

IOT based Paralysis Patient Monitoring System Team Efftronics

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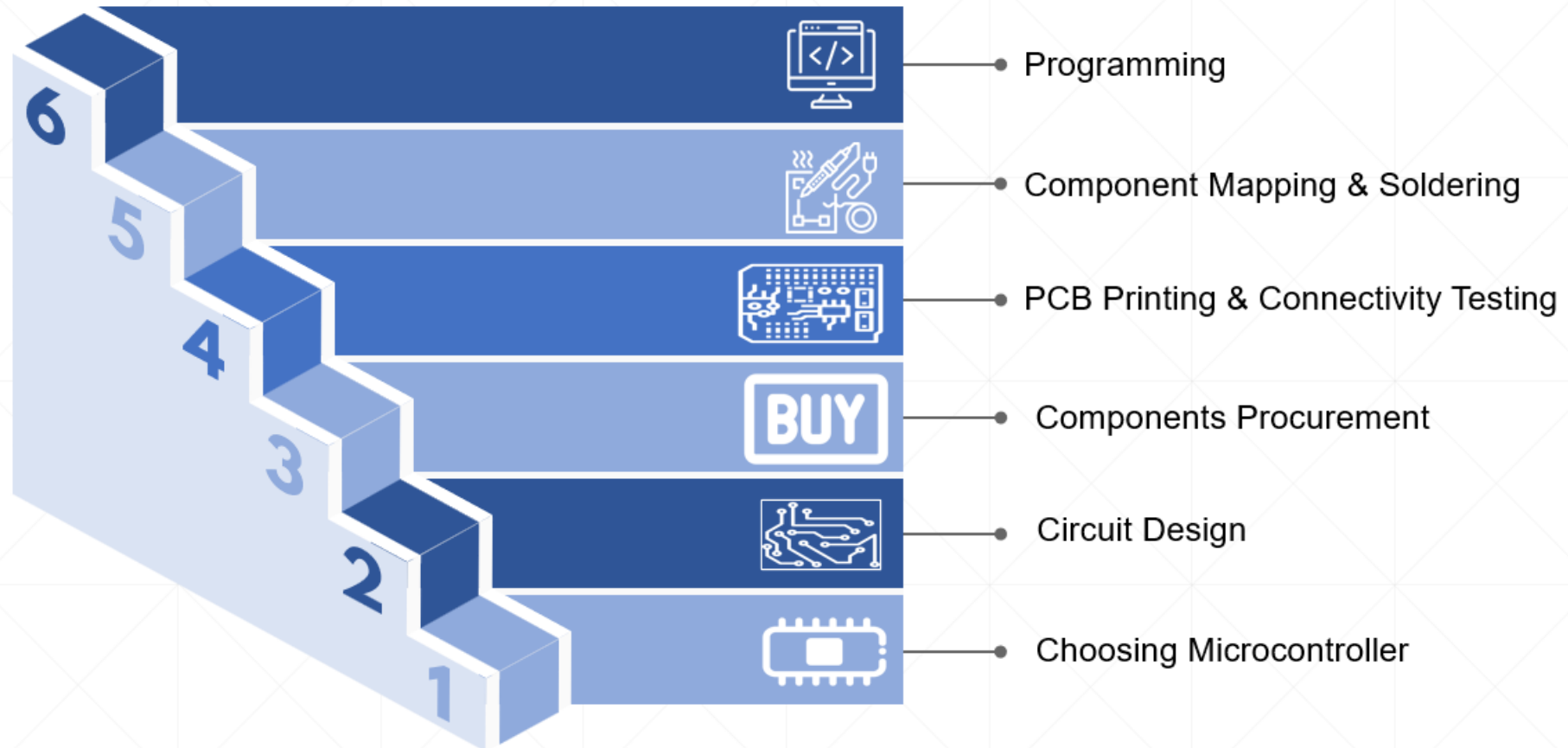
PROBLEM STATEMENT:

- As we all know, paralysis is the inability to move muscles on your own and with purpose.
 - Unfortunately they cannot convey their basic requirements even to their known ones.
 - Also constant monitoring of their health is also very essential.
 - Hence it is required to have a system which conveys us their basic needs.
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PROPOSED SYSTEM:

- The IOT-based paralysis patient health care system is a system designed to assist the patient in communicating various messages to doctors, nurses, or loved ones while sitting at home or in the office via the internet.
 - To achieve this functionality, the system employs Wi-Fi -based circuitry. It employs a hand motion recognition circuit along with healthcare monitoring circuit.
 - The hand motion circuit detects hand movements with an accelerometer. Few sensors are being used for monitoring the health of the patient. This information is transmitted to a server via a Wi-Fi module.
 - An IOT based platform known as Blynk is used for displaying the messages to the concerned ones.
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PROJECT DEVELOPMENT STAGES



HARDWARE REQUIREMENTS:

- ESP32 WIFI Microcontroller
- ADXL335 Accelerometer Sensor
- MAX30100 Pulse Oximeter and Heart Rate Sensor
- DS1820B Temperature Sensor
- Push(Panic) Button
- Buzzer
- Bread Board
- Jumper Wires

SOFTWARE REQUIREMENTS:

- Arduino IDE
 - Blynk IOT Platform(Server & Smartphone App)
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ESP 32

- The ESP32 is a single 2.4GHz Wi-Fi and Bluetooth combo chip designed with TSMC's 40nm low power technology.
- Designed for maximum power and RF performance, demonstrating reliability, versatility, and reliability in a wide range of applications and power scenarios.



ESP 32 SPECIFICATIONS:

Specifications	
Operating Voltage	2.2V to 3.6V
GPIO	36 ports
ADC	14 ports
DAC	2 ports
Flash memory	16 Mbyte
SRAM	250 Kbyte
Clock Speed	Up to 240 MHZ
Wi-Fi	2.4 GHz
Sleep Current	2.5 μ A

ADXL335 ACCELEROMETER SENSOR

- The ADXL335 gives complete 3-axis acceleration measurement.
- This module measures acceleration in the x, y, and z axes within a 3 g range.
- This module's output signals are analog voltages proportional to acceleration.
- It has a surface-micro machined polysilicon sensor and signal conditioning circuitry.



MAX30100 PULSE OXIMETER AND HEART RATE SENSOR

- The MAX30100 is a sensor system that combines a heart rate monitor and pulse oximetry.
- By combining two LEDs, a photodetector, improved optics, and low-noise analog signal processing, it can detect pulse oximetry and heart rate.
- The MAX30100 can be turned down by software with very little standby current and operates on 1.8V and 3.3V power supplies, allowing the power supply to always be attached.



DS1820B TEMPERATURE SENSOR

- The DS18B20 is a tiny temperature sensor with an integrated 12 bit ADC.
- It is simple to connect to an Arduino digital input.
- The sensor requires few extra parts and communicates over a one-wire bus.
- The sensors' quoted accuracy in the temperature range of -10 degrees Celsius to +85 degrees Celsius is +/-0.5 degrees Celsius.



BUZZER

- A buzzer or beeper is a mechanical, electromechanical, or piezoelectric audio signaling device (piezo for short).
- Buzzers and beepers are frequently used as alarm clocks, timers, and to validate human input such a mouse click or keyboard.



PUSH(PANIC) BUTTON

- Panic buttons are used when it may be unsafe or uncomfortable to call for help in other ways.
- The purpose of a panic alarm is to allow a person under duress to quickly and silently call for help in the event of an emergency.



ARDUINO IDE

- The Arduino Software (IDE), also referred to as the Arduino Integrated Development Environment (IDE), has menus, a message area, a text console, a toolbar with buttons for essential operations, and a text editor for creating code.
- It establishes a link with the Arduino hardware so that programs may be uploaded and interacted with.
- With the inclusion of unique methods and functions, which we'll discuss later, Arduino programming is written in C++.
- Human-readable programming languages include C++. A "sketch" the name given to Arduino code files is created and then processed before being translated into machine language.

Three major categories can be used to divide the Arduino programming language:

- Functions
- Values (variables and constants)
- Structure.



BLYNK IOT PLATFORM(SERVER & SMARTPHONE APP)

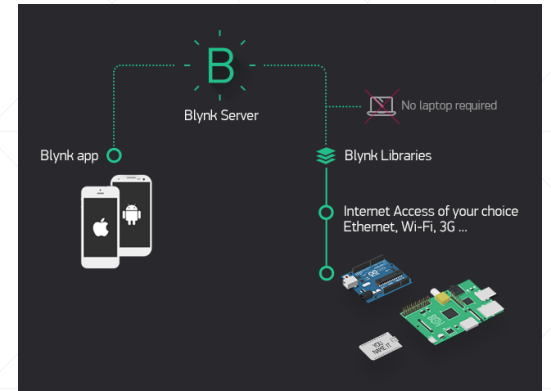
- Blynk is a platform for creating mobile apps for smartphones that function with a variety of programs.
- The Blynk platform's main goal is to make creating mobile phone applications incredibly simple.

Blynk Platform: Mobile App

- Create Blynk projects using it.
- Several widgets and connections to various devices are possible for each project.
- Projects can be distributed.

Blynk Platform: Server

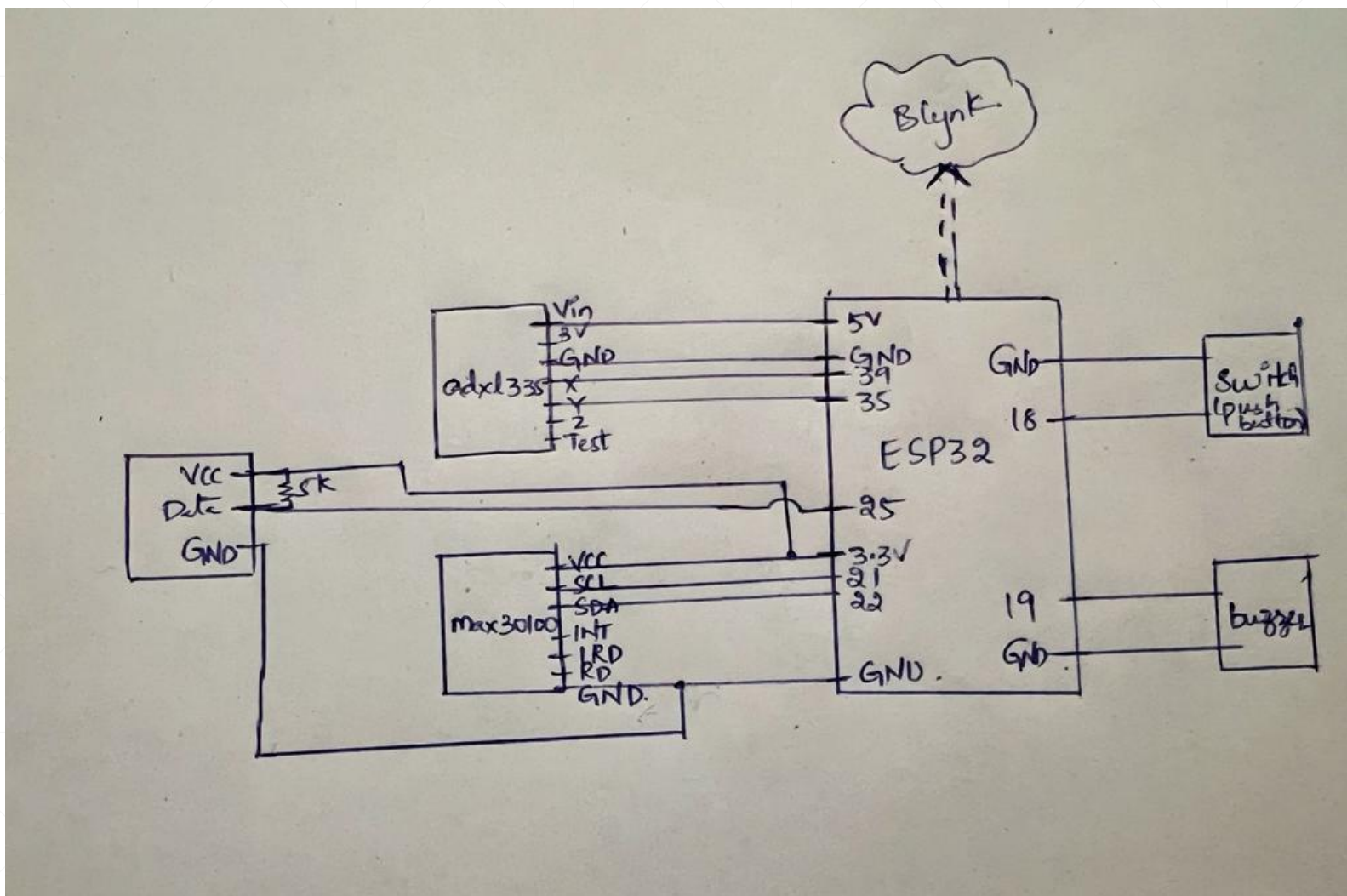
- Python and JavaScript are supported by the Blynk library.
- Can function on any host as long as it has a Java runtime environment.
- Cloud server: Simple to use, quick to get going.
- Private Server: Complete access and management of your data. Maximum security and minimal latency.



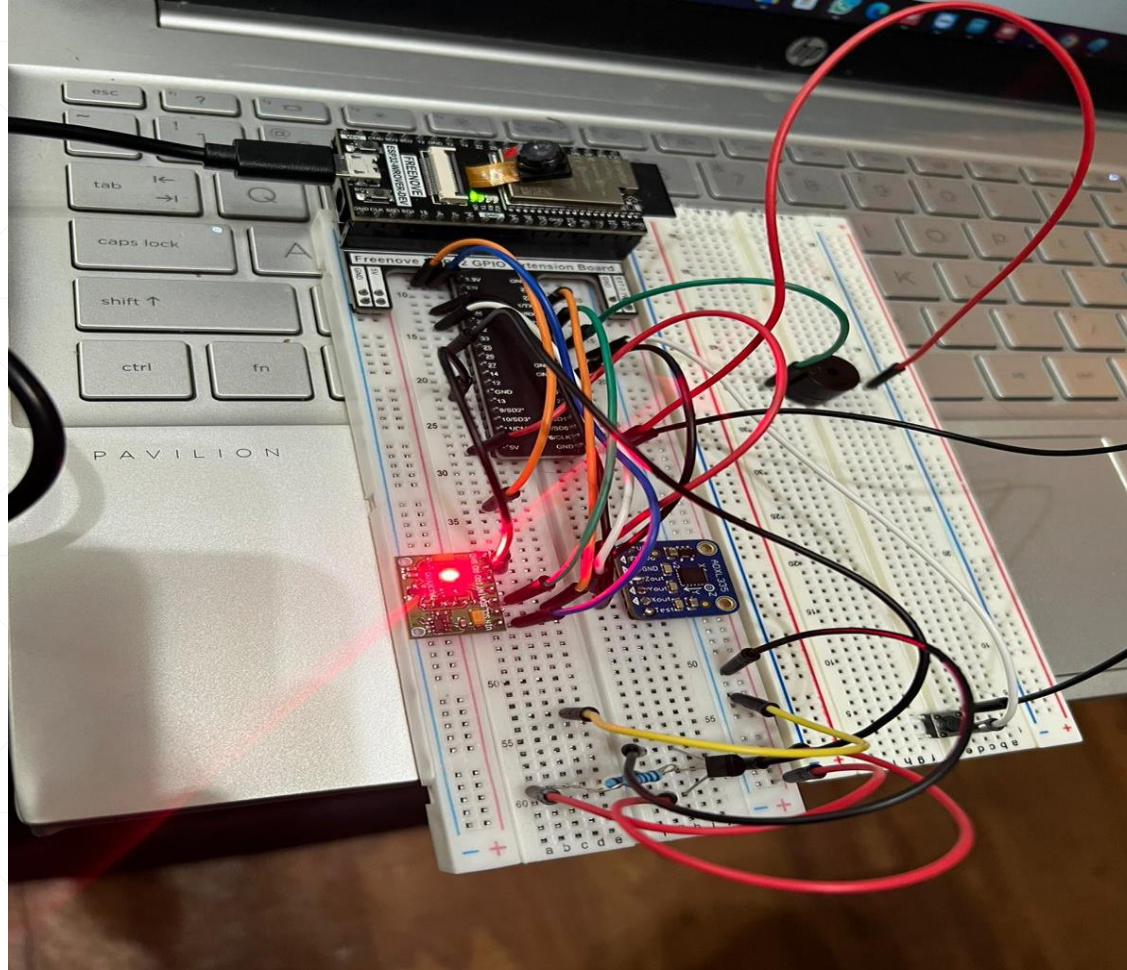
WORKING

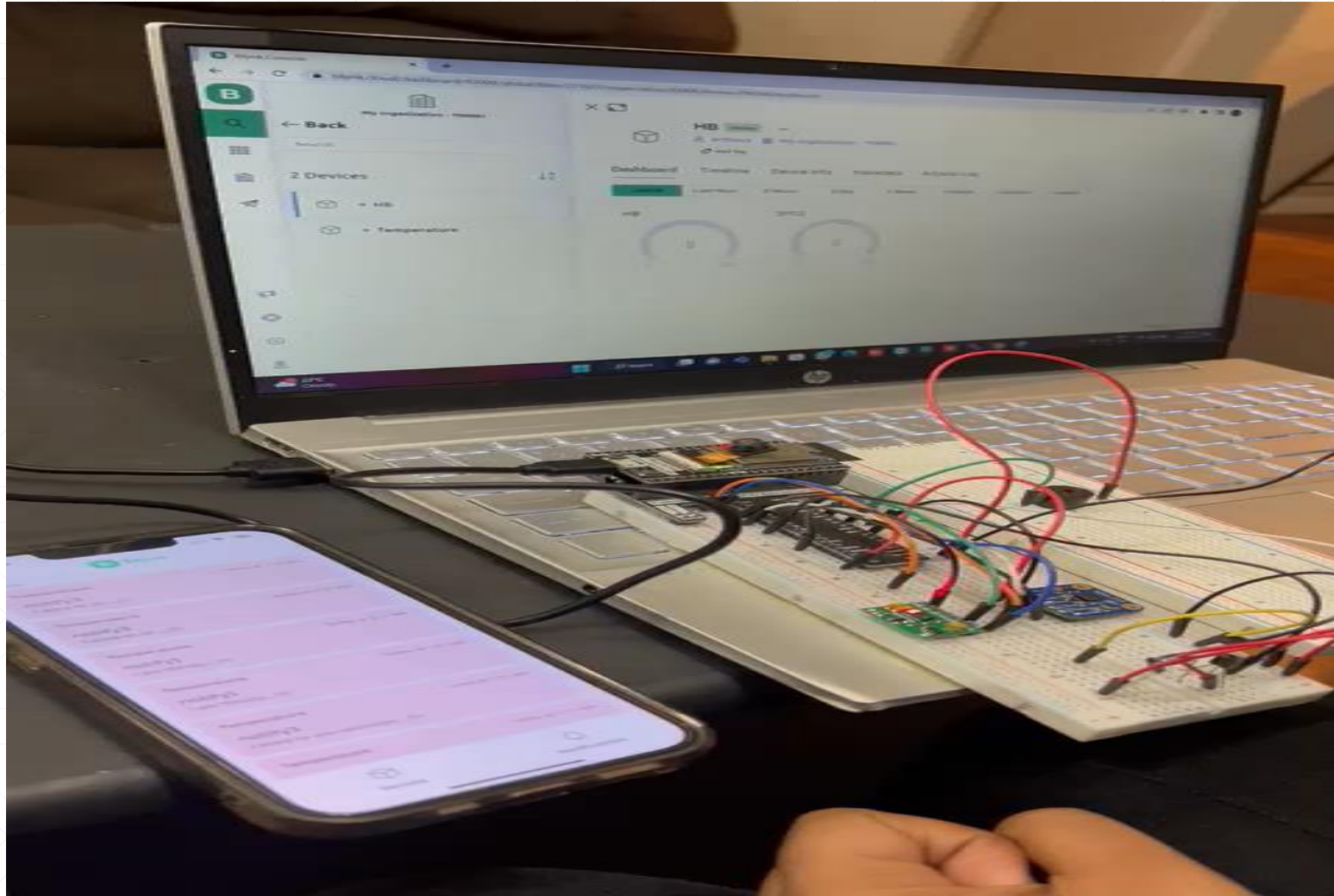
- System uses three sensors: Accelerometer(ADXL335), Temperature(DS1820B) and Pulse sensor(MAX30100).
 - ADXL335 captures the gestures of the patient to display basic messages.
 - DS1820B senses the temperature of the patient.
 - MAX30100 senses the pulse as well as oxygen levels.
 - Push button is used as a panic button to notify if any help is required.
 - Buzzer is used to alarm people nearby whenever help is required.
 - ESP32 analyzes the data sensed by all the sensor as well as the push button.
 - The analyzed data is processed and sent to IOT server i.e., Blynk to display the temperature, pulse rate, oxygen levels and the required messages on the server.
 - Blynk server displays the pulse rate, oxygen levels and temperature values. Along with that Blynk mobile application can notify others the hand movement messages and panic button messages(Help messages) to the users.
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BLOCK DIAGRAM



Connections and Circuit





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THANK YOU

