

# GSM BASED WIRELESS NOTICE BOARD

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**Abstract**— Various notices has been displayed in schools and various institutes over the years by using manual notice board and different methods which has been developed in the past. This paper presents the design and construction of E-noticeboard using GSM technology. The system consists of four basic units: GSM modem, Raspberry pi board, LCD monitor and Mobile device. The operation of the system is centered on Raspberry pi board. The operation of system is such that the notice which is to be displayed is send by the mobile device to the GSM modem and displayed on the LCD monitor using Raspberry pi board. The system is based on real time process and saves lot of resources i.e. human effort and mainly paper thereby saving world from global warming.

**Key Terms**- E-Noticeboard, Raspberry pi, GSM modem.

## I. INTRODUCTION

In this world everyone needs a comfortable living life. Man has researched different technology for his sake of life. In today's world of connected ness, people are becoming accustomed to easy access to information. Whether it's through the internet or television, people want to be informed and up-to-date with the latest events happening around the world. Wired network connection such as Ethernet has many limitations depending on the need and type of connection. Now a day's people prefer wireless connection because they can interact with people easily and it require less time. The main objective of this paper based on our project is to develop a wireless e-notice board that displays message sent from the user and to design a simple, easy to install, 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. GSM and Wi-Fi are the wireless technology used.[3]

Various types of noticeboards are used in various institutes to display notices and these boards are managed manually. It is a long process to put up notices on the notice board. This wastes a lot of resources like paper, printer ink, man power and also loss of time. Other noticeboards are L.E.D indicator used at railway stations for displaying the information of arriving trains as it is a L.E.D indicator the performance of L.E.D depends on the ambient temperature of the environment and L.E.D's are currently more expensive and requires heat sinking for long life. Some other types of noticeboards are notice displayed in buses and malls using LCD screen. These notices are previously feed in the memory of the displaying unit and the notice can't be change easily and it is time consuming process.

In this paper we have proposed a system which will enable people to wirelessly transmit notices on notice board using wi-fi or through the data access over a mobile phone . Here we have proposed a system by which only authorized person can accesses the notice board. It require less time due to fast data transmission through wi-fi. Less cost and save the resources like human effort, ink and majorly paper.

Table-I below summarizes the key differences between the 2 short range wireless technologies. Wi-fi provides higher data rates for multimedia access as compared to bluetooth which provides lower data transfer rates. Bluetooth are intended for communication (about 10m), while wi-fi is designed for WLAN about 100m.

## II. LITERATURE SURVEY

Standard	Bluetooth	Wi-Fi
Application Focus	Cable Replacement	Web, Email, Video
Frequency Band	2.4 GHz	2.4GHz; 5GHz
Max Signal Rate	1 Mb/s	54Mb/s
Nominal Range	10m	100m
Channel Bandwidth	1 Mhz	22 MHz
Data Protection	16-bit CRC	32-bit CRC
Max Number of cell nodes	8	32

Table 1.1 Comparison of Bluetooth And Wi-Fi

### III. SYSTEM OVERVIEW

In our work there are two sections Hardware and Software.

#### Hardware:

- [1] Monitor/LCD screen
- [2] Raspberry Pi
- [3] GSM
- [4] Mobile Device

#### Software:

It mainly consists of programming language used for coding the Raspberry Pi board and GSM modem. Python language is used for coding raspberry pi board and AT commands is used to operate GSM modem.

The process contains one transmitter part and other is receiver for displaying notices.

#### A. Transmitter:

Authorized Mobile/PC is used as a transmitter.

#### B. Receiver:

It consists of following units.

#### I. Wi-Fi Module

Wi-fi is a high performance, cost effective WLAN USB module which connects the raspberry-pi low cost computer, to a wi-fi local area network. Wi-fi uses the latest 802.11n wireless technology, and can support data rates up to 150Mb/s, compared with the older 54 Mb/s 11g products. It also benefits from a higher wireless LAN bandwidth, making data transmission more efficient.[3]

#### II. LCD Monitor

It is used to display the data of any form such as text, images etc. Wi-fi will check the authorization of user and raspberry-pi will convert the message that will be displayed into LCD format.[3]

#### III. GSM modem (900/1800 MHz) Interface

A GSM is specialized type of modem which accepts the SIM card, and operates over a subscription to a mobile phone operator, just like a mobile phone. From the mobile operator perspective, a GSM Modem looks like a mobile phone. GSM Modem comes in various interfaces, such as USB and Serial. GSM modem is However the main difference is that GSM Modem is wireless.[3]

#### IV. AT commands:

AT commands are used to control MODEMs. AT is abbreviation for attention. These commands come from Hayes commands used by Hayes smart modems. The dial up and wireless MODEMs need AT commands to interact with computers. In this project it is used to operate the GSM modem.

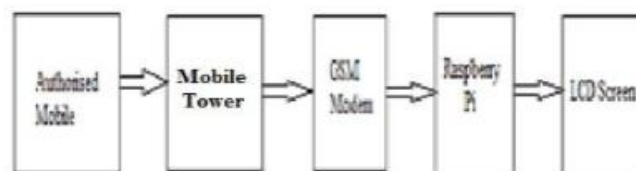


Figure 3.1: Block Diagram

#### Description of the interfaces

The modem comprises several interfaces:

- LED Function including operating Status
- Serial and control link
- Power Supply
- SIM card holder

#### V. Raspberry-pi

Raspberry pi boards are of two types such as model A, Model B. We are using Model B which is the higher-spec variant of Raspberry Pi A, with 512 MB of RAM, two USB ports and a 100mb Ethernet port.

The raspberry-pi model B is having cost about 35\$.system on chip is broad cam BCM 2835. It has ARM11 core, 700 MHz frequency& Memory 512 Mb. The 2 USB ports are Composite video & HDMI output. Onboard storage is provided with the help of SD card. It has 700 mA power ratings. [3]

#### VI. Python:

Python is a widely used general purposed high level programming language. Its design philosophy emphasizes code readability. It is used to code raspberry pi model

#### IV. WORKING

The above figure [3.1] shows a detailed block diagram of the proposed system. A mobile device is used at transmitter side for transmitting the notice which is to be displayed and GSM modem, Raspberry pi and LCD screen or monitor is used at receiver side for displaying the required notice.

The authorized mobile device used at transmitter side sends a message which is to be displayed as a notice using local operator network. The mobile is authorized using a ANDROID application which is secured by a password. This message is received at receiver side by the GSM modem. A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. Two types of GSM modems are available i.e. SIM 300 and SIM 900 based on frequency bands they works on. We will be using GSM SIM 300 modem which works on 3 different frequency bands. AT commands are used to control the GSM modem, so suitable commands should be transmitted to the modem for each purpose and the modem will respond to these commands by transmitting suitable message that should be received. A sim card is inserted in the GSM modem which will receive the message from the Mobile device.

Now this message is sent to Raspberry pi board using an interface through serial ports. The Raspberry pi is a series of credit card sized single-board computers. It consist of quad-core ARM Cortex-A7 CPU and 1 GB of RAM. It also have 512MB inbuilt memory and can be extended externally. Raspberry pi works on Raspbian Os which is installed on the SD card inserted inside the Raspberry pi board. The message received from GSM modem is stored in the SD card of the raspberry pi for future access. As the message is received a notification will be send to the class representative's mobile device. For this purpose a database is created containing the mobile numbers of the respected class representatives. The database is created using SQLite in process library. This

database is also processed on the SD card of the Raspberry pi board.

The message is now delivered to the LCD monitor whose work is to display that message. OpenCV library is installed for this purpose of displaying the message or images. Raspberry pi is connected to LCD monitor using HDMI port. Using this HDMI interfacing between LCD and Raspberry pi the message is displayed as the notice on the LCD screen. Images can also be displayed on LCD screen as a notice. Generally the LCD screen or Monitor having HDMI ports are used because the interfacing is done through this HDMI ports with Raspberry pi.

#### V. ADVANTAGES AND LIMITATIONS

##### A. ADVANTAGES:

1. It is a wireless system.
2. Text can be delivered from remote place.
3. Data can be stored in the memory so it will not be lost in power failure condition.
4. A lot of interaction and information sharing occurs.
5. Printing and photocopying cost not require.
6. Save time, energy and resources.
7. GSM can be used for long distance data transmission.

##### B. LIMITATIONS:

1. Power failure will switch off all the LCD screen thereby can be a major limitation.
2. Network failure will restrict the transmission of message.
3. Cost is relatively more than the manual noticeboards.

#### VI. APPLICATION

1. In Educational institutions and organizations for displaying the notices
2. In crime prevention: Display boards put up on the roads will display tips on public security, accident prevention
3. In metropolitan cities for managing traffic
4. Advertisement: In shopping malls
5. Railway stations: Instead of only announcing the delay in arrival of trains we can display the information.[3]

#### VII. CONCLUSIONS

Now the world is moving towards automation, so in this world if we want to do some changes in the previously used system we have to use the new techniques. Wireless operation provides fast transmission over long range communication. It saves resources and time. Data can be sent from remote location. User authentication is provided. Previously the notice board using GSM technology was developed but there was no storage capability and they were unable to display images but in our system Multimedia data can be stored on chip or on SD card. Text messages and multimedia data can be seen whenever we want to see.

#### VIII. ACKNOWLEDGEMENT

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