GROUP - 6

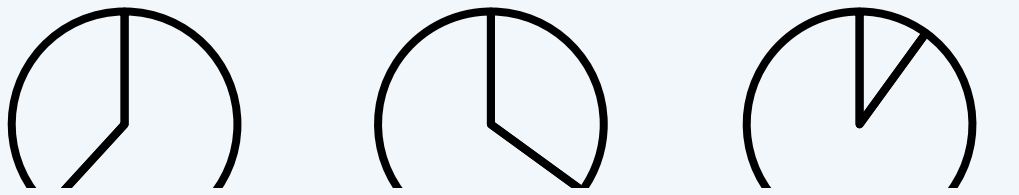
Industrial Plant cum Environmental Monitoring System

INTRODUCTION & MOTIVATION :

The **Industrial Plant cum Environmental Monitoring System** project was conceived to address the growing need for real-time monitoring and control of critical environmental parameters within industrial settings. By leveraging robust industrial communication protocols **Modbus** and **MQTT**, this system provides a comprehensive solution for tracking temperature, humidity, pressure, and air quality (in ppm) in real-time.

METHODOLOGY:

The system begins by reading environmental sensor data, through a slave ESP32. Using the Modbus communication protocol, this data is transmitted to a master ESP32. A Node.js server is then set up and connected to a MongoDB database for data storage. The server integrates with MQTT to fetch real-time data from the database and display it on a live website.



Time dedicated to MODBUS | **Time dedicated to MQTT** | **Time dedicated to displaying data**

APPLICATIONS:

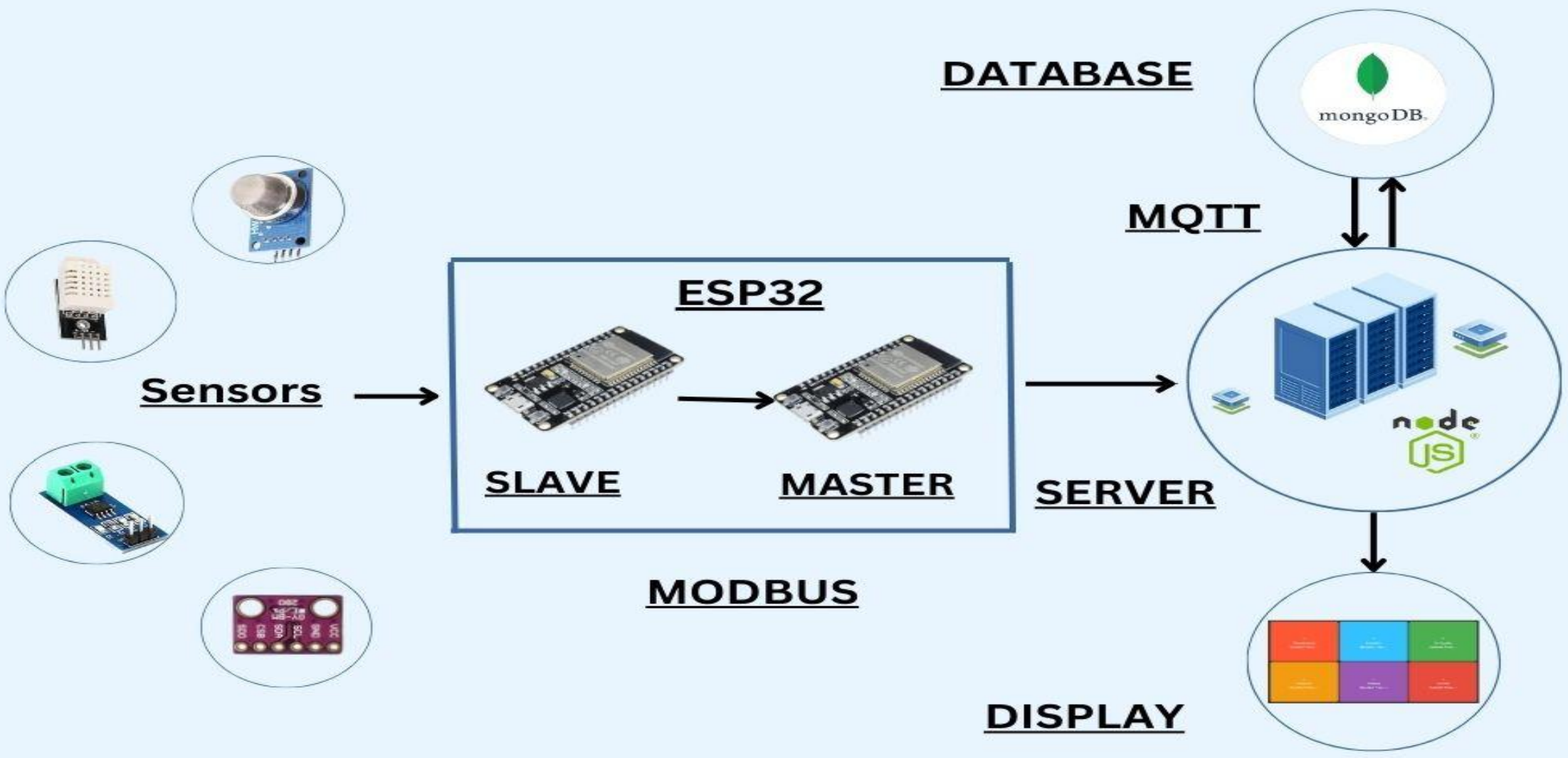
real-time monitoring of critical environmental parameters such as temperature, humidity, pressure, and air quality in **manufacturing plants, production facilities, warehouses, and industrial zones**

FUTURE SCOPE:

The system can be enhanced by adding **security features** like authentication and encryption to protect data integrity. A **user-friendly display interface** can be integrated to control hardware operations, such as stopping data collection for specific sensors or adjusting parameters in real-time. Further expansion could include predictive maintenance alerts and integration with advanced IoT platforms.

Industrial IoT Framework

Industrial Plant cum Environmental Monitoring system



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