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A Smart Notice Board System Using IoT Technology

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ABSTRACT: Digital Notice board is used in institution or organization or public utility places like College campus, railway stations etc., but Sending and monitoring various notices every day is a heavy process. A separate person is required to take care of these notices. This paper deals with advanced notice board. Our proposed system will enable people to wireless transmit notices on a notice board using GSM with smart Phone and users get auto notification using parse cloud. Its operation is based on microcontroller ATMEGA 328 Programmed in C language. When the user sends notice via registered smart Phone that message will get display on the notice board simultaneously through the parse cloud other users get auto notification on their smart Phone. We can also makethe system compatible with more than one wireless technology. The numbers of notice boards are connected in IOT to get the status of the notice boards automatically to the cellular device.

KEYWORDS: GSM Module, P10 LED Display, Smart Phoneud, IoT (Internet of Things)

I. INTRODUCTION

Now-a-days advertisement is going digital. The big shops and the shopping centers use digital displays now. Also, in trains and buses the information like platform number, ticket information is displayed in digital boards. People are now adapted to the idea of the world at its finger-tips. The use mobile P10ones have increased drastically over years. Control and communication has become important in all the parts of the world. This gave us the idea to use mobile P10ones to receive message and then display it on an electronic board. The GSM technology is used. GSM stands for GlobalSystem for Mobile Communication. Due to this international roaming capability of GSM, we can send message to receiver from any part of the world. It is has the system for SMS-Short Message Service. This Paper is a remote notice board with a GSM modem at the receivers end. So if the user wants to display any message, he can send the information by SMS and thus update the LED display accordingly. As engineer's main aim is to make life simple with help of technology, this is one step to simplify real time noticing.

In this world Mobile Phones and the relatetechnologies are becoming more and moreprevalent. Various technical arenas in the field of Telecommunication and Embedded Systems are becoming omnipresent in the people. The use of cell phones has rapidly increased over the last decade and a half Upgradation in networking technologies has encouraged the development and growth of very dense networks. Now-a-days the general mass prefer communicating while on the move therefore landlines usage has been drastically reduced. Notice boards are one of the widely used ones ranging from primary schools to majororganizations to convey messages at largeverify for the password, if the pass word is correct then it will start displaying the messages in the display system. The messages are displayed on the LED display. The prototype of the GSM based display toolkit has facilities to be integrated with a display board thus making it truly mobile. The toolkit accepts the SMS, stores it, validates it and then displays it in the led module. The SMS is deleted from the SIM each time it is read, thus making room for the next SMS. The major constraints incorporated are the use of “*message@” as the termination character of the SMS and the display of one SMS as a

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time. The limitations can be removed by the use of higher end microcontrollers and extended RAM. The prototype can be implemented using commercial display boards. The use of "Embedded System in Communication" has given rise to many interesting

II. LITERATURE REVIEW

The detailed survey of various literatures for the execution of the project is presented in this chapter. Moore's law states that the number of transistors that could be integrated into a single die would grow exponentially with time. Thus this causes increasing computational complexity of the chip and physical limitations of devices such as power consumption, interconnect will become very difficult. According to recent analysis the minimum limit for transistor size may be reached. Thus, it may not be possible to continue the rule of Moore's law and the clock rate for every three years. So in order to overcome this physical limit of CMOS-VLSI design an alternative approach is Quantum dot Cellular Automata (QCA). In ALU adder plays a vital role

In this survey a binary adder is taken for analysis and a new adder is designed based upon QCA technology. This modified novel bit adder is implemented into ALU structure. The aim of this proposed technique is that to reduce number of majority gates used in the design. This will lead to reduce number of QCA cells so that total area of ALU circuit can be minimized compare to previous designs. It also achieves reduced power consumption and high speed performances than all other existing ALU design which uses normal full adder

Buzzer

Buzzer is controlled by the microcontroller using single pin. Sometimes it can be interchanged according to the transistor used to drive the device. The buzzer subsystem produces a 2 KHz audible tone when powered. The buzzer will sound when the signal coming into the driver is high. It must be connected to a Darlington transistor or transducer driver subsystem. The buzzer is connected between the supply rail (+ V) and the input signal. This acts as load on the driver. When the input signal coming into the buzzer subsystem is low, a potential difference across the buzzer causes current to flow. It is this flow of current that causes the buzzer to sound. Buzzer is connected to microcontroller port pin, so microcontroller will give high or low to switch

METHODS

A schematic of the circuitry within Peggy can be found in its datasheet which is referenced in the Bibliography of this report. While this board doesn't have the modular capabilities that some of the other options contained, the open source guide to the processing of the system. The code that is provided for some of the recommended projects on the site gives a good guide for the processes that must be completed to produce interesting effects on the matrix.

Another small downside to this product is that the LED's are the globe shaped led available in either 3mm, 5mm, or 10mm sizes. This is sufficient for testing and recreational purposes, but with a display that will be visible in a public place such as Atwater Kent, we want to have a concealed LED section such as that found in the dot matrices from Betlux seen above. Another useful aspect with the open source availability of this product is that we were easily able to view a schematic diagram of the circuitry, as well as a description of a schematic of the circuitry within Peggy can be found in its datasheet which is referenced in the Bibliography of this report. While this board doesn't have the modular capabilities that some of the other options contained, the open source guide to the processing of the system.

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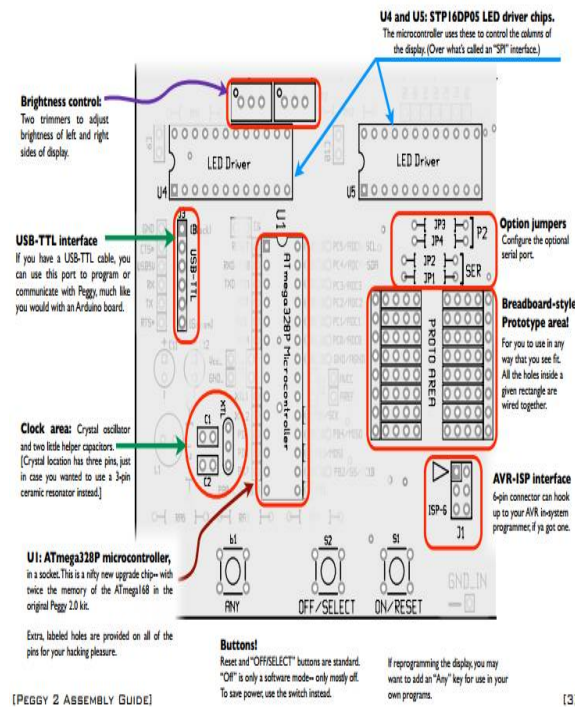


Fig 3.7: Peggy 2 Configuration Diagram Part

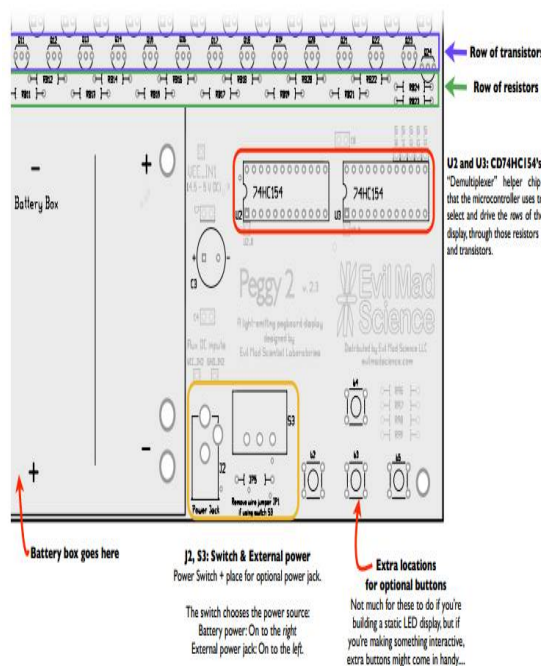


Fig 3.8: Peggy 2 Configuration Diagram Part

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III. CHOOSING THE DESIGN

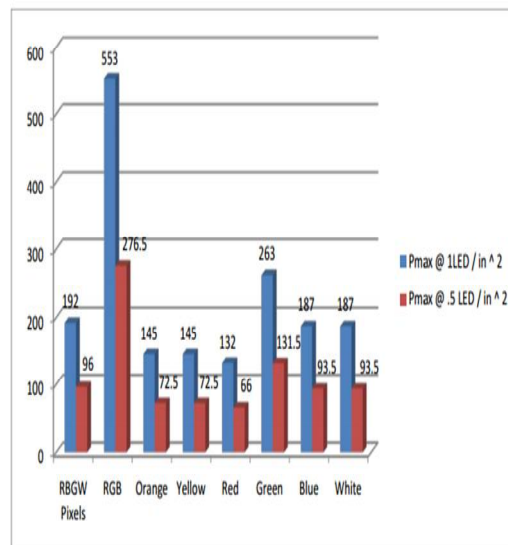
Group found itself with dozens of ideas of how would be able to implement an interactive and entertaining, yet informative display. At first, not a single idea accomplished all of the criteria while still remaining feasible under the constraints that we were placed under, such as cost, power consumption, and completion time. The top part of the display we are proposing to build will be composed of about 60 8x8 RGB LED matrix displays. The model number of these 8x8 displays is BLM23B881RGB-11.

This portion will be set up 2 rows high, and about 30 columns long. Final dimensions of this portion using 60 modules would be about 5 inches by 6 feet. In this section, we plan on displaying information which can scroll across the screen such as news, temperature readings, etc.

Table LED Display Board Number of Modules

	8*8(Dim inches)	8*8(m matrices)	Size(inches)	Size(feet)
Rows	2.37	2	4.74	0.315
Columns	2.37	30	71.1	5.925
Total module		60		

In considering the cost for this portion of our MQP, have already purchased numerous circuitry elements to be used to drive individual modules. estimate the cost per module to come to around \$20 to \$25 not including the cost for circuit board fabrication. This cost includes the cost of the LED screen, and all electrical components expected will need to complete one module.



Graph 2 Power Dissipation Graph

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IV. RESULTS

FUNCTIONALITY TESTING AND RESULTS

This chapter describes the testing that was performed to check the functionality of the different blocks of our system. Again, a “divide and conquer” style of debugging is very useful. We also used a breadboarding method of implementation before committing to a PCB design. Evaluating the circuitry and programming using hardware configurations that are easily changed on the breadboard assures us that the other blocks are functional.

IoT

The Internet of things (IoT) is the inter-networking of physical devices, vehicles, buildings, and other items—embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data. The IoT allows objects to be sensed or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention. Here all the digital notice boards are connected through IoT

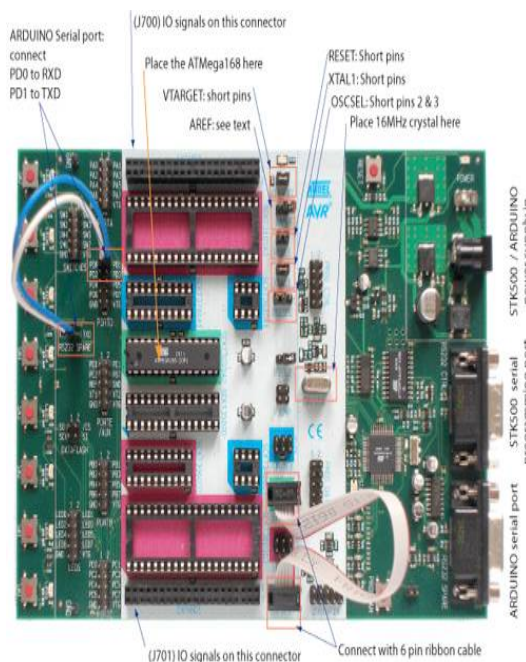


Fig 4.3.2: STK500 Description Diagram

Oscilloscope measurements are a key to understanding to data that is being sent from the microprocessor. Since our data is primarily in the form of 5V pulses, this makes it fairly straightforward to examine the way a particular pin is functioning in accordance to the program. An example of the circuit used on the breadboard is seen below, in its initial stage without the microprocessor incorporated.

GPRS

The General Packet Radio Service (GPRS) is an enhancement to the existing GSM network infrastructure and provides a connectionless packet data service. The same cellular base-stations that support voice calls are used to support GPRS and as a consequence GPRS can be used wherever it is possible to make a voice call. GPRS

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roaming agreements exist with a large number of countries and this means users can use GPRS devices whilst broad. GPRS is based on internet Protocols (IP) and enables users to utilize wide range of applications—email and internet and/or intranet resources for instance. With throughput rates of upto 40Kbit/s, users have a similar access speed to a dial-up modem, but with the convenience of being able to connect for many where.

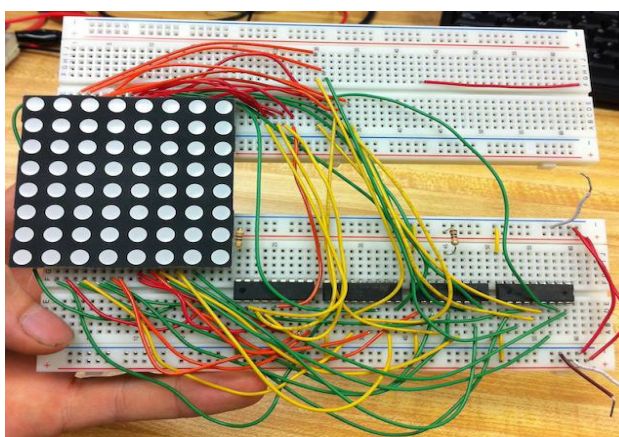
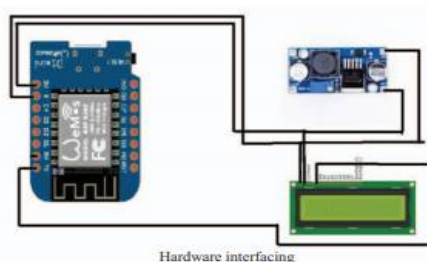


Fig 4.3.3 :8x8 Prototype Board with Transistor Arrays

Other information's the other information of the P10 SMI-outdoor green color LED is, it has P10 Color Display Item Specification Pixel Pitch (mm) 10, Pixel LED, DIP546 ,Pixel Density (dot/m²), 10000Pixel Configuration 1GModule Size (Lmm*Hmm)320;Á160,Brightness(CD/m²)4000,Best Viewing Angle,45;ãH/100;ãV, Drive Mode, Constant Current drive 1/4 scan,Drive IC74HC595,Working Voltage AC110V, 220~240V,50HZ,Environment Temperature



Hardware Implementation

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The next step from here would be to reconfigure the layout of the entire schematic in multi sim (to fix the pin layout of the 8x8 array), and possibly move the chips around on in ulti board to reduce the complexity of the traces. Additionally, working with surface mount packages (both on the top and bottom of the board) would help reduce the amount of PCB area needed. Also, putting surface mount chips in between the rows of pins for each of the 8x8 arrays on the top and bottom of the board would significantly decrease the size of our boards. Also, on the PCB layout, we would need to move the bypass capacitors to be next to each of the chips to help reduce noise in the PCB. Additionally, adding another layer to the PCB would significantly help reduce the complexity of the traces on the board and would there fore help greatly with reducing the size of the PCB as well.

LONG TERM

In the long term, it would be important to get the main microcontroller block working. A microcontroller would have to be selected that has enough memory to store all intensity bits for all microcontrollers in it at the same time. For example, this microcontroller could be a laptop and microcontroller system. Using a USB interface chip on a separate PCB board, the laptop can be used to communicate with a microprocessor telling it which microprocessor or digital memory to communicate with. Then, the computer can send serial data directly to the activated microprocessor. To select a microprocessor, the same row, column select method can be used as was used to select an individual LED in the 8x8 array. Except in this case, a NAND gate placed at the CS pin of the microprocessor would cause the microprocessor to listen for in coming serial data when the two pins connected to it are set high (one connected to the row it is a part of, and the second connected to the column it is a part of). Updating the data being sent to the display board can be as simple as connecting to an HTTP server running on the laptop and using a variation of the script described in the software section which takes in a string of ASCII characters and spits out the C data representation of what needs to be sent to the microprocessor to display the text supplied to the script.

V. CONCLUSION

The proposed system accepts the message, stores it, validates and displays it on the LED display. LED displays are used to display messages in Railway stations, shopping malls for displaying advertisement, Educational institution and organizations, managing traffic in smart cities and other public utility places. Cost of printing and P10otocopying is also reduced because the information can be delivered to a large number of people in a very short time. It provides faster transfer of information and are easy to install and maintain. This paper provides an efficient way of displaying messages on Notice Board and also gets auto notification using Wireless Technology. It also provides user to easily receive the important information or message.

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