SMS Based Wireless Notice Board with Monitoring System

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Abstract— **This project is designed using ARM-LPC2148 interfaced with Graphical Display. At present, when information has to be updated in a notice board, it has to be done manually. Also in present electronic systems, no matter how many displays are present, only a single notice can be sent to all of the notice boards irrespective of their places. In order to overcome this disadvantage, multiple displays along with a decoder are used to select a particular display and the corresponding information is sent through an ARM controller by using GSM technology. The monitoring system consists of an image sensor which captures the images for the specified amount of time and the images can be transferred through an USB port to a PC for storage purposes.**

Index Terms— **ARM-LPC2148, Graphical Display, ARM controller**

I. INTRODUCTION

This is an embedded based project. An embedded system is a combination of hardware and software and perhaps other mechanical parts designed to perform a specific function. A Notice Board is a very essential device in any institution / organization or public utility place like bus stations, railway stations and parks. The main aim of this project is to design an SMS driven automatic display which reduces the manual operation. This information can in turn be updated instantly at the desired location. Updates can be done in individual displays without disturbing other displays. The message to be displayed is sent as an SMS to a GSM receiver module. This message is then stored in PC and is sent to the LCD displays through the controller. The monitoring system includes a micro-miniature camera which would be capable of acquiring 3 mega pixel color images, transfer them on to a personal computer through a Universal Serial Bus (USB) link, and also store the image in a micro SD card after applying an image compression algorithm.

II. COMPONENT DESCRIPTION

A. *LPC2148 ARM CONTROLLER:*

We are using LPC2148 which is an Advanced RISC Machine. It is a 32 bit controller which follows Von Neumann architecture. It has a 3 way pipelining and a memory of 4GB

along with two UARTs. We preferred ARM over PIC because of its faster response i.e. it operates at a speed of 60 MHz and also due to its interrupt priority feature. It consumes less power and is used in applications were miniaturization is of paramount importance.

B. *LCD:*

A 16x2 character LCD with black text on green background display is used. Being sufficiently wide it serves the purpose of a notice board display screen. LCD displays are used among which any one display can be chosen for displaying the notice. We use a maximum of three LCDs in this project.

C. *GRAPHICAL LCD:*

Besides writing text, this serial graphic LCD allows the user to draw lines, circles and boxes, set or reset individual pixels, erase specific blocks of the display.

D. *GSM MODULE*

A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone.

From the mobile operator perspective, a GSM modem looks just like a mobile phone.

These GSM modems are most frequently used to provide mobile internet connectivity, many of them can also be used for sending and receiving SMS and MMS messages. We have used SIM300 GSM module. It is an Advanced Low cost modem for wireless GSM communications which includes sending and receiving text messages.
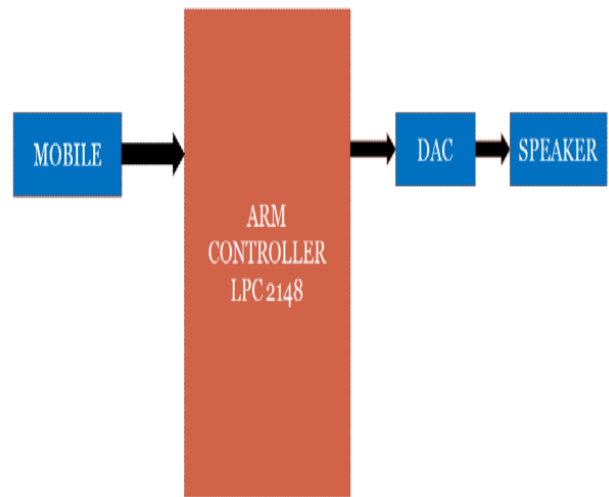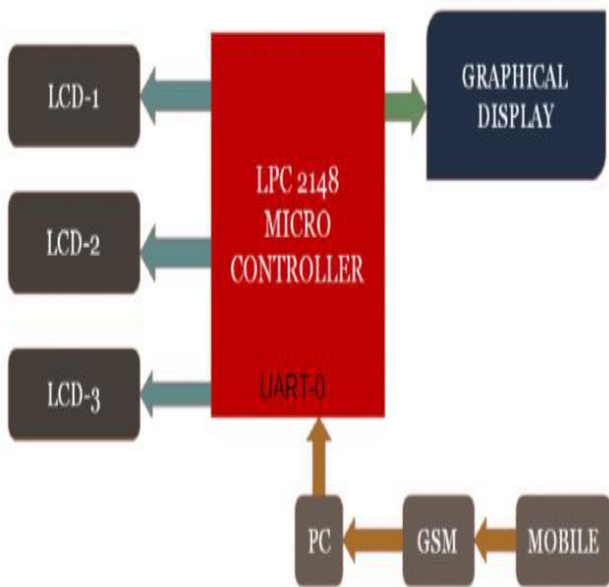
E. *AUDIO DRIVER*

Audio speaker is used to alert whenever an event takes place.

III. MODULES

A. *Module 1:*

In this module the controller is interfaced with displaying unit. The displaying unit consists of LCD and a graphical LCD. The message for this unit comes from an authorized mobile phone using GSM technology.
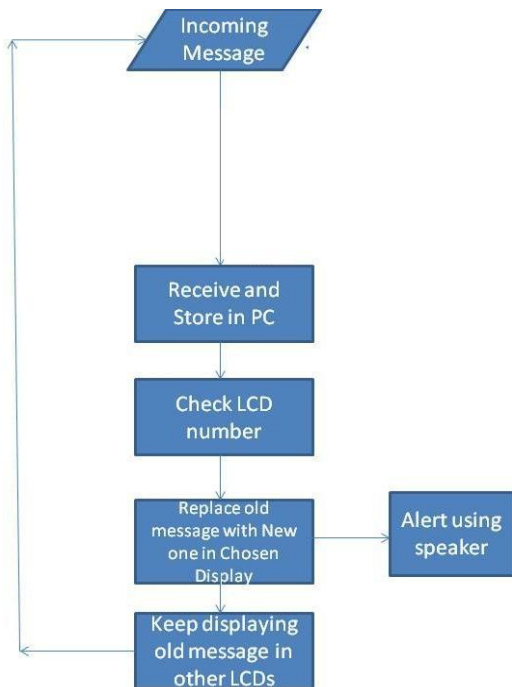
Block diagram for displaying:

Flowchart:

B. Module 2:

This module consists of a speaker and a real time clock. The speaker is used to announce the event of arrival of new information. An interrupt is generated every time a message is received and a pre-recorded message is announced by the speaker. A real time clock runs within the system which records the timing detail of the messages received.

Block diagram for announcing:

IV. OPERATION

Initially an authorized mobile user will send a message containing information to choose the required LCD display. Once the message is received it is stored in the computer. The graphical display can be used to view the marks of the students or any information about the institution or organization. When there is a high priority message (mobile user) the current information that is displayed will be held up and this high priority message will be displayed. The audio driver which has the pre-recorded voice will announce the arrival of new messages.
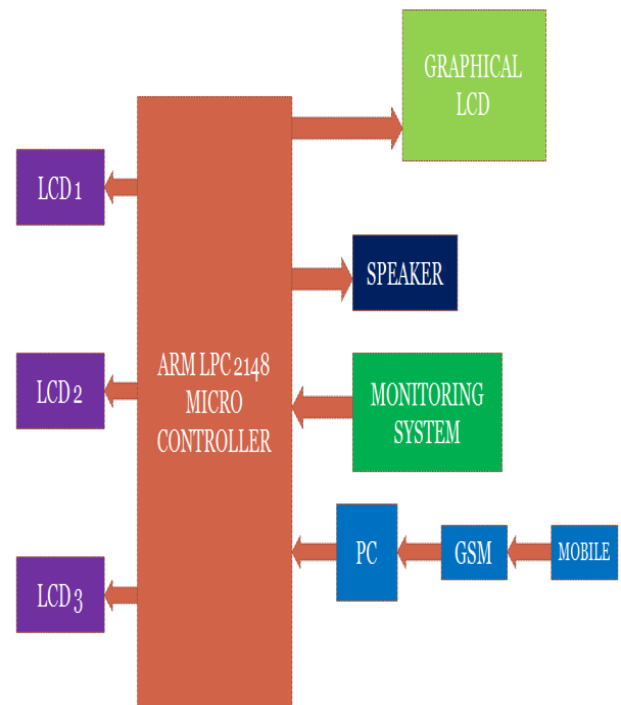
Block diagram of SMS based wireless notice board:

V. RESULTS:

Figure: Hardware part with LCD display

The code was written in Keil and then was simulated using Proteus simulator. The results were satisfactory we went about with the hardware implementation part. The hardware part was also implemented using a decoder board for the choosing among the multiple LCDs and the speaker part was also implemented successfully. But in order to use ARM controller in full effectiveness, much more development can be brought about such as the addition of a monitoring system which can make use of the other UART.

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