Engineering Clinics Review-1

PROJECT TITLE- Speech Generation Device For Mute People

Using Raspberry Pi and Python

Faculty Guide- **Prof. Kumar Debasis**

Team members-

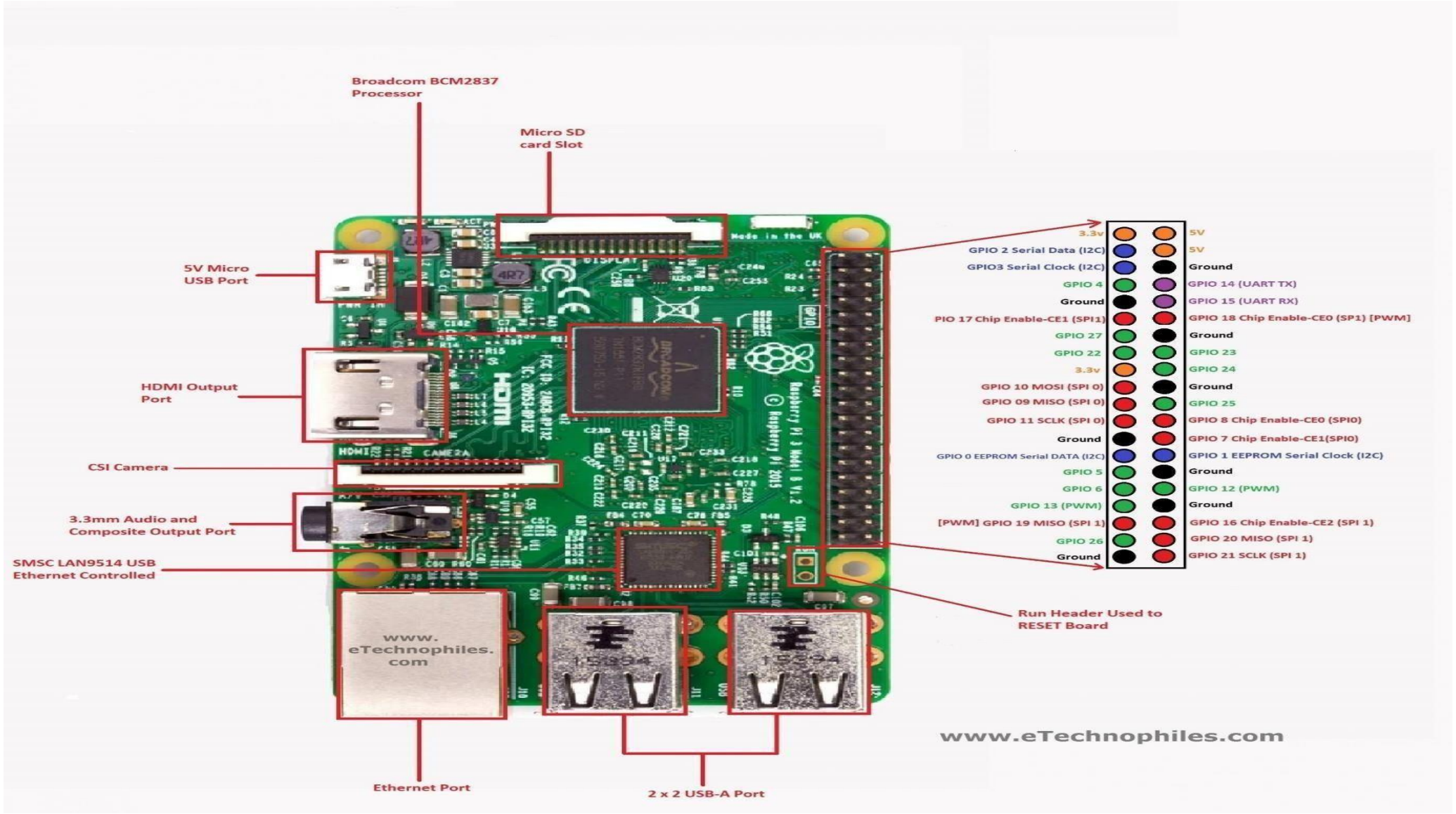
1. Vishal Kumar Singh-21BCE8647
2. Markanday Singh-21BCE7601
3. Chandan Thakur-21BCE7469
4. Harshit Tyagi-21BCE7931
5. Veeresh Thakur-21BCE7492
6. Chaitanya Phadke -21BCE7497

IDENTIFICATION OF THE PROBLEM AND THE TITLE OF THE PROJECT

Its very difficult for mute people to convey their message to regular people. Since regular people are not trained on hand sign language, the communication becomes very difficult. In emergency or other times when a mute person travelling or among new people communication with nearby people or conveying a message becomes very difficult. Here we propose a smart speaking system that help mute people in conveying their message to regular people using hand motions and gestures. The system makes use of a hand motion reading system equipped with motion and flex sensors along with a speaker unit. This system is powered by a battery powered circuitry to run it. A raspberry pi is used for processing the data and operating the system. The system consists of around 10 stored messages like “need help”, “where is the toilet/washroom” and so on that help mute people convey basic messages.

The system reads persons hand motions for different variations of hand movement. It also consists of a trigger sensor in order to indicate that the person wishes to activate the system and speak something. This ensures the system does not speak when the person is just involuntarily making hand motions. The raspberry pi processor constantly receives input sensor values and then processes it. Now it searches for matching messages for the set of sensor values. Once it is found in memory this messages is retrieved and is spoken out using text to speech processing through the interfaced speaker. Thus we have a fully functional smart speaking system to help mute people communicate with regular people using a simple wearable system.

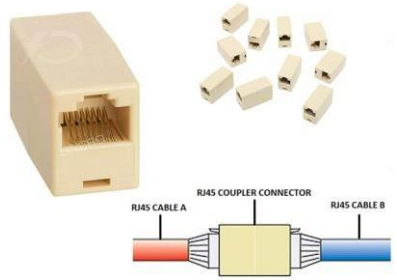
Raspberry Pi Detailed Diagram-

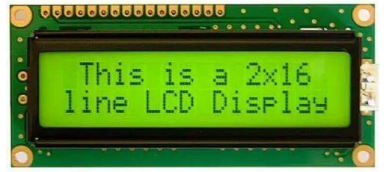


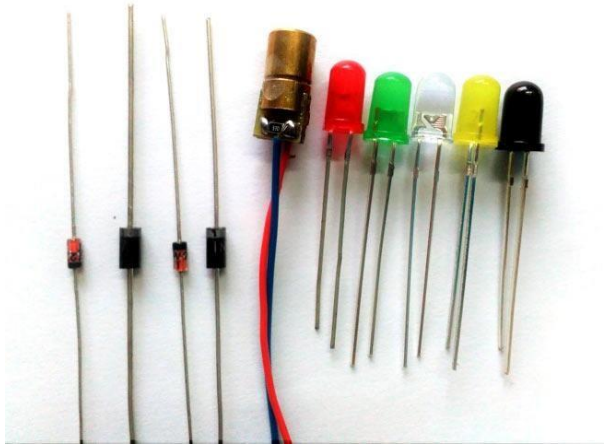
IDENTIFICATION OF REQUIRED COMPONENTS

Hardware components-

- Raspberry Pi 3
- Accelerometer
- Flex Sensor
- Gloves
- Speaker
- LCD Display
- Crystal Oscillator
- Resistors
- Capacitors
- Transistors
- Cables and Connectors
- Diodes
- PCB and Breadboards
- LED Transformer/Adapter Push Buttons
- Switch
- ICIC Sockets

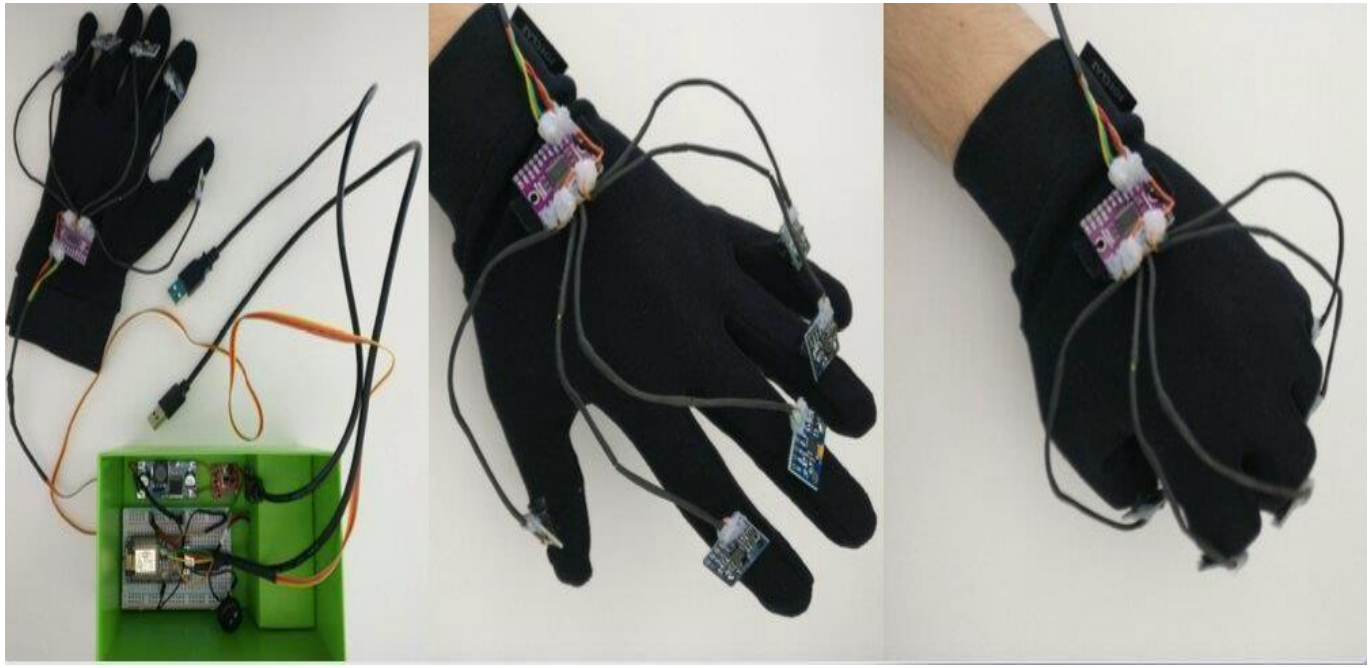






SOFTWARE COMPONENTS

- MC Programming Language: Python
- Block Diagram



Estimated Budget-

Components Required	Estimated Cost
Raspberry PI	Rs 3500/-
LCD (16 by 2)	Rs 300/-
Capacitor	Rs 170/-
Connecting wires	Rs 300/-
Bread Board	Rs 150/-
Accelerometer	Rs 540/-
Speaker	Rs 800/-
Diodes	Rs 50/-
Switch	Rs 100/-
Gloves	Rs 200
LED Transformer	Rs 130/-
Resistor	Rs 200/-
ICIC Sockets	Rs 100/-
Total Budget	**Rs 6540/-**

PLAN OF ACTION

Action	
Phase – 1	Setting up Raspberry pi and procuring the required elements
Phase – 2	Connecting the hardware
Phase – 3	Coding and testing of Smart Speaking System

TIMELINE OF PROGRESS

Action	Timeline
Phase – 1	26-June-2023 to 1st-July-2023
Phase – 2	17-July-2023 to 22-July-2023
Phase – 3	07-Aug-2023 to 12-Aug-2023

Wiring of the Smart Speaking System For Mute People

The connections are as follows-