**Department of Computer Science and Engineering**

**Amrita School of Computing, Coimbatore**

**Amrita Vishwa Vidyapeetham – India**

**19CSE446 – Internet of Things**

**2024-25 Even Sem**

**Course Project Details**

**Title of the Project:** IoT-Based Campus Water Level Monitoring & Management System

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| --- | --- | --- | --- |
| **S.No** | **Roll No** | **Name** | **WhatsApp No** |
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**Main Objectives of the Project:**

1. Continuously monitor water levels in a tank using IoT sensors.
2. Alert truck drivers when the water level drops below a set threshold.
3. Enable GPS tracking of water supply trucks to monitor their location.
4. Update water level and truck location status in real-time on a mobile app.
5. Collect and analyse data on water usage.

**Hardware Components Required:**

|  |  |  |  |
| --- | --- | --- | --- |
| **SNo** | **Name of the Items with Tech Spec.** | **Qty** | **Approximate cost (Rs)** |
| 1. | **Water Level Sensor**: Ultrasonic sensor (e.g., HC-SR04) or float sensor for water level detection. | 2 | 50 \* 2 = 100 |
| 2. | **Microcontroller**: ESP32-WROOM-32E | 5 | TBD |
| 3. | **GPS Module**: NEO-6M GPS or similar for truck location tracking | 3 | 200 \* 4 = 800 |
| 4. | **Power Supply**: Battery or DC power supply for the system. | 5 | 20 \* 5 = 100 |

**Software Components Required:**

|  |  |  |  |
| --- | --- | --- | --- |
| **SNo** | **Name of the SW / Cloud with Tech Spec.** | **Free / licensed Version** | **Approximate Budget** |
| 1. | **Mobile App**: Cross-platform app for water level and location updates | Free/Open Source | Nil |
| 2. | **Server**: Cloud-based server (Firebase/AWS) or local database for data storage. | Free or Licensed | Nil |
| 3. | **Firmware**: Microcontroller code written in C/C++ using ESP-IDF or Arduino framework. | Free | Nil |
| 4. | **Messaging Service**: Twilio or Firebase Cloud Messaging (FCM) for alert notifications. | Free/Pay-as-you-go | TBD |

**Project Plan and Timeline**

|  |  |  |
| --- | --- | --- |
| Phase | Tasks | Timeframe |
| Phase 1 | Research and finalize hardware and software requirements. | Week 1 |
| Phase 2 | Procure components and set up initial prototypes. | Week 2 - Week 3 |
| Phase 3 | Develop firmware for the ESP32 microcontroller and integrate sensors. | Week 4 - Week 5 |
| Phase 4 | Build the mobile application and integrate GPS tracking functionality. | Week 6 - Week 7 |
| Phase 5 | Test the system in a controlled environment and debug issues. | Week 8 - Week 9 |
| Phase 6 | Deploy the system and prepare project documentation. | Week 10 |

**Team Members – Specific Contributions**

| **Team Member** | **Role** | **Key Contributions** |
| --- | --- | --- |
|  | Firmware Development | ESP32 programming, sensor integration. |
|  | App Developer, GPS Integration | Mobile app development, GPS module configuration. |
|  | Hardware and Testing Engineer | Hardware setup, power supply management, testing. |

**Specific Outcome (Expected)**

* A functional IoT-based system capable of monitoring water levels and notifying stakeholders.
* Real-time location tracking of water supply trucks via GPS.
* A user-friendly mobile application displaying tank levels and truck locations.
* Improved efficiency in water management and delivery within the campus.
* Real time Analysis of water usage.