

An Android Application Based Digital Notice Board

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Abstract— The world is evolving digitally, and technologies are becoming more advanced daily but the information exchange between people is more difficult in public premises as a solution to this problem every public premises needs a digital display board, it has the ability to quickly disseminate information to people. Increase in information sharing technologies, such as advertising, aids in the advancement of digital technology. Since the beginning, corporations have used pin boards to share information, which takes time, adds to employee workload, and shared information won't get to the intended audience properly as a solution to this, we proposed an Android Application Based Digital Notice board to share information in public premises quickly. With the help of web site and database to store information that shared by user in the android app can easily transferred to digital board. The proposed model is a cost effective, portable and it has high efficiency in the real time. The user and admin can edit/delete message at any time after posting and also the user can set the scroll time of notice.

Keywords—Web page, Database, Android Application, Portable, Digital display board

I. INTRODUCTION

Notice board is an indispensable thing in an organization. In the past, pin boards were used by every organization to share information by printing or writing notices on paper, then pasting them to the bulletin board. However, utilizing pin boards wastes a lot of paper and can cause information to get mixed up, so we decided to create a digital display board that addresses these issues. Our model was created using Database, Web page and an Android application was created so that users could share announcements with the digital board as well as delete and update them. Use of the Web page in the system allows users to send notices from anywhere in the globe, and it is utilized to display notices in the digital display board. Instead of just showing texts, our digital notice board can also show document files and pictures. Photos or document files are the majority of the data the government gives to universities and institutions. By sharing this type of files or pictures, our proposed model is made to be more convenient to users. Two modules—the admin module and the user module—are present in the Android application. If the admin module authorizes the notices posted by the user module, then only the notices will display. Anyone else working for the organization can view any communications,

whether they may be text or multimedia images, that are posted by an authenticated user.

The existing method is not commonly used because it takes a long time and money to implement. Web page and Android applications can simply create their own high-performing, low-cost systems by utilizing Database technologies. Traditional systems employ the human-interfaced, time-consuming, and slowly-moving pin and paper method. As a result, you arrive late for unexpectedly critical notices. The system operates without a human interface, allowing a variety of demands to be satisfied while reducing the need for human labor and time. Damage to paper or notice boards is caused by employing pins, which also has an impact on the publication of notices. With the aid of an Android application, this system is portable and simple to use, and power conception is also less. Displaying notices on LCD display screen can clearly capture the content of the notices immediately.

- Uses traditional way of posting information.
- More time consuming.
- Direct Human interference required.
- System is not portable.

The problem statement is to develop a cost-effective, user-friendly and accurate digital notice board. So, the following are some of the goals of our proposed paradigm.

- To develop a real-time digital notice board in organizations.
- To post various types of information's.
- Too fast and efficient way to post information's.
- To make advancement in existing product.
- To create an affordable product.

Technologies are rising day by day and people want to know about the things happening in world. The digital notice board has applications in schools, colleges and public places. As it operates on Wi-Fi, the scope of this concept is global (for organizations). The system creates an efficient, real-time application to post information on LCD display.

II. RELATED WORKS

We have analyzed various existing work in the field of digital display and notice board, different type of

classification in web page and IoT models. The summary of the most relevant 20 papers is set down below.

Ting et al has proposed a model [1] for cloud-based bulletin board, they have used HDMI capable display with Chromecast in it and the model uses cloud as storage it also uses an application known as Android Sender for easily interacting with digital display. Their previous model is not much modern and it is based on Chromecast and Android sender app but they failed in the design of UX and UI, to overcome their fault they redesign their UX and UI to give user a new experience. They use three different BBcast versions, first version is BBcastv1 but it has very poor reception, so they use Google's Dark Holo for their BBcastv2 but this design also confuses peoples, So, they make some changes by using Google's Flat 2.0 for BBcastv3 and to make the app more compactable to user to redesign the app they use "Nielsen's usability heuristics". Then they perform some Experimental tests, Firstly User Acceptance Test (UAT) for this test, they deployed their model in an educational institute and each version is evaluated by staffs and students they repeated their process 3 times to ensure the proper functionality of the app. Secondly User Experience and Usability Evaluation to determine the productiveness of android app. They have evaluated their model and it uses a non-neutral colour palette it helps the users and it also provide better user interface. The main disadvantage of this model is, designing multiple BBcast version is very time consuming and can't assure whether the people like or not.

Shukla et al proposed a model [2] for electronic notice board using cloud. In our modern world the need for a digitalized notice board is very needful it reduces the operation cost and publishing the notices become very easy in campuses and public premises. They have used LED monitors for displaying digital content, Android or web-based application to interacts with notice board, Java and XML languages are used for android app while Angular JS for web application, for real time syncing Google Firebase is used as back-end cloud database system. For projecting contents to display the model uses Raspberry-Pi. They use this technique to replace the old conventional bulletin notice board, it's very difficult to pass information throughout the campus by old age technology. For this model they use three systems connects to Firewall data base, Android app, Web app and the display monitor is linked to same database. Every monitor use Raspberry-Pi to displays the content. This model has 5 modules, Administrative Module, High Authority Module, Authority Module, Teacher Module and Student Module. The implementation process is done for three sub-system, LED, Android and Web sub-system. All three sub-systems work properly both Android and Web app works perfectly. Their model is highly reliable, easy to interact and simplified architecture. But cost is very high and all the platform are connected in same Fire base Database, it forms a closed compact system in future if Firebase stops working the system can't able to share information thus model will stop

Palngipang et al proposed a model [3] for interactive public bulletin board based on cloud. Our world is moving digitally forward and there are various new technologies thus the scope for old bulletin board reduced. They have developed a new BBcast based on cloud; it reduces the cost and usage of space and Android application allows the user to share the content. They use these techniques to resolves the usage of large screen and dedicated machines for deployment

and it is very costly, their new BBcast system resolves this entire problem. They use Chromecast for digital display as it is very cheaper and easy to deploy and uses cloud services to store and manage contents and its helps in multiple deployment. The primary elements used in this model are BBcast Android Sender application, Chromecast device plugged in displays, BBcast API and Chromecast receiver application. They have used BBcast algorithm it shows the interaction of the entire model the entire contents are stored in cloud-based database it ensures the accessibility of the contents and web application. The systematizations used in this model are API and BBcast server, BBcast Receiver Application helps to receive the content in display and BBcast Sender Application to sends the content. They tested each layer of this model different times and ensure it proper working. For deployment test they deployed the model in an academic institute consist of 1000 of peoples. Their model has advantages like reducing cost and bulky deployment, and organizing the content properly and engaging user interaction. But their model fails in many areas, like it depends on cloud server, if anything happens to cloud server it affects the entire system.

Chen et al proposed a model [4] based on IoT for the digital notice board towards ubiquitous. In our world usage of digital notice board was increasing but they are not much realizable. To overcome this problem and make a highly efficient model they use "novel NEP system", POC (proof-of-concept) implementation, and MQTT (Message Queuing Telemetry Transport) that require user in the process of IoT, it is interactive message exchange architecture. For this they have studied various papers and identify various elements need for a digital notice board, they are User Interface (UI), Connection, Management and Display. The environment for the model is; Location, it mainly focuses on campus, the second one is Boards it is a device consist of a "Raspberry Pi 3 Model B+" and displays having HDMI port and a device with wireless network connection and the third one is, "Software Agent", this model have three different kinds of software model, in board device, in mobile device, in application server. The model uses different use-case scenarios for smart campus environment like the interaction of different users, using of software agent. Python and Kivy UI are used for implementation of software agent it helps to register each board and participant as an MQTT topic. The same software agent and UI module in this model is shared by mobile device and digital board. To improve the functionality the servers like database server, application server and media server are used. Their model shows some advantages like; it is highly reliable and user-friendly. But the system failed to address some problem like, the high cost in implementation and not much secure

Yasa et al has proposed a model [6] based on digital signage method for displaying digital information's in a notice board. They have used digital signage method for the implementation of the notice board and also used deep learning to classify people with their age to adjust the font size according to that for avoiding difficulties of older ones to read and this is the major merit of this model. The people are classified as young and old using binary representation method and the result is not always exact so that they used confusion matrix for resolving the issue. They have developed this model to implement the model on the public or private places and to diminish the difficulties faced by the

older ones on reading a notice board. They have evaluated this model by providing images to the model to classify people with their ages in that image, 90% of images are for training and 10% are for testing and by the testing the accuracy value, position predicted value, recall value and f measure value obtained, these values indicates that the model is efficient and effective in nature. But their model fails to become economic and power consumable.

Khera et al proposed a model [7] based on android for displaying digital information's in a notice board. They have used IoT technology and an Android application for the implementation of the model. This model uses Bluetooth or WI-FI for the communication. The main issue in this model is that they are trying to implement this model in low cost but for receiving messages from long distances the model needs more volts as the power, this will increase the cost of implementation of model and it is also the major demerit of the model. For receiving message from 200-250 meters, ESP 8266 module is joined with microcontroller board which is programmed with attention commands to get the message from a better range. This model can be implemented in the banks, schools, score Boards etc. The main merit of this model is that it is simple and economic. But this model fails to address the video or image display in the notice board..

Teckchandani et al proposed a wireless model [8] for displaying digital information. They have used HTML to display the output, GSM for receiving the message from mobile to display and raspberry pi for the implementation of the model. The messages received from the mobile is stored in SIM memory. The main issue is that the SIM have only short storage space so it cannot store more messages received from the user, for resolving this problem the messages in the SIM is fetched and clear the SIM memory to receive another message from the users and it is done by using an Attention Command. This model can be implemented on private or public organizations and because of using GSM we can sent the notice from anywhere in the world. This model is capable of displaying 2 or more messages at a time. But this model fails to address the audio, video or image display in the notice board.

Maheshwari et al proposed a cost effective and self-regulating model [9] for displaying digital information. They have used IoT technology and AWS cloud services for the implementation of the model. The issue they faced in the implementation process is the way to connect the notice board and client so that to resolve that they developed a website, which is more secure and safe and in that website each one has Section_id and file stored in it have File_id. The open CV python script alert the display script to wait for an input audio when a student stand in front of noticeboard and it is detected by a camera in front of the noticeboard, the google speech to text API transform the audio to text and detect the notice based on that text. The noticeboard automatically deletes the notice if reached the present time of the notice expires. They have implemented this model in their college and they have developed this model to implement it in gram panchayat as part of the smart village concept proposed by ministry of rural development, India. The main merit of this model is that it is user friendly and reliable but their model fails to address the audio facility in the model.

Anuradha et al proposed a model [10] for displaying digital information for a smart campus on e-bulletin board.

They have used IoT technology for the implementation of the model. The notice passed by the users are displaying in the notice board using the Hypertext Transfer Protocol. The issue faced by the model is that firstly the notice board only display notice based on one topic or area that is waste of time so that it is resolved by splitting the notice board into 4 quadrants and make the first 3 quadrant for notices based on different area and 4th quadrant for displaying images. They have implemented this model in their college. Their model also shows the humidity and temperature of the campus and also the pH value of the drinking water in the campus. But their model fails to address the reliability of the model, the model did not have a power backup. If the electricity in the campus got stop the notice board will also got stopped

Pramanik et al proposed a model [5] based on digital notice board and smart home. This model uses an Android application and GSM SIM900; it uses a microcontroller and GSM technology for controlling the system and for communication. This system has home automation as well as LCD display for displaying information from any part of world. The android app helps in home automation and displaying information. The module used in this model are "ARM processor with development board, GSM SIM900 module, 16*2 Alphanumeric LCD display, Relay, USB 2.0 to RS232 serial db9 driver, DC Motor, Android Application, Smartphone with Android OS". The entire system is divided into two, Home Automation and Digital Notice Board. In between SIM, GSM module and the user Android application acts a communication medium. This model provides a message block option in homepage of the application for sending messages to LCD board. This model shows many advantages like, reduce the physical effort and it can be controlled from any part of world. But the model fails to address many problems like, this model is not reliable

III. PROPOSED SYSTEM

There are 3 modules in the proposed system.: Android app module, Database, Web Site. An Android app is used for sharing information to the web page as messages and images. The Android app is managed by the admin and user module for sharing the information to the resulting web page. The information from the user is displayed into the display board after approved by the admin module. The Dalvik Virtual Machine (Dalvik VM) is used by the Android platform to manage memory, security, devices, and processes. The Dalvik Virtual Machine can be thought of as a box that provides the necessary environment for you to run an Android application without having to worry about the target device, even though the internal workings of the Dalvik VM are not that important to the average developer. You must first download and instal Android Studio before you can begin using Java for Android. The latest SDK platforms and tools can then be downloaded and installed using the SDK Manager. Java is used to create apps that the Dalvik Virtual Machine uses to run on the Android platform (DVM)

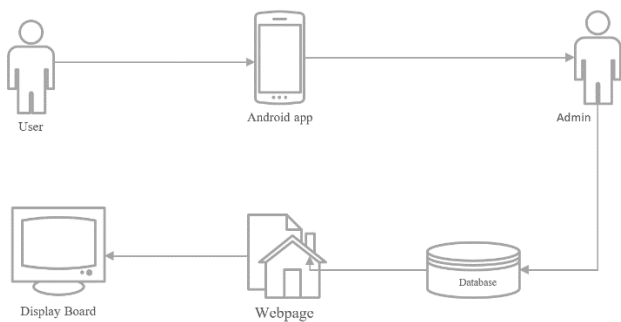


Fig. 1. Workflow Diagram

If the client needs to display the notice first the client needs to send the notice through the android app and notice get approved by the admin to get displayed. Firstly, the notice from the client is sent to the admin module and the approved notice from the admin is shared into web page. A web page is opened in the Android monitor and then the notice is displayed.

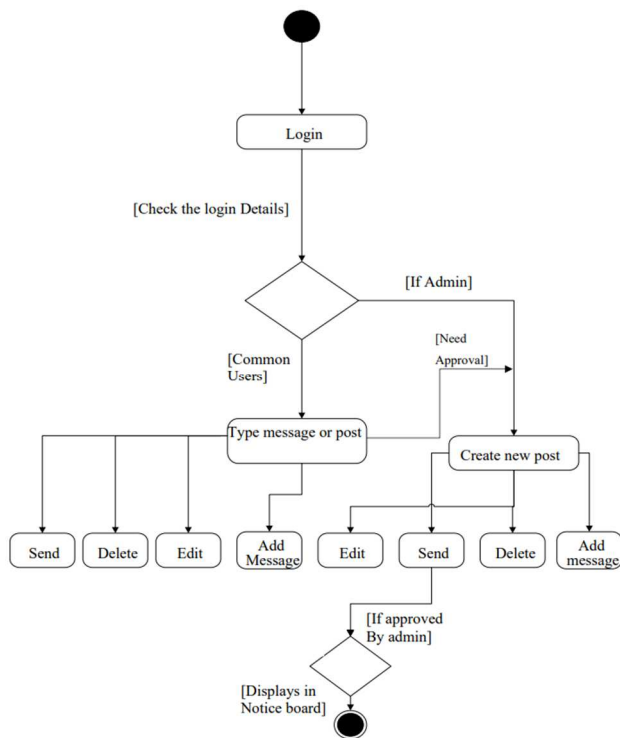


Fig. 2. Activity Diagram

IV. IMPLEMENTATION & RESULTS

The proposed system model is depicted using a variety of system modelling techniques, and finally needed an Android TV to act as digital notice board. Major methods used are:

A. Using Java for Building Mobile Applications

Java ME refers to Java's mobile edition. The majority of smartphones and tablets support Java ME, which is based on Java SE. A flexible and secure environment is provided by the Java Platform Micro Edition (Java ME) for developing and running applications that are aimed at embedded and mobile devices. Java ME is used to create secure, portable applications that can make use of the device's native capabilities. The limitations that come with developing

applications for mobile devices are addressed by Java ME. Java ME essentially addresses the issue of running applications on devices with limited memory, display, and power resources

B. Web Page

A web page is opened in the display board for displaying the notices from the two modules Faculty, Principal, Student are the three categories for displaying the information in the web page. The information from the three categories is displayed into the display board after approved by the admin module.

C. Data Base

MYSQL database is used for storing the information from the admin and the user modules. All the notifications shared is stored into the database after been approved by admin user it will display in web page. This information stored in database from the two modules can be searched and retrieved after been deleted

D. Working of System

The process of notification services includes communication with mobile app and web application which can cocurate on 1) Admin and 2) User, Admin is one who can manifest all the services from user, also provide access permission to survey the notification to web browser, as well as admin can able to edit and delete the services whether if the request is approved or not. Admin handle whole mobile application to access the request. In second Part, User can send the notification to other credential user meanwhile admin doing the main role, which is given full access, if admin gave approved, notification service will show in web browser [web browser fetching all accept notification from mobile]. Data will be saved into MYSQL DB to provide all accepted data from admin. Sending message of service would also saying the time duration of day to showing message in browser, if the message duration is expired, it will eliminate from web browser.

Table Estimate:

Login Table: To verify account details of user and Admin

User registration Table: To create an account

Message table: To send message

Message Details: Message will consist of [IMAGE, NAME FIELD, DESCRIPTION, DATE, DURATION OF DAY]

Web Page Design and Android app Design: Designing of Frond End is in web app: JSP, CSS, JAVASCRIPT, MYSQL

Designing of Mobile: XML, Android, Java, MYSQL

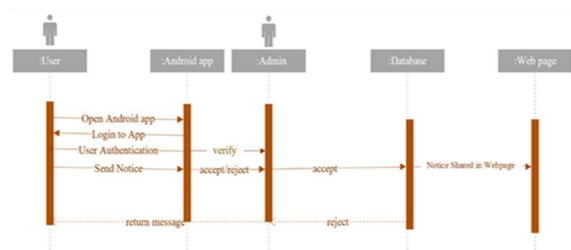


Fig. 3. Sequence Diagram

The interaction between the user and the application is depicted in Figure 3 by a sequence diagram. The user first opens the app and login. The admin will respond to the user message. If the message is rejected user will receive notification and they are shown as output

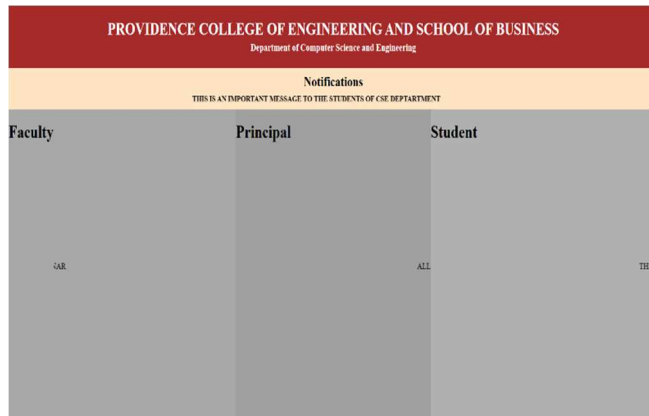


Fig. 4. Notice Board Prototype System

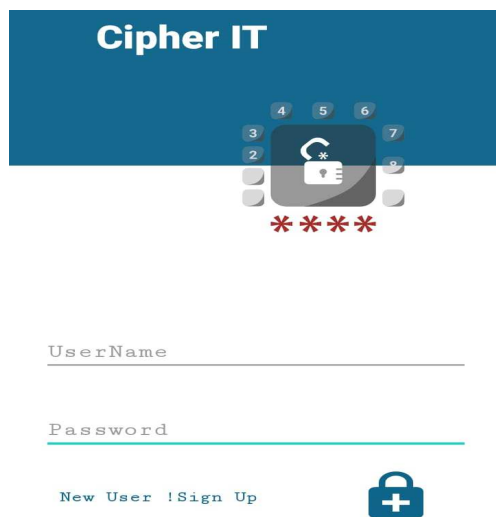


Fig. 5. Android App

E. Using Android TV as Display Board

Our proposed system requires an Android TV, and we are using this model because it is inexpensive and has a variety of built-in features. Our website can be opened on the Android TV with ease thanks to its easy internet connection and browsing capabilities. Shared images can also be properly viewed.

V. ADVANTAGES

The primary benefits of our system are that it is more cost effective; Notices can be updated and shared easily as it is displayed in a web page linked with an android application. We can access it from anywhere with a network connected

mobile phone with the help of a private link. It works in private institutions like colleges and schools. This method is said to be more effective as the students and teachers can easily access the notices shared even if they are not at school or college. This can also be implemented in any public organisations or public places in order to catch people's attention towards any event.

VI. CONCLUSIONS

We can improve the speed, efficiency, and quality of our wireless communications by utilising the technology behind this concept. We can display the messages more effectively and with fewer errors. Time can be spent, and paper waste is decreased. This technique can be used very effectively in businesses like high-tech restaurants, where placing an order and offering discounts can be displayed at all branches simultaneously, and in colleges, where staff and students can be informed of information at the same time. It is affordable and can be placed in emergency situations like hospitals, temples, and airports as well as public transportation locations like railways, bus terminals, and airports.

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