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DEVELOPMENT OF A WIRELESS COMMUNICATION MESSAGE BOARD USING BLUETOOTH TECHNOLOGY

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ABSTRACT: Wearable electronic display boards that are Bluetooth-enabled are the focus of this article, which describes a creative and fun way to interact with the public. You won't have to wait long at all to send any letter when you use short messaging service (SMS). Compared to the prior method, the current approach to commenting on bulletin boards is more efficient and dependable. Public areas, shopping complexes, institutions, and other sorts of facilities could be made safer by using the proposed technique. On top of that, it might teach people how to stay safe and what to do if an emergency rolls around.

KEYWORDS: Bluetooth module, Arduino, 8x8matrix display, microcontroller, muti terminal

1. INTRODUCTION

Cell phones and associated devices are becoming increasingly commonplace in today's society. Embedded systems and communications are becoming increasingly popular topics of research. In the past fifteen years, mobile phone usage has skyrocketed. Innovations in networking technologies have made it simpler to establish and expand networks of any size. Traditional landlines are quickly becoming obsolete as the majority of people choose to communicate through mobile devices. Notice boards are a common means of communication for many different types of organizations, from small enterprises to large educational institutions. Lots of paper is made and then thrown away by businesses. Global warming has been exacerbated by deforestation.

The environmental issues we care about are so important to us that we worry even modest adjustments to our technology use can have a negative impact. The development of an autonomous display board that can be controlled by short message service (SMS) is the primary goal of this project. This board can serve as a substitute for both permanent and temporary electronic notice boards. We need a display toolkit that can communicate with actual mobile phones and get text messages.

The procedure is detailed in the section that addresses the transmitter and the listener. A message is sent to the Bluetooth module by the approved mobile device. A word is sent from the Bluetooth module to the microcontroller, which then displays it on the matrix display board. From the WIFI module, the communication cycle travels to the matrix display via both parallel and serial formats. To get the result, an LCD panel is utilized. This article delves into

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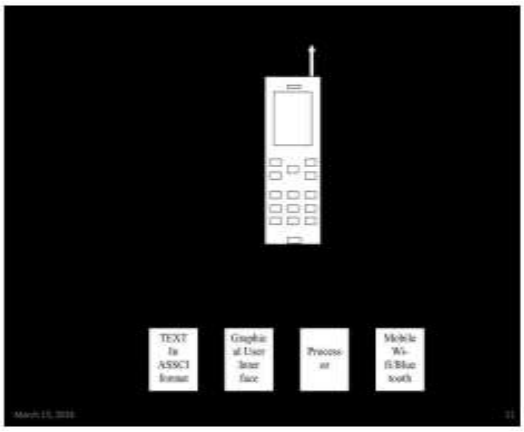
a potential system that a school or company may implement to assist with many operations such as advertising, train operations, crime prevention, traffic control, and more.

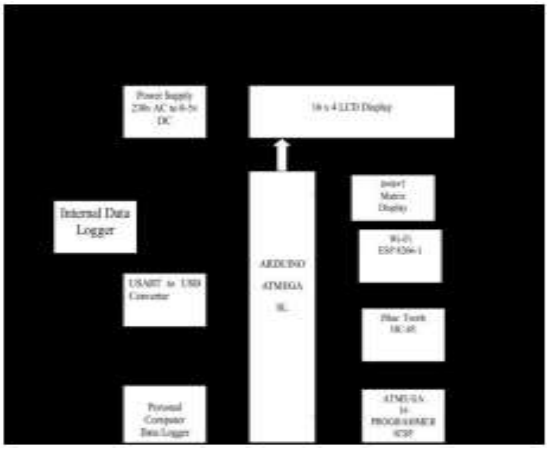
The program's versatility, speed, and user-friendliness are a few of its benefits. We can improve the security system, raise public awareness of emergency procedures, and reduce the risk of many disasters by implementing these concepts.

2. RELATED WORK

The audience is provided with a wireless electronic message board that is synchronized with GSM. All claims of rapid message transmission are disproven by this, which suggests that SMS transmission is superfluous.

Folks believe this is a better and more dependable alternative to the old-fashioned method of putting messages on bulletin boards. Improving safety, educating individuals on emergency protocols, and solving long-term concerns are the goals of the suggested strategy. Many public spaces, including huge buildings and commercial complexes, benefit from its use. The message board displays the results of a sequence of AT instructions. Boards that work with GSM can disseminate posts made by registered users.





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3. DESCRIPTION OF THE PROPOSED METHOD

USING HC-05

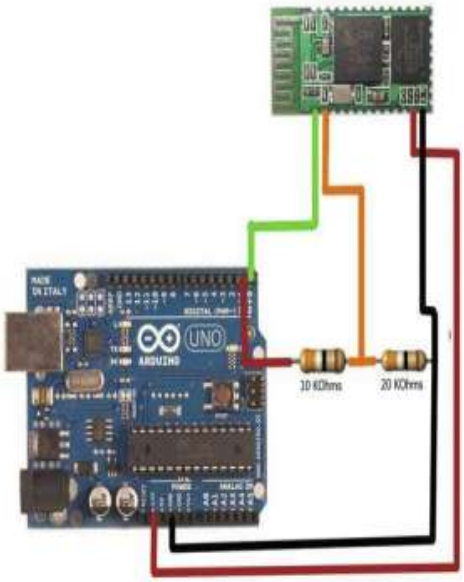
Operating environment:

The most important things you should focus on while working with the Arduino are establishing a safe connection to the device and collecting data in real time. Within a radius of ten meters, the device could only be used to carry out its functions; these activities could not be carried out any further. To put it into perspective, the devices have the potential to have a range that is as far as fifteen meters.

The building of habitation walls that can reach heights of up to five meters is made possible through the utilization of lightweight materials. It will be feasible to completely do away with the range by the simple addition of a single layer of paper insulation to the framework. There is a risk that this will lead to the transmission of information that could be harmful between the internal domain and the external domain. This is a possibility.

Equipment used:

1. Basic Mega or Arduino Uno for beginners. Any Arduino that operates on 5 volts will do.
2. The HC-06 is a more budget-friendly option, however either of the two Bluetooth adapters (HC-05 and HC-06) will do the trick. The supervisory capabilities of the HC-05 allow it to process more requests. The additional leeway it provides can prove useful, especially considering how near the prices are.
3. A channel for conveying the message. Connecting a prototype shield to a connector is done using a four-conductor cable. A breadboard arrangement or female-to-male connectors directly to the Arduino's terminals are all that's required. The module may be more easily attached to the proto cover. You can disable Bluetooth while the code is being broadcast by connecting a capacitor to this 5-volt line. It may be sufficient to set up a resistance of 1 to 2 kΩ between the soil and the Tx. This image shows the steps needed to link a Bluetooth module to an Arduino.



The standard serial protocol and the Arduino's D0 and D1 ports will be utilized in this course. A link exists between the Bluetooth reception pin (D0, Rx) and the Bluetooth transmission

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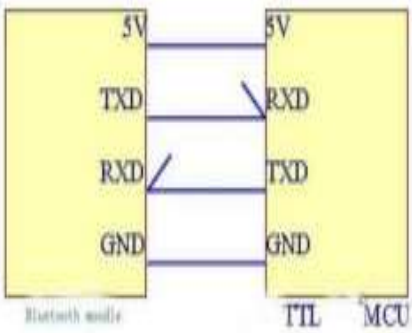
pin (Tx). According on the data provided, it seems that D1 and Rx are linked via the Bluetooth protocol.



Correct connection

This discussion will not investigate the alternative Bluetooth method, "software serial." If your Bluetooth is configured as software serial, this step is superfluous. No additional hardware is needed beyond the standard 5V and ground connectors. Typically, there are six needles on an HC-05. No one else needs to be involved with this project. The JY-MCU power supply has level shifting capabilities, thus it can operate from 3.6V to 6V, however the HC-0x modules can only be powered by 3.3V. The optional appendix is the sole location where you can discover details regarding the variations between Bluetooth master and slave equipment.

Notes on what the bluetooth module is about:

The Bluetooth settings of Android and Arduino are different. When connected to an Arduino, it doubles as a serial display, enhancing the device's utility. Android will recognize the Arduino as any other Bluetooth device, connected or not. It seems like this is the situation:

The assembly process is beyond Arduino's control. Since it is only responsible for supplying energy, it can be disabled if an alternative power source is accessible.

The Arduino's functionality is still uncertain, even if your Android and Bluetooth devices establish a successful connection. For Android users, it may be possible to link an Arduino and Bluetooth using serial, however the efficacy of this connection is unclear. make sure that Arduino and Bluetooth won't be able to connect until the signal reaches Android.

The software for Android controls the whole process of connecting and pairing devices. The device's processing and data storage capabilities make it perfect for interacting with sensors and other application-specific devices through general-purpose input/output (GPIO) interfaces. It can run with minimal coding or programming. The front-end module and any auxiliary hardware are superfluous because the device is built within the chip. Printed circuit boards (PCBs) could potentially shrink in size as a result of this. In addition to supporting Bluetooth coexistence, the ESP8266 can also handle VoIP applications. Because its self-calibrating radio frequency (RF) functions independently in any working environment, it does not require any additional parts. Thanks to the amazing community, the ESP8266 can pick up a plethora of practical skills. Further facts regarding the ESP8266 can be found in the helpful documentation section below.

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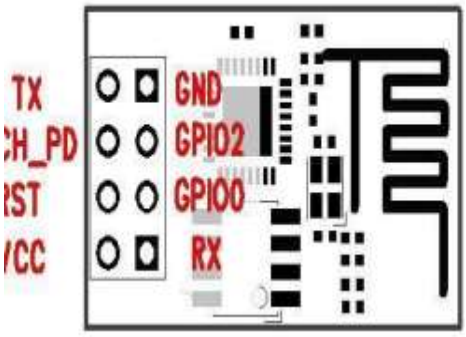
ESP8266 Pin diagram:



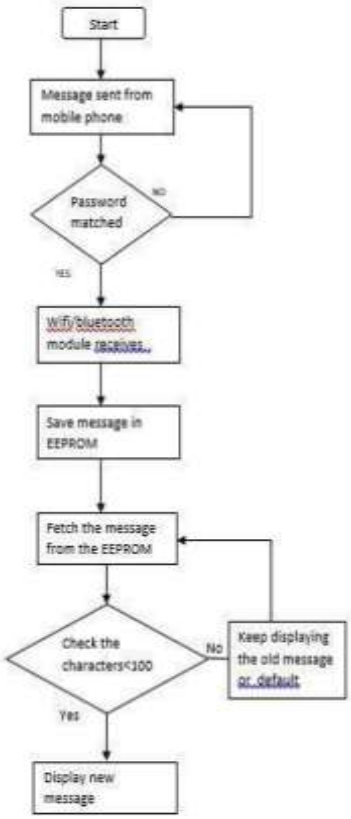
USING ESP8266

The ESP8266 WiFi Module is a small microcontroller that comes with a built-in TCP/IP stack and a standard operating system. It is possible that it may provide some.

PROTEUS

Short, efficient scripts can be easily created by combining the functional technique with an extensive library of pre-existing functions. In order to make the text more readable, quite broad keywords were included. With the help of the SDK templates and the instructions, users can extend Proteus with additional high-level functions, expanding the capabilities of C. The previous features' usage pattern is very similar to the new ones. Formulas are provided by value references, while variables are passed by references. It is the interpretive structure of the Proteus programming language that sets it apart. This architectural system precompiles programs before storing them in memory.

The abundance of existing methods typically leads to a rapid execution time. It often functions in the same way as executable programs.



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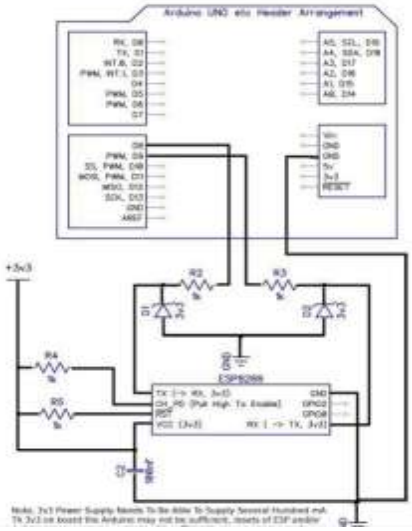
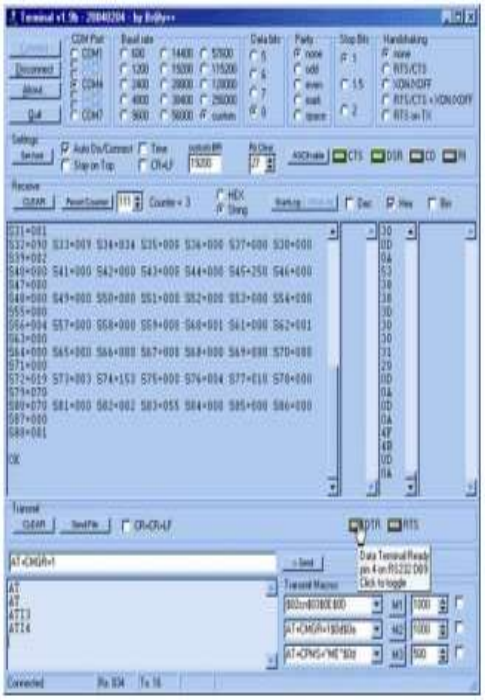
CONNECTING THE ESP TO AN ARDUINO



The key distinction between Arduino and ESP is the ease of their logical connections. The data is sent from the Arduino Tx to the Arduino Rx using the ESP-Rx.

The ESP-8266 can only be powered by a 3.3V supply, unlike the 5V connectors on the Arduino board. We need to figure out how to manage these voltages before we can apply them. Someone might be able to access your ESP if you skip this step.



4. BASIC TERMINOLOGIES

Prior to beginning your work in a serial terminal window, it is imperative that you ensure that you have a complete comprehension of the following phrases. The Serial Communication class goes deep into each of these topics. Please click on the website provided if you would want to understand the narrative completely.

The system translates the special characters on keyboards into 7-bit binary information that

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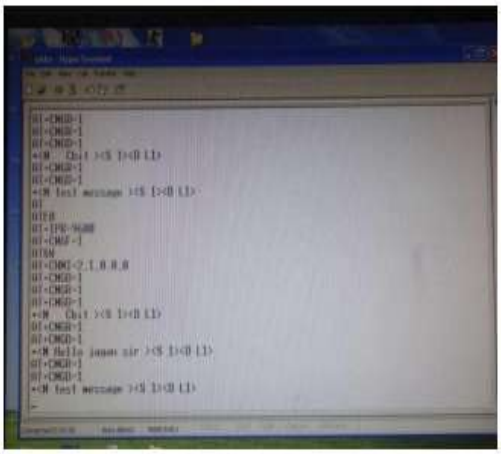
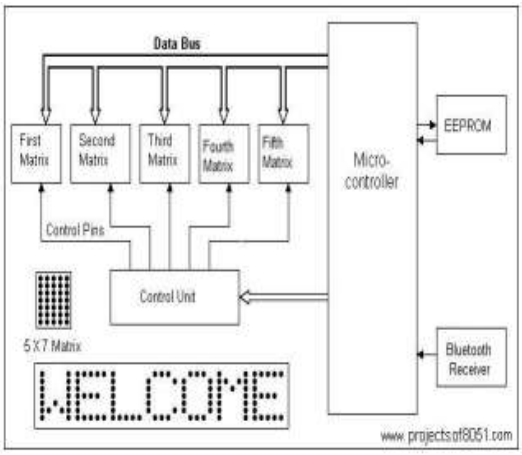
can be read by many different kinds of devices and software. The abbreviation "ASCII" refers to the "American Standard Code for Information Interchange." When dealing with serial systems, ASCII diagrams are useful.

The baud rate is a measurement of the data transmission and reception speeds. Some devices operate at different speeds, even though 9600 is the standard in the industry. Verify that the touch chain as a whole operates in unison. The data will be lost if this isn't done. Get the word out. This is sometimes expressed using the acronym "Data Out" (TXO). The TX line is where you'll find any device that can transmit data. In order to communicate with the gadget, connect this to its RX line. While data is being transmitted, you might hear the words "Data In" or "RXI" said. Each device has a data-receiving RX line. The level of alignment with the terms should be determined. That line of communication that lets you make and receive calls at will.

The Common Media Interface (COM) interface, often known as a serial port, assigns a unique port number to each device that connects to a computer. Connected gadgets can be located in this way. An assigned interface is always used whenever a device is connected to a computer. Keep in mind that Linux and Mac use different terms when referring to COM ports.



TERMINAL WINDOW



Hyper Terminal allows you to observe the device do various duties when connected to a computer's COM port and messages are sent in the correct manner.

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MATRIX DISPLAY

An LED matrix is a display that uses a network of connected LEDs and is controlled by a microcontroller. An LED grid is incomplete without a cathode, sometimes called a negative terminal. There is an anode in every single LED column. A different arrangement would be to link the positive terminals to the columns and the negative terminals to the rows. A typical 8x8 LED matrix looks like this. Each dot in a color LED dot matrix display could have several LEDs.

A red, green, or blue LED is concealed behind each dot in the 8x8 grid by the project's matrix; a "dot" is defined as the individual lenses that make up a "dot." In a system with multiple dots per row, the positive terminal of each column is connected to a secondary control port in order to control each additional LED color. But it doesn't differentiate between the dead ends of the divisions. The current RGB grid has 16 control connections, however that number will increase to 32 in the future.

The positive and negative terminals of each LED in a row or column of an LED matrix are identical. This means that turning them all on simultaneously is not going to work. The matrix is executed by accessing each row sequentially and activating the LEDs in that row using the CPU in conjunction with the corresponding column ports.

The matrix display's LEDs will all light up simultaneously and without flickering as long as the switching operation is finished fast. According to the Persistence of Vision theory, visual information is retained by the retina for a duration of 0.010 seconds. Because of this, operating an LED grid with caution is essential for safety reasons. Colum data is transmitted at the same frequency as the rows, which are scanned sequentially at a rate greater than 40 Hz. This undertaking calls for the use of a microprocessor in conjunction with other components. Basic programming instructions for microcontrollers

The Atmel ATMEGA8L can run programs written in C, BASIC, or Assembly. Once the code is complete, the microcontroller can be directly sent the Hex file by the CPU. Once the microcontroller receives the Hex file, an in-circuit programmer links it to a personal computer in parallel.

5. SIMULATION RESULTS

The 8051 simulator was utilized to confirm the findings were accurate before the proposed plan was implemented. By facilitating the usage of publicly available technology, this simulator facilitates the acceleration of the construction of different project components. By inputting the hexadecimal code into the virtual microcontroller and connecting it to the circuits that were previously developed, the proposed method may be validated. The proper functioning of a project example requires the following actions to be taken:

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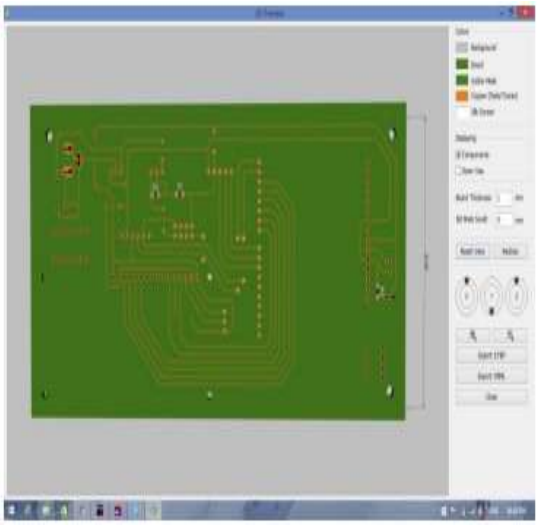

Daughter board view 1.

The graphic shows a schematic diagram that was made using simulation tools. Everything is put together correctly, as can be seen in the photo. The LCD board, microprocessor, and WI-FI module are all part of this.

The graphic shows the AT instructions, which link the module to the chip. Two examples of virtual terminal interfaces are shown below. Every part of the television circuit shows the instruction sent by the central processing unit.

MULTI TERMINAL

The board will display the predetermined message when the WIFI module is turned on. This is the result of people not talking to each other, as shown in the image up top.

Andriod application:

The computer can handle several users at once. Having memberships to numerous online and Bluetooth is most effective when

- Connecting to the internet. A rather new development
- The terminal facilitates real-time collaboration among a number of instruments.
- This suggests that there is a possibility that it will spread to a large number of people.
- This high-tech tool will be easy for me to learn right away.
- Within a limited timeframe. Following their selection of the
- The installation of a mobile app is prerequisite to the operation of any mobile device.

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6. CONCLUSION

Digital formats are slowly but surely supplanting conventional written displays in display board systems due to the exponential growth of technology. The use of WiFi-enabled TVs is another consideration. This article walks readers through the process of creating a photonic laboratory model using a wireless notice board system that links to WiFi and Bluetooth. The system's architecture allows it to provide the right word to the user by SMS even in heavily populated areas. Ads, traffic control, crime prevention, and the security of schools and other organizations are just a few potential uses for the proposed system.

The application's speed, extensive feature set, and user-friendliness are only a few of its many benefits. Security design, situational awareness, and risk mitigation can all be enhanced by adhering to established standards.

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