

## SPEECH CONTROLLED LCD DISPLAY

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**Abstract**--In the devastating situation of the pandemic that hit the world in 2019 and still continues to haunt the health ecosystems around, Hospitals and Medical Shops were the only allowed as essential services to continue in the wake of the nationwide lockdown.

Patients hyped up the place making such places a breeding ground for Virus free-flow. Relatives, friends, caretakers etc. who assisted the patient were on a continuous verge to catch the virus despite taking heavy precautionary measures. Such circumstances were even more challenging for the healthcare workers, front-desk departments, patient handling staffs and of course the doctors in case of hospitals, who were managing a number of patients at the same time.

In case of medical supply shops that were assisting such hospitals with the required essentials were compelled to handle number of customers at the same time increasing their risk towards catching the Virus.

Mitigation mechanism for such person to person contact in abnormal circumstances like a pandemic where inhaling, touching or speaking near a person in the ambit of 2 meters of distance possessed risk of contracting the virus, Such Mitigation mechanism were absent.

To Mitigate such Circumstances of person to person contact where a distance of 2 meters is hard to implement and where opening up of mask to speak up or touching devices such as computers to complete transactions/communication, Voice Controlled Display Board was the idea that put shadow on the curbing out of situations as such.

Voice Controlled Display Board not only reduced the person to person contact but also helped complete transactions/communications remotely. The presence of both the parties is not required as the notice board is handled by a remote/distanced place which transfers communicated voice into displayed form to the receiving side. Being Used in real-time environment the device requires just an electric supply which enables the device they have advantage over other devices that require Internet/ Connections/Networks to enable communication.

**Keywords**—Android, Bluetooth, Board, Display, LCD, Microcontroller, Notice, PCB, Speech, Voice.

## 1 INTRODUCTION

The logic of speech recognizing electronics using a display is to broadcast data/statements/information in real time and to control them just by our own voice. As already came across during our research about other available display boards that use other methods but speech-controlled LCD displays are

convenient, user-friendly, time efficient and easy to use. The user just has to speak out the message to be displayed and the device will conveniently display the input.

Speech gets recognized in the App (here using Google voice-search) the users have to provide speech inputs to the application interface. The interface then provides these inputs to the microcontroller through the connected Bluetooth device. Which indicates that the users can handle the device from a remote-location. i.e. The necessity to be present in the vicinity of the device to handle it is not mandatory. Bluetooth communication is the method used in this project in terms of Wireless-Distanced Communication. The microcontroller receives the input through the Bluetooth receiver. Then these commands are further provided to the display which is made up of a 20\*4-character LCD.

Notice-boards are often used to broadcast important news, messages, announcements and schedules in educational facilities, hospitals, offices and public places etc. But, the disadvantages of these notice-boards are the physical hand work that is required to modify or remove existing data.

Hence, new methods are getting invented using automated, wireless technologies to lower the physical hardships and make notice-board work without the physical presence of a handler

Our Speech controlled LCD display is totally automatic and wireless. Other Voice boards based on android tech are most useful in organisations where there is a need for emergency announcements and those announcements could be broadcasted instantly by speaking out the announcement in real world scenario. Our device has proved to be reliable and efficient in carrying out such protocols. It removes the necessity of printing of data and saves paper which initially was used to supply information. Other advantage of our device is that the data is displayed in seconds as inputted through speech without any obstructions or delay in the transmission as far as a proper network-connection within the vicinity is maintained. In the new developing world, new technologies bring with them new digital e-advertisement methods too. i.e. ease in transactions and sophisticated shops, centres and mall etc.

## **2 LITERATURE SURVEY**

1. R. G. Gupta in his research-papers focused on designing display boards for different sectors like educational centres. The data could be sent within seconds and without any wired connections. This new method can be used to display real-time info instantly. The data of the notice can be changed in run time. This method was developed to make an SMS-based automated display-board which can take place of the current e-display.

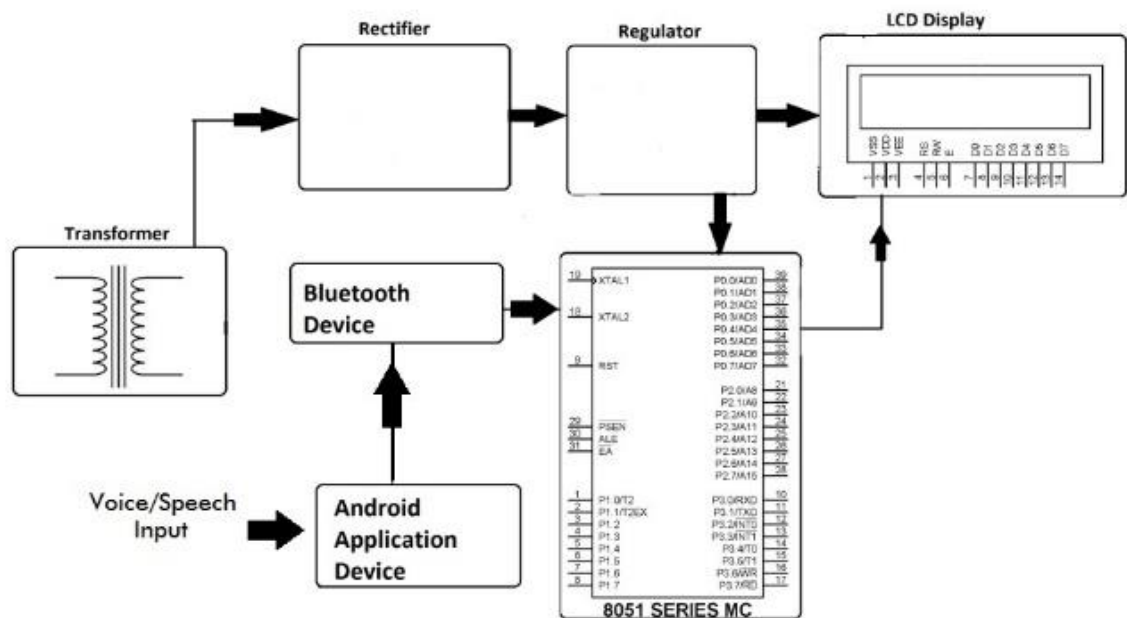
2. Abhishek Gupta: the main purpose of his research-paper was to develop a wireless notice-board that displays info sent from the users and to develop a non-complicated, ease of use, User-friendly, reliable device which could display info in a precise way, and the users can help keep records of the information conveniently every-day, as he/she uses the system.

3. Ramchandra K. Gurav: in his research-paper the main focus was on GSM (Global System for Mobile) to develop a digital notice-board, "Wireless Notice Board using GSM System" is a non-wired device that sends information wirelessly using GSM technology [3]. Which means that the registered persons may be able to send data from any place and the data is projected on the LCD.

### 3 WORKING

Our Speech-controlled display board comprises of an AT-89S52 Microcontroller and a 20\*4-character LCD display which is used for displaying data which is sent through UART RS232 serial converter Trans-receiver Bluetooth component. The Bluetooth component receives the data from the connected speech recognizing device (here Mobile-application) and the data is fabricated by the microcontroller from the Bluetooth component and is displayed on the LCD. Transmitter is a component that converts a physical data into an electrical data. Receiver is a component that converts that electrical data back into physical data. Electrical data from the transmitter is transmitted into receiver from a particular channel, it can be in a wired/non-wired type of communication channel. As our project is based on google speech recognition application, here we are using a wireless Bluetooth component, a non-wired type of communication channel. Whereas the operator sends the data through the app installed on a smartphone/tab which enables us to operate the device remotely. With Android-OS, using GUI (Graphical User Interface) comprises speech recognition. Transmission side uses google voice recognition library package through which voice is recognized and converted into text and sent to the Bluetooth receiver connected remotely. On receiving side, the received data is converted into signal inputs for microcontroller which then displays it on the 20\*4 LCD. Serial communication info sent through the Android app is collected by the Bluetooth receiver. The transmission made in our project is through an Android app named “AMR Voice”. The coding of app was carried out collectively by the team members online using Android studio. This means that the app operates on the basis of speech commands after establishing a connection manually. Whenever users send a data to be projected, it gets projected instantly, the dependency to type/write/code and upload anything is not required. Users can just connect their app installed device to the Bluetooth receiver on the device requiring only to establish the connection and handle the input through voice in the interface provided on the app.

#### 3.1 DEVICE FLOW DAIGRAM



This diagram helps us understand the working of the device as well as the flow of transmission followed as to project the output the speech input on the LCD.

#### 3.2 HARD-WARE REQUIREMENTS:

8051 Family Microcontroller

Resistor

20\*4 LCD Board

Bluetooth component

Capacitors

Push-Buttons

Crystal-Oscillator

Cables & Connectors

Diodes

PCBs

LEDs

Transformer/Adapter

Switches/IC&IC Sockets

*Project Development Stages: -*

Research for scope

Procuring the right Microcontroller

Designing the flow-circuit

Procuring other components

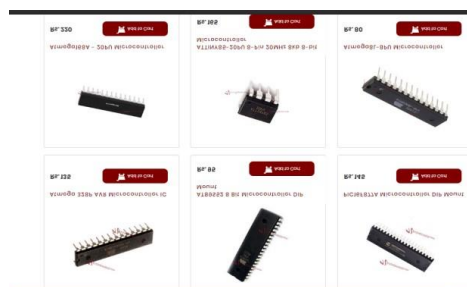
Printing the PCB

Solder and establish components into the PCB

Testing (Connectivity&Issues)

Developing the Application and establish working

### 3.3 Procuring the right Microcontroller: -



Step 1. Making a list of required hardware components.

- Step 2. Examining the architecture
- Step 3. Selecting the architecture
- Step 4. Identifying for Memory Needs
- Step 5. Searching for the desired microcontrollers
- Step 6. Examining Cost & other Constraints. ...
- Step 7. Checking for parts availability
- Step 8. Ordering/buyingMicro-Controller

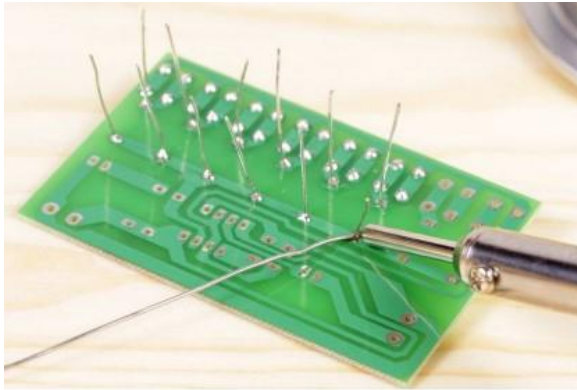
**3.4 Procuring other components:** -Procuring the right components is a difficult and hectic task. Suitable components required for the project designingwerenot easily available in the local markets.



### 3.5 Soldering: -

Soldering is the joining of components in the PCB to establish a perfect connection it is done through silver soldering, in which little particles of soldering wire is kept on the metal before melting it on. A flux, made up of boric acid and denatured alcohol is helpful in keeping the metal and solder-wire clean and to preserve the solder from sliding before it liquifies. Solder handles & wires are available at any local electronics centre or can be purchased through e-commerce websites.



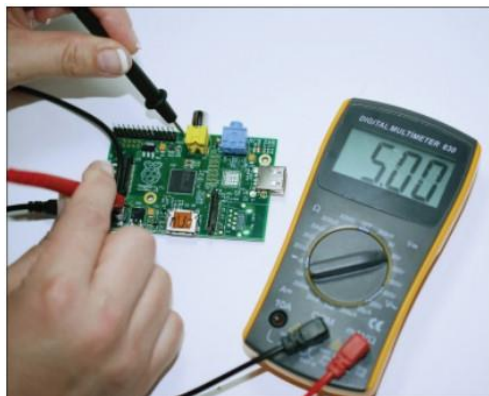


### 3.6 Testing for Connectivity & Issues Testing Tools:

Multi-meter testing

Supply power testing

Oscilloscope testing



Multi-meter, power Supply & Oscilloscope can be purchased locally or through e-commerce websites.



## 4FUTURE SCOPE

By making advancements and increasing the strength, wireless displays could be helpful in transportation systems or hubs like Bus Arena, Railway platforms & at Airway Hubs.

Speech controlled LCD displays purposely designed to be used in educational institutes like school, college, universities, coaching centres, training centres campuses etc. It can also be used in displaying data such as exam schedules, important notifications, event notices, examination result/announcements etc.

The other main Advantage of speech-controlled LCD display is that it is simple to install and easy to use even in newly established start-ups/business or corporates.

Speech controlled LCD display is of real help to persons with disabilities, handicap individuals or persons with special needs.

We can further add a feedback initiative in the Android app by which users can get feedback of the input they provided was displayed successfully or not. Further introducing a password initiative to secure the users and denying access to strangers other than the main user can help prevent misuse.

## **5 CONCLUSION**

The need of the changing world to get fast, efficient and wireless transaction of information without the burden to physically operate a device gets fulfilled by the Speech controlled LCD display. Though, having drawbacks of not being able to apply long distance communication, the idea to broadcast an info instantly to the masses in a cost and time effective manner is successfully met by the device.

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