MESSAGE DISPLAY ON NOTICE BOARD USING GSM AND ARDUINO

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ABSTRACT

In the last couple of decades, communication technology has developed leaps and bounds. It has already established its importance in sharing the information right from household matters to worldwide phenomena. Apart from sharing information, it is also used for remote control of machines and electronic appliances. In our day-to-day life, we use many such appliances at home, office and public places for our comfort and convenience. Every device requires one or the other kind of operation control for which it has a HMI (Human-Machine Interface).

Communication Technology not only helps us to exchange information with human beings but also allows us to carryout monitoring and controlling of machines from remote locations. This remote control of appliances is possible with wired or wireless communication interfaces embedded in the machines. The use of "Embedded System in Communication" has given rise to many interesting applications. One of such applications is Public Addressing System (PAS). Many companies are manufacturing audio/video systems like public announcement system, CCTV, programmable sign boards etc. But all these systems are generally hard-wired, complex in nature and difficult to expand. So, by adding wireless communication interface such as GSM to these systems, we can overcome their limitations.

Key words: Human-Machine Interface (HMI), Public Addressing System (PAS), GSM.

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 communication with over 90% market share, operating in over 219 countries and territories.

Nowadays conveying messages using notice boards is widely used ranging from schools to organizations. We know the significance of notice boards in public areas like bus stands, railway stations, airports and banks, etc. But day to day changing of these boards is a very difficult task and a waste of time. At present, all electronic boards are designed with a wired system. The major drawback of designing these boards is; not flexible and cannot be located anywhere due to messy wire. To overcome this problem, a

wireless board is designed to display the latest information.

PROJECT OVERVIEW:

The main concept of this project is to design a wireless notice board that displays various notices sent from the mobile phone. When a mobile user sends information from his mobile, it is received by a SIM slot, which is integrated into a GSM modem at the receiver end.

The GSM modem is properly interfaced with an Arduino UNO board through level shifter IC for connecting RS232 communication protocol to the 8051 microcontroller. So the message received is thus sent to the 8051 microcontroller. Furthermore, that displays it on a wireless notice board which is inbuilt with an LCD display. Here LCD display is interfaced with an 8051 microcontroller which is duly powered by an RPS (regulated power supply) from a 230V AC mains supply.

EXISTING SYSTEM:

In the existing system, a person is needed to manually set the message into the display board by being present in the place where the notice board is situated. This can be done by using many technologies present in the market these days. They have come into existence long ago.

Existing System Drawbacks:

There might not be a possibility of a person always being present near the notice board. Due to this there might be delay in communicating important and urgent messages/notifications to the public.

Proposed System:

Taking this problem into consideration, I would like to propose a system where in a notice can be displayed on the notice board by sending it through a GSM based system which immediately displays the information without any further delay.

LITERATURE SURVEY:

The word GSM Refers to Global System for Mobile Communications. Nowadays many people are showing lot of interest to know more about GSM related concepts. So, here we have surveyed a list of various GSM based projects ideas which are having more demand and very interesting to learn. The following projects based on GSM technology we surveyed would give better idea about the GSM technology practically.
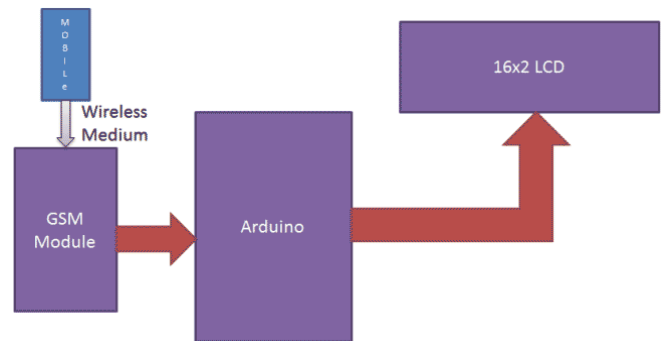
BLOCK DIAGRAM

Fig.1. Block Diagram of Notice Board using GSM and Arduino

BLOCK DIAGRAM DESCRIPTION:

The block diagram of display message on notice board using GSM and Arduino is shown in the above figure. The blocks of the circuit are

1. .Arduino UNO
2. GSM SIM900 MODULE
3. 16×2 LCD Display
4. Mobile

II.   HARDWARE DESCRIPTION

The hardware components used for the implementation of display message on notice board are:

1. Arduino UNO
2. GSM SIM900 Module.
3. 16×2 LCD Display.
4. Potentiometer.
5. Resistor.
6. Power Supply.

ARDUINO UNO:

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button,
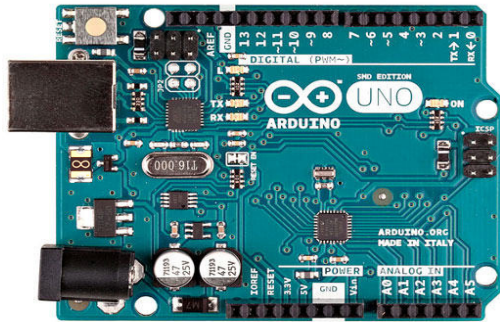
or a Twitter message and turn it into an output activating a motor, turning on an led, publishing as it reached a wider community, the Arduino board started something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board.

**Fig.2. Arduino UNO board**

Introduction to Atmega328:

ATmega328 is an eight (8) bit Microcontroller. It can handle the data sized of up to eight (8) bits. It is an AVR based micro-controller. Its built in internal memory is around 32KB. It operates ranging from 3.3V to 5V. It has an ability to store the data even when the electrical supply is

removed from its biasing terminals. it is the excellent features include the cost efficiency and low power dissipation, programming lock for security purposes, real timer counter with the separate oscillator and It is generally or normally used in Embedded Systems applications.

III.   SOFTWARE IMPLEMENTATION SYSTEM TESTING

Testing Strategies:

Testing is a set of activities that can be planned in advance and conducted systematically testing requires that the developer discard preconceived notations of the correctness of the software just developed and overcome a conflict of interest that occurs when errors are encountered. Testing also provides the main objective of our project and understand the risk of implementation. Testing is a process of technical investigation, performed on behalf of stakeholder, that is intended to reveal quantity related information about the product with respect to the context in which it is intended to operate. Testing is the process of executing a program or an application with an intent of finding an error or bugs. Testing can be stated as the process of validating and verifying that a software program/application/product.
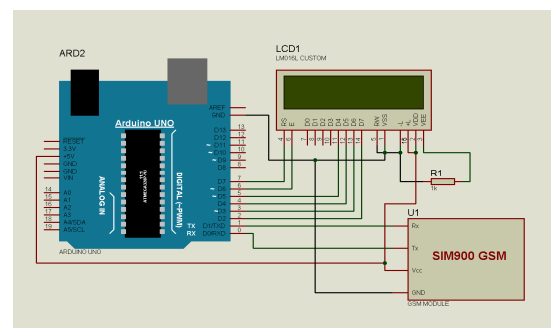
PROJECT DESCRIPTION

Fig.3. Schematic Diagram of the circuit
CIRCUIT DESCRIPTION:

Connections of **Wireless Notice Board using GSM and Arduino** are simple and shown in the figure below. Here a liquid crystal display (LCD) is used for display the "Notice" or message, which is sent though the mobile phone as SMS. Data pins of LCD namely RS, EN, D4, D5, D6, D7 are connected to arduino digital pin number 7, 6, 5, 4, 3, 2. And Rx and Tx pin of GSM module is directly connected at Tx and Rx pin of Arduino respectively. And GSM module is powered by using a 12 volt adaptor.

OPERATION OF THE PROJECT:

The project is operated by giving power supply directly to the GSM module and thus all the components are given operating power supply. The GSM module receives the message from external mobile phone and sends the message to Arduino board. The board processes this information and sends it to the LCD display so that is displays the message.

IV.　RESULTS AND APPLICATIONS

The hardware below shows the different stages of outputs obtained by the GSM based notice board. First the Arduino board will search for a GSM module connected to it. Later when the GSM module is found it establishes the network with the carrier. When a message is received by the SIM, the same message is displayed by the LCD display as shown below.

Fig.4. Initializing the Notice Board

Only after connecting the Tx and Rx pins of GSM Module to Rx and Tx pins of Arduino UNO respectively the display shows the message as "Module Connected". This means the system is ready to get connected to the carrier service.

Fig.5. Display showing message notification

The LCD displays that there is a new message that has been received and then displays it immediately on to the LCD.

CIRCUIT ADVANTAGES:

- No need of any complex wires to display the message on LCD as it is wireless.
- Consumes less power and easy to operate.
- The circuit is portable.

CIRCUIT APPLICATIONS:

- Used in bus stations, railway stations, parks, etc. to display the messages wirelessly
- This Project can also be used in colleges and organizations.

CIRCUIT LIMITATIONS:

- Display unit must have the network to receive the message wirelessly
- The must always be running power supply to the board.

V. CONCLUSION AND FUTURE SCOPE

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.

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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