IOT BASED WIRELESS NOTICE BOARD

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***Abstract*—Notice Board is main important primary thing in any institution or organization or public utility places like bus stations, railway stations and parks. But sticking various notices day-to-day is a difficult process. A separate person is required to take care of this notices display and it is very difficult. The Notice board is used to display the information in an effective way to the people, but to update the messages instantly is not easy on the notice board. This project deals about an advanced hi-tech notice board. The notice will be updated to notice board using Adafruit via a Nodemcu. At any time, the user can add or remove or alter the text according to his requirement.**

***Keywords*-Notice Board, Adafruit, Arduino UNO, Node MCU, LCD.**

INTRODUCTION

Notice board is an essential information gathering system in our life. In our day-to-day life we can see notice boards in various places like, educational institutions, railway stations, shopping malls, Bus stations, offices etc. So, we can say that Notice boards are the places to leave public information such as advertise events, announce events or provide attention to the public, etc. Now days a Separate person is needed to stick those information's on the notice board. It will lead to lose of time as well as usage of manpower. In conventional analog type notice boards paper is the main medium for information exchange. We know that information's counts are endless. So, there is a usage of huge amount of paper for displaying those endless counts of information's.

I. BLOCK DIAGRAM DESCRIPTION

This will be a moving message display, which might be utilized as the digital notice board, and moreover a Wi-Fi transceiver, that will be that the most recent innovation utilized for communication between the mobile and also the embedded devices. System can work like once the user desires to display or update the notice board.

This proposed system consists of an Arduino controller as a main controller, Node MCU, and a P10 LED Matrix to display the notice. The notice that has to be updated on the notice board is sent to Arduino using Google voice assistance via Nodemcu which is connected to the Arduino. So that we can send messages from anywhere.

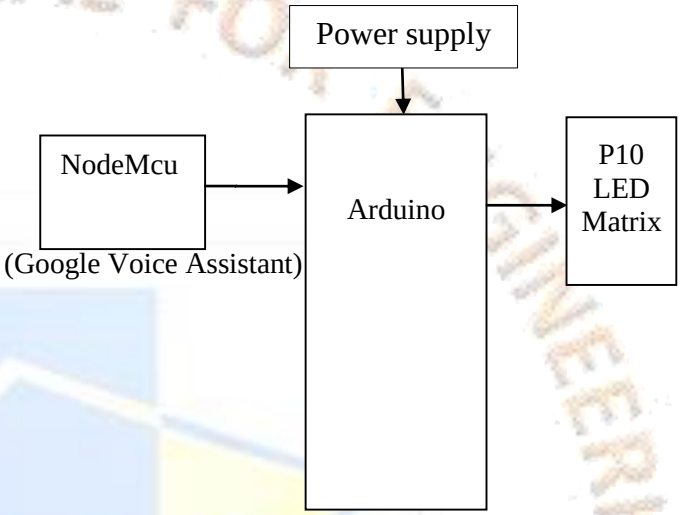

Fig1. Block diagram of System

II. EXISTING SYSTEM:

- If the user wants to change the message it needs to be done using a computer and hence the person needs to be present at the location of the display board. It means the message cannot be changed from wherever or whenever.

Disadvantages:

- Manually changed
- Particular person should write it.

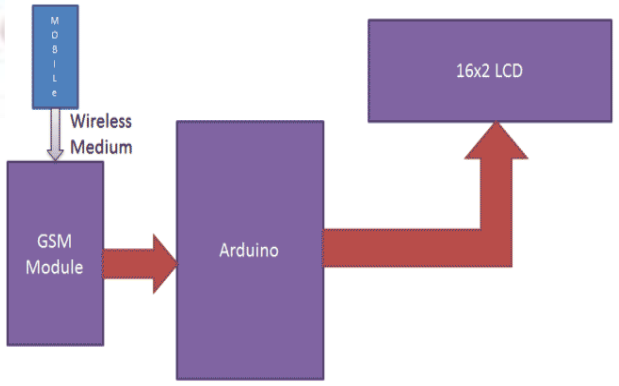

Fig. 2:

A. Over view of Arduino

Arduino is an open-source electronics prototyping platform, mostly based on small, easy-to-use hardware and software . It can affect devices, like lights, motors and other actuators by receiving input from sensor. All the action performed by Arduino is programmed to the microcontroller on the board via Arduino programming language and the

Arduino development environment. Arduino projects can be standalone or communicate with other software applications running on a computer and other types of hardware.

Fig. 3: Arduino Uno Microcontroller Development Board

The Adruino Uno board as shown in Fig.3 shows the specifications of Arduino Uno microcontroller board. The Arduino microcontroller is an easy-to-use yet powerful single-board computer that has gained considerable traction in the hobby and professional market. The Arduino is open-source, which means the hardware is reasonably priced and development software is free. This guide is for students in ME 2011, or students anywhere who are confronting Arduino for the first time. For advanced Arduino users, prowl the web; there are lots of resources. The Arduino programming language is a simplified version of C/C++. If you know C, programming the Arduino will be familiar. If you do not know C, no need to worry as only a few commands are needed to perform useful functions.

B. Arduino Hardware

The power of the Arduino is not its ability to crunch code, but rather its ability to interact with the outside world through its input-output (I/O) pins. The Arduino has 14 digital I/O pins labeled 0 to 13 that can be used to turn motors and lights on and off and read the state of switches. Each digital pin can sink or source about 40 mA of current. This is more than adequate for interfacing to most devices, but does mean that interface circuits are needed to control devices other than simple LED's. In other words, you cannot run a motor directly using the current available from an Arduino pin, but rather must have the pin drive an interface circuit that in turn drives the motor. A later section of this document shows how to interface to a small motor.

To interact with the outside world, the program sets digital pins to a high or low value using C code instructions, which corresponds to +5 V or 0 V at the pin. The pin is connected to external interface electronics and then to the device being switched on and off. The sequence of events is shown in this figure4.

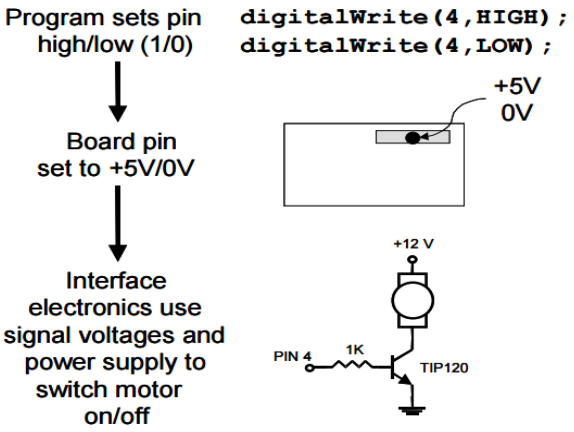

Fig. 4:

To determine the state of switches and other sensors, the Arduino is able to read the voltage value applied to its pins as a binary number. The interface circuitry translates the sensor signal into a 0 or +5 V signal applied to the digital I/O pin. Through a program command, the Arduino interrogates the state of the pin. If the pin is at 0 V, the program will read it as a 0 or LOW. If it is at +5 V, the program will read it as a 1 or HIGH. If more than +5 V is applied, you may blow out your board, so be careful. The sequence of events to read a pin is shown in this figure 5.

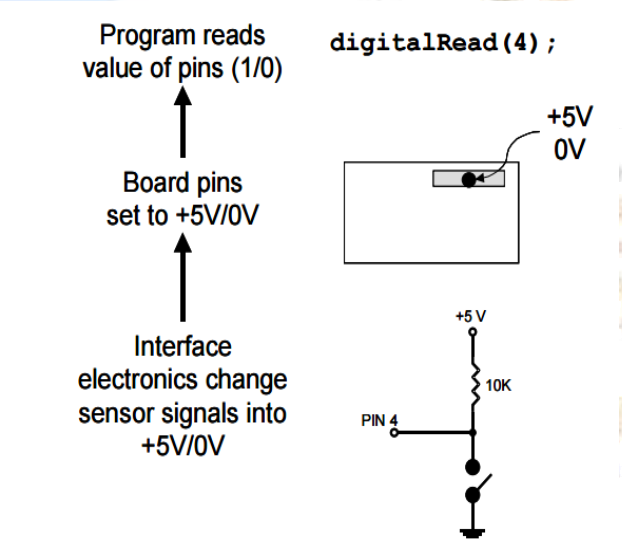

Fig. 5:

Interacting with the world has two sides. First, the designer must create electronic interface circuits that allow motors and other devices to be controlled by a low (1-10 mA) current signal that switches between 0 and 5 V, and other circuits that convert sensor readings into a switched 0 or 5 V signal. Second, the designer must write a program using the set of Arduino commands that set and read the I/O pins. Examples of both can be found in the Arduino resources section of the ME2011 web site.

Communication

The Arduino Uno has a number of facilities for communicating with a computer, another Arduino, or other microcontrollers. The ATmega328 provides UART TTL (5V) serial communication, which is available on digital pins 0 (RX) and 1 (TX). An ATmega16U2 on the board channels this serial communication over USB and appears as a virtual com port to software on the computer. The '16U2 firmware uses the standard USB COM drivers, and no external driver is

needed. However, on Windows, a .inf file is required. The Arduino software includes a serial monitor which allows simple textual data to be sent to and from the Arduino board. The RX and TX LEDs on the board will flash when data is being transmitted via the USB-to-serial chip and USB connection to the computer (but not for serial communication on pins 0 and 1).

C. POWER:

The Arduino Uno can be powered via the USB connection or with an external power supply. The power source is selected automatically. External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the Gnd and Vin pin headers of the POWER connector. The board can operate on an external supply of 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may be unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts. The power pins are as follows:

- **VIN**. The input voltage to the Arduino board when it's using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.
- **5V.** This pin outputs a regulated 5V from the regulator on the board. The board can be supplied with power either from the DC power jack (7 - 12V), the USB connector (5V), or the VIN pin of the board (7-12V). Supplying voltage via the 5V or 3.3V pins bypasses the regulator, and can damage your board. We don't advise it.
- **3V3**. A 3.3volt supply generated by the on-board regulator. Maximum current draw is 50 mA.
- **GND.** Ground pins.

D. Introduction to NodeMCU

NodeMCU is an open-source firmware and development kit that plays a vital role in designing your own IoT product using a few Lua script lines. Multiple GPIO pins on the board allow you to connect the board with other peripherals and are capable of generating PWM, I2C, SPI, and UART serial communications.

How to Power NodeMCU: You can see from the pinout image above, there are five ground pins and three 3V3 pins on the board. The board can be powered up using the following three ways.

USB Power. It proves to an ideal choice for loading programs unless the project you aim to design requires separate interface i.e.disconnected from the computer.

Provide 3.3V. This is another great option to power up the module. If you have your own off-board regulator, you can generate an instant power source for your development kit.

Power Vin. This is a voltage regulator that comes with the ability to support up to 800 mA. It can handle somewhere between 7 to 12 V. You cannot power the devices operating at 3.3 V, as this regulator unable to generate as low as 3.3V.

E. LED Display Module

A **P10 LED Display Module** is the most suitable for designing any size of outdoor or indoor LED display advertisement board. This panel has a total of 512 high brightness LEDs mounted on a plastic housing designed for best display results. Any number of such panels can be combined in any row and column structures to design an attractive LED signboard.

F. Google Assistant

Assistant is Google's voice assistant. At launch, it was an extension of Google Now - designed to be personal - while expanding on Google's existing "OK Google" voice controls. Originally, Google Now smartly pulled out relevant information for you: it knew where you worked, your meetings and travel plans, the sports teams you liked, and what interested you so that it could present you with personal information that mattered.

Google has long killed Google Now, but Assistant very much lives in the same space, fusing these personalized elements with a wide-range of voice control. Google Assistant supports both text or voice entry and is happy to follow the conversation whichever entry method you're using.

III. SOFTWARE REQUIREMENTS

A. EMBEDDED C

Implanted C makes use of KEIL IDE programming. The framework program written in implanted C can be placed away in Microcontroller. The accompanying is a portion of the actual motives behind composing applications in C as opposed to get collectively. It is much less disturbing and much less tedious to write down in C then amassing. C is less traumatic to trade and refresh. You can utilize code available in capacity libraries. C code is compact to different microcontrollers with subsequent to 0 alteration. Genuine, installed C programming need nonstandard expansions to the C driver with a view to bolster charming components, as an example, settled point range catching, numerous unmistakable reminiscence banks, and fundamental I/O operations. Installed C utilize the greater part of the grammar and semantics of well-known C, e.g. number one() paintings, variable definition, facts type statement, contingent proclamations (if, switch. Case), circles (even as, for), capacities, exhibits and strings, structures and union, piece operations, macros, unions, and so on.

B. Embedded systems programming

Installed frameworks writing computer programs is not quite the same as creating applications on a desktop PCs. Key attributes of an implanted framework, when contrasted with PCs, are as per the following:

•Embedded gadgets have asset limitations (restricted ROM,

constrained RAM, constrained stack space, less handling power)

•Components utilized as a part of installed framework and PCs are distinctive; implanted frameworks ordinarily utilize littler; less power devouring segments. Inserted frameworks are more fixing to the equipment.

Two remarkable components of Embedded Programming are code speed and code estimate. Code speed is represented by the handling power, timing requirements, while code size is administered by accessible program memory and utilization of programming dialect. Objective of implanted framework writing computer programs is to get greatest elements in least space and least time.

Implanted frameworks are modified utilizing distinctive sort of dialects:

•Machine Code

•Low level dialect, i.e., get together

•High level dialect like C, C++, and Java and so on.

•Application-level dialect like Visual Basic, scripts, Access, and so on.

C. Arduino IDE:

Arduino IDE where IDE stands for Integrated Development Environment – An official software introduced by Arduino.cc, that is mainly used for writing, compiling and uploading the code in the Arduino Device. Almost all Arduino modules are compatible with this software that is an open source and is readily available to install and start compiling the code on the go.

Introduction to Arduino IDE:

- Arduino IDE is an open-source software that is mainly used for writing and compiling the code into the Arduino Module.
- It is an official Arduino software, making code compilation too easy that even a common person with no prior technical knowledge can get their feet wet with the learning process.

IV. OVERVIEW

The ATmega48PA/88PA/168PA/328P is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega48PA/88PA/168PA/328P achieves throughputs approaching 1 MIPS per MHz allowing the system designed to optimize power consumption versus processing speed.

The AVR core combines a rich instruction set with 32 general purpose working registers. All the 32 registers are directly connected to the Arithmetic Logic Unit (ALU), allowing two independent registers to be accessed in one single instruction executed in one clock cycle. The resulting architecture is more code efficient while achieving throughputs up to ten times faster than conventional CISC microcontrollers.

V. CONCLUSION

By introducing the concept of this technology in the Field of the communication we can make our communication more efficient and faster, with greater efficiency. We can display the messages with less errors and maintenance. This system can be used in college, school, offices, railway station and commercial as well as personal used.

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