PROGRESSIVE BRAILLE LEARNING KIT WITH INTERFACE

Faculty of Engineering and Technology (Exclusively for women), Kalaburagi
Electronics and Communication Engineering
Poornima, Sana Kousar, Rahathunisa, Sushma
Prof. Laxmi Patil
Prof. Shobhana

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1. INTRODUCTION:

In the India it's true that the computers didn't reach common schools in rural areas and making the blind people to study, which seems like definitely implausible to many blind students in India, almost the blindness is always major for effective segregation from the society. The blind children actually sacrifice their education and struggle to come up in their life by doing some household or labourer job to have the daily allowance.

The voluntary response of the engineer's society as regards to extend the ideas and the conviction behind the 'Assistive Technologies' which is being saturated. In this developing society there are especial facilities which are being to help the visually impaired people to move on every side to work for not relying on any supports. The technical assists, especially in this field of the precision production and electronic gadgets which are resulting in the outcome a way to help blinds to survive with the blindness. Especially in India situation observed that are basically because of two reasons:

1. Majority of people are not able to afford the technologies specially people who are leaving in the rural places.

2. The Lack in knowledge/little knowledge about the Braille Script for the English or any other languages, which is required to be in contact with the ever running technologies.

2. OBJECTIVES:

We have decided to give a solution for blind students to strengthen their education at the early stage. In initial stage of the schooling, to teach the Braille script is elementary for the blind students. So, the Braille Learning electronic device is to be fully-fledged device which will give facility to them in learning the Braille script and meeting the objective in the cost-effective manner. This is Arduino based project in which the speech is given as input and then speech is converted into text, then given

to the kit via Bluetooth module further converted into Braille script which is given as output on Braille pad and speaker as shown in below block diagram.
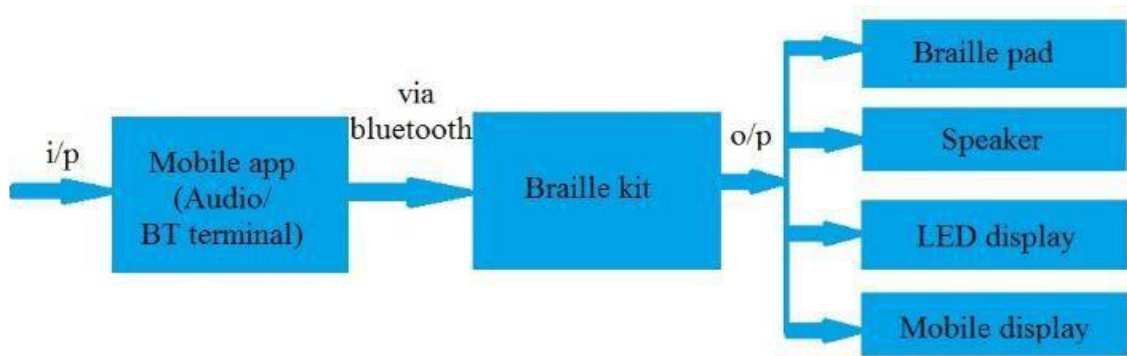

Fig. 1: Basic structure

3. METHODOLOGY:

This contains the brief methodology of Electronic Braille learning kit.
- Microcontroller converts the speech input from the user into digital format which can be used to drive the Braille pins.
- Toggle switch is to switch.
- The browsing mode the Smartphone is used to give the input in which the audio app installed in it converts the speech into text and then transmitted to kit in which it is processed into Braille script and given to Braille pad again the app installed in Smartphone is working in vice versa mode. Or the input can also be given through the text app and then the input is sent to the kit which processes then the output is displayed on the phone, Braille pad, LED and the audio output.
- The ULN2003 is a transistor IC to drive the relay and prevent the circuit from any electrical damage.
- Bluetooth module is utilized to impart information from the cell phone to microcontroller.
- Solenoid push pull is a device which is used as Braille keypad by joining six such devices. The device makes up and down movement by the force which is generated by passing current through it.
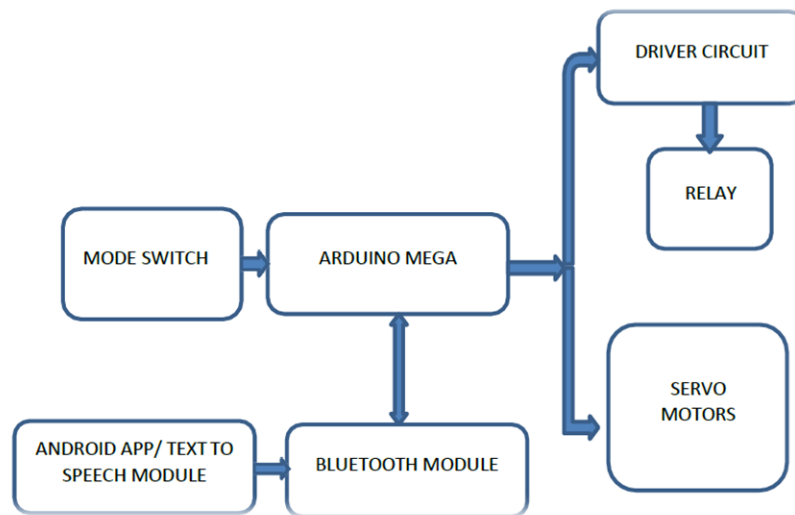- Overall, the output is given on Braille pad along with speaker simultaneously.

Fig. 2: Block Diagram and flow

4. RESULTS AND CONCLUSIONS:

When power is supplied to the kit and linked to the app in mobile via the Bluetooth module on the kit.

- We need to choose in which mode the kit is to be worked as on auto mode or browse mode using the button.

- When the Auto mode is switched the yellow color LED is on , the Braille pad starts showing the alphabets on it along with LED blinking on the LED display and also along with all these the audio output is also given on the cell as shown in the below.

Here we can see the opposite of L is displayed so you all may be thinking why is this so now I can tell you that it's because usually the Braille script written in English alphabets and numbers show the same point some time for example taking alphabet A and Number 1both display 1st point on Braille pad on the kit.

So to differentiate the alphabets and numerical they is indication for numbers that is before displaying number the opposite of L is displayed and then is displayed so when opposite of L appears then we will get to know that numbers will be displayed.

So when we give the audio input it is converted into the text and sent to the kit in which its further processed and sent to the Braille pad where its displaying the output on Braille pad, LEDs display, and also on the mobile screen along with the audio output to make it easier to understand that the letter displayed is that particular output required and also why we have got an audio output because specially blinds do all the works on listening so that this audio output makes easier for them to use the device. In this way the device helps blinds to get educated at the basics of education.

5. WHAT IS THE INNOVATION IN THE PROJECT?

As the projects name itself says that ***"PROGRESSIVE BRAILLE LEARNING DEVICE"*** this device is helping the blind students to learn the Braille script using the basic language without any ones guidance at their own place and also this device is not costing much it's just cheaper that any blind person can buy this device. And now I will tell how this device actually applicable in this device we have English and Hindi languages which are having each alphabets written in Braille script adapted in it already.

6. SCOPE FOR FUTURE WORK:

This project can be magnified by adding some of the extra new features like so many other multiple basic regional languages.

- o Interface electronic kit with a Braille kit with another option of taking exam to know whether the student understood or no.
- o And also we can make battery of solar power which make kit work without the ac power supply and that will be still more compatible to carry the kit even in places like where there is no power supply.
- o We can do this project by implementing IOT for more précised device.
- o The device can be made more compact still using only those pins required in Arduino instead of using whole board so that it can very small and carry in pocket.