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TECHNOLOGY****WIRELESS NOTICE BOARD BASED ON ARDUINO AND GSM TECHNOLOGY****Fizza Hamid*¹ & Nusrat Hamid Shah²**

*¹M.Tech. Electronics and Communication Engineering, CGCTC, Jhanjeri, affiliated to I Gujral Punjab Technical University, India and B. Tech. Electronics and Communication Engineering, SSM College of Engineering & Technology affiliated to University of Kashmir, India

²MCA from University of Pune, India, BCA from University of Pune, India

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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 like 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 over 219 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. Over the 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 nano for storage and then displays the received SMS on the wireless digital board. The SIM card at the receiving end in the GSM module receives only those messages whose initial character is * and final is '#'. The device can be used anywhere irrespective of the place of deployment provided mobile network connectivity is available [2].

II. PROPOSED SYSTEM

In this proposed project, arduino nano is used to control the whole process, GSM module (SIM 900A) to receive the message sent from the authenticated mobile handset and LCD (20*4) to display the received SMS. Figure below shows the block diagram of wireless notice board using GSM technology.

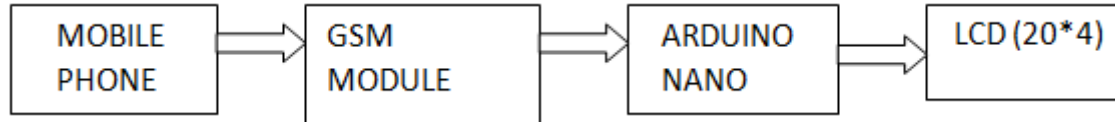


Figure 1: Block diagram of wireless notice board using GSM technology.

III. HARDWARE REQUIREMENT

GSM based wireless notice board requires the following list of hardware:

- 1.1. GSM module
- 1.2. Arduino nano
- 1.3. LCD

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 every command 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 NANO: The Arduino Nano is small in size and completely based on the ATmega328 (Arduino Nano 3.x) or ATmega168 (Arduino Nano 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 Nano can be powered via the Mini-B USB connection, 6-20V unregulated external power supply (pin 30), or 5V regulated external power supply (pin 27). The power source is automatically selected to the highest voltage source [6].

LCD: In the proposed project, 20x4 LCD is used to display the received SMS. This LCD has four lines with maximum of 20 characters to be displayed on each line.

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: GSM Based wireless Notice Board

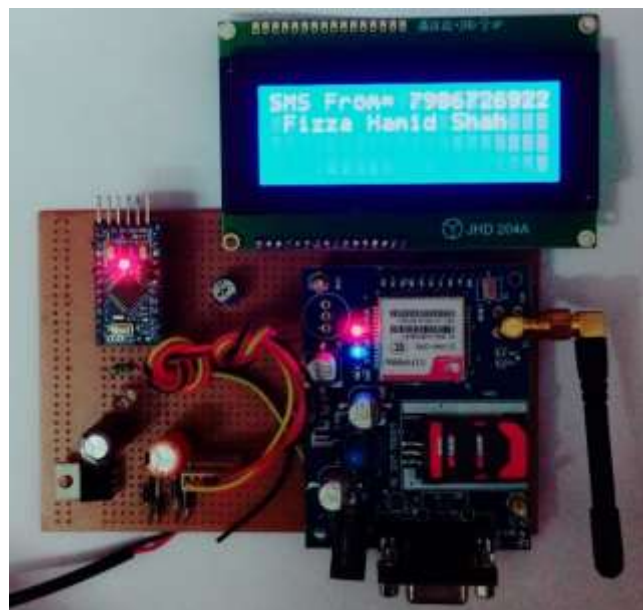


Figure 3: Displaying notice.

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 LCD 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 significant 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.



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