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SMART WIRELESS NOTICE BOARD

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ABSTRACT: This paper deals with an interesting and innovative manner of displaying messages on an electronic display board using wireless technology. Notice boards are one of the basic things in any organisation or public utility places likes hospitals, airports, bus stations, railway stations, shopping malls and parks. It is time consuming and tedious process to manually write down the different notices every now and then. To overcome the problem, the idea of wireless digital display board has been proposed in this paper. The key objective of this project is to develop a notice board that receives and displays messages from an authentic user from anywhere in the world using GSM technology. The SIM card loaded in the GSM module fitted with the wireless display board receives messages from authorized user having a mobile phone. The received message is then displayed on the wireless notice board making the whole process easy and fast. Thus the authentic users can send messages from any corner of the world to be displayed on the notice board using GSM technology.

 KEYWORDS: GSM, AT commands, wireless technology

I.   INTRODUCTION

GSM (Global System for Mobile Communications)– an open, digital cellular technology, first deployed in Finland in December 1991 is the most widely used wireless digital communication technology. As of 2017, it has become the global standard for mobile communications – with over 90% market share, operating in over219 countries and territories [1].

Digital advertisements have become popular nowadays as shopping malls, super markets, airports use digital display boards. From every small institution to big organization, messages are displayed on digital boards. Overt he last two decades the use of cell phones has been rapidly increasing. Mobile phones and the related technologies have become one of the most important things in this modern era. This drastic use of mobile phones gave the interesting idea of sending and receiving messages and the displaying them on digital board. The SMS (Short Message Service) facility in mobile handset enables us to send and receive messages all around the world by virtue of International roaming feature.

The main aim of this project is to replace the conventional notice boards by wireless digital displays driven by GSM technology. The authenticated user on the sending end sends SMS (notice to be displayed on the board) using his mobile handset to the SIM card loaded in the GSM module (attached to the wireless notice board), which receives the message and passes it to the microcontroller in the Arduino UNO for storage and then displays the received SMS on the wireless digital board. The SIM card at the receiving end in the GSM module receivesonly those messages whose initial character is * and final is '#'. The device can be used anywhere irrespectiveof the place of deployment provided mobile network connectivity is available [2]

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II.   PROPOSED SYSTEM

In this proposed project, Arduino Uno is used to control the whole process, GSM module (SIM 900A) to receive the message sent from the authenticated mobile handset and LED (32*16*3) to display the received SMS. Figure below shows the block diagram of wireless notice board using GSM technology.
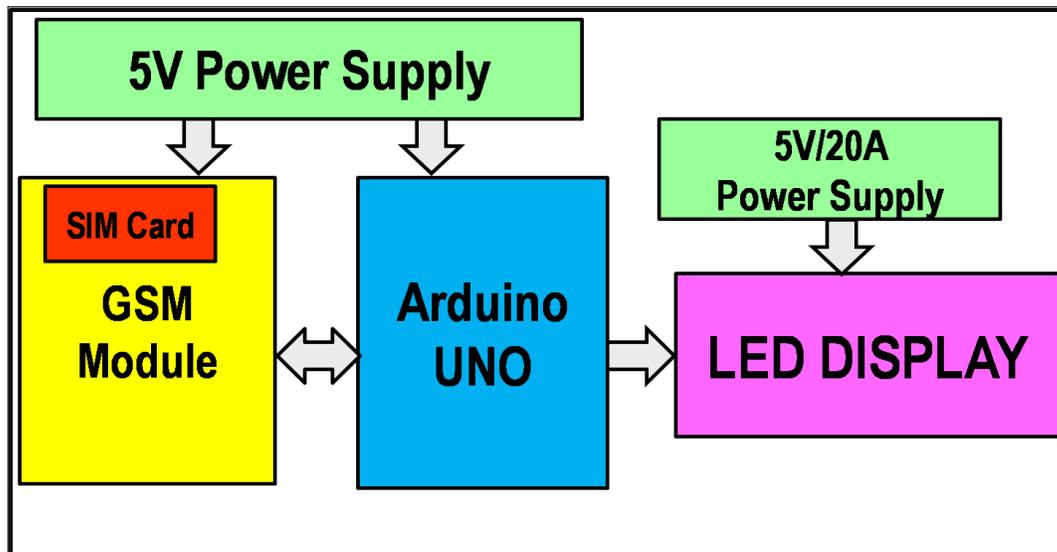

Figure 1: Block diagram of wireless notice board using GSM technology

III.   HARDWARE REQUIREMENT

GSM based wireless notice board requires the following list of hardware:
1.1. GSM module
1.2. Arduino Uno
1.3. LED

GSM MODULE:GSM network is the most worldwide mobile communication network used nowadays [3].Like a GSM mobile phone, a GSM modem has a SIM card inside it in order to provide wireless communication between the sender and the receiver. The GSM modem understands only the modem commands with everycommand line starting with 'AT' or 'at', hence the name AT commands ("AT" meaning 'attention'). The most basic command is "AT", if GSM responds OK then it is working good otherwise it will respond with "ERROR".ARDUINO UNO: The Arduino Uno is small in size and completely based on the ATmega328 (Arduino Uno 3.x) or ATmega168 (Arduino Uno 2.x) [4]. It lacks only a DC power jack, and works with a Mini-B USB cable instead of a standard one [5].The Arduino Uno can be powered via the Mini-B USB connection, 6-20Vunregulated external power supply (pin 30), or 5V regulated external power supply. The power source is automatically selected to the highest voltage source [6].
LED: In the proposed project, 32x16X3 LED is used to display the received SMS. This LED has 16 lines with maximum of 32 characters to be displayed on each line

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IV.   SOFTWARE USED

1.4. ARDUINO IDE SOFTWARE
1.5. AT COMMANDS

ARDUINO IDE SOFTWARE: Arduino consists of a physical programmable circuit board (known as a microcontroller) as well as a piece of software, or IDE (Integrated Development Environment) that runs on computer [7]. With the help of this software we can write and upload computer code to the physical Arduino board. Programs written on the Arduino software (IDE) are called sketches [8].

AT COMMANDS: Hayes commands starting with 'AT' or 'at' are called AT commands [9]. AT commands("AT" meaning 'attention') are the instructions used to control the modem. There are two types of AT commands: basic commands and extended commands. AT commands that do not start with "+" are called basic commands [10]. For example, D (Dial), A (Answer), and O (Return to online data state) are basic commands. AT commands that start with "+" are known as extended commands. All GSM AT commands are extended commands. For example, +CMGS (Send SMS message), +CMSS (Send SMS message from storage), +CMGL (List SMS messages) and +CMGR (Read SMS messages) are extended commands.
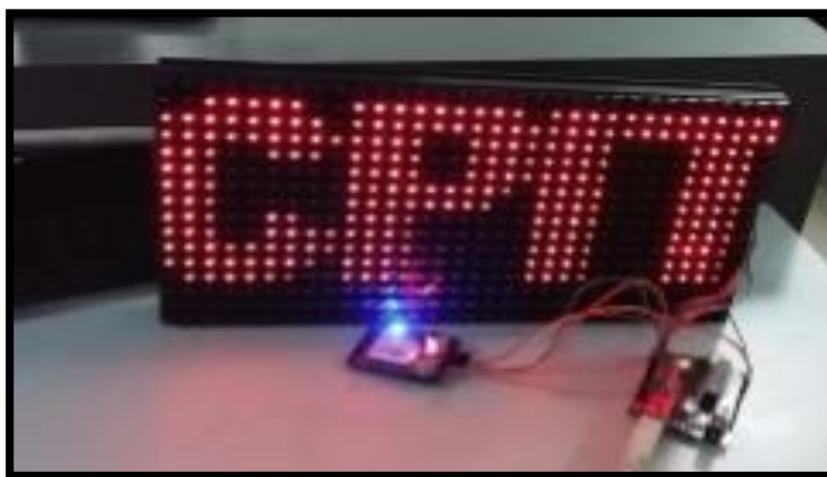
V. RESULT

Figure 2: GSMBased wireless Board Notice

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Figure 3: Displaying notice

VI.   CONCLUSION

The wireless GSM technology used in the proposed project to display messages on the notice board is efficient, reliable, and faster with minimal errors. It is cost effective system, requires very little maintenance, and is easy to handle and use. It fills the role of conventional and old notice boards that require papers to write the messages. This time consuming and tedious work has been replaced by wireless digital display board. From small institutions to big organizations, the digital notice board is gaining popularity.

VII.   FUTURE SCOPE

 The proposed model consists of LED to display messages. However, bigger LED boards can also be used. Since, the proposed system can display only one message at a time, another very useful and sign if I cant improvement can be done by using higher end microcontrollers and extended secondary memories so that it can display more than one message at the same time.

VIII.   REFERENCES

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