

Smart Noticeboard System Using IoT

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Abstract—Noticeboards are playing crucial role in all organization, as one of the ways of information dissemination. Noticeboards are used in railway stations, hospitals, restaurants, educational institution and many more public utility places. These noticeboards are of different types like wooden, glass, wired, wireless. Advancement of technology leads to digital revolution. New inventions make people favor automatic system than manual operated system. In today's digital world by replacing the conventional analog type noticeboard with digital noticeboard, the objective of a paperless community can soon be achieved. Digital noticeboards contribute in providing faster, secure and authenticate information communication. In this paper, entirely a new system "IoT based smart noticeboard" is designed in which internet serves the purpose of wirelessly transmitting the messages from browser to the display.

Keywords—Digital Noticeboard, IoT, internet.

I. INTRODUCTION

A noticeboard is something that needs to be "noticed". To effectively implement this, noticeboard must be attractive, appealing, interesting, eye-catching which gravitate people towards it. Noticeboard's primary goal is public awareness. It displays key information about upcoming events, including news, messages, advertisements and vital facts. Noticeboards are used almost everywhere in crowded public areas like bus stops, railway stations, hospitals, restaurants, colleges, offices and many others to inform concern public regarding relevant schedules and events. However, daily notice pasting is a challenging task, as a different individual is essential to update traditional noticeboard. The entire process from making a decision to printing of notices consumes time and circulating these notices among people consumes extra time. The traditional noticeboard is a solid flat surface that is positioned in key areas as a place where notices and articles are posted in printed form.

In educational institution, noticeboards are used to update students regarding different schedules, reminders, warnings, results and appointments. As these notices are placed on the same noticeboards, some of the older notices are not removed, as a result in a short period of time the noticeboard is filled with number of notices, making it difficult to see any important notices or may happen any important message remained unnoticed.

Advancement of technology leads to digital revolution. Digitization in the field of communication leads to quick wireless data transfer. Digital noticeboards are those which displays notices in digital format. Digital noticeboard

allows secured authenticate display of notices with user required format like word, pdf, and images. These noticeboards instantly change upon updating the information. Also, multiple notices can be shown by using scrolling feature. Digital noticeboard not only allows faster, secure, authenticate, attractive, digitized information dissemination but also provides record tracking, scrolling and information storing feature.

II. LITERATURE REVIEW

Teckchandani Y. in his paper, "large screen wireless notice display system (2015)" proposes a method to overcome the drawback of small sized 16*2 LCD display with comparatively bigger display like LED screens, computer screens, TV screen etc which can be further used for information dissemination. HTML is used to display the outcomes, as it offers variety of customization options like font size, background color and display of multiple notices at a time. A web browser operating on the Raspberry Pi can display this HTML output. The notice should be sent in the form of SMS to GSM modem. This makes reception of messages wireless. Raspberry Pi checks the GSM modem for new messages periodically [1].

In paper, "Smart Notice Board" Shruthi K. develops a GSM based smart noticeboard which basically consists of two units, an end user's mobile unit and a control unit. The setup of LCD display, the Arduino UNO board (having ATmega328 microcontroller) and the GSM (ITEAD SIM 900 GPRS) module together create control unit. The information to be displayed must be sent in the form of SMS to the control unit. GSM module will receive the message, Arduino will transfer it from GSM module to LCD display. LCD display unit will display the message [2].

In this paper Neeraj Khera presents, "the development of simple and low-cost Android based wireless noticeboard". This system comprises of wireless serial data communication based on Bluetooth or Wi-Fi. User specific Android application programs are designed for Bluetooth and Wi-Fi communication between android based handheld PC and remote wireless display unit. The Android PDA and the connected Bluetooth devices communicate with each other through Bluetooth application program to send (or receive) the messages in hexadecimal (hex) as well as string format. Receiver side consists of, the microcontroller along with HC-05 module, used to store the received message and the display the same on the LCD screen. Android based PDAs

communicate with Wi-Fi device through Wi-Fi keyboard application program. The Wi-Fi transceiver module (ESP 8266) and Wi-Fi keyboard application program installed on Android PDA communicates with each other via Wi-Fi network, comprises of receiver section of the system. Microcontroller is interfaced with ESP 8266 module which is programmed to save the received message and display the same on the LCD screen.

For communication in a Bluetooth mode, a personal Area Network is created in the 10-15 meters range specified with frequency band of 2.45 GHz for connection. With AT commands preprogrammed to receive user messages, an Android PDA equipped with an ESP 8266 module is connected to a microcontroller having range of 200-250 meters, for Wi-Fi communication mode. Wi-Fi communication technique improves the range of receiving messages on wireless notice board but it is not affordable as it is costlier [3].

Traditional noticeboards make people manually gather at the noticeboard and read the notices. This is a time-consuming process. Rajesh G. P. in his paper "Near Field Application: NFC Smart Notice Board", suggests a solution of using NFC application. The concept used here is, NFC tags are used to display noticeboard. The notices to be displayed should be programmed in each NFC tag. Simply update the notice through NFC tag when there is a need to display circular. NFC enabled smartphones are used to scan the notices through NFC tags which downloads notices online to their handheld devices. Provides end user appropriate time to read notices thoroughly. NFC tags works on the principle of RFID having small range, 13.56 GHz operating frequency and maximum 10 cm communication range. Once implemented NFC enabled noticeboards are efficient in saving time and provides end user facility to read notices with their convenient time [4].

"Smart Notice Board System", written by Dhara Rangani and group proposes a noticeboard system based on Internet of Things technology. The message / notice to be displayed is sent by authenticate person using android application or web interface to the server. The server will check for authentication of message through flowchart process. If authenticity is valid, the message will be transferred to LCD display. Android based cellphone and ESP8266 will communicate with each other through MQTT broker. Authentication system is deployed on Arduino board, Arduino C is used for coding project. ESP8266 and MQTT also supports Arduino C. For android application, android studio is used [5].

Ceren Yasa in their paper, "Interactive Digital Notice Board" developed a system which makes use of Digital Signage method. Wireless access is necessary for a system based on digital signage method in order to enable remote content management. A web server is required to control this system. This newly developed system also able to classify age of the people, following to which font size should be adjusted. Deep learning - a part of machine learning is used to develop age classification application. A graphical user interface is

designed using Raspberry Pi which includes time, date, weather and announcement information for announcement screens. A website is designed for secured storing of announcement information by authorized person. Interface is made attractive by adding different notification sounds and background colors. Age detection and classification application with font size enhancement procedures with deep learning method for aged people also developed [6].

III. BLOCK DIAGRAM

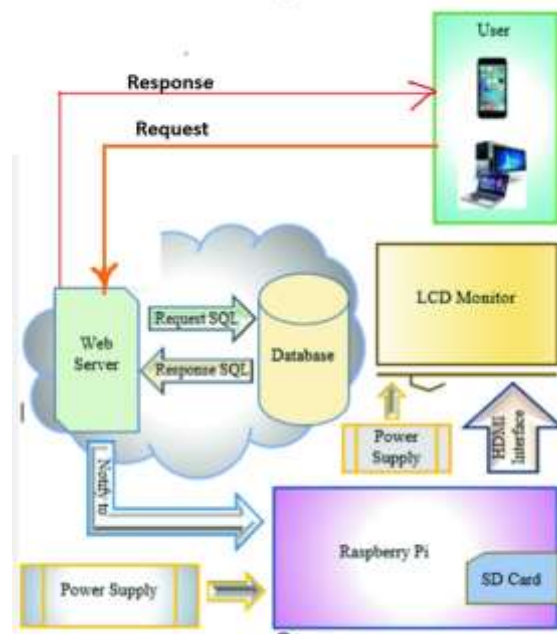


Fig.1 shows block diagram of the system

IV. PROPOSED METHODOLOGY

This section gives a basic overview of the system. In this proposed system a php based portal is designed for the admin panel. Raspberry-pi is used for accessing wireless notice board which displays the notice in the form of text, image, pdf according to user choice.

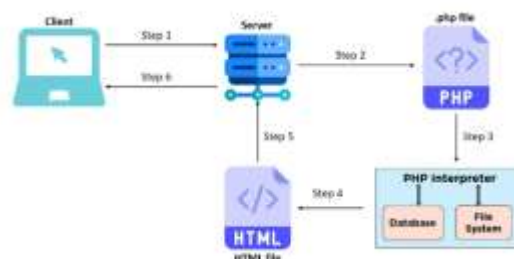


Fig.2 shows information flow diagram

Above fig. shows how php works. Firstly, client requests the web-page on the browser. The server where PHP software

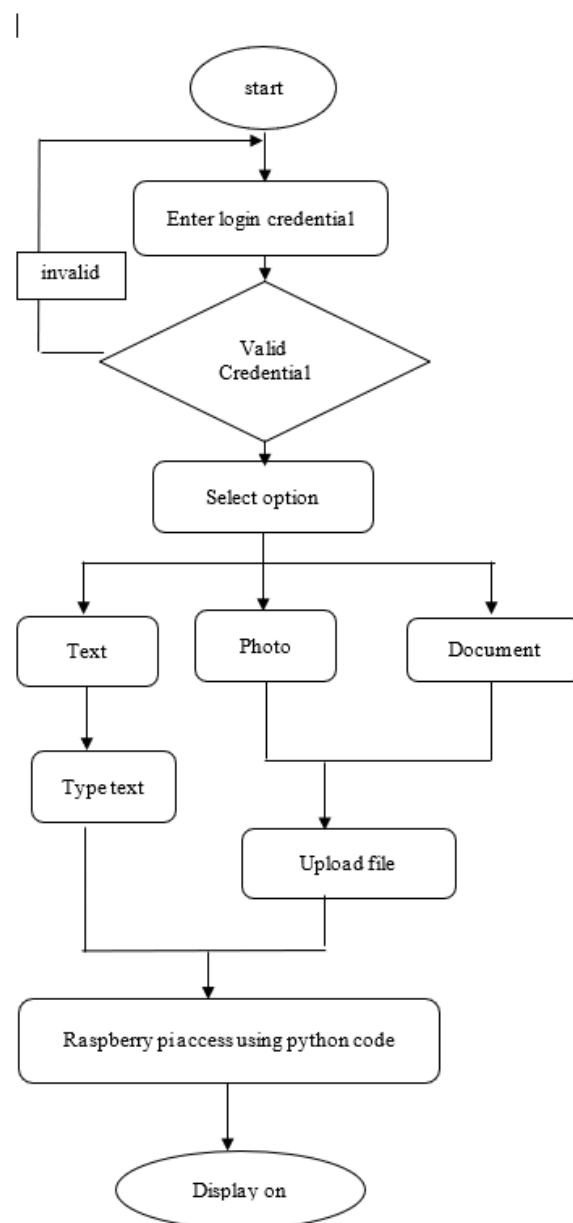
is already installed then checks for the .php file associated with the request. If found it sends the file to the php interpreter, which checks for requested data into the database. The interpreter then sends back the requested data output as HTML webpage. The web server receives the HTML file from the interpreter and sends to the browser.

System consists of two sections sender and receiver section. As shown in the flowchart to get access of sender section we must login to web page with login credentials. If login credentials are authenticated, user is forwarded to application landing page. If authentication fails, user remains on the login page with message "Invalid Username or Password." After successful login, user can upload file ("text/image/pdf") according to requirement. Now this file is stored on the cloud.

In receiver section, wi-fi connected Raspberry Pi is used for accessing internet. Raspberry Pi works on the power supply of 5V. Once Raspberry Pi is turned ON it will get connected to the internet and fetches recently uploaded information and displays it on the digital notice board.

Provision for alteration, modification, deletion of messages also provided along with the facility of changing background and font theme, size, color. Also, you can add delay or scrolling feature.

V. FLOWCHART OF ADMIN LOGIN SYSTEM



VI. RESULTS AND DISCUSSIONS

a) Login and Sign-Up Page: -

For security purpose to prevent unauthorized users from accessing the system. "Sign up" button is provided on the up-right corner of the login page. Through sign-up new user can register to the system. This is one time process. By clicking the sign-up button, the user will be directed to registration form.



Fig.3 shows screens for login and sign-up page

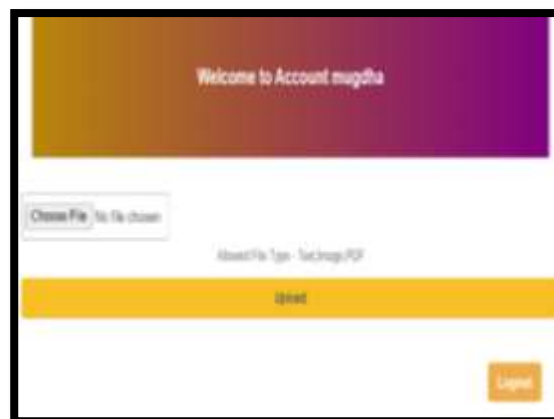


Fig.5 shows screens for home page

b) Registration Form: -

This user registration form allows new users to register themselves on the system. In order to register, user must fill all the fields and click the "Sign up" button. After successful sign-up, user will be notified with message "You have registered successfully". After successful sign up the user can login the application by clicking on "Login" button provided at up right corner of registration form.

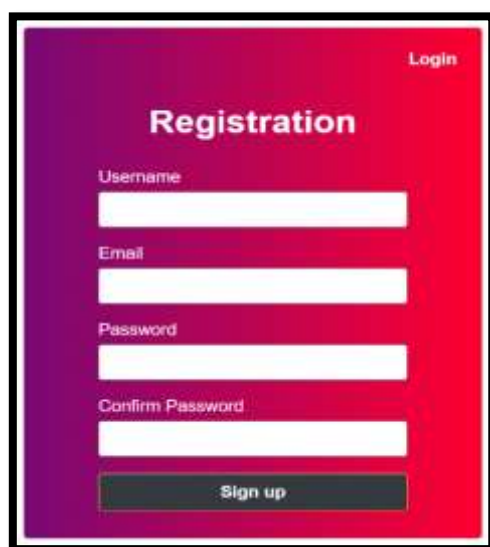


Fig.4 shows screens for registration form

c) Home Page: -

After successful login, user will be redirected to Home Page. In home page, there is a provision to upload "image, text, pdf" as per requirement of user. After clicking "upload", the respective file will be displayed on the same page. After logout user redirect to login page.

VII. CONCLUSION

Advancement in technology and digitization in the field of wireless communication allows easier implementation of digital notice board to display notices in user required format. Various studies are overviewed to understand the technologies and features proposed to implement the system. Pros and Cons are also studied to define the objectives of the paper. We have proposed the design of a digital noticeboard system equipped with Raspberry Pi, which displays the message of the user by providing notification on the screen. Raspberry Pi is called a single board computer (SBC) which efficiently works with software in digital notice boards. Application areas for this proposed system include educational institutes, shopping malls, restaurants, hospitals etc. As this system promises to provide faster, secured, wireless, authenticate information communication, further study in this area will boom the researcher and end user.

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