SMART NOTICE BOARD USING RASPBERRY PI MODULE

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Abstract: Notice boards are playing very important role in our day to day life. By replacing conventional Analog type notice board with digital notice board we can make information dissemination much easier in a paperless community. Here the admin can control notice board through internet. So information can be send anywhere in the world and can be displayed within seconds. Information may be in the form of text, image, pdf etc. PC is used for sending information and Raspberry pi is connected to internet at the receiving side. In addition to this an application which is installed on the admin's mobile phone can serve the same purpose. This application also contains a speech to text converter .So the admin can send text messages through his/her own voice.

Keywords- Notice, Board, Digital, IoT Based

I. INTRODUCTION

In educational institutions, the organization use circulars and notice boards for conveying information to the students. This methodology takes additional time for updating also many students may not be aware of the information displayed on notice boards due to non-eye catching notices. Digital Notice board is one of the ways of displaying notices in which the notices are display on a LCD Display Screen. These notices are changed dynamically .We have to only type the notices and send that notice for displaying on display screen. The Display screen and the System are connected with the help of the different mechanisms. Also another advantage is that more than one notice is visible on the screen as the notices scroll across. Notice board is an essential information gathering system in our life. In our day-to-day life we can see notice boards in various places like, educational institutions, railway stations, shopping malls, Bus stations, offices etc. So we can say that Notice boards are the places to leave public information such as advertise events, announce events or provide attention to the public, etc.

Now days a Separate person is needed to stick those information on the notice board. It will lead to lose of time as well as usage of manpower. In conventional analog type notice boards paper is the main medium for information exchange. We know that information counts are endless. So there is a usage of huge amount of paper for displaying those endless counts of information. The problems faced by the wooden or conventional type notice boards are resolved by the implementation of our digital notice board. It will bring an advanced means of passing notices around in the world in a much easier and efficient way. Due to the popularity of internet, we choose internet as a medium for transferring information. The Internet of things (IoT) is the network of physical devices, vehicles, home appliances and other items embedded with electronics. Software, which enables these objects to connect and exchange data. Each device is uniquely identifiable through its Embedded computing system but is able to inter operate within the existing Internet infrastructure For provide security, we add username and password type authentication system. So only respective authority can send information. Raspberry pi which is the Heart of our system. A monitor is interfaced with Raspberry Pi. So information in the form of text, image and pdf can display on the large screens. Our primary aim is to get more people's attention on the display. By the usage of high definition display devices people can get more attention on the notice board rather than conventional notice boards. In conventional wireless notice board can display only texted messages. But in our newly implemented system can display images and pdf documents in addition to text messages. Because in Educational institutions majority of information given from the higher authorities in the form of images or pdf format. So displaying these types of information make our system more user friendly. Due to the utilization of internet the sender can send message anywhere in the world. There is no range limitation for the successful exchange of information.

Everyone knows what a mirror is. It is an object found in most people's homes. In mirrors, we see our reflections. But what happens when you combine the idea of a mirror with technology? What possibilities are there and how smart could a mirror be? These are some of the questions that inspired my choice of final year project, a project which aimed to develop a smart mirror notice board and a small operating system to power it. The main goal of this project was to develop a smart mirror

device as well as an operating system to run on similar devices. The device was to look like a regular mirror but would have a screen inside. The operating system would support running apps and would show images, videos & notices depending on the time. Magic Mirror is a mirror device built with a cardboard frame, a flat screen monitor, a Raspberry Pi 4 and software running on a web browser and a tool called Electron. The module system is very simple and even allows others to develop their own modules. The default installation comes with some basic widgets for images, videos & Notices.

II.   MOTIVATION OF WORK

Design a notice board in such a way that it can full fill the requirements like less manual operation, some notices can be displayed at various places at the same time, this notice board should be visible from maximum area or distance, It is easy to handle & compact in size. Effective time management is one of the most important factors for success and productivity in a person's day-to-day life. With the increasing integration of technology in our lives, maintaining an efficient schedule has become both easier and more difficult. Keeping up to date with appointments, Twitter, news, social media, and other things is made easier through technology such as tablets, PCs, and smart phones yet also provide distractions that can interrupt anyone's routine. Technology has become another task in the day that time must be allotted for. In the finite time of the day, technology needs to be designed to work within our schedule and not be an extra piece to it. The key to effective time management involving technology is multitasking. Anyone in the business or academic world would agree that every second counts in the day. This project was formulated through inspiration seen through movies such as Iron Man and tech demos, such as Samsung's transparent LCD Smart Window, seen at the International Consumer Electronics Show in 2012. This extends as well to the continuing trend of integrating touch screens and internet-connectivity into everyday appliances such as ovens and refrigerators. Constant information and instant access to it drive the current generation. Forget bringing smart phones and tablets into the bathroom and risking damage. The smart mirror will show you that information with the swipe of a hand. The smart mirror is the result of our team brainstorming on how to solve all these issues and develop something that is functional as well as a showpiece.

III.   PRAPOSED SYSTEM

Figure above 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, pdf. 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. In addition mobile application is used to convert voice into text. Here the voice is pass through the voice reorganization system and converted into text.
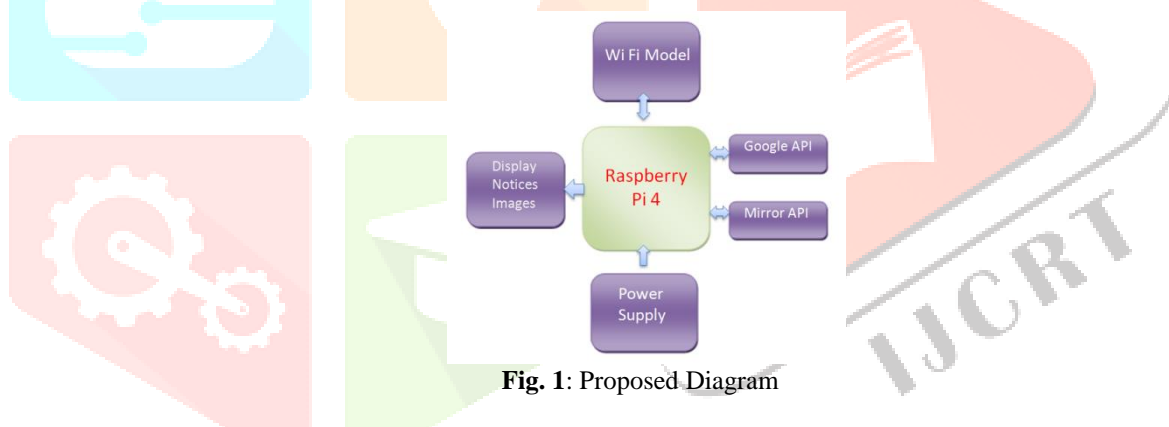

Fig. 1: Proposed Diagram

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 which will help the user to easily keep the track of notice board every day and each time he uses the system. System consist of two section 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 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 an Web page. By using this Webpage sender can directly enter into the web address. These messages including text file, image file and pdf 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.
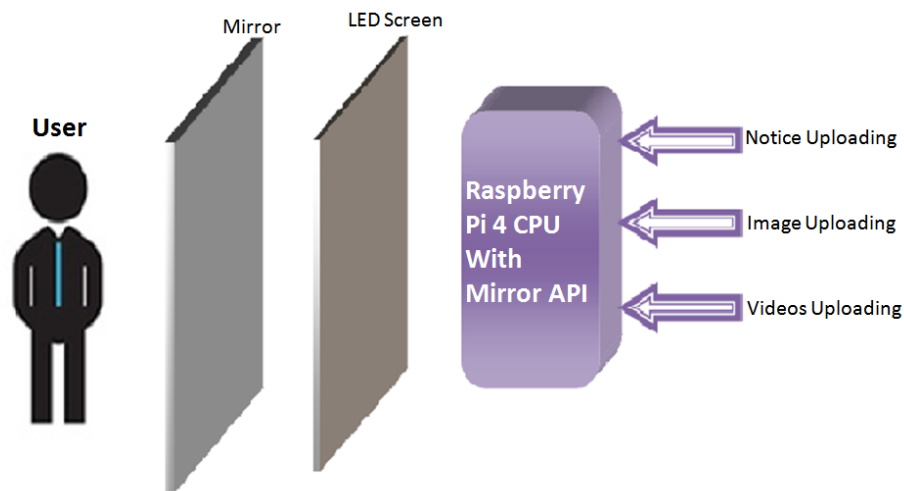
Fig. 2: Arrangement of proposed system

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 displayed 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. For displaying Pdf files, first it converted into image file by the program written in the Raspberry pi. After converting all the pdf pages in to images then it will display. Each two pages in the received pdf file will displayed at a time. To achieve this monitor screen is spitted into two sections. Each section displays each page. After a certain delay the next pages will displayed. All these messages are displayed sequentially after short delay. 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. Also we delete or modify text messages whenever we want. After deleting the messages from the cloud it will automatically deleted on the display after a short delay. We can change the scrolling text color, text size, display graphics, delay between the messages by simply made changes on the program.
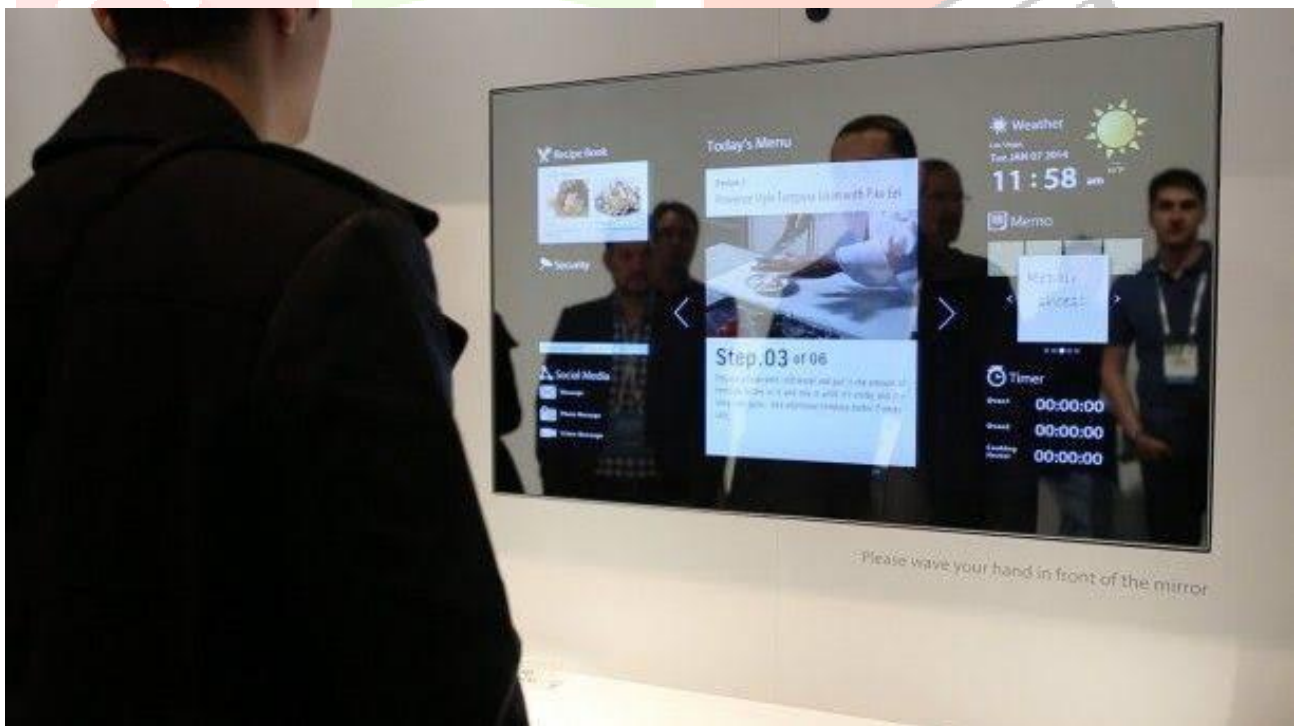

Fig. 3: View of Smart Notice Board

Algorithm

Following step by step procedure will explain the actual working of the system

- Start
- Login for access notice board.
- If the user is valid then go to step 4 otherwise go to step 2.
- Select Information's in the form of image, pdf and text files
- Upload files.
- Store the message.
- Set the duration of displayed messages.
- Received image and text files
- Display stored messages
- Every Minutes the clock validation is keep for set the time

Our proposed smart mirror notice board consist of a Raspberry Pi4, acrylic glass, monitor or TV. Raspberry Pi is a minicomputer. It uses raspbian operating system. A wooden frame will be prepared with LED attached behind the glass with all the sensors, and the raspberry pi. The power supply is attached to the raspberry pi which will power the LED monitor and the sensors. The block diagram depicts that it would collect personalized data like Notices, Events, Images, videos etc. of college. For this process internet access will require which will be provided by Wi-Fi module on the raspberry pi. All the information is displayed on the LCD screen connected with the raspberry pi. The contents of this mirror will be changed through proper authentication. So this will be done by only few, currently the project members. After providing correct username and password the admin will login and he will be able to add more contents to display on the board or to change the sequence of how the contents are displayed on the smart notice board.

IV. RESULT & DISCUSSION

In this web page application is used as a transmitter and Raspberry is used as a receiver. Sender and receiver is interfaced through a wireless network Display is connected a. the receiver side. Raspberry pi is connected to Wi-Fi network to access data on the cloud. After establishing connection data stored on the cloud will be displays. For sending information sender must enter in to the login page. The login page of our IOT based digital system. Username and Password is predetermined. If we enter wrong username and password an error will displayed on the login page. So after typing correct username and password in the respective columns, next page will displayed in the web server. Upload page contain icons for sending text messages files, image files, videos. In addition to this there is a separate icon for deleting previously send data. Illustration of displaying files on our digital notice board. Here two pages are simultaneously displayed on monitor.
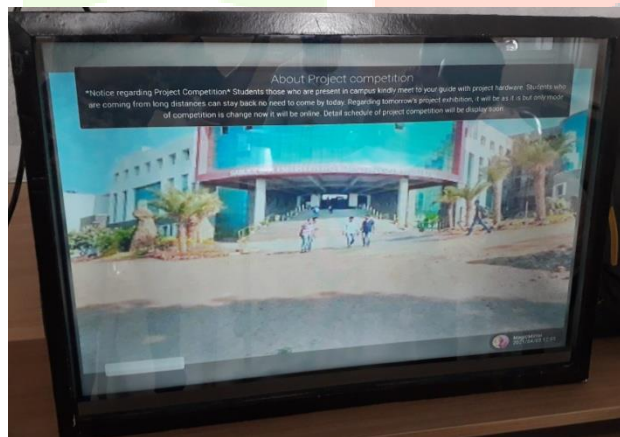

Fig. 4: Displaying Images & Alerts Messages

Received text messages will display like breaking news in TV channels. Text messages can also be sending from the android application through voice. After few seconds displayed messages will changes to next message. Newly send image file has high preference. So when we send a message in the form of image or it will displayed first then after Few seconds delay previously received messages will display. But in the case of texted messages newly received message is displayed followed by the previously send text message. So text message is displayed one after one in the serial manner. This process will continue as long as the power supply is maintained.

Fig. 5: Remote Controlling From URL

V. CONCLUSION

The project "SMART NOTICE BOARD" has been successfully done & tested with solving problems to the best of our knowledge. Each block present all information with reasoned and justified. The project is very economic cost & marketable & the components used in project are very simple and easily available in the market. We believe that our project has become commercial as well as industrial & can be used in places such as colleges, banks, railway stations, bus station etc. Finally we conclude that this project being based on the widely used IoT technology & as per Industrial Technology 4.0 has further scope for future development & research & can be modified according to its application.

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