

AN ADVANCED BRAILLE SYSTEM-COMMUNICATION DEVICE FOR BLIND-DEAF PEOPLE

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ABSTRACT- Braille System is a sense of touching system used by the blind-deaf people. Generally it is conventionally written with Design paper. The purpose of this project is we are developing a new methodology with Braille system to read a message for blind and deaf people. In this project we are using GSM modem in order to receive a message. The contents and letters of the message is read by blind people. Reading messages will became easy because of the vibrator motor. By using vibrator motor visually impaired people can easily read the message by feeling the vibration and the same message will be displayed on the LCD. In this project we are also using Buzzer. This Buzzer is working as a message alerter.

Keywords: GSM Modem, LCD, Buzzer, Vibration Motors, Arduino Uno.

I. INTRODUCTION

Mobile phones are playing a vital role in our modern life. It is usually essential for us to make a call or send a message at anytime from anywhere in world. For blind people voice based list of contact is provided with many mobile phones, they can also choose contact through voice and make call whenever it is necessary. In telecommunication technology the physically impaired people have limited access for these technologies. To fill up the gap between the visually impaired people and the technological advancement in the telecommunication field we have decided to design a Short Message Service system for them [1].

We are designing a modular device which is attainable by visually impaired person. For this purpose we are using Braille language as the foundation of the project. Usually the visually impaired people use the Braille language for reading and writing. Now let's focus towards short message system, it is text messaging service serves as a component of cell phone, by using standard communication protocol allow the exchange of short text messages between mobile phones.

SMS text messaging is one of the mostly used message application in the world, with 2.4 billion users. Here we are designing a modular device which can be easily accessible by blind person. Till date they traditionally use Braille books. But it is not an efficient way of communicating in now-a-days. A Braille book has a limitation on the number of words in each paper and number of pages in each book. So we are interfacing Braille pad with the mobile phone so that visually impaired people can also have the access to the SMS system [5].

Braille is named after its designer, Frenchman Louis Braille. He lost his vision due to a childhood accident. Braille consists a pattern of raised dots that enables blind people or low vision people can read with the fingers through touch as shown in Fig. 1.

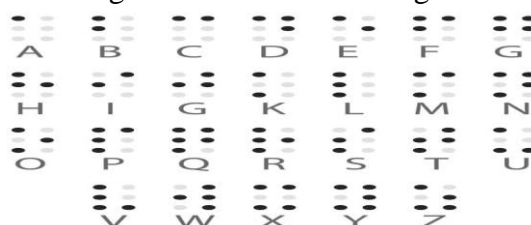


Fig.1 Braille Code for English Character

II. LITERATURE SURVEY

With all the technological advances and modern gadgets available, huge and top initiatives aren't only constrained to the discovery of latest technologies and ideas but also to the merging of present technologies ensuing in new thoughts and gadgets that deal with issues not yet solved. Tele

communication and transportable gadgets are changing the relationships between human and communication, and introducing a brand new technique of communication based on context [6]. According to Braille messenger system this new approach of communication permits impaired people to interact seamlessly with objects, micro vibrator, environments, etc

This new project idea called Braille messenger system, named by Louis Braille (1809-1852) has the capacity to introduce and developed many kind of ideas. Its present day applications and future opportunities may be applied in an nearly invisible way permitting the consumer to communicate with technology without the help of other people [2].

The blind people field, in its consistent pursuit for finding new techniques of concept for read and writes SMS, has been a main beneficiary of telecommunication system. Braille is crucial to all visually impaired people and it's the only system through which visually impaired kids can learn how to read and write, but the rate of Braille literacy among visually impaired people belonging to growing countries.

The Braille system idea primarily based totally on visually impaired people, the blind people can't easily access the today's facts and the Technologies that can offer them an alternating way for communication. Modern technological improvements cannot be easily affordable to the visually impaired people. Braille character is crucial to developing Braille project.

Short Message Service is the most inexpensive and quickest of all forms of digital communication. But, the visually challenged haven't been capable of use this low-cost facility to the maximum possible extent. Text to voice converters exist, however they go through a main disadvantage in the truth that they interfere with the user's hearing, which is the only manner by which a blind person feels and senses the world interfering with this may prove fatal to the user. Braille is a system that permits visually impaired people to write and read. It makes use of the finger contact on raised dots produced by specialized machine.

In this paper, we recommend a total system to understand characters for a single aspect Braille document. We additionally present an intensive overview for Braille Recognition systems and related studies efforts Our Braille recognition system is completely flexible to the scale of the scanned picture.

We propose a easy Braille Messenger which would obtain a message and display it in the form of Braille script by the use of vibrators. The Braille Messenger is a very low cost, quite efficient and easily implementable product. A GSM modem, a microcontroller, and a Braille Cell display would sufficient. The messages from the modem are filtered and dispatched to a microcontroller, which would manage the vibrators. The micro vibrators especially using touch to understand the various letters by visually impaired people.

The Braille people information stepped forward to a lot of products available in marketplace including mobile phones. But the visually impaired people can't capable of use this facility. Louis Braille was an inventor of Braille system. This is universally accepted primary system that is being utilized by blind people for reading and writing purpose. Braille is read by passing the fingers over characters designed as an arrangement of 1 to 6 embossed points. Braille is not a language but it is the manner of writing different languages.

III. PROPOSED SYSTEM

Many digital Braille systems are published onto paper and this form of Braille is liable to wear and tear. Most digital Braille systems used are very costly particularly in growing nations including India. Hence, we're presenting a virtual Braille system that is cheap and smooth to use. Here we are using GSM modem, Arduino Uno, LCD, Vibration motors. By these requirements we are developing a new technique which is easier to the visually impaired persons to read the message using short message service.

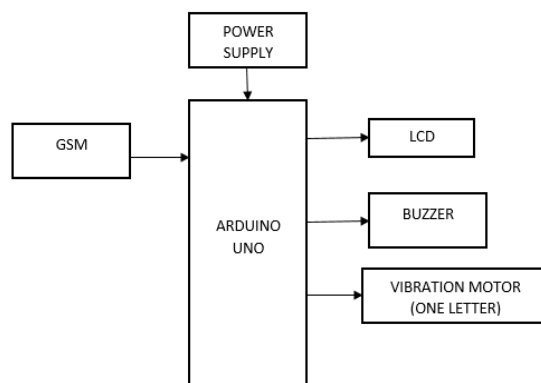


Fig.2 Block Diagram of proposed Braille system

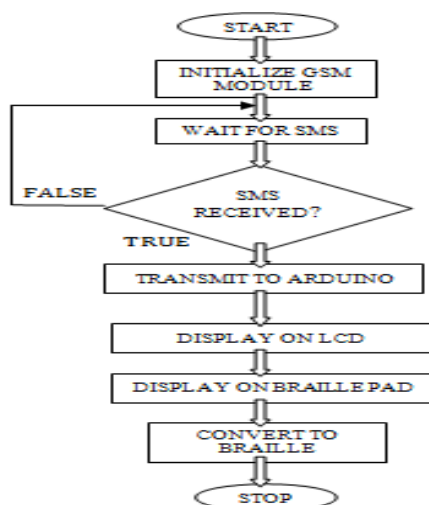


Fig.3 Flow Chart for SMS send
IV. HARDWARE DESCRIPTION

A. Arduino Uno:

Arduino is an open source, pc hardware and software program company, project, and consumer network that designs and manufactures microcontroller kits for constructing virtual gadgets and interactive gadgets which could feel and control items with inside the physical world. It is a microcontroller board consists of a on-board supply, USB port to communicate with pc, and an Atmel microcontroller chip. These structures offer units of virtual and analog I/O pins that may be interfaced to various extension forums and different circuits. It also consists of a 16MHz ceramic resonator, an ICSP header, a power jack and reset button. The Arduino platform affords Integrated Development Environment (IDE) primarily based on the processing project, which supports C and C++ programming languages. We can run the code in Arduino IDE, and then upload it into the Arduino board using USB.

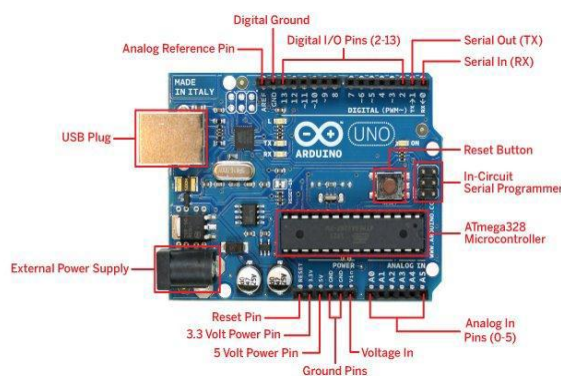


Fig. 4 Arduino Uno

B. GSM:

GSM-Global System for Mobile Communication. The frequencies of GSM ranges from 850MHz, 900MHz, 1800MHz and 1900MHz. It could be very compact in length and easy to use. It is designed with RS232 degree converter circuitry, which lets in you to at once interface PC serial port. The baud rate may be configurable from 9600-115200 through AT command. Using this modem, you'll be capable of transmit and receive SMS and additionally connect with net via GPRS through easy AT commands.



Fig. 5 GSM

C. BUZZER:

It is an active passive device. It is a small component which adds sound features like buzzing or beeping sound in various projects. It is very small and compact 2-pin structure and can be easily used on bread boards. It is also acts as an indicator which makes it a widely used component. As it is a 2-pin sensor it consists of positive terminal and negative terminal. Positive terminal is powered to the input voltage and negative terminal is powered to ground. We are using piezoelectric buzzer which contains of two electrodes it is very inexpensive and produces a very loud sound with less power. Here buzzer is used to identify whether the message is received or not.



Fig.6 Buzzer

D. Vibration motors:

The vibration motors are the motors which will vibrate when sufficient power is given. Here we are using an Eccentric mass vibration motor. It is easy to implement and very inexpensive[4]. The micro vibration motor has two wires i.e., Red and Black. Red is connected to the supply and Black is connected to ground. The operating voltage of micro vibrator motor is 2 to 5 volts. Here we are connecting 3V across the terminals so that it can vibrate really well. The small vibration motors can be integrated into a project so that the users can depend on the sense of touch. This is one of the evident method with cell phones, we can receive a notification without disturbing the people around us. Now these tiny vibration motors playing a vital role around the world because of their wide range of applications.

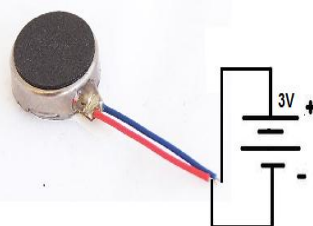


Fig.7 Vibration Motor

E. LED

Light Emitting Diode is primarily a p-n junction diode. That has the ability to give the light when certain voltage is applied to it. When we are applying a suitable voltage to the leads, electrons and holes will recombine and release the energy in the form of photons. This is known as electroluminescence and the colour of the light is identified by the energy band gap of semiconductor.

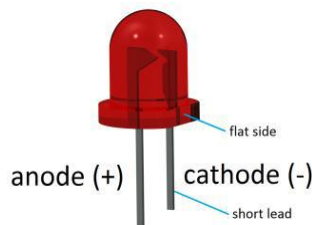


Fig.8 LED

F. LCD

Liquid Crystal Display is a thin flat display tool made from any variety of color monochromatic pixels organized in the front of a light supply or reflector. In this project we are using 16*2 LCD. It is a 16-pin device that has two rows that can accommodate 16 characters each. It is interfaced with 4-bit or 8-bit microprocessor. Without the liquid crystals among them light passing through one could be blocked with the aid of using other. LCD accepts two types of signals, data and control. These signals are identified by the LCD module from the status of RS pin. The data can be read by the LCD using R/W pin.

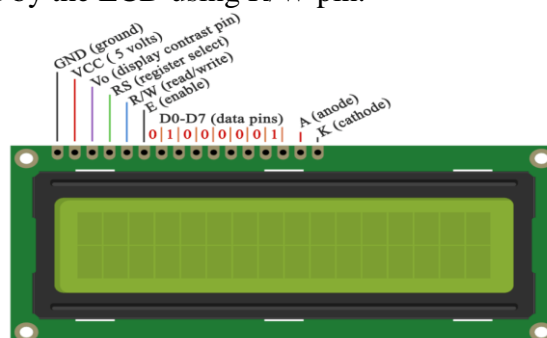


Fig.9 LCD

G. Power Supply:

In regulated power supply the entire voltage is 230V. Regulated power supply includes 4 simple factors namely a transformer, a rectifier, a filter and a voltage regulator. The step down transformer will step down the voltage from the ac mains to the specified voltage level. Rectifier may be carried out through the use of bridge rectifier. The voltage from transformer is transformed into pulsating dc voltage through rectifier. Rectifier output is unidirectional. Here we use capacitor filter along the output of the rectifier to get ripple free DC waveform. Regulator gives the constant output even if the input or any other changes occurs. In this we require a 5V for this we are using a step down transformers 7805 and 7812 by this we can lessen the power.

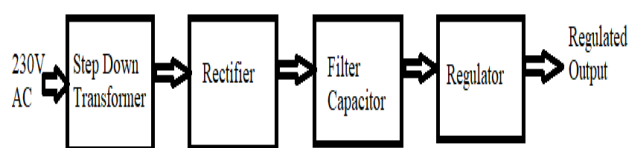


Fig.10 Block Diagram of Power Supply

V.RESULT

Fig. 11 Shows the resultant kit of our project. The components are connected through wires. Vibration motors are connected to the arduino digital pins. LCD pins are connected to the arduino

analog pins. The output will be displayed on LCD and vibration motors will vibrate when message is received.

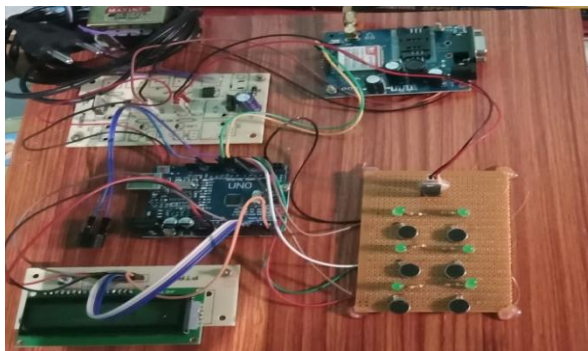


Fig. 11 Resultant Kit

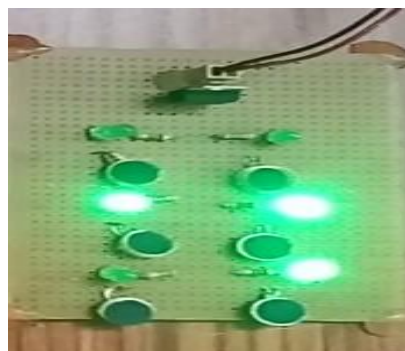


Fig. 12 Output of Vibration motors

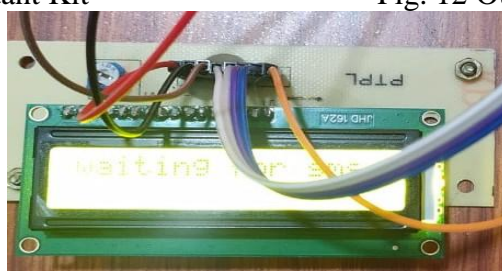


Fig.12 Output of LCD

VI. FUTURE SCOPE

The system is further modified to read the whole SMS in a string of words and also blind person can read an e-mail.

VII. CONCLUSION

Thus we conclude from above study that with some modifications in conventional communicating device, we can include large number of physically challenged people in communication device.

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