USER FRIENDLY WIRELESS DIGITAL NOTICE BOARD USING WIFI

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Abstract: To collect data on LED matrix display, use a wireless digital notice board display. Institutions, organisations, etc. may also utilise this project, however daily notice-sending is a laborious operation. The advanced notice board is the subject of this project. With our suggested solution, users will be able to send wireless announcements on a notice board by utilising a smart phone and a controller WiFi module. They will also get automatic notifications via the cloud. Arduino microcontrollers are the foundation of its functioning. When a person concurrently submits a notice via their smartphone, the message is shown on the LED display board and other users get automatic notifications on their smartphones via the cloud.

I. INTRODUCTION

In every institution and public space, including bus and train terminals and amusement parks, notice boards are a typical means for people to share information. But it takes time to put up different notices every day. This message display board requires more personnel to maintain. The topic of this study is a cutting-edge wireless electronic notice board. One often used tool for information presentation is the electronic notice board. LCDs and Graphical LCDs are used to show the data or messages. The wireless LCD system employs radio frequency as the communication medium. The transmitter and receiver components make up the system. A user uses an input module on a PC or mobile device to place a message via the transmitter module. The receiver then receives the information using GSM technology. After then, it will be decrypted and shown on an electronic bulletin board.

II. LITERATURE REVIEW

In the 1970s, cellular networks were developed to increase the frequency shortage in radiotelephone services. This resulted in the launch of the Advanced Mobile Phone System (AMPS), which used analogue transmission. It was recognised that cellular networks began with this generation. The second generation, known by a variety of acronyms such as ERMES (European Radio Messaging System) and GSM (Global System for Mobile Communications), was built on digital transmission. During this period alone, a number of standards for cordless phones were also established. The third generation has emerged as a result of the unification of several technologies; FPLMTS (Future Public Land Mobile Telecommunications System), UMTS (Universal Mobile Telecommunication System), and IMT-2000 are a few of the well-known examples.

III.DESIGN OF HARDWARE

This chapter provides a quick explanation of the hardware. It goes into great depth about each module's circuit diagram.

ARDUINO UNO

A microcontroller board based on the ATmega328 is called the Arduino Uno (datasheet). It has a 16 MHz ceramic resonator, 6 analogue inputs, 14 digital input/output pins (six of which may be used as PWM outputs), a USB port, a power connector, an ICSP header, and a reset button. It comes with everything required to support the microcontroller; all you need to do is power it with a battery or an AC-to-DC converter or connect it to a computer via a USB connection to get going.

The FTDI USB-to-serial driver chip is not used by the Uno, setting it apart from all previous boards. As an alternative, it has the Atmega16U2 (or Atmega8U2 up to version R2) configured as a serial-to-USB converter. The 8U2 HWB line on the Uno board is pulled to ground by a resistor, which facilitates DFU mode entry. The Arduino board now includes the following updates:

• 1.0 pin out: two further new pins, the IOREF, are positioned next to the RESET pin, the SDA and SCL pins that were introduced, and they enable the shields to adjust to the voltage supplied by the board. Shields will eventually work with both the Arduino Due, which runs on 3.3V, and the boards that utilise the AVR, which runs on 5V. The second pin is unconnected and set aside for future uses.

• A more robust RESET circuit.

• The 8U2 is replaced with an ATMega 16U2.

"Uno" is an Italian word for one, and it was chosen to commemorate the impending introduction of Arduino 1.0. Going future, the Arduino reference versions will be the Uno and version 1.0. The Uno is the most recent in a line of USB Arduino boards and the platform's standard model; see the index of Arduino boards for a comparison with earlier iterations.

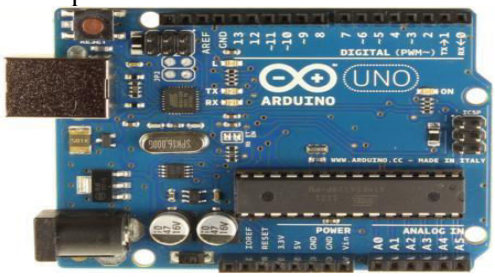

Fig: ARDUINO UNO

POWER SUPPLY:

The purpose of the power supplies is to convert the high voltage AC mains energy into a low voltage supply that is appropriate for use in electronic circuits and other devices. One may disassemble a power supply into a number of blocks, each of which carries out a specific task. "Regulated D.C. Power Supply" refers to a d.c. power supply that keeps the output voltage constant regardless of differences in the a.c. main or the load.

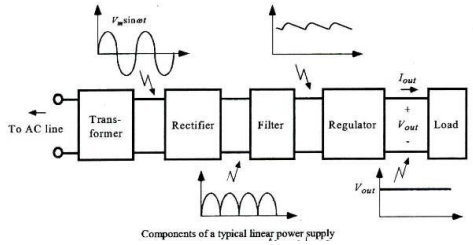

Fig: Block Diagram of Power Supply

LCD DISPLAY

The model shown here is the one that is most often utilised in practice due to its cheap cost and enormous potential. Its HD44780 microcontroller (Hitachi) platform allows it to display messages in two lines of sixteen characters each. All of the alphabets, Greek letters, punctuation, mathematical symbols, etc., are shown. Furthermore, it is possible to show custom symbols created by the user. Some important features are the automatic changing of the message on the display (shift left and right), the presence of the pointer, the lighting, etc.

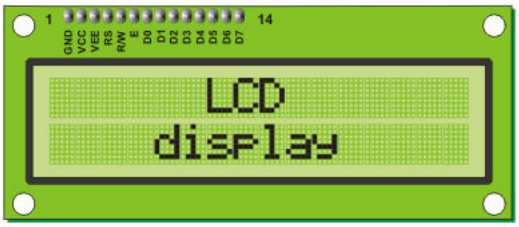

Fig: LCD

BUZZER

Relays, buzzer circuits, and other circuits cannot be driven by the current available on digital systems and microcontroller pins. The microcontroller pin can provide a maximum of 1-2 milliamps of current, even though these circuits need around 10 milliamps to work. Because of this, a driver—such as a power transistor—is positioned between the buzzer circuit and microcontroller.Relays, buzzer circuits, and other circuits cannot be driven by the current available on digital systems and microcontroller pins. The microcontroller pin can provide a maximum of 1-2 milliamps of current, even though these circuits need around 10 milliamps to work. Because of this, a driver—such as a power transistor—is

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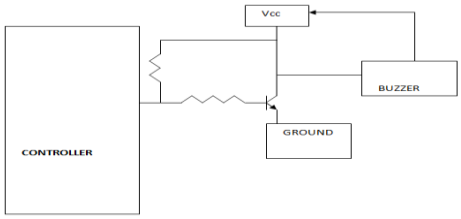


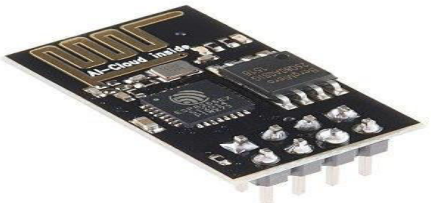
WIFI MODULE:

A low-cost Wi-Fi microprocessor with complete TCP/IP stack and microcontroller functionality, the ESP8266 is made by Chinese firm Espressif Systems, located in Shanghai.[1]

In August 2014, a third-party producer named Ai-Thinker's ESP-01 module brought the chip to the attention of western manufacturers for the first time. With the help of this little module, microcontrollers may establish basic TCP/IP connections and connect to Wi-Fi networks by utilising Hayes-style instructions. But at the time, there wasn't much documentation available in English on the chip or the commands it could execute.[2] Many hackers were drawn to investigate the module, chip, and software on it as well as translate the Chinese documentation because of its very cheap cost and the fact that it had very few external components, suggesting that it may someday be very affordable in production.[3]

With its 1 MiB of integrated memory, the ESP8285 is an ESP8266 that enables single-chip Wi-Fi capable devices.[4]

The ESP32 is these microcontroller chips' replacement.



LED:

A light source made of semiconductors with two leads is called an LED. When turned on, this p-n junction diode generates light.[5] Within the device, electrons may recombine with electron holes when a proper voltage is given to the leads, releasing energy in the form of photons.

This phenomenon is known as electroluminescence, and the energy band gap of the semiconductor controls the colour of the light, which corresponds to the photon's energy. Since LEDs are usually tiny—less than 1 mm2—the radiation pattern may be modified by integrated optical components.

Early LEDs were often utilised to replace tiny incandescent bulbs as indication lighting for electrical equipment. They were quickly bundled into seven-segment displays for use as numeric readouts, and digital clocks became popular with them. Modern advancements have led to the creation of LEDs that are appropriate for task and ambient lighting. New displays and sensors have been made possible by LEDs, and enhanced communications technology has benefited from their rapid switching rates.Compared to incandescent light sources, LEDs are smaller, quicker switching, more physically resilient, need less energy, and have a longer lifespan. Applications for light-emitting diodes are many and include traffic signals, advertising, traffic lights, camera flashes, lit wallpaper, aircraft illumination, and car headlights. Additionally, they are much more energy-efficient, and their disposal may pose less environmental risks.

LED MATRIX DISPALY

An increasing range of outdoor and interior applications are benefiting from the increased adaptability and visually appealing effects offered by LED-based signage and matrix

displays. Even now, it's difficult to tell still photos on their excellent displays apart from conventional printed or painted billboards thanks to recent advancements in LED technology. Texas Instruments examines in-depth the fundamental technological ideas of LED display systems in this course, as well as the engineering factors needed to create them using arrays of discrete LED lights.

LED driving basics

In order to choose the optimal approach, we will first examine the several LED driving circuitries. establishing a voltage supply connection

It is well known that when there is sufficient forward voltage (VF), an LED bulb (or diode) turns on. Light is released when the forward current is ON. Using this foundational information, the first choice in Figure 1a may be generated, but, it is not functional. Equation 1 states that an LED's current is an exponential function of its voltage bias, meaning that the voltage has a significant impact on the LED lamp's light intensity. Most of the time, the high current situation transforms the typically long-lasting LED into a very costly flash bulb.

This explains why Figure 1a is inoperable. Depending on the LED product and if VT is the thermal voltage, RS is a constant in equation 1. The difference in ILED is only 47 times more than 0.1V of VF change, assuming that the series resistance RS is perfect and zero.

For instance, a target LED current of 20 mA increases to 1A with a just 0.1V bias current variation. A genuine LED device still displays a 10 to 20 times difference with a 0.1V bias differential even when accounting for a realistic RS value.

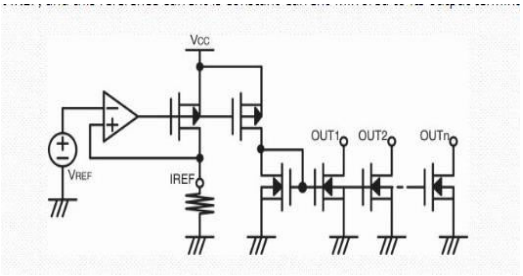


Figure :Comparing three LED driver circuits

IV. PROJECT DESCRIPTION

The design of a dot matrix LED display utilising a Micro Conroller is suggested in this project.

4.1. BLOCK DIAGRAM:

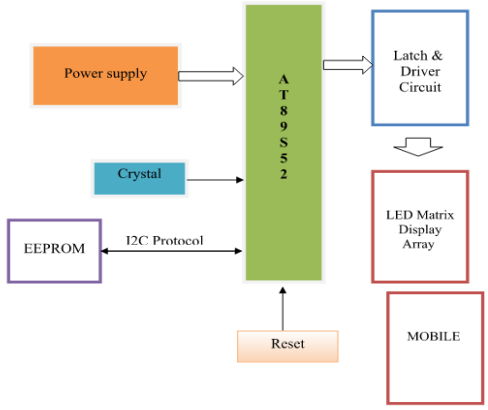


Fig 6.1 block diagram

4.2. SOFTWARE REQUIREMENTS:

- Arduino IDE
- Embedded c language

4.3. HARDWARE REQUIREMENTS:

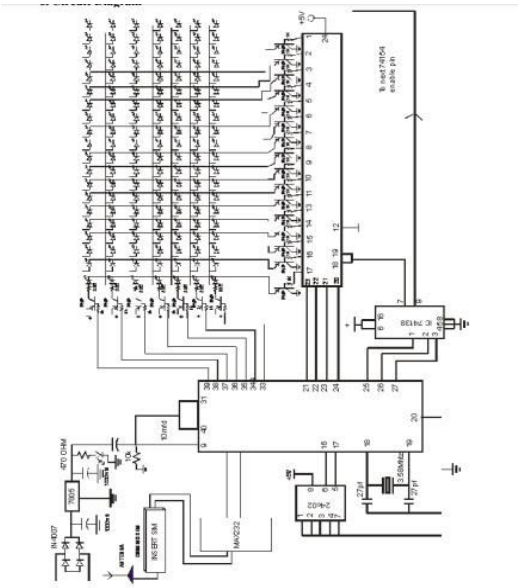
- Transformer
- Diodes
- Capacitors
- Resistors
- LEDS
- Transistor
- PC Key Board
- GSM Module
- 8051 series Microcontroller

4.4. WORKING:

The Atmel micro controller serves as the foundation for the project. All of the display and control capabilities is provided by this micro controller. It also handles the creation of various display effects for the text that is provided. A printed circuit board with 5mm LEDs is used in the creation of a matrix-style display. All of these LEDs are intended to be driven by a driver circuit. To input the necessary text or message, a simple PC keyboard may be attached to this

device. The keyboard's function keys may be used to pick among a variety of scrolling effects. The user has the ability to adjust the text's scrolling pace to suit their needs. The user may unplug the keyboard after typing the text. The user may change the text at any moment to suit his needs, including adding and removing words. A regulated 5V, 1A power supply is used in this project. Voltage control is accomplished using the 7805 three terminal voltage regulator. A bridge type full wave rectifier is used to rectify the 230/12V step down transformer's secondary's ac output.

4.5 CIRCUIT DIAGRAM



4.6. FLOW CHART:

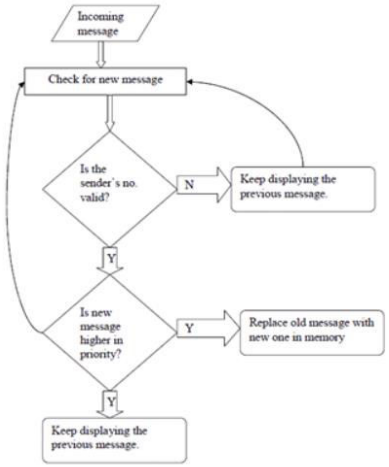


Fig 6.3. Flow chart

V. CONCLUSION

The WiFi-based display prototype has an effective design. This prototype may be made fully transportable by integrating its capacities with a display board. The SMS is accepted, stored, verified, and then shown in the LED module. Every time an SMS is read, it gets removed from the APP to make way for the next one. There may only be one SMS shown at once. Extended RAM and more advanced microcontrollers may be used to overcome these restrictions. It is possible to use commercial display boards to build the prototype. Here, it may address the issue of immediate information sharing.

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