Project Proposal: Tempro – Wireless Temperature Monitoring Unit

# Project Overview

Tempro is a low-cost, wireless temperature and humidity monitoring system designed for real-time data collection using the NodeMCU ESP8266 and DHT22 sensor. The system consists of 5 compact IoT units (4 active + 1 spare) that communicate via a Wi-Fi router to a central server or dashboard. This proposal includes a detailed breakdown of costs for each unit and the complete system.

# Objectives

- Accurately monitor temperature and humidity.

- Transmit sensor data wirelessly over Wi-Fi.

- Power each unit using a portable battery pack.

- Protect components in a durable enclosure.

- Use a central router for connecting all units to a common network.

# Component Costs (Per Unit)

|  |  |  |  |
| --- | --- | --- | --- |
| Component | Qty | Unit Price (INR) | Total (INR) |
| NodeMCU ESP8266 | 1 | ₹300 | ₹300 |
| DHT22 Sensor | 1 | ₹250 | ₹250 |
| 1.5V Batteries | 3 | ₹20 | ₹60 |
| Battery Case (3x1.5V) | 1 | ₹50 | ₹50 |
| Enclosure/Box | 1 | ₹30 | ₹30 |
| Wires | — | ₹50 | ₹50 |
| Misc. Components (glue, resistors, small tools, etc.) | — | ₹50 | ₹50 |

Total per Unit: ₹790

# System-Wide Shared & Additional Costs

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Qty | Price (INR) | Total (INR) |
| 5 Units (4 active + 1 spare) | 5 | ₹790 | ₹3,950 |
| Wi-Fi Router (shared) | 1 | ₹1,200 | ₹1,200 |
| Other Miscellaneous Expenses | — | — | ₹700 |

Grand Total: ₹5,850

# System Features

- DHT22 Sensor: High-accuracy temperature and humidity sensor.

- NodeMCU ESP8266: Wi-Fi-enabled microcontroller with built-in USB.

- Battery Powered: Portable 4.5V system (3x 1.5V).

- Wireless Communication: Supports MQTT or HTTP protocols.

- Modular Design: Easy to replace, update, or scale.

# Future Upgrades

- Switch to rechargeable lithium batteries with solar charging.

- Integrate OLED display for local reading.

- Develop a web or mobile dashboard for centralized monitoring.

- Add automatic alerts for extreme conditions.

# Conclusion

The Tempro system offers an affordable and modular solution for wireless environmental monitoring. With a per-unit cost of just ₹790, plus shared and miscellaneous costs, the full 5-unit setup totals ₹5,850. This makes Tempro ideal for schools, research, smart homes, or agriculture projects.