SMART LED NOTICE BOARD USING BLUETOOTH DEVICE

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Abstract : 'Smart LED Notice Board using Bluetooth Device' is a model for displaying notices/messages at places that require real-time noticing, by sending messages in the form of SMS through mobile. The project aims to develop a moving sign board which empowers the user to change the scrolling message using SMS service instantaneously unlike a deskbound device such as PC or laptop. The user can update it even from a remote distant. The SMS is deleted from the APP each time it is read, thus making room for the next SMS. This document deals with an innovative rather an interesting manner of intimating the message to the people using a wireless electronic display board which is synchronized using the Bluetooth technology. This will help us in passing any message almost immediately without any delay just by sending SMS which is better and more reliable than the old traditional way of passing the message on notice board. This proposed technology can be used in colleges, public places, malls or big buildings to enhance the security system and also make awareness of the emergency situations and avoid many dangers. Using Bluetooth module display the message onto the display board.

IndexTerms - Bluetooth module, Arduino Uno R3, 8*8 LED matrix.

I. INTRODUCTION

In this world Mobile Phones and the related technologies are becoming more and more prevalent. Various technical arenas in the field of Telecommunication and Embedded Systems are becoming omnipresent in the people. The use of cell phones has rapidly increased over the last decade and a half. Upgradation in networking technologies has encouraged the development and growth of very dense networks. Now-a-days the general mass prefer communicating while on the move therefore landlines usage has been drastically reduced .Notice boards are one of the widely used ones ranging from primary schools to major organizations to convey messages at large. A lot of paper is been used and which is later wasted by the organisation. This in turn leads to a lot of deforestation thus leading to global warming. Small innovative steps in making use of technology for regular purposes would have an adverse effect on the environment issues which we are presently concerned about. The main aim of this paper is to design a SMS driven automatic display Board which can replace the currently used programmable electronic display and conventional notice boards. It is proposed to design to receive message in display toolkit which can be used from an authorized mobile phone. The whole process can be described from the transmitter and receiver section. The Bluetooth module receives a message from the authorized mobile phone and the message is extracted by the microcontroller from the bluetooth module and is displayed on the matrix display board. Serial to parallel communication is used for the entire process from WIFI module to Microcontroller and from microcontroller to the matrix display. And for the acknowledgement LED display is used. The proposed system in this paper has many upcoming applications in educational institutions and organizations, crime prevention, traffic management, railways, advertisements etc. Been user friendly, long range and faster means of conveying information are major bolsters for this application. By using this proposed methodology we can enhance the security system and also make awareness of the emergency situations and avoid many dangers.

II. RELATED WORK

Intimating the message to the people using a wireless electronic display board which is synchronized using the BLUETOOTH technology. This will help us in passing any message almost immediately without any delay just by sending a SMS which is better and more reliable than the old traditional way of pasting the message on notice boards. This proposed technology can be used in many public places, malls or big buildings to enhance the security system and also make awareness of the emergency situations and avoid many dangers. Using various AT commands is used to display the message onto the display board. BLUETOOTH technology is used to control the display board and for conveying the information through a message sent from authenticated user.

In [1] Ajinkya Gaikwad, et al proposed a framework which will empower individuals to remotely transmit on a notification board utilizing Zigbee. The manuscript provided an efficient way of displaying messages on Notice Board using Wireless Technology. It also provided user authentication in order to avoid any misuse of proposed system. Likewise the framework could be made perfect with more than one remote innovation.

In [2] Bhumi Merai, et al presents an SMS based notice board incorporating the widely used SIM300 GSM to facilitate the communication of displaying message on noticeboard via user's mobile phone. When the user sends a SMS via a registered number from his mobile phone, it is received by SIM300 GSM modem at the receiver's end. SIM300 is duly interfaced to the microcontroller. The messaged is thus fetched into the microcontroller. It is further displayed on an electronic notice board which is equipped with LCD display interfaced to microprocessor powered by a regulated power supply from mains.

In [3] Anushree S P, et al developed an online web application that is fully capable of passing relevant notices and announcements, and keeping the users updated from time to time. The user is kept updated each time the E-Notice Board is uploaded based on their preferences with respect to the departments and categories of a college through a SMS. Also the users can view the notices and articles anytime and from anywhere by opening the web application E-Notice Board which is available online and thus makes the project highly efficient and effective.

In [4] Twaha Kabika, et al designs a system that will allow user to change message timely. The designed system PC Based Moving Message Display Board System with RF link is a combination of wireless technology with 8×32 matrixes LED Display Boards formalized by designing and integrating the hardware and software with AT89S51 microcontroller, RF module, and 8×32 matrix

moving LED display. The system also consist of the GUI, Visual basic 6.0 is used in designing this GUI. GUI has also linked with the database (MS Access 2007) so that only the authorized user will have access to the system, also every single message sent by the user will be stored to the database.
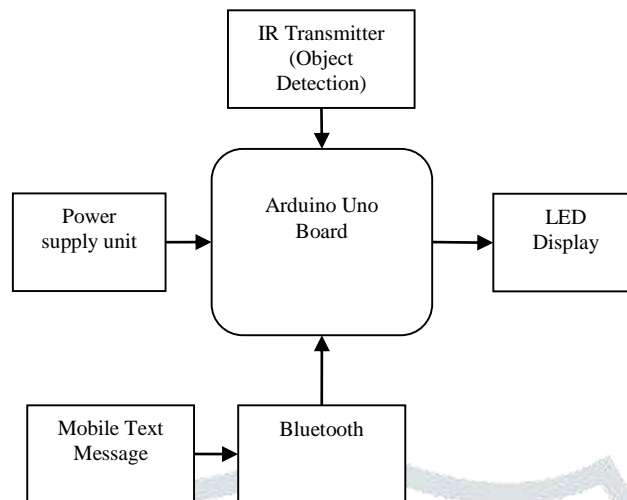
III. FUNCTIONAL BLOCK DIAGRAM

Fig. 1. Block diagram of project

The system is a Microcontroller based SMS box. The main components of the kit includes Microcontroller, GSM modem and Bluetooth device. These components are integrated with the display board and thus incorporate the wireless features. The GSM modem receives the SMS which are in turn passed to the microcontroller via a Bluetooth connecting device. The AT commands are serially transferred to the modem through MAX232. In return the modem transmits the stored message through the COM port. The microcontroller validates the SMS and then displays the message in the LED display board. Various time division multiplexing techniques have been suggested to make the display boards function efficiently. In this prototype model, LED display is used for APP purpose. During the process of implementation this can be replaced by actual display boards. In addition to address matching, data can be received only by the dedicated receiver, and this data is displayed on LED. It displays the same message until it receives another verified message.

IV. HARDWARE AND SOFTWARE REQUIREMENTS

4.1 Operating Environment

The objective is to be able to stand near the Arduino and casually acquire live data. The equipment is claimed to work over 10m. It has been used over 15m with clear line of sight. One wall of lightweight domestic construction will cut the range to about 5m maximum, and a single layer of foil building insulation can kill it stone dead. This implies that indoor to outdoor communication could be pretty risky.

4.2 Equipment used:

1) A standard Arduino Uno R3 or Mega.
2) An HC-05 bluetooth module is used.
3) A four-conductor cable to a header on a proto shield is used. A female-male leads direct into the Arduino headers. The module is directly soldered into a proto shield.

4.2.1 Bluetooth Module – HC-05

Fig. 2 HC-05 Bluetooth devices

Pin D0, Rx, is the receiver and therefore connected to the Tx pin on Bluetooth. D1 is connected to Rx on Bluetooth. HC-05s come with six pins. The HC-0x modules are 3.3v devices but note that the JY-MCU package level shifters on board for the power supply and is clearly labelled for 3.6 to 6v operation. The Arduino UNO R3 supports APSD for VoIP applications and Bluetooth coexistence interfaces; it contains a self-calibrated RF allowing it to work under all operating conditions, and requires no external RF parts.

4.2.2 MATRIX DISPLAY

An LED Matrix consists of an array of LED's which are interconnected such that the positive terminal (anode) of each LED in the same column are connected together and the negative terminal (cathode) of each LED in the same row are connected together.

An LED dot matrix display ("dot" refers to the circular lenses in front of the LEDs) can also come with multiple LEDs of varying colors behind each dot in the matrix. For example, the matrix used in this project has a Red, Green and Blue LED behind each dot in the 8x8 grid. A configuration with multiple LEDs behind each dot adds another control pin to every column (positive terminal) for each additional color of LED, while the rows (negative terminals) are still all connected together. Therefore an RGB Matrix has 32 control pins compared to the 16 pins. Controlling the LED Matrix Since all of the individual LED's in a matrix share their negative and positive terminals in each row and column, it is not possible to control each individual LED at the same time. Instead, the matrix is controlled by cycling through each row very quickly while triggering the correct column pins to light the desired LED's for that particular row.

If the switching is done at a quick enough rate, there will be no visible flicker and the LED matrix display will appear to have each LED turned on at the same time. This works because of the principle known as Persistence of Vision, which is the theory that the retina of the human eye retains an image for about a tenth of a second. Thus an LED matrix must be very precisely controlled, with the Rows being scanned through sequentially at a rate greater than about 40Hz (to be safe) while sending out the column data at the exact same rate. This kind of control is easily accomplished with the aid of a microcontroller, plus some additional components.

4.2.3 PROTEUS

The functional approach and the extensive library of built-in functions allow to write very short but powerful scripts; to keep them comprehensible, medium-length keywords were adopted. The user, besides writing new high-level functions in Proteus, can add new functions in C/C++ by following the guidelines and using the templates available in the software development kit; the new functions can be invoked exactly the same way as the predefined ones, passing expressions by value or variables by reference. Proteus is an interpreted language: programs are loaded into memory, pre-compiled and run; since the number of built-in functions is large, execution speed is usually very good.

4.2.4 ANDROID APPLICATION

The multi terminal is intended for simultaneous management of multiple accounts, such as a Bluetooth for which is mostly helpful for transmitting message to the display. The new terminal successfully combine great functionalities that allow effective transferring with many accounts and with exceptional usability Terminal can easily get acquainted to this new program within a few minutes. After installing the application in mobile phone it need to configure with password.
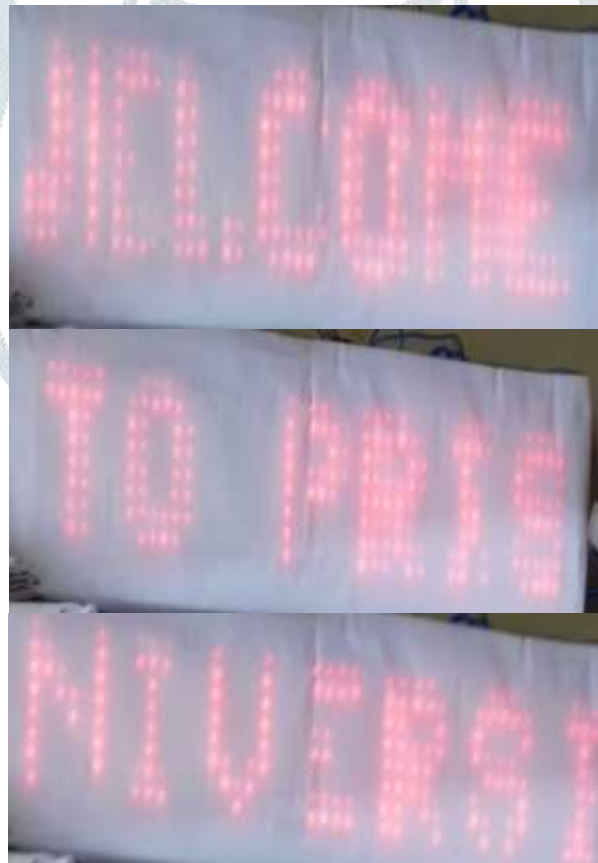
V. IMPLEMENTATION RESULT

Fig. 3 Scrolling Display of Smart LED Notice Board

VI. CONCLUSION

As the technology is advancing every day the display board systems are moving from normal hand writing display to digital display. Further to Wireless display units. This paper develops a photo type laboratory model wireless notice board system with BLUETOOTH connected android phone to it, which displays the desired message of the user through an SMS in a most populated or crowded places. This proposed system has many upcoming applications in educational institutions and organizations, crime prevention, traffic management, railways, advertisements etc. Been user friendly, long range and faster means of conveying information are major boosters for this application.

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