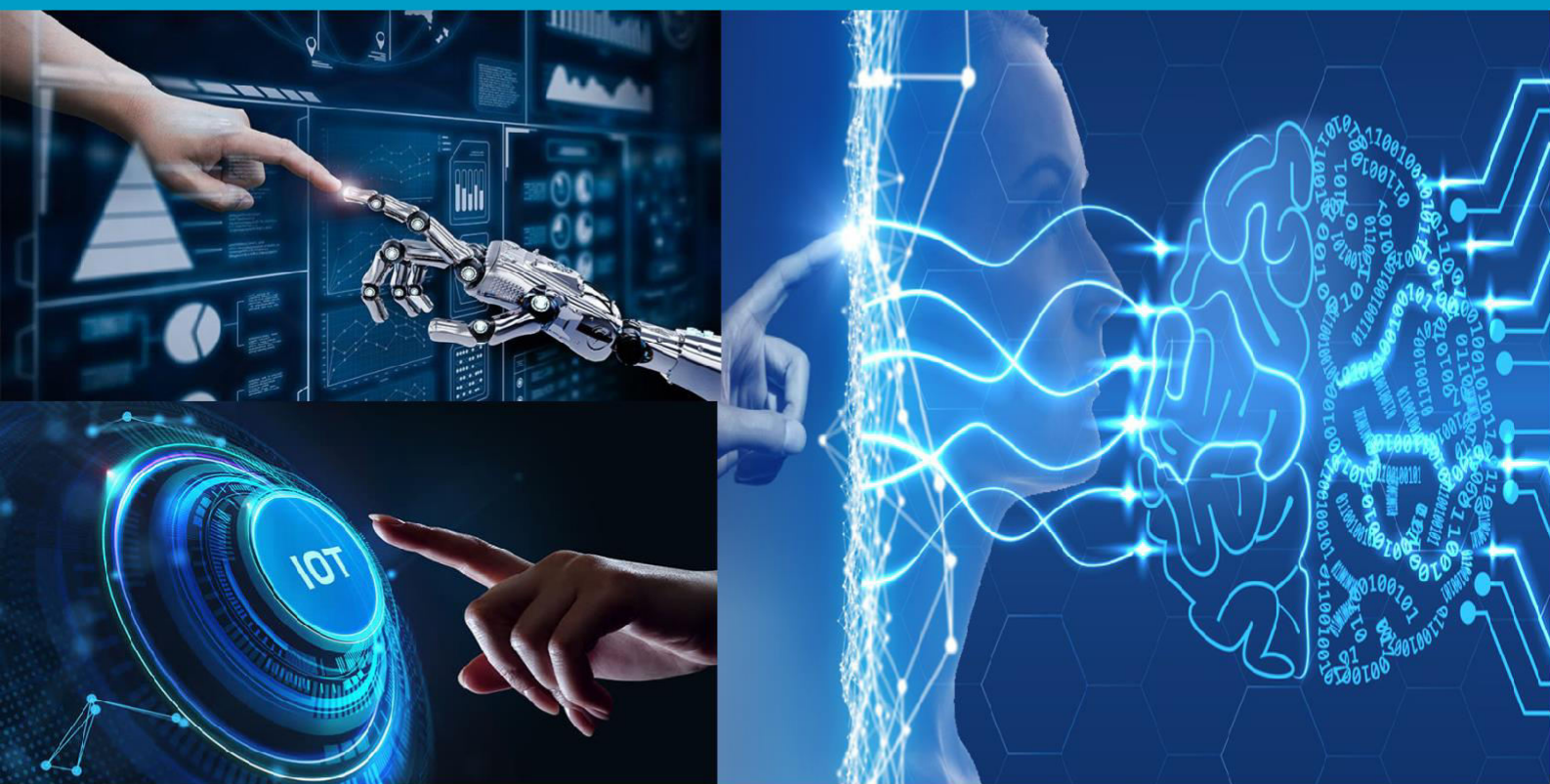




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Smart Information Display System

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ABSTRACT: The implementation of a Digital Notice Board using Raspberry Pi and Internet of Things (IoT) technology revolutionizes the traditional notice board system by offering an efficient, dynamic, and interactive communication platform. This project leverages the capabilities of Raspberry Pi, a credit card-sized computer, and IoT to create a centralized digital notice board that can display information remotely and in real-time.

The Digital Notice Board system consists of three main components: the Raspberry Pi, a display unit, and a web-based interface. The Raspberry Pi serves as the core processing unit, responsible for retrieving data from the internet and controlling the display unit. The display unit can be an LCD screen, LED matrix, or any other suitable output device capable of showcasing text and images. The web-based interface allows administrators to manage the content displayed on the notice board. To establish connectivity and enable remote updates, the Raspberry Pi is connected to the internet via Ethernet or Wi-Fi.

KEYWORDS: Web server, Raspberry pi, Monitor display, electronic components.

I. INTRODUCTION

The implementation of a Digital Notice Board using Raspberry Pi and Internet of Things (IoT) technology has revolutionized the way information is displayed and communicated in various settings. Traditional notice boards, with their static paper notices, have limitations in terms of updating, interactivity, and accessibility. However, by leveraging the power of Raspberry Pi and IoT, a new era of digital notice boards has emerged, offering dynamic, remote-controlled, and real-time information dissemination. The Digital Notice Board system utilizes the Raspberry Pi, a versatile and compact computer, as its central processing unit. Raspberry Pi provides the necessary computational capabilities to retrieve and process data from the internet and control the display unit. Coupled with IoT technology, this implementation enables seamless connectivity, allowing administrators to remotely update and manage the notice board's content. Gone are the days of manual notice updates and time-consuming paper-based communication. The Digital Notice Board leverages IoT principles to establish connectivity between the Raspberry Pi and a web-based interface. Administrators can conveniently access this interface from any device connected to the internet, enabling them to create, modify, and schedule notices with ease. The system supports various notice categories, durations, and customization options, ensuring flexibility in delivering different types of information to the intended audience.

By harnessing the power of IoT, the Digital Notice Board system achieves real-time synchronization between the web-based interface and the display unit. Whenever a notice is created or modified, the web interface communicates the changes to the Raspberry Pi, which dynamically updates the content displayed on the notice board. This seamless integration ensures that viewers have access to the most up-to-date information at all times, eliminating the need for manual intervention or physical updates. Moreover, the Digital Notice Board can be enhanced with additional features such as integration with external data sources. By incorporating RSS feeds, social media platforms, or weather APIs, the system can display live news updates, social media posts, or weather forecasts, making the notice board more interactive and engaging for the audience. This capability enables organizations to provide dynamic and contextually relevant information, enhancing the overall user experience. The advantages of implementing a Digital Notice Board using Raspberry Pi and IoT are manifold. It reduces the reliance on paper notices, leading to cost savings and environmental sustainability.



Project Objectives

1. To study existing ordinary notice board display system and data transfer.
2. To develop Smart Information Display system using Raspberry Pi.
3. To build interface to integrate display with Raspberry pi using website.
4. To test and validate the developed system

II. LITERATURE SURVEY

Smart Information Display System:

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In early days GSM technology is used for displaying information. Here GSM module which is located at digital notice board is used to receive information's from the authorized user and displayed. In this work only text message is transferred. It became inefficient when we need to transfer other than text messages. By introducing the concept of Bluetooth technology, communications become faster and efficient. Here an android application is used for enabling Bluetooth for sending message. This work mainly focused on cable replacement and data can send up to the rate of 1 Mb per sec. Bluetooth has limited range (approximately 70m to 100 m). In order to increase the range of communication Zigbee based notice boards are introduced. But here data rate is only about 250 Kb per sec. Wi-Fi based digital notice boards are currently used in many places like schools, colleges, railway stations, Airports etc. Here Raspberry pi which act as a receiver and it connected with local Wi-Fi networks. When a person wants to send information to raspberry pi, the person first connected to corresponding Wi-Fi. So, sender and receiver must be within the Wi-Fi range.

Design Rationale:

Achieving the following criteria is the main designing goal for the architecture of the proposed system.

- Reduction of man power: Reduction in the effort of a separate person, who has stick notices manually on the conventional notice board.
- Reduction in time: The facilities in the high-speed internet, the peoples can view transmitted information's on the display board within seconds. There is less waiting time for accessing the information's.
- Ease in accessibility: Here notice information's are accessed through internet, so there will be widespread of the information over a wide region. Also internet will give access to its respective nodes connected to its server and hence accessibility becomes easy.
- Improvement over technology: The sender and receiver are connected with each other with the help of internet. Thus, it will enable the communication over a wide range without any physical connections between them.
- Reduction in the size of system: Only Raspberry pi is used for achieving overall performance of the system. This single hardware makes the reduction in the system.

III. IMPLEMENTATION

PROPOSED SYSTEM:

Figure below shows the Block diagram for the proposed system. The main objective of the system is to develop a wireless notice board that displays notices in the form of image, text, Information. It uses a Raspberry pi as a processor. Raspberry pi is equipped with a Portable Projector/LCD display. We can display messages and can be easily set or changed from anywhere in the world.

The main function of the proposed system is to develop a Digital notice board that display message sent from the user through internet and to design a simple, user-friendly system, which can receive and display notice in a particular manner with respect to date and time.

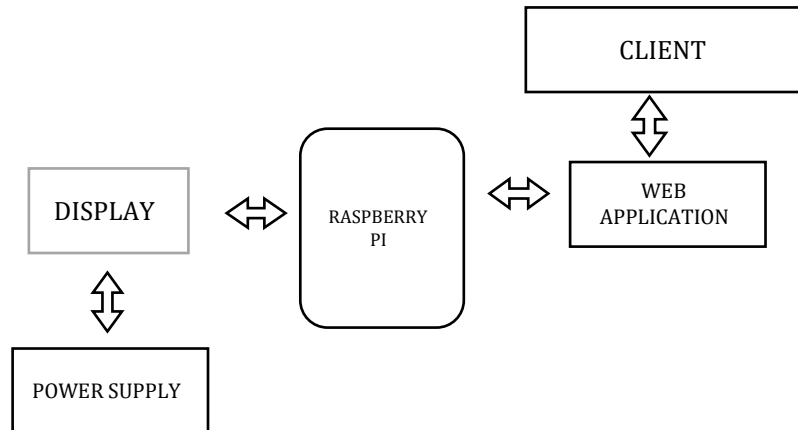
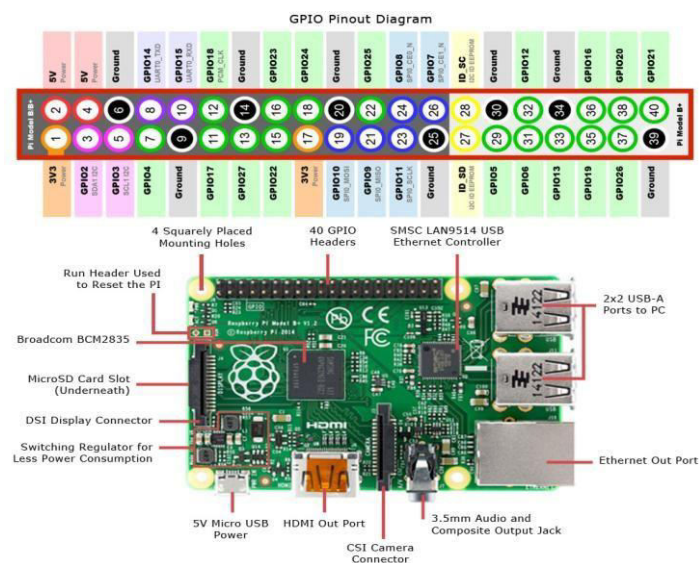


Fig 1: Proposed Diagram

which will help the user to easily keep the track of notice board every day and each time he uses the system. System consists of two sections called as sender and receiver, which shown in the figure Sender is responsible for sending valuable information's through the wireless network. In order to access Digital notice board, the sender must enter into the corresponding web address. For preventing unauthorized access web address, we provide security authentications like username and password. If the username and password entered are invalid then the user can't access the digital notice board. When the user enter correct password and user name web address will be opened and get space for the information transmission. User can access this web address either using personal computer or mobile phone. To make the proposed system more user friendly we make a Web page. By using this Webpage sender can directly enter into the web address. These messages including text file, image file will send to the cloud. In the simplest terms, cloud means storing and accessing data and programs over the Internet instead of our computer's hard drive. The cloud is just a metaphor for the Internet.

Proposed solution for the hardware part:

The solution that we have adopted consists of the exploitation of the Raspberry pi card. It is a single nano-computer card ARM processor designed by designer David Braben video games, as part of its foundation "Raspberry pi". The following photo presents the Raspberry pi card:



This computer has the size of a credit card, allows the execution of several variants of the free operating system GNU / Linux and compatible software. It is supplied bare (single motherboard, without housing, power supply, keyboard, mouse and screen) with the aim to reduce costs and enable the use of recovery equipment. Around the central part,

there are different connectors for connecting devices to interact with the computer and range of connections offered by GPIO Pins.

IV. METHODOLOGY

In receiver section, Raspberry pi is connected on Wi-Fi for accessing internet. The Raspberry Pi is a low cost, credit-card sized computer that plugs into a computer monitor or TV, and uses a standard keyboard and mouse. It is a capable little device that enables people of all ages to explore computing, and to learn how to program in languages like Scratch and Python. It's capable of doing everything you'd expect a desktop computer to do, from browsing the internet and playing high-definition video, to making spreadsheets, word-processing. Raspberry pi is activated by supply power around 5v. After switch on Raspberry pi, it will collect data from the cloud. The web address for collecting data from the cloud is already specified through program written in the processor. Upon receiving messages, it will display on the monitor. Raspberry pi has no VGA port. So, in order to interface LCD, monitor with Raspberry pi, HDMI interface is used. The received text messages are displayed on the screen like scrolling manner. Similarly received images will display on the screen. In addition to this we provide Deleting and modification option at the web link. If sender wants to delete some image or pdf file, he can simply delete it by clicking the corresponding link in the web page.

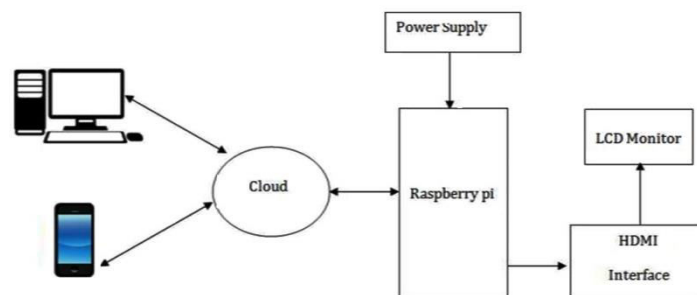


Fig 2:Proposed Methodology of IOT and Raspberry System

Also, we delete or modify text messages whenever we want. After deleting the messages from the cloud, it will automatically be deleted on the display after a short delay. We can change the scrolling text colour, text size, display graphics, delay between the messages by simply made changes on the program

V. RESULT

The implementation of a Digital Notice Board using Raspberry Pi and Internet of Things (IoT) technology has proven to be a highly effective and efficient solution for modernizing communication and information dissemination in various settings. This innovative system has demonstrated several noteworthy results and benefits. Firstly, the Digital Notice Board offers real-time updates and synchronization. With the integration of IoT principles, administrators can remotely update the notice board's content through a web-based interface. This capability ensures that the information displayed on the notice board is always up to date, eliminating the need for manual intervention and physical updates. The system's ability to dynamically reflect changes in notices has proven to be invaluable in scenarios where timely and accurate information dissemination is crucial. Secondly, the Digital Notice Board has significantly enhanced interactivity and engagement. By incorporating external data sources such as RSS feeds, social media platforms, and weather APIs, the system is able to display dynamic content alongside traditional notices. This feature has resulted in a more engaging user experience, as viewers can access live news updates, social media posts, or weather forecasts directly from the notice board. The interactive nature of the Digital Notice Board has proven to be particularly beneficial in educational institutions, corporate environments, and public spaces where timely and relevant information is essential. Another notable result of implementing the Digital Notice Board is the reduction in costs and environmental impact. By eliminating the need for printed notices and manual updates, organizations can achieve significant cost savings associated with paper, printing, and labor. Additionally, the shift towards digital communication contributes to environmental sustainability by reducing paper waste and promoting a more eco-friendly approach to information dissemination. Furthermore, the Digital Notice Board has demonstrated enhanced accessibility and convenience. Administrators can manage the notice board's content remotely from any device with an internet connection, providing flexibility and convenience in updating notices.



VI. CONCLUSIONS

The implementation of a Digital Notice Board using Raspberry Pi and Internet of Things (IoT) technology represents a significant advancement in the realm of communication and information dissemination. This innovative system offers a range of unique features and advantages that make it a valuable asset in various settings. By leveraging Raspberry Pi's computational capabilities and IoT connectivity, the Digital Notice Board provides real-time updates, enabling administrators to remotely and instantly update notices. This eliminates the limitations of manual updates and ensures that viewers have access to the most current and relevant information. The system's remote accessibility allows for convenient management from anywhere, offering flexibility and convenience to administrators. One of the standout features of the Digital Notice Board is its ability to display dynamic content. By integrating external data sources such as RSS feeds, social media platforms, and weather APIs, the system showcases live news updates, social media posts, weather forecasts, and more. This dynamic content enhances user engagement, making the notice board a more interactive and engaging platform for communication. Moreover, the Digital Notice Board brings cost and environmental savings by replacing paper notices with a digital platform. Organizations can achieve significant cost reductions associated with printing, paper, and manual updates. The system promotes environmental sustainability by reducing paper waste, contributing to a greener and more eco-friendly approach to communication. The centralized management capability of the Digital Notice Board allows administrators to control and update multiple notice boards across different locations from a single web-based interface.

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