Digital Advertising of Still and Moving Images using Raspberry Pi

Umakant B. Gohatre
M.E. Scholar
Department of Electronics and Telecommunication,
NMU Jalgaon University
GF's Godavari College of Engineering, Jalgaon

V. D. Chaudhari
Assistant Professor
Department of Electronics and Telecommunication,
NMU Jalgaon University
GF's Godavari College of Engineering, Jalgaon

Abstract - **The system is about a remotely managed digital advertising system designed considering raspberry pi python programming and characteristics. The digital advertising display system designed is based on various methods of using LED matrices Display LCD panel, single screen and multiple screens as well as other display derives. Those are as efficient as possible to provide advertising and information to people in public areas which area that does not convenient to build- up the other types of any hoardings display advertisement board. And Over the past decade the display technologies have seen major advances in resolution and drastic cost reductions.The proposed system aims to substitute another controller interface system with Raspberry PI which will not only drastically reduces the cost involved but also will help achieving quality of services as the system will consume a smaller amount of power also.**
In this digital advertising system using raspberry pi model the screens are divided in to region and layers and also used multiple screens for displaying the big size advertising purpose and the contents on the screen is made up of several images files and the main goal of this project study are broadcasting display information and remotely control it. The broadcasting information such as road highways ,subways , buses and bus station, train and train station, shopping malls, city squires, hospital, conference hall, colleges and schools for displaying notice for student information and displaying all institutional information for visitors and this same application in industry for displaying notices or useful information which has wand to giving employees.

Keywords - Raspberry pi model, HDMI, Display Screen Panel, Web Server, Personal computer.

I. INTRODUCTION

The Digital advertising, the topic related "network of digital displays that are centrally managed and addressable for targeted information and advertisement". The broadcasting information such as road highways ,subways , buses and bus station, train and train station, shopping malls, city squires, hospital, conference hall, colleges and schools for displaying notice for student information and displaying all institutional information for visitors and this same application in industry for displaying notices or useful information which has wand to giving employees[2]. While digital advertising display is now found in many different scenarios (e.g. traveller information at airports, pedestrian guidance in buildings, cafeteria menus), the highest revenue comes from, and hence the major focus of the industry is on, digital out-of-home advertising

Broadcasting or a PC running a power point presentation in an infinite loop.

The First good news the global market for digital advertising display technology is expected to rise dramatically within the same years. While the United States represents the largest regional market, developing economies in Asia, Latin America and the Middle East are seen as major contributors to the predicted uptake of digital display technology. The past decade the display technologies have seen major advances in resolution and drastic cost reductions. It has Heavyweight, cumbersome and power-hungry CRT screens have essentially vanished from the scene and made way for ultra-flat LED, LCD and plasma panels in all sizes and resolutions,. The Raspberry Pi is a small size single-board low cost computer. It is designed on ARM board and has I/O port. It can be used in electronics projects and form any of other things that any computer does. There are different modules available in the market of raspberry pi that is model A, model B, and latest model B+. The raspberry Pi developed in the United Kingdom by the Raspberry Pi Foundation with the intention of promoting the teaching of basic computer science in schools. The Raspberry Pi is manufactured in three board configurations through licensed manufacturing deals with Newark element14 , RS Components and Egoman. The computer is inspired by Acorn's BBC Micro of 1981 Model A, Model B and Model B+ are references to the original models of the British educational BBC Microcomputer, developed by Computers. The first ARM prototype version of the computer was mounted in a package the same size as a USB memory stick. It had a USB port on one end and an HDMI port on the other. And The Raspberry Pi having basically MODELS A, MODEL B AND MODEL B+ [1].

A Raspberry Pi Foundation sanctioned device designed for educational purposes, and expands the Raspberry Pi's GPIO pins to allow interface with and control of LEDs, switches, analogy signals, sensors and other devices[1].It also includes an optional Adriano compatible controller to interface with the Pi the Raspberry Pi primarily uses Linux kernel-based operating systems. The ARM 11 is based on version 6 of the ARM which is no longer supported by several popular versions of Linux, including Ubuntu. The install manager for Raspberry Pi is NOOBS. The raspberry pi is a one system on chip which has a Broadcom BCM2835 system on a chip In the Broadcom BCM2835 includes an ARM 1176JZF-S 700 MHz processor, Video Core IV GPU and was originally shipped with 256 megabytes of RAM, later upgraded (Model B & Model B+) to 512 MB. It does not include a built-in hard disk or solid-state drive, but it uses an SD card for booting and persistent storage, with the Model B+ using a Micro SD Card. The Foundation provides Deben and Arch Linux ARM distributions for download. Tools are available for Python as the main programming language, C, Java and Perl.

II. LITERATURE REVIEW

The main goal of digital advertising technology is the proper information at the proper time, for the proper mass. And reducing expenses, being easy to reach a huge amount of people, integrating citizens with up–to–date technologies, dynamic and effective advertisement, being easy to deliver information when it is necessary Main usage purposes of this system are corporate communications, corporate messaging, corporate announcements, advertising and promoting products, entertainment, public information systems such as news, headlines, weather, and menu information such as digital menu boards with information on pricing, also use in schools and colleges for informing student through Notice Board[3]. Over the past decade the display technologies have seen major advances and drastic cost reductions. It has Heavyweight, cumbersome and power-hungry CRT screens have essentially vanished from the scene and made way for ultra-flat LED, LCD and plasma panels in all sizes and resolutions.

Introduce the model for displaying notices in colleges on digital notice board by sending messages in form of SMS through mobile. This is a wireless transmission system which has very less errors and maintenance [8]. The hardware board contains microcontroller AT 89c52 at the heart of the system. The microcontroller is interfaced with GSM Modem via MAX232 level convertor. It is used to convert RS232 voltage levels to TTL voltage levels and vice versa. The EEPROM is used to store the timings and a message to be displayed hardware also contains a real time clock DS1307 to maintain track of time. A 16x2 Character LCD display is attached to microcontroller for display. Microcontroller coding will be done using Embedded C and Kiel. PC Coding will be done using Visual Basic. Multiple Users are authorized to update notices on the digital notice board by providing them password. Researchers also use a PC with an administrator for monitoring the system. The Wireless communication has announced its arrival on big stage and the world is going mobile [4].

This remote control of appliances is possible through Embedded Systems. The use of "Embedded System in Communication" has given rise to many interesting applications that ensures comfort and safety to human life, the proposed to design a model where the message to be displayed is sent through a SMS from an authorized transmitter [5]. The toolkit receives the SMS, validates the user and displays the desired information after necessary code conversion. Also the global advertising landscape has seen a dramatic transformation over the past decade [10]. While the traditional print advertisements in newspapers and magazines have witnessed a decline that threatens the existence of some print news media outlets, market share and interest in interactive advertisement on web, mobile and other innovative media the advent of affordable, interconnected, high-definition flat digital displays has enabled content providers, including advertisers, to replace static screens by timely targeted content delivered to the audience. For developing some of GSM based applications we need to have some commons peripherals including GSM MODEM, SIM, microcontroller, LCD (Liquid crystal display), power supply and also some connecting wires.

III. PREVIOUS PROBLEMS

Tradition media is not as strict and efficient as digital display techniques it is not often to sudden changes and cost much more than digital advertising display techniques. Recently mobile and interactive version of digital system has been developed. In the previous display technology it is needed to change the display panel which is used for displaying advertising informational messages, not only to change the input data in program easily. Many displaying technology difficult to interfacing system various complication for programming and reprogramming display information and main thing is that implementation cost and highly effective energy requirement. The LED-based moving-message displays are becoming popular for transmitting information to large groups of people quickly. These can be used indoors or outdoors [8]. It can find such displays in areas like railway platforms, banks, public offices, hotels, training institutes, nightclubs and shops. Compared to LEDs, liquid-crystal displays (LCDs) are easy to interface with a microcontroller for displaying information as these have many built-in functions. Large size LCDs are very costly. LED-based displays can be of two types: dot-matrix and segmental. If you implement a moving-message display with multiplexed dot-matrix LEDs, it will be very costly for displaying 16 characters or more at a time. Moreover, programming will require a lot of data memory or program memory space. An external RAM may be needed to complement a microcontroller like AT89C51 [6]. Now a day the same messages if the person wants to display in main centre of cities means he has to go there with laptop and changes the message by connecting in to pc these system problems face mostly in previous technology. To solve all this previous technologies problems developed technology using Raspberry PI model and these system proposed the use of Raspberry PI and its interface with screen display and web. The proposed system aims to substitute another controller interface system with Raspberry PI which will not only drastically reduces the cost involved but also will help achieving quality of services as the system will consume a smaller amount of power.

IV. DESIGN LAYOUT

The remotely managed digital advertising system designed considering raspberry pi python programming and characteristics. The digital advertising display system designed is based on various methods of using LED matrices Display LCD panel, single screen and multiple screens as well as other display derives. Those are as efficient as possible to provide advertising and information to people in public areas which area that does not convenient to build- up the other types of any hoardings display advertisement board. Raspberry PI model and this system proposed the use of Raspberry PI and its web interface. The proposed system aims to substitute another controller interface system with Raspberry PI which will not only drastically reduces the cost involved but also will help achieving quality of services as the system will consume a smaller amount of power also.

In this digital advertising system using raspberry pi model the screens are divided in to region and layers and also used multiple screens for displaying the big size advertising purpose and the contents on the screen is made up of several images files and the main goal of this project study are broadcasting display information and remotely control it The broadcasting information such as road highways ,subways , buses and bus station, train and train station, shopping malls, city squires, hospital, conference hall, colleges and schools for displaying notice for student information and displaying all institutional information for visitors and this same application in industry for displaying notices or useful information which has wand to giving employees.

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interface system with Raspberry PI which will not only drastically reduces the cost involved but also will help achieving quality of services as the system will consume a smaller amount of power
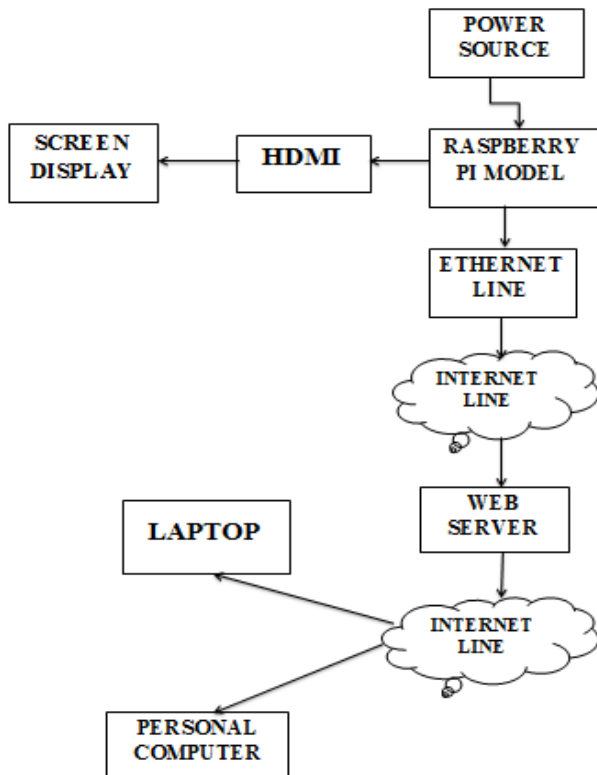

Figure 1: Block diagram of system

A. Hardware details about Raspberry pi

Raspberry Pi is a credit card sized computer. It's basically a small PC which provides all the basic functions that are provided by a desktop PC. For example, it provides functions like word processing, gaming and playing audio/video [16].

The Raspberry Pi is a 3.370 X 2.125 motherboard with a 700 MHz CPU and a 250 MHz GPU. The Ethernet LAN port is present for internet and remote access. It also has an HDMI port, through which it can be connected to any display device, like the monitor or the projector. Another great facility which Raspberry Pi provides is the presence of two USB ports, where one can connect his pen drive or USB mouse/Keyboard. General Purpose Input/output (GPIO) are a set of generic pins on a Raspberry Pi whose behaviour can be controlled as well as programmed through software. The Raspberry Pi also has an SD card slot, which can act as an internal storage and can also store an image of Operating System [1].

Raspberry Pi model B is to be used for this purpose. It comprises of a 512 MB RAM model with two USB ports and a 10/100 Ethernet controller. The figure below shows the model The Raspberry Pi model B consists of a 512 MB RAM. It exhibits the Broad com BCM2835 ARM11 700Mhz „System on Chip" Processor. One can play Full 1080p High Definition Blu-Ray Quality Videos on Raspberry Pi due to the presence of Integrated Video core 4 Graphics Processing Unit (GPU)[17]. One can program as well as learn programming conveniently due to the presence of the free, versatile, and highly developer friendly Debian GNU/Linux Operating System. It consists of 2 USB ports, 1 HDMI Video output, RCA Video output, 3.5mm Audio Jack

output. Raspberry Pi Model B is powered by a 5V Micro USB Power Input Jack. It is pretty energy-efficient as it requires only about 700mA current to operate. It also consists of an SD, MMC, SDIO Flash Memory Card Slot SD, MMC, SDIO Flash Memory Card Slot as well as a 26-pin 2.54mm Header Expansion Slot[20].

This study is very well prepared combinations of digital advertising display, Raspberry Pi, Raspbian, Linux Operating System, HTML, CSS, JavaScript and PHP programming technologies the back end side of the project is based on PHP language and the front–end side is HTML5 bootstrap. Server side of the project has to be developed on a web server; client side is on ARM board. About the ARM board the research and decide to use Raspberry Pi. Raspberry Pi is a wallet sized microcomputer, suitable for digital advertising display purposes. It is the cheapest solution for digital advertising display. Development stage is a major part of the project because of developing on PHP and Python.
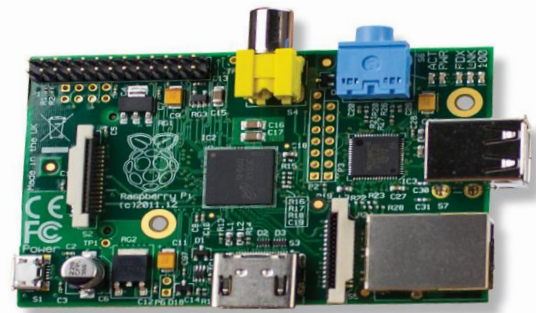

Figure 2: Raspberry Pi model B

Main part of the study is the embedded system design which runs on Raspberry Pi. Raspberry Pi electronic board provides much more affordable digital advertising display system. User interface is easy to learn and creating basic media is very practical. It is not necessary to install an extra program on client device to run the mechanism. Unfortunately, Raspberry Pi has limited features in terms of speed and boot processes. Initial boot process is slow and multitasking is not available.

The Raspberry Pi is a credit card sized single board low cost computer. It is designed on an ARM board and has I/O ports. It can be used in electronics projects, and for many of other the things that any computer does. Besides it can play high definition video. There are different models available in the market: Model A and Model B. In this study, the Model B is used, because Internet connectivity over Raspberry is desired. The Model A does not have an Ethernet port and the RAM is less than Mode B. On the other hand, the Model B has an Ethernet port and has 512 MB of RAM [19].

B. Boot process and Performance

The raspberry Pi has an auto boot feature when the model of raspberry is plugged in to electricity then the boot processes automatically start and the web browser Midori start after initial process. All the files necessary for booting are installed in a FAT32 partition of the SD card. Raspberry Pi has an auto boot feature. When the Raspberry Pi is plugged into electricity, the boot process starts automatically; web browser–Midori starts after initial boot process. The GPU provides Open GL ES 2.0, hardware–accelerated Open VG, and 1080p30 H.264 high profile encodes and decode. The GPU is capable of 1Gpixel/s, 1.5Gtexel/s or 24 GFLOPs of General purpose computer and features a bunch

of texture filtering and DMA infrastructure. Overall real world performance is something like a 300MHz Pentium 2.

Raspberry Pi has composite and HDMI out on the board, so you can hook it up to an old analogue TV through the composite or through a composite to connector, to a digital TV or to a DVI monitor. The Raspberry Pi can encode (record) and decode (play) h.264 out of the box. Sound over HDMI port is supported. Also there is a standard 3.5 mm jack for audio out on board.

C. Programming software

There are several open source distributions available on Raspberry Pi's web page. The NOOBs installer is the easiest and the best way for beginners, as it walks you through the download and installation of a specific distribution. The recommended distribution is Raspbian which is used in our project. Raspbian is a Linux based Debian distribution; it can run on Raspberry Pi's ARM processor. There is a six main Linux distribution s which can run on the Pi. These six main distributions are:

Raspbian (Version: January 2014)

Pidora (Version: 18)

Openelec (Version: 3.2.0)

Raspbmc (Version: December 2013)

Risch OS (Version: July 2013)

Arch Linux (Version: January 2014)

The recommended language for Raspbian is Python. Also, any language which will compile for ARMv6 can be used with the Raspberry Pi, though; so you are not limited to using Python. C, C++, Java, Scratch, and Ruby all come installed by default on the Raspberry Pi. The back–end side of this study is based on PHP language and the front–end side is HTML5 bootstrap. Server side of the project has to be developed on a web–server; client side is on ARM board. About the embedded system side, it is decided to use Raspberry Pi. Raspberry Pi is a wallet sized microcomputer, suitable for digital advertising display purposes. It is the cheapest solution for digital advertising display. Development stage is a major part of the project and software development is achieved on PHP and Python.

V. SCOPE OF PROJECT

By using multiple screens for displaying the big size advertising purpose and the contents on the screen is made up of several images files and broadcasting display information and also remotely control it. The broadcasting information such as road highways ,subways, buses and bus station, train and train station, shopping malls, city squires, hospital, conference hall, colleges and schools for displaying notice for student information and displaying all institutional information for visitors and this same application in industry for displaying notices or useful information which has wand to giving employees. Reducing expenses, being easy to reach a huge amount of people, integrating citizens with up–to–date technologies, dynamic and effective advertisement, being easy to deliver information when it is necessary

The purposes of this system are corporate communications, corporate messaging, corporate announcements, advertising and promoting products, entertainment, public information systems such as news, headlines, weather, and menu information such as digital menu boards with information on pricing.

VI. CONCLUSION

In this paper studied about Raspberry Pi and using raspberry pi module implemented new application techniques. Advertising makes use of several tools and techniques to attract the customers outdoors. The most common examples of outdoor advertising are billboards, kiosks, and also events and trade-shows organized by a company. Billboard advertising is very popular and study about the various technology used for displaying information as an advertising purpose various technology made up of using various microcontroller, PIC microcontroller and remotely controlled by using GSM techniques. But it's having lots of problems for remotely managed display information. And the next research scope system will be controlled by using wireless technology that means using Wi-Fi network dongles and using smart phone based remote control technology this adding convenience.

Such types of technology future scope for People interacting up to date Smart cities, Shopping malls, Smart colleges and school notice board, Corporate areas, Smart rail and bus station. And also focused on cost and enhancing the quality of services in the field of technology aided advertising.

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