WIRELESS DIGITAL NOTICE BOARD

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Abstract:

Notice Board is primary thing in any institution/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. 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. Matrix type display is designed using 5mm LED on a printed circuit board. The notice will be updated to notice board using goggle voice assistant via a Nodemcu. At any time the user can add or remove or alter the text according to his requirement

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.

Existing System:

In the 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.

Proposed System:

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.

Block Diagram:
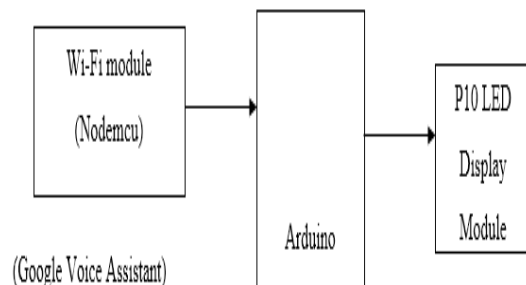
Arduino Uno

Arduino is an open source platform microcontroller board which has 6 analog pins, 14 digital pins, one serial port, one power jack and one USB jack.
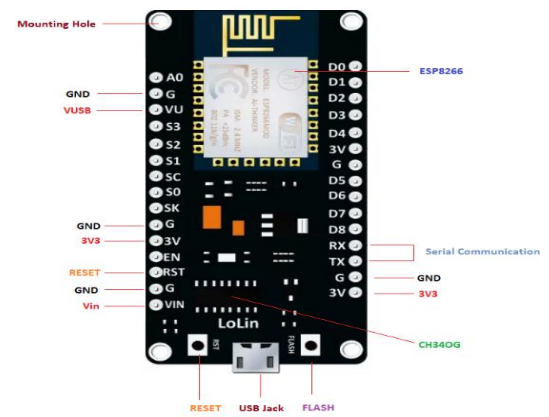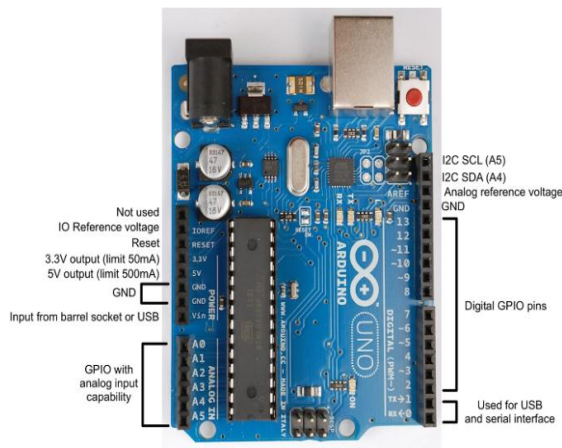
Arduino Board:

The Arduino board comprises of I/O pins. In this 13 pins are digital I/O pins. There are 6 Analog pins i.e., from A0 to A5. In this Arduino board we have some pulse width modulation pins those are in between 0 to 13 pins. They are 3, 5, 6, 9, 10, &11.

Features of Arduino Microcontroller:

- ✓ Its operating voltage is 5V.
- ✓ In Arduino we have serial communication for that we use 0 & 1 pins in which 0 is for TX and 1 is for RX.
- ✓ It supports I2C and SPI protocols for communication.
- ✓ Its clock speed is 16MHZ which is faster than other Controller.
- ✓ It has USB connection which means we can connect it to PC and can operate through PC.

Nodemcu:

Nodemcu is an open source platform microcontroller and development board that plays a active part in creating IOT product using a few Lua script lines. It supports all GPIO pins to connect with peripherals and it generates PWM, I2C, SPI and UART Serial Communication

P10 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.
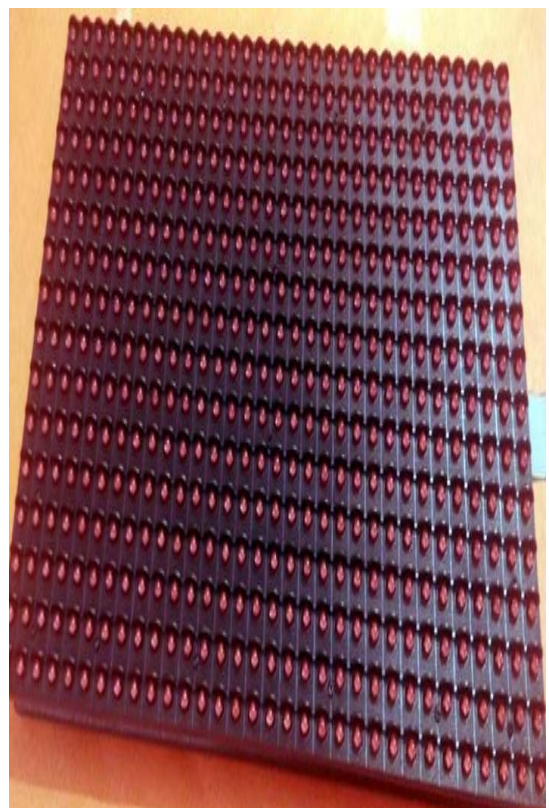
Software Requirements

Arduino IDE:

The Arduino IDE is a software which can be implemented in multiple computing platforms. It is widely used for Windows, MACOS, and Linux. This is used to write and upload the programs into different types of Arduino boards (Arduino UNO, Arduino MEGA). This IDE supports C, C++ Languages. Arduino IDE provides its libraries from an open source electronics prototyping programs.

Working of the Project

This proposed system consists of an Arduino controller as a main controller, Wi-Fi module (Node MCU), and a LED matrix display to display the notice. The notice that has to be updated on the notice board is sent to Arduino using goggle voice assistance via a Wi-Fi module which is connected to the Arduino. The user has to install the goggle voice assistant application on the mobile phone and login to the application using the Gmail ID and the same has to be updated in the Arduino controller. So every time when the user wants anything to be updated on the LED matrix display then he/she has to imply give message as voice command using goggle assistant and the same will be updated from anywhere in the world.

Advantages

➢ No need of any cables for displaying the new information on the LED display.
➢ It is very easy to operate and consumes less power
➢ The whole setup of notice board is portable

Applications

➢ Public places like bus stands, railway stations, airports, shopping malls.
➢ This project is also used in organizations, schools and colleges.

Embedded system implementation

Introduction:

An embedded system is one kind of a computer system mainly designed to perform several tasks like to access, process, and store and also control the data in various electronics-based systems. Embedded systems are a combination of hardware and software where software is usually known as firmware that is embedded into the hardware. One of its most important characteristics of these systems is, it gives the o/p within the time limits. Embedded systems support to make the work more perfect and convenient. So, we frequently use embedded systems in simple and complex devices too. The applications of embedded systems mainly involve in our real life for several devices like microwave, calculators, TV remote control, home security and neighborhood traffic control systems, etc.

Embedded system includes mainly two sections, they are
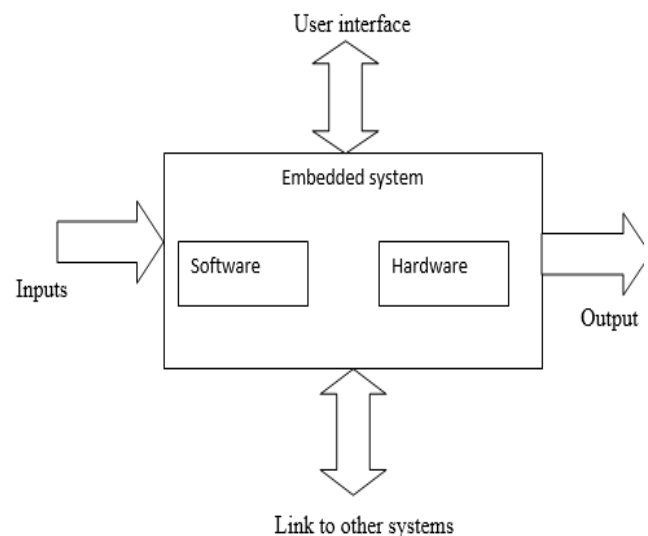
1. Hardware
2. Software

Fig: Overview of embedded system

Embedded System Hardware:

System hardware has elements like input output (I/O) interfaces, user interface, memory and the display. Usually, an As with any electronic system, an embedded system requires a hardware platform on which it performs the operation. Embedded system hardware is built with a microprocessor or microcontroller. The embedded embedded system consists of:

- Power Supply
- Processor
- Memory
- Timers
- Serial communication ports
- Output/Output circuits
- System application specific circuits
- Embedded systems use different processors for its desired operation. some of the processors used are

1. Microprocessor
2. Microcontroller
3. Digital signal processor

Microprocessor vs. Microcontroller

Microprocessor

- CPU on a chip.
- We can attach required amount of ROM, RAM and I/O ports.
- Expensive due to external peripherals.
- Large in size
- general-purpose

Microcontroller
- Computer on a chip
- fixed amount of on-chip ROM, RAM, I/O ports
- Low cost.
- Compact in size.
- Specific –purpose

Embedded System Software:

The embedded system software is written to perform a specific function.

It is typically written in a high level format and then compiled down to provide code that can be lodged within a non-volatile memory within the hardware.

An embedded system software is designed to keep in view of the three limits:

Availability of system memory
Availability of processor's speed
When the system runs continuously, there is a need to limit power dissipation for events like stop, run and wake up.

Bringing software and hardware together for embedded system:

To make software to work with embedded systems we need to bring software and hardware together .for this purpose we need to burn our source code into microprocessor or microcontroller which is a hardware component and which takes care of all operations to be done by embedded system according to our code.

Generally we write source codes for embedded systems in assembly language, but the processors run only executable files .The process of converting the source code representation of your embedded software into an executable binary image involves three distinct steps:

Each of the source files must be compiled or assembled into an object file.

All of the object files that result from the first step must be linked together to produce a single object file, called the re-locatable program.

Physical memory addresses must be assigned to the relative offsets within the re-locatable program in a process called relocation.

The result of the final step is a file containing an executable binary image that is ready to run on the embedded system.

Related Works:
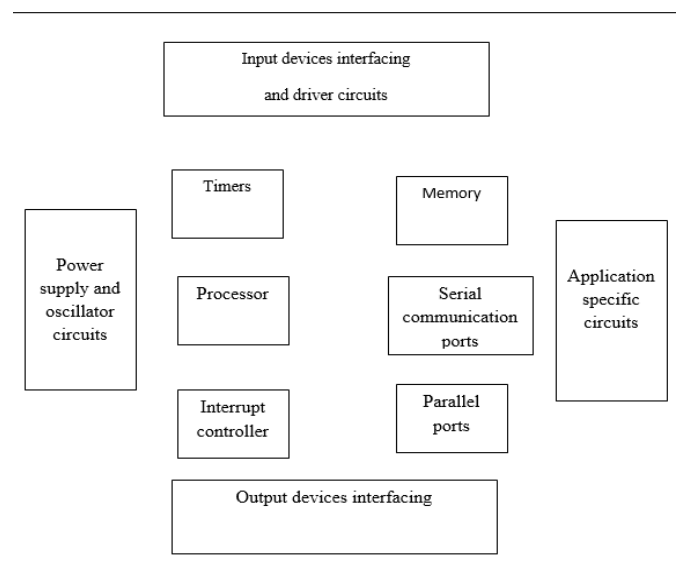

Block diagram of embedded system

Stage 1:

Considering the problems of existing methods and giving solution to that problem by considering the basic requirements for our proposed system
Stage 2:
Considering the hardware requirement for the proposed system
For this we need to select the below components:
1. Microcontroller
2. Inputs for the proposed system (ex: sensors, drivers etc..,)
3. Outputs (ex: relays, loads)
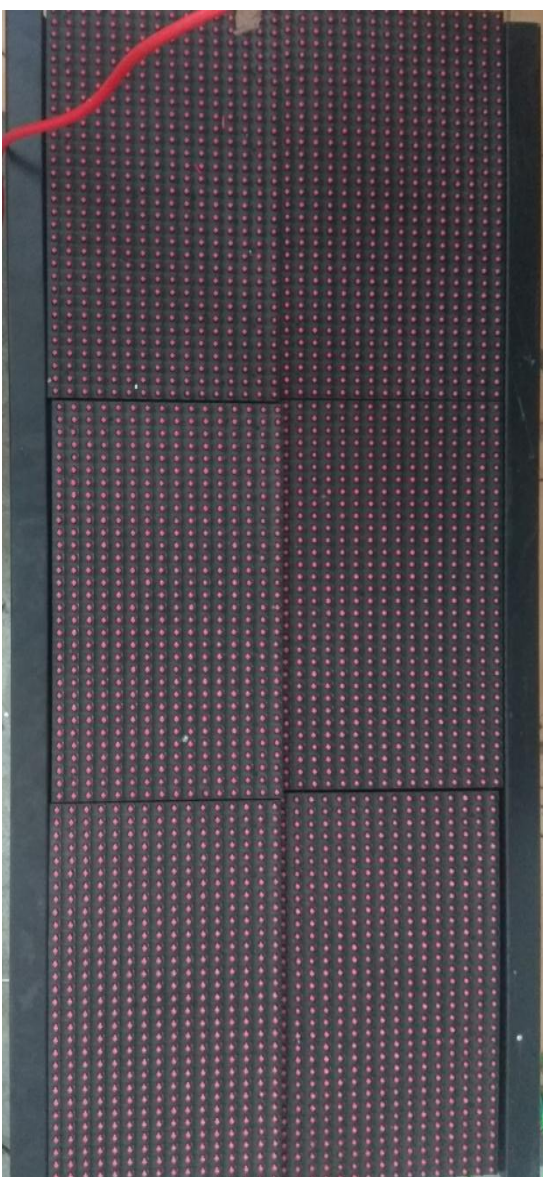
Stage 3:
After considering hardware requirements, now we need to check out the software requirements. Based on the microcontroller we select there exists

different software for coding, compiling, debugging. we need to write source code for that proposed system based on our requirements and compile, debug the code in that software.

After completing all the requirements of software and hardware we need to bring both together to work our system. For this we need to burn our source code into microcontroller, after burning our source code to microcontroller then connect all input and output modules as per our requirement.

likewise gives client validation to maintain a strategic distance from any abuse of proposed framework.

References

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Conclusion

- Remote activities allow administrations, for example, long-go interchanges, that are inconceivable or illogical to execute with the utilization of wires. It gives quick exchange of data and is less expensive to introduce and keep up. This paper give effective method for showing messages on Notice Board utilizing Wireless Technology. It Neeraj Khera and Divya Shukla "Development of simple and low cost Android based wireless notice board" IEEE 2016.
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