

A Past, Present and New Features of Digital Notice Board

Gaurav Sattiwale, Rushabh Tongase, Vaidehi Kamble, Rupesh Saut, Prof. Manish K. Shriwas

Electronics and Telecommunication, PRMIT & R, Badnera, Amravati.

Abstract- In any organization or institution a Notice Board is a very important component as it is one of the best mediums to communicate with the individuals of that organization or institution. The System DIGITAL NOTICE BOARD using a GSM is an SMS-based digital display system which has been designed to display a notice in a very attractive manner. The system allows the user to display the message (text or image or video) from anywhere just by sending the text via SMS with an associated password. The sent text is received at the GSM module and enables it to get displayed on LCD screen. The System is an experiment for displaying real time notices.

Index Terms- GSM (Global System for Mobile communication), SMS (Short Messaging Service), LCD (Liquid Crystal Display).

I. INTRODUCTION

The Digital Notice Board comprises of two major units. The first unit is a simple user's mobile handset. The second unit is the control unit. For instance, this system can be achieved with the help of GSM modem and LCD display. The control unit comprises of a display, the Raspberry Pi board and the GSM module. Whenever any information or message have to be displayed the user can send the message via user's mobile phone to the control unit. This smart notice board can be used in many applications including educational institutions, banks, public places like bus and railway stations.

Previously the System had been done using a microcontroller, a 16x4 LCD display and a GSM module. It enabled the user to display a notice by using SMS. No doubt it was a good System with some glimpse of evolving technology but it failed to display the notice in a attractive manner, the number of characters were limited, also the display was too small and couldn't be implemented for an actual use. Sometimes also there occurred some network problems, leading to slowing down of its process. Some features like an acknowledgment message to user's phone, feedback signals like LED or a buzzer were further added to make the System more reliable but these features couldn't improve the control system of the System.

Later, for enabling a colorful display the control system was changed from an ATMEL microcontroller to an Arduino board. This provided a luxury to interface a big LED or LCD screen as a display component of the System. Moreover this also reduced the process time. Now the process of authentication was also enabled and only authorized user were allowed to display the notice.

Further for displaying the notices in the form of image and for a better speed of operation, the control unit was replaced by a

Raspberry Pi Board which was like a mini computer. This change promoted to enhancement of various features. Now the user was not only able to display a notice by using a SMS but also by an Android Application with all facilities of accessing the notice board with a strong authentication system. Further the use of internet was also introduced and now the user was all set to display the notices using a webpage from anywhere in the world. But these advancement in features led a surplus increase of cost.

Our System deals with the displaying of notices on a LCD screen by using GSM technology and the local wireless network. This System also takes care of security concerns also the System mechanism takes care about the records of previously displayed notices. Moreover it helps to display a large size files without any android application. Raspberry Pi is the heart of system, so the focus is to use maximum of its features in a very effective manner.

II. LITERATURE SURVEY

1) GSM Wireless Communication System [2010] :[1] This paper mainly focuses on the application of GSM (Global System for Mobile communications). Advantages and Disadvantages of GSM has been marked here. GSM system is the most famous system for the Second Generation mobile telephony worldwide.

2) Display Message on Notice Board using GSM [2013]:[2] This paper proposes the use of GSM technology for displaying notices on a digital notice board which helps to save time and energy. The notice board is eco-friendly and reduces the use of papers. Information can be given to a large mob in a very effective manner.

3) Wireless Electronics Display Board Using GSM Technology [2013]:[3] This paper explains a photo type laboratory model wireless notice board system. The board is connected with a GSM modem which enables the user to display the notice in public places using SMS.

4) SMART NOTICE BOARD [2013] :[4] This technical paper discusses on the present technology in association with daily life. It explains the importance of the Smart notice board and how efficiently it can be used in day to day life.

5) A Protocol for End-to-End Secure Transmission of SMS [2014] :[5] In this paper the Easy SMS protocol and how it can be successfully designed so as to provide end to end secure communication through SMS is discussed. The analysis shows the focus on security and methods to prevent various attacks. Also it explains the other aspects like communication, bandwidth etc.

SURVEY TABLE:

System name	Year	Author	Advantages	Limitation	Application
GSM Wireless Communication System	2010	Guifen Gu and Guili Peng	1. Knowledge about GSM Services. 2. we can connect without internet	Communication consumes cost. Its not free service	Cellular Communication System.
Wireless Electronics Display Board Using GSM Technology	2013	N.Jagan Mohan Reddy and G.Venkeshwaralu	1. Effective use of LCD display. 2. Effective use of electronic boards..	Network problem could happens at some palces. Remote	Notice Board by using GSM device
Display Message on Notice Board using GSM	2013	Foram Kamdar, Anubhav Malhotra and Pritish Mahadik	1. we can use in advertisement world. 2. we can use in public utility areas	There is limitation of number of characters used in SMS.	LCD Display's used to Notify Notices.
SMART NOTICE BOARD	2013	Shruthi K., Harsha Chawla, Abhishek Bhaduri	1. Quick communication with digital system. 2. Effective use of LCD Notice board.	Only one notice shows at a time.	Notice board with many features.
A Protocol for End-to-End Secure Transmission of SMS	2014	Neetesh Saxena and Narendra S. Chaudhari	1. Define working of Transmission Protocols.	Speed of transmission of notices depends on network.	Transmission protocol for SMS service.
Transmission Policies for Multi-Segment Short Messages	2015	Yi-Bing Lin, Sok-Ian Sou	1. Define process of communication. 2. Shows working of SMS (Short message services).	Limited Characters should be accepted while Transmitting SMS.	

III. PROPOSED METHODOLOGY

Technology is influencing every aspect of society and such is the case of an institution. A Digital Notice board is a very innovative System for any institution. In our proposed System, the digital notice board enables the user to display the notices wirelessly. The system uses a GSM module for transmission purpose, connected to a raspberry pi and a LCD screen display. The System consists of a simple voltage regulator circuit for the purpose of power supply to the GSM. For displaying the notice a webpage has been created and user needs to access the page before sending the notice. All the programing related to the Systems had been done using Python. Also a buzzer had been provided so as to get notification of new notice. The Notice board also sends an acknowledgement to the user after display of notice.

At the start, the programs fed are run. After successful execution of the programs followed by entering the correct

password the notice board is ready to display the notice. For displaying the notice the user need to send the text via SMS with a set password as prefix. The sent message is received at GSM module, which then transmits it serially to the Raspberry Pi. Finally the message is displayed on the webpage with an IP address.

The System also enables the user to display an image or video using the Wifi of the Raspberry Pi. The user just needs to upload the image or video on an URL and send text with the image or video or name in a set format. Also multiple images can be displayed like a slideshow.

Using a File Transfer Protocol the user can access the database of the notice board from any other PC or Mobile after a suitable authentication. This FTP helps the user to keep the records of the notices and in case it can be displayed again if someday it is missed by majority in the institution.

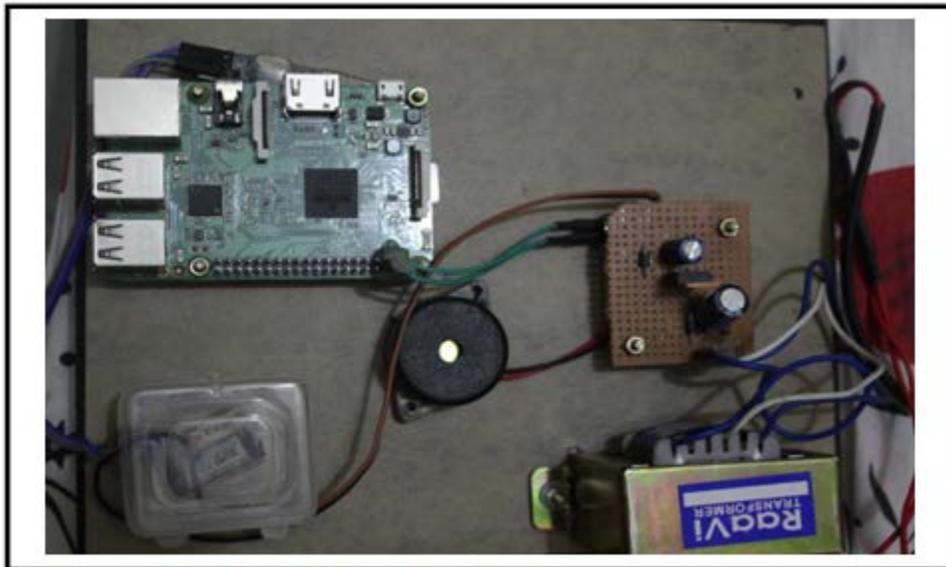
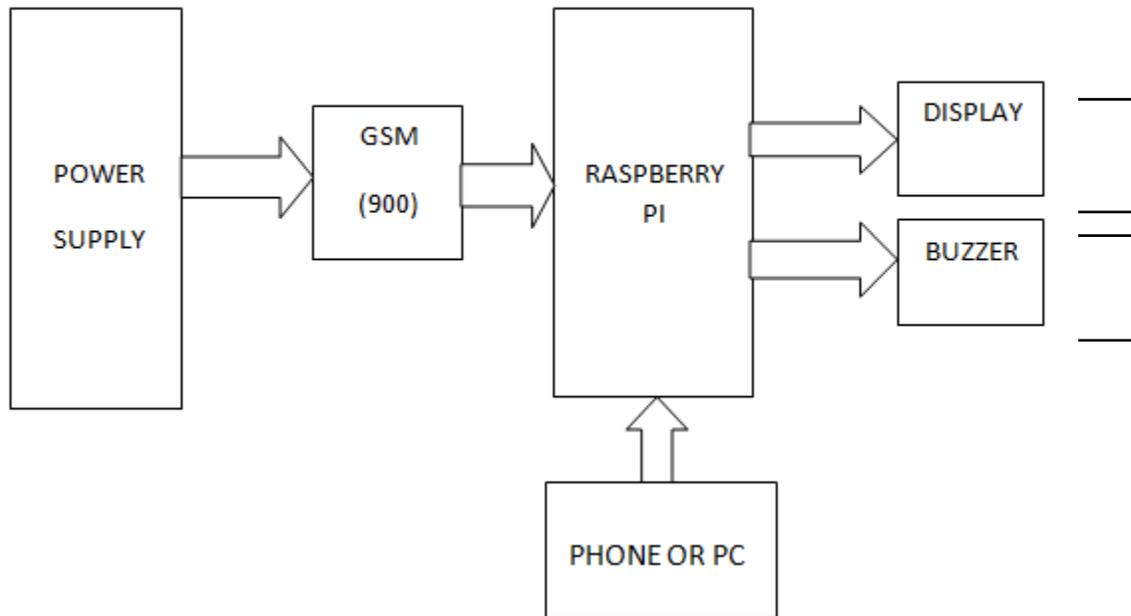


Fig. Digital Notice Board circuit arrangement.

SYSTEM ARCHITECTURE:



IV. WORKING

The basic aim of this system design is that the allowed user will send SMS from his mobile phone to GSM module, this message is the notification to be inserted in the website database which is displayed on the monitor.

To receive the message a SIM card is placed in GSM module and this is connected to Raspberry Pi through RS232 serial port . A website is created to display the message received on monitor. The webserver will run itself on Raspberry Pi. A program is written for reading the messages from GSM module and to insert them in to website database.

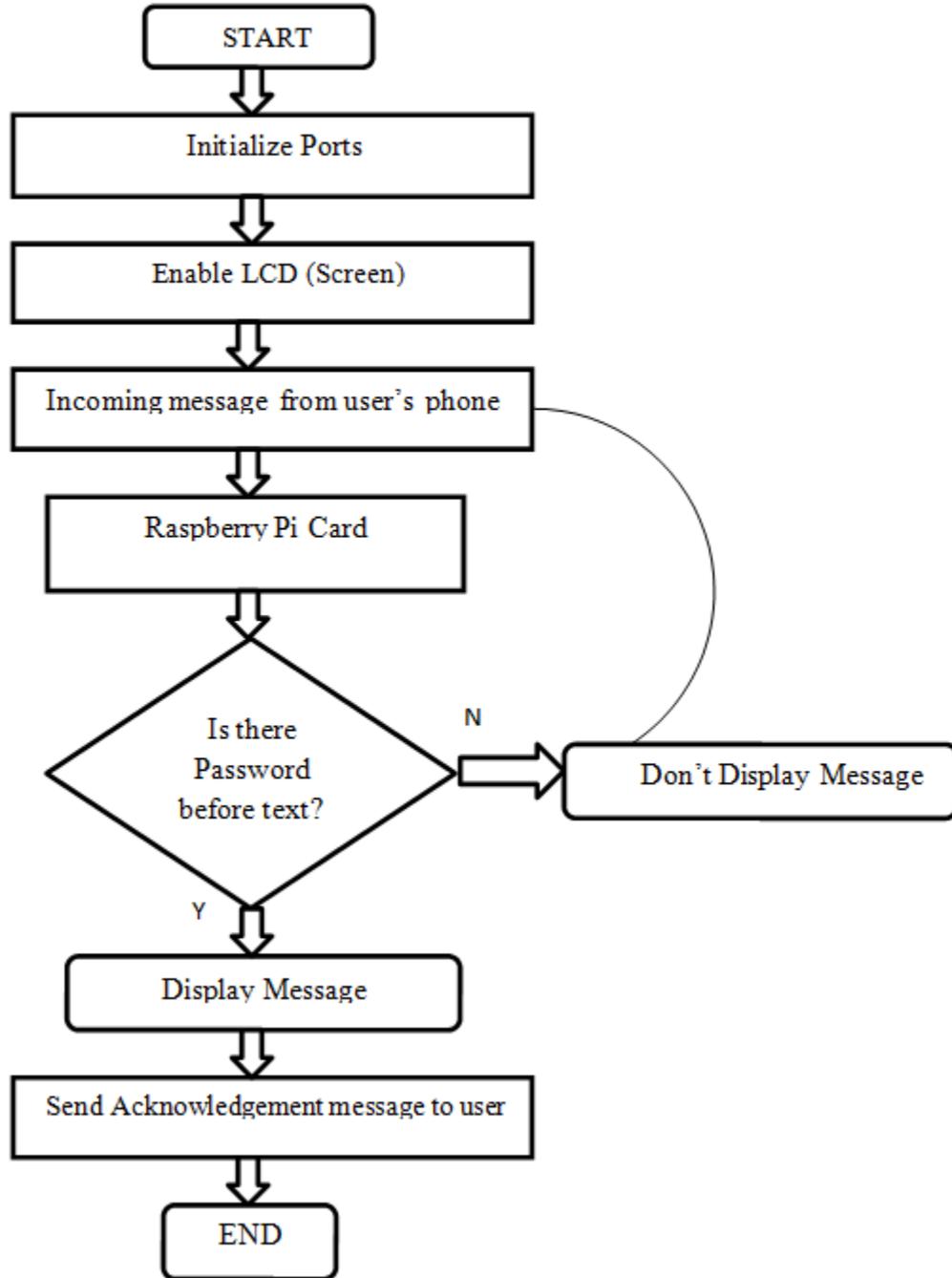
Raspberry Pi will use this program to read the messages using GSM module only from allowed users i.e. users entering password (\$12345) before the text. And it inserts them to database of the website which will be displayed on the monitor connected through HDMI port. Thus, Raspberry Pi will act as central authority of the whole system controlling the website and the GSM module as well. By using HDMI port LCD / LED monitors can be connected. By using a HDMI extension switch, message can be displayed on several

monitors at a time. This system is applicable to display messages / notices that need to be regularly updated in industrial areas / college notice boards. is easy to communicate with serial port and easy to connect databases using a python module. GSM module accepts only certain commands through serial communication and responds to them. These commands are called "AT Commands", AT means attention. There are a set of AT commands to perform different functions, every command starting with 'AT'. In Raspberry Pi, a program is written in python programming language to read the messages from GSM Module through serial connection to link it with a pre-created webpage with address "127.8.0.1:8888" and displays it on the monitor connected.

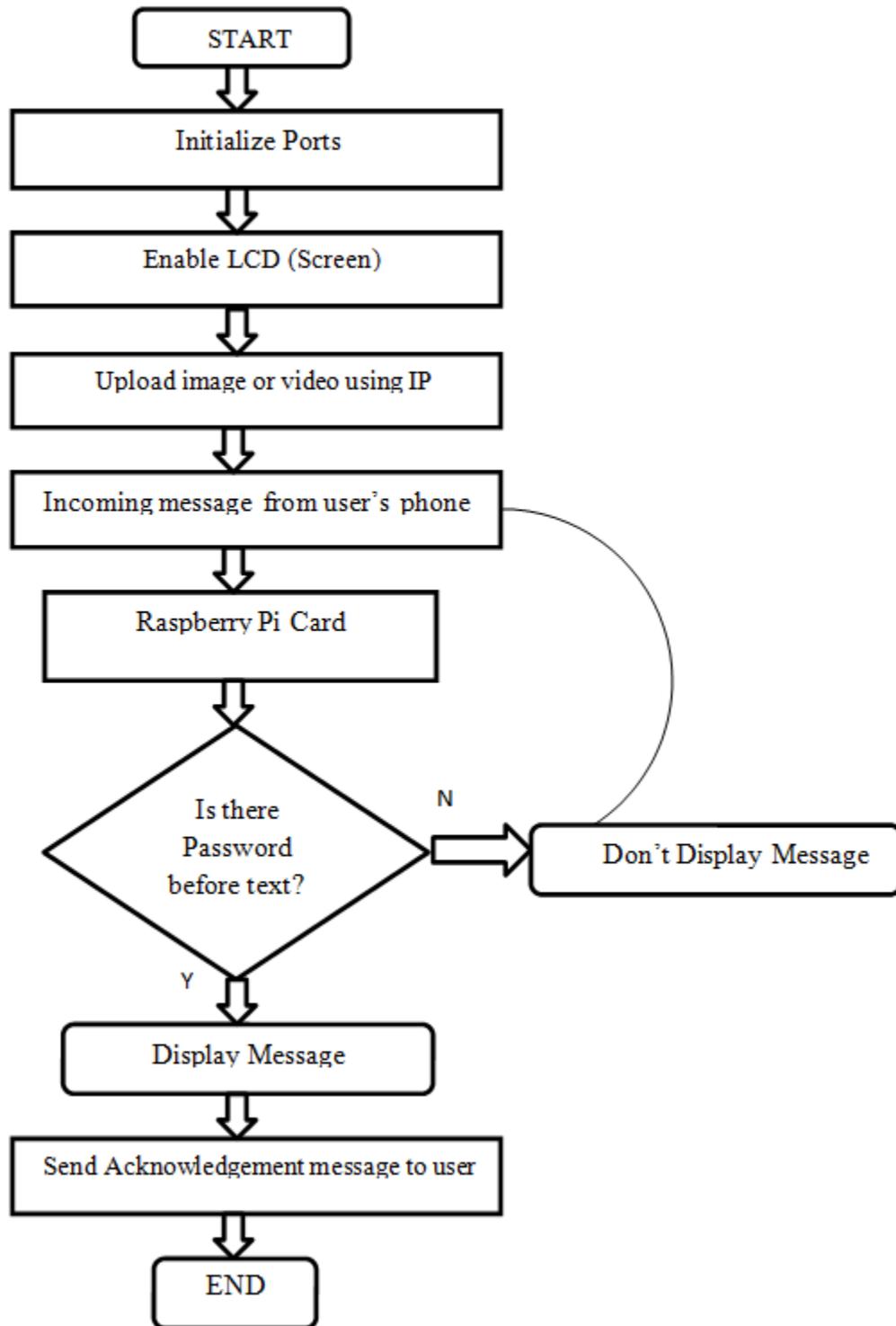
Moreover images can be displayed on the screen by using a webpage with IP address "10.42.0.1:8888/upload". The process is enabled by connecting the source of an image i.e. a phone or a laptop via Wi-Fi of Raspberry Pi . After uploading the image it can be displayed on the screen by sending a message starting with "\$12345 img:" followed by the image name, e.g. an uploaded image named "PRMITR" can be displayed by first uploading it and sending a SMS as "\$12345 img:PRMITR".

FLOWCHART:

1) For Displaying Notice in the form of a text.



2) For Displaying Notice in the form of an image or video.



V. STEPS TO BE FOLLOWED TO DISPLAY NOTICE: GENERAL STEPS

STEP 1: Run the program named “app.py”(stored in database) on the terminal. This will launch the web-socket and start the display in the form of a webpage.

STEP 2: Followed by app.py run the program named “chk.py”.

STEP 3: Enter the required password for starting the notice board.

STEP 4: After entering the correct password the status of the GSM module is checked. STEP 5: If the status of GSM module is OK, launch the webpage of notice board using the allotted IP address on the Browser.

A) DISPLAYING NOTICE IN THE FORM OF TEXT:

STEP 1: Enter the authentication password followed by the notice to be displayed in the textbox of the user’s phone.

STEP 2: Send this text to the authorised SIM in the GSM module connected to control unit of notice board.

STEP 3: The received text is serially transmitted to the control unit and then authentication password is checked.

STEP 4: If the password is correct, the notice will be displayed on the screen with a buzzer notification and simultaneously an acknowledgement will be sent to the user.

B) DISPLAYING NOTICE IN THE FORM OF IMAGE/VIDEO:

STEP 1: The image or video that is to be displayed needs to be uploaded on the database of the notice board using an IP address that is allocated for the uploading purpose.

STEP 1: Enter the authentication password with a prefix “img:” followed by the image name (or video name) of image (or video) to be displayed in the textbox of the user’s phone.

STEP 2: Send this text to the authorised SIM in the GSM module connected to control unit of notice board.

STEP 3: The received text is serially transmitted to the control unit and then authentication password is checked.

STEP 4: If the password is correct, the image(or video) will be displayed on the screen with a buzzer notification and simultaneously an acknowledgement will be sent to the user.

VI. OUTPUT

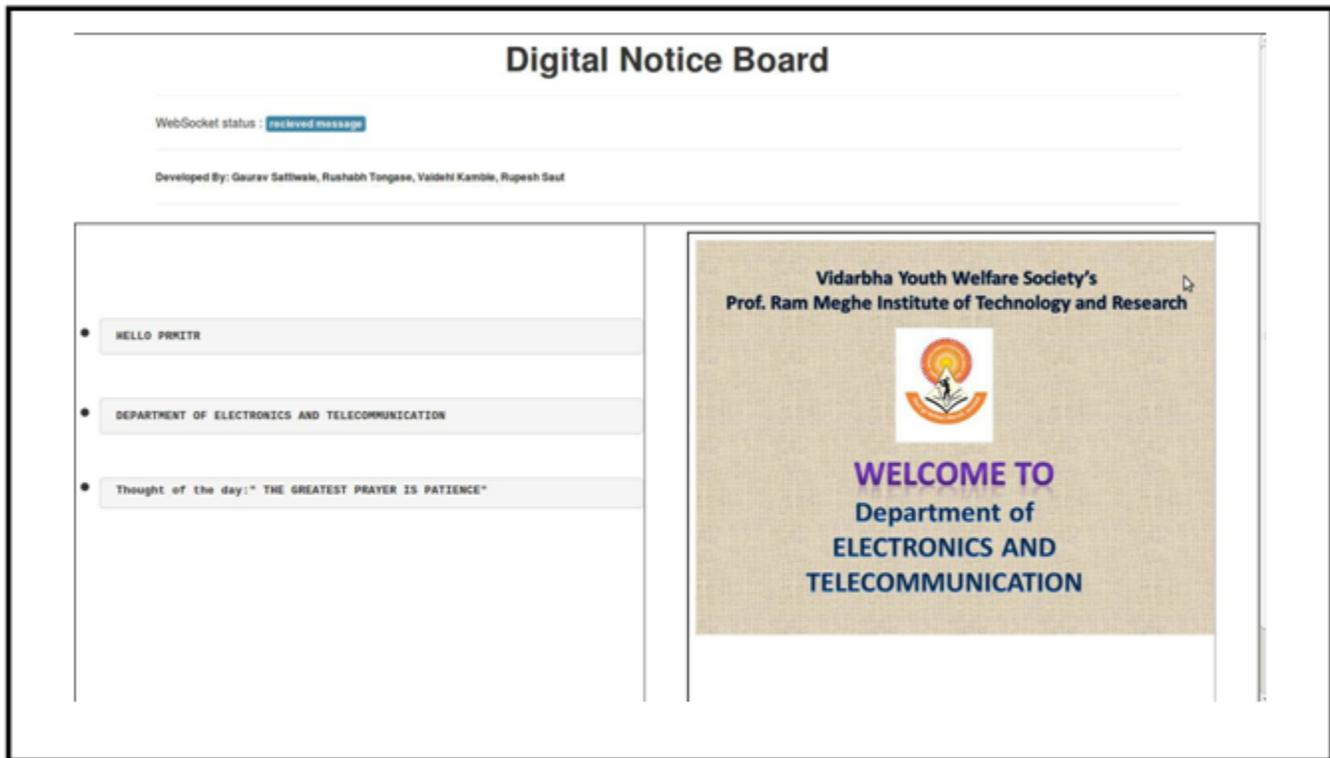


Fig. Display of Multiple notices in the form of text and images on the LCD screen.

VII. CONCLUSION

With the day to day advancement in technology the Notice Boards are also evolving from a hand- written system to a digital display and further to a Wireless Display System. The paper reflects a Digital Notice Board System with a GSM module and

raspberry pi, which displays the desired notices in the form of a text or an image or video on the LCD screen through a SMS. Multiple notices can be displayed simultaneously in parallel with an image or video. Use of a password scheme before the message and for starting the notice board display has also enhanced the security concerns.

VIII. FUTURE SCOPE

Notices can be displayed in the form of word document, power point, video clips by uploading them directly. This can be done by using a suitable operating system, program files, drivers, players so as to make them more eye-catching. Such notices can be displayed by using a webpage and giving an access to authorised users .The best way is the use of an INTERNET. An IP address can be used to achieve this. The IP will enable the user to upload any notice and from anywhere in the world. Moreover cloud can be used to dump the past notices and keep record of them.

REFERENCES

- [1] Guifen Gu and Guili Peng The Survey of GSM Wireless Communication System, International Conference on Computer and Information Application (ICCA 2010).
- [2] Foram Kamdar, Anubhav Malhotra and Pritish Mahadik Display Message on Notice Board using GSM ISSN 2231-1297, Volume 3, Number 7 (2013), pp. 827- 832 Research India Publications
- [3] N. Jagan Mohan Reddy and G.Venkeshwaralu Wireless Electronics Display Board Using GSM Technology, International Journal of Electrical, Electronics and Data Communication, ISSN: 2320-2084.
- [4] Shruthi K., Harsha Chawla, Abhishek Bhaduri "SMART NOTICE BOARD", Department of Electronics and Communication, Manipal Institute of Technology, Manipal University, Karnataka

- [5] Neetesh Saxena and Narendra S. Chaudhari, EasySMS: A Protocol for End-to-End Secure Transmission of SMS IEEE Transactions on Information Forensics and Security, vol. 9, No. 7, July 2014.
- [6] Yi-Bing Lin, Sok-Ian Sou, and Chao-Liang Luo Transmission Policies for Multi-Segment Short Messages"
- [7] Jaiswal Rohit , Kalawade Sanket , Kore Amod , Lagad Sanket: Digital - Notice Board

AUTHORS

- First Author** – Prof. Manish K. Shriwas, shriwasmans@gmail.com, Prof. Ram Meghe Institute of Technology and Research, Badnera ,Amravati.
- Second Author** – Gaurav R. Sattiwale, gauravsattiwale@gmail.com, Prof. Ram Meghe Institute of Technology and Research, Badnera , Amravati.
- Third Author** – Vaidehi Kamble, vaidehi.p.kamble@gmail.com, Prof. Ram Meghe Institute of Technology and Research, Badnera, Amravati.
- Fourth Author** – Rushabh Tongase, rushabh.tongase1@gmail.com, Prof. Ram Meghe Institute of Technology and Research, Badnera , Amravati.
- Fifth Author** – Rupesh Saut, rupeshsaut@gmail.com, Prof. Ram Meghe Institute of Technology and Research, Badnera , Amravati.