Dhaka University of Engineering & Technology (DUET), Gazipur
Department of Computer Science and Engineering

Project Proposal

Title: *IoT-Based Patient Health Monitoring System Using ESP32 Web Server*
Course: CSE 2122 – Software and Hardware Project

Submitted by:

- Md. Mamunur Rahman (ID: 2204011)
- Most. Sabina Yasmin Laboni (ID: 2204025)
- Mohatamim Haque (ID: 2204044)

Supervised by:

- **Dr. Fazlul Hasan Siddiqui**
  Professor, Department of Computer Science and Engineering, DUET, Gazipur
- **Dr. Md. Shohidul Islam**
  Associate Professor, Department of Computer Science and Engineering, DUET, Gazipur

Objective

To design and implement a low-cost, real-time health monitoring system using the ESP32 microcontroller that can measure and display vital signs such as body temperature, heart rate, and blood oxygen level (SpO_2) through a local web server accessible via Wi-Fi.

Key Features

- ESP32 as Web Server: Hosts a responsive web interface to display live health data.
- Sensor Integration: Measures body temperature (MLX90614 or DS18B20), heart rate and SpO_2 (MAX30102).
- Wireless Monitoring: Data accessible from smartphones or computers over Wi-Fi.
- Real-time Visualization: Display sensor values as text or dynamic graphs.
- Threshold Alerts: Optional buzzer/LED for alerts when readings cross danger limits.
- Portable and Low Power: Small, efficient system for home or hospital use.

Estimated Cost

Serial No.	Item	Quantity	Approx. Cost (BDT)
1	ESP32 Development Board	1	600
2	MAX30102 Pulse Oximeter	1	400
3	MLX90614 / DS18B20 Sensor	1	250
4	OLED Display (optional)	1	300
5	Jumper Wires + Breadboard	1 set	150
6	Miscellaneous (LED, buzzer)	-	100
7	DHT11 Sensor	1	150
8	Resistor 4.7K	1	20
	Total	-	৳1970 approx.

Summary

This project aims to develop a smart patient health monitoring system using the ESP32 microcontroller and various sensors. The system gathers vital signs and displays them through a built-in web server over Wi-Fi. The device is cost-effective, simple to build, and can be used for continuous monitoring in home or clinical environments. It enhances accessibility to healthcare data and can be expanded to include cloud storage, SMS alerts, or app support.

Outcome

A fully functional IoT-based prototype capable of displaying real-time body temperature, heart rate, and SpO_2 levels via a web browser. The system enables remote health tracking and can help in early detection of critical conditions, making it ideal for home-based or rural healthcare monitoring.