

**1. Overview of Existing Systems and Their Limitations**

**Existing Systems**

Current health monitoring systems are primarily hospital-based or rely on wearable devices that transmit data to local storage or cloud servers. These include:

* **Traditional patient monitoring systems** used in hospitals, which require professional supervision.
* **Wearable smartwatches** that track vitals but may lack clinical accuracy.
* **IoT-based health monitoring solutions**, which are relatively new but often require complex setups and high maintenance costs.

**Limitations**

Despite advancements, existing systems have several drawbacks:

1. **Limited Remote Access**: Many systems do not provide real-time monitoring outside of hospital settings.
2. **High Cost**: Advanced health monitoring devices are expensive, making them less accessible.
3. **Energy Inefficiency**: Many wearable devices have short battery lives, requiring frequent recharges.
4. **Lack of Continuous Monitoring**: Some devices only collect periodic data, missing critical health fluctuations.
5. **Connectivity Issues**: Certain systems require stable internet connections, which may not always be available

**2. Proposed Methodologies**

### ****a. Motivation****

The increasing need for real-time health monitoring, especially for elderly and chronically ill patients, necessitates a cost-effective and accessible solution. The **Dynamic Health Surveillance System** (DHSS) aims to bridge the gap by leveraging IoT technologies for real-time patient monitoring and alerts.

### ****b. Objectives****

* Develop a **reliable** and **affordable** health surveillance system.
* Ensure **real-time monitoring** and **data visualization** through a mobile application.
* Provide **timely alerts** using LED and buzzer indicators.
* Enable **remote access** for doctors and caregivers via cloud integration.
* Ensure **low-power consumption** for long-term use.

### ****c. Development of Tools and Methodologies****

**Tools Used**

1. **Hardware:**
   * ESP8266 (Microcontroller with Wi-Fi capabilities)
   * Pulse Sensor (Heart Rate Measurement)
   * DHT11 (Humidity and Room Temperature Sensor)
   * DS18B20 (Body Temperature Sensor)
   * LCD Display (Real-time data output)
   * Buzzer and LED (Alert mechanisms)
2. **Software:**
   * **Arduino IDE** for programming
   * **Blynk Application** for cloud-based visualization
   * **Wi-Fi communication protocols** for real-time data transfer

**Methodology**

1. **Sensor Integration:** Collecting health parameters such as heart rate, body temperature, and room conditions.
2. **Data Processing:** ESP8266 processes the acquired data and applies threshold values.
3. **Cloud Integration:** Data is transmitted to the Blynk cloud for remote access and storage.
4. **Alert Mechanism:** Abnormal readings trigger an LED and buzzer alert.
5. **User Interface:** Data is displayed on both an LCD screen and the Blynk app.

**3. Identification of Components**

### ****Sensors****

* **Pulse Sensor:** Measures real-time heart rate.
* **DHT11 Sensor:** Records room temperature and humidity.
* **DS18B20 Sensor:** Monitors body temperature.

### ****Actuators****

* **LED Indicator:** Lights up when pulse levels drop below normal.
* **Buzzer Alarm:** Sounds an alert when critical health conditions are detected.

### ****Smart Objects****

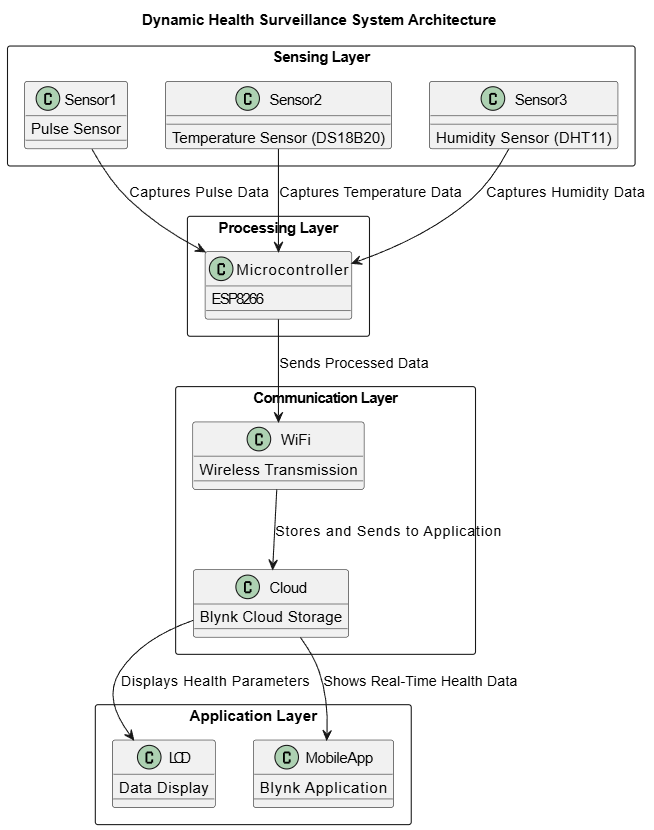
* **ESP8266 Microcontroller:** Processes data and connects to Wi-Fi.
* **Blynk App:** Provides a real-time visualization of patient vitals on a mobile platform.

**4. System Specification**

* **Microcontroller:** ESP8266 NodeMCU
* **Connectivity:** Wi-Fi-based data transmission
* **Data Reporting Interval:** 1 second
* **Power Supply:** 5V (via USB or battery)
* **Alert Mechanism:** LED and buzzer notification system

**5. IoT Level Specifications**

* **IoT Level 1:** Sensor-based real-time data collection
* **IoT Level 2:** Cloud-based storage and remote accessibility
* **IoT Level 3:** Data analytics and historical tracking via the Blynk platform

**6.System Architecture**