**Abstract**

Basically Notice board is very important and primary need of any organization or Institutes. So all the notices related with employee or students are displayed on the notice board. Currently we are using a lot of paper work for this notice board. So to avoid this paper work and to save time we have implemented a digital notice board which is based on GSM technology. In this system we have used a LED display on which we have displayed our message. Any authorised user can send a text message from his/her mobile phone so this message will received by GSM receiver modem which is placed at LED display and finally this message gets displayed on LED display. Also we have made an arrangement in such a way that the same message will transmitted to number of users i.e. mobile numbers that we have saved in our microcontroller using programming.

1. **INTRODUCTION**

Now days the notice board is a primary thing at everywhere that means in the institutes, or colleges, organization, government sectors also at public utility places like bus stops, railway stations or parks. But today's process of sending various noticed day to day is a very tedious process. Requires daily notices of information’s so conveying this we require the paper for the same. It require the billions of paper hence it directly effect on the cutting trees its effect on Global warming. To avoid this we are introducing the Electronic Notice Board on the same location. By using Electronic Notice Board we can save consumed paper which is used for display different mind of the notices.
The world is now going to digital and the use of the mobile phones as increased drastically over years. This gave us the idea to use mobile phones to send and receive the message and also display the notice on Electronic Notice Board. We use the GSM technology in our project. GSM stands for the Global System for Mobile communication. Due to this international roaming capability of GSM we can send message to receiver from any part of the world. It has the system for SMS stands for Short Message Service.

In this proposed system we have used GSM module which configured for the "TEXT" mode. It will receive the SMS from the sender mobile and convert this Text in data frame for serial communication. It has serial port for communication between microcontroller and GSM module. Then microcontroller kit is implementing the controller itself. MAX232 driver to convert logic level from GSM module to microcontroller because the logic levels of the microcontroller and GSM module are different. Hence our microcontroller doesn’t understand this logic level. Hence we required MAX232 to convert desired logic level for controller or for the serial communication between microcontroller and GSM module. Moving LED display is used for displaying the actual Notice send by the user mobile and here we are going to additional part to this is the same notice is also send to the every person whose mobile number is stored in our program or microcontroller. Because of this everyone get the message personally.

2. PROPOSED SYSTEM BLOCK DIAGRAM

Figure 1: Block Diagram of Proposed System
The above block diagram shows the major blocks of the project, here we have the GSM module which configured for the "TEXT" mode. It will receive the SMS from the sender mobile and convert this SMS in data frame. There is need of serial communication between microcontroller and GSM module. There are two pins of microcontroller that has serial port for communication between controller and GSM module. The logic level of microcontroller is +/- 5 V. For logic low [0] it uses 0V and for logic high [1] it uses +5V. But GSM module has the different logic level than microcontroller that is +/- 13V. For logic low [0] it uses 0V and for logic high [1] it uses +13V. Hence our controller doesn't understand this logic level hence we required MAX232 driver to convert desired logic level for communication between microcontroller and GSM module.

For serial communication there are two pins of microcontroller i.e. RxD [p(3.0)] and TxD [p(3.1)] for receiving and transmitting respectively. But here we use the two serial communication devices that are GSM module and LED display. Those two pins of microcontroller are not capable to serial communication of the GSM module and LED display at a time. Hence we use the relay circuitry for separating two serial communication devices.

Here we use the moving LED display for displaying the notice or message send by the user mobile. The LED display will have buffer that store the 256 characters. While initial start-up loop command to initialization of GSM module in text mode after checking parameters of GSM by sending some AT commands, then it switch on to LED initialization for display with right to left display.

Here we have use code protected receiving SMS that means the controller only access authorized messages from the sender only. Microcontroller cannot respond every message from company or any either person. Here only 160 characters are accessed by microcontroller. Then same message is send to the several numbers of users that are stored or programmed in microcontroller. We use the buzzer to indicate the new incoming coded SMS from the user/sender's mobile.

3. HARDWARE IMPLEMENTATION

3.1 Microcontroller 89S52

Instead of microcontroller 89C51 we have used microcontroller 89S52 because it is have extra memory than 89C51. It is a low-power, high-performance CMOS 8-bit microcomputer with 8K bytes of Flash Programmable and Erasable Read Only Memory (PEROM). The device is manufactured using Atmel’s high-density non-volatile memory technology and is compatible with the MCS-51™ instruction set and pin out. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional non-volatile memory programmer. By combining a versatile 8-bit CPU with Flash on a monolithic chip, the Atmel micro-controller is a powerful microcomputer, which provides a highly flexible and cost effective solution so many embedded control applications. Also it can store the more numbers than 89C51.
3.2 Three Terminal Voltage Regulator

We have used LM7803 because we want 5v dc supply. By using this device we can get the 5v dc for our hardware. Three terminal voltage regulators is a regulator in which the output voltage is set at some predetermined value. Such regulators do not require an external feedback connection. Hence, only three terminals are required for device of such types, input (Vin) output (Vo) and a ground terminal. Since the regulator operates at a pre-set output voltage the current limiting resistor is also internal to the device. The main advantages of such regulators are the simplicity of connections to the external circuit and the minimum of external components.

3.3 Capacitors

Capacitors store electric charge. They are used to smooth varying DC supplies by acting as a reservoir of charge. They are also used in filter circuits because capacitors easily pass AC (changing) signals but they block DC (constant) signals.

We used the numbers of capacitors in our project for different purpose like 1000uf used for storing the charge,33pf used for crystal oscillator,10uf used for the also for charge.

3.4 Diodes

Diodes allow electricity to flow in only one direction. The arrow of the circuit symbol shows the direction in which the current can flow. Diodes are the electrical version of a valve and early diodes were actually called valves.

3.5 Light Emitting Diodes (LEDs)

LED used for indication purpose, LEDs emit light when an electric current passes through them.
3.6 Reset switch
Reset switch used for reset the CPU. We used the push to ON-push to OFF switch for this purpose.

3.7 MAX 232
MAX 232 is level converter IC which can translate between the microcontroller and the GSM module. So we were used the max 232 IC as a translator between this two devices. A standard serial interfacing for PC, RS232C, requires negative logic, i.e., logic '1' is -3V to -12V and logic '0' is +3V to +12V. To convert TTL logic, say, TxD and RxD pins of the microcontroller chips thus need a converter chip.

3.8 GSM module
GSM module used for sending the messages to LED display and to numbers of peoples whose mobile numbers are store in the controller. GSM/GPRS Modem-TTL (5V) from rhydoLABZ is built with Tri-band GSM/GPRS engine, works on frequencies EGSM 900 MHz, DCS 1800 MHz and PCS 1900 MHz. It is very compact in size and easy to use as plug in module. The Modem is coming with 5V TTL interface, which allows you to connect directly to 5V microcontroller/Arduino. The baud rate is configurable from 9600-115200 through AT command. The GSM/GPRS TTL Modem is having internal TCP/IP stack to enable you to connect with internet via GPRS. It is suitable for SMS as well as DATA transfer application in M2M interface. You need only two wire (Tx,Rx) except Power supply to interface with microcontroller/Arduino. The built in Switching Power supply allows you to connect wide range unregulated power supply. Using this modem, you can send SMS, data and read SMS through simple AT command.

3.9 Relay Circuit
In our microcontroller there is only serial communication port and we need 1 more port for serial communication so we made the relay circuit for that purpose. After receiving the message it will ON and send the signal to the display.

3.10 LED Display
We used LED moving display because of character limitation. Using this display we can display the large numbers of characters in on message. This message can be visible from longer distance so this is advantage of this display.

4. RESULTS AND DISCUSSIONS
After Successful Testing of proposed system we have observed the results. When authorised user sends a text message from his mobile then this message will be received by GSM receiver and same message will be displayed on the LED display. Also in addition with this message will be sent to the number of mobile numbers that we have saved in our programming. We have also measured time for each operation.

When turn on the power supply on the LED display displays the Text "Welcome to D.A.C.O.E. Karad E&TC Department Waiting 4 New Notice". Then message send from the remote location to the GSM module then message will receive at GSM module within 5 seconds. After receiving the message at GSM module the buzzer will ON for 2 seconds. Then message will read by the microcontroller. Then this message will transfer to LED...
display in 2 seconds. Then same notice will send to mobile numbers that are saved in microcontroller program. First mobile number saved in the program will receive the notice in 5 to 10 seconds. Then it will continue the sending the message to other saved numbers. The notice receiving time for remaining saved numbers will variable. It will depend upon the network available for the mobile number.

Figure 3: Testing of System (Results)

Table 1: Analysis of the results of our system.

<table>
<thead>
<tr>
<th>Sr No</th>
<th>Operation</th>
<th>Time Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Message display on LED display</td>
<td>7sec</td>
</tr>
<tr>
<td>2</td>
<td>Message send to number of persons</td>
<td>15sec</td>
</tr>
</tbody>
</table>

5. CONCLUSION
The display boards are one of the major communications medium for mass media. Local language can be added as a variation in this project. This can be achieved by using graphics and other decoding techniques. Also we realize that this project saves time, energy and hence environment. Cost of printing and photocopying is also reduced as information can be given to a large number of people from our fingertips. Thus we can conclude that this project is just a start, an idea to make use of GSM in communications to a next level.

6. REFERENCES