google Docs can be published as a Web page that can be viewed by general public. The major advantage of Google docs is that the data created through it will be stored online, hence there is no risk of total data loss.

V. BLOCK DIAGRAM

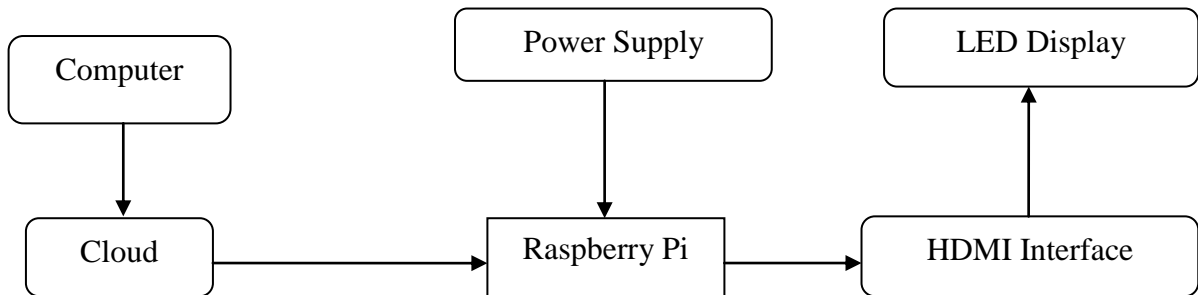
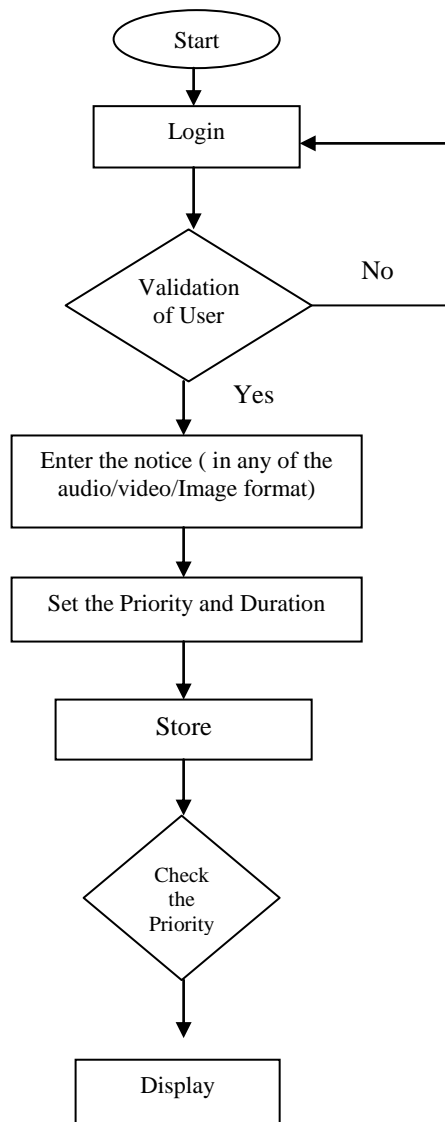


Fig.1 block diagram

VI. FLOW CHART



VII. IMPLEMENTATION

The data which should be displayed on the LED display should be uploaded to the Screenly software which could only be accessed by the user. Each account consists of a user name and specific password which will be used by the user to login to the software. The data/video/image can then be uploaded with the help of Google docs and can be then set a priority. In further developments, the required time duration can also be added in enhancements. Then the data will be then sent to Raspberry Pi in which the data will be stored in the SD card. With the help of HDMI (High Definition Multimedia Interface) port of the Raspberry Pi is then connected to the Smart TV through its respective ports. The Smart TV should be connected to the wireless hotspot to properly acquire the data sent by the user. After checking the priority, the data sent by the user will be displayed in the LRD Display of the Smart TV.

VIII. CONCLUSION

With the help of Screenly (Client based Server) , the uploaded documents can be sent to any display connected to Raspberry Pi. It will reduce the necessity of various resources like man power, paper, printer ink, etc. It provides ease of communication between administration and students in colleges. With options like priority and the time duration, the user can have absolute control over the content displayed in the LED display. It can be easily seen and read by people which is not the case with conventional notice boards.

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