

Abstract

A smart city is the future goal to have cleaner and better amenities for the society. With the use of sophisticated sensor technology, data processing, and intuitive user interfaces, the Real-time Oxygen Level Detection for Enhanced Safety system improves safety precautions in a variety of situations. It investigates IoT technology and makes use of user-friendly interfaces for information on current oxygen levels and alarm records.

Objectives

- 1. To provide early detection of low oxygen levels to prevent health risks, accidents, or hazardous situations.
- 2. Implement alarm systems that trigger when oxygen levels fall below safe thresholds, promptly notifying relevant personnel.
- 3. Provide a user-friendly interface for operators to easily monitor oxygen levels and respond to alarms and alerts.

Introduction

- Oxygen levels in the manhole are crucial for worker survival, and accurately measuring and detecting them is essential for various reasons.
- In the end, the recommended design for the drainage system contributed to people's survival. Reducing the risk related to urban drainage systems and minimizing the amount of work required of the municipal corporation were the main objectives of this research.
- Health and Safety of Drainage Workers: Ensuring the health and safety of workers requires precise monitoring and detection of oxygen levels.
- A manhole detection and monitoring system based on IoT is a very useful system for all of us because it detects manhole conditions.

Development Stages

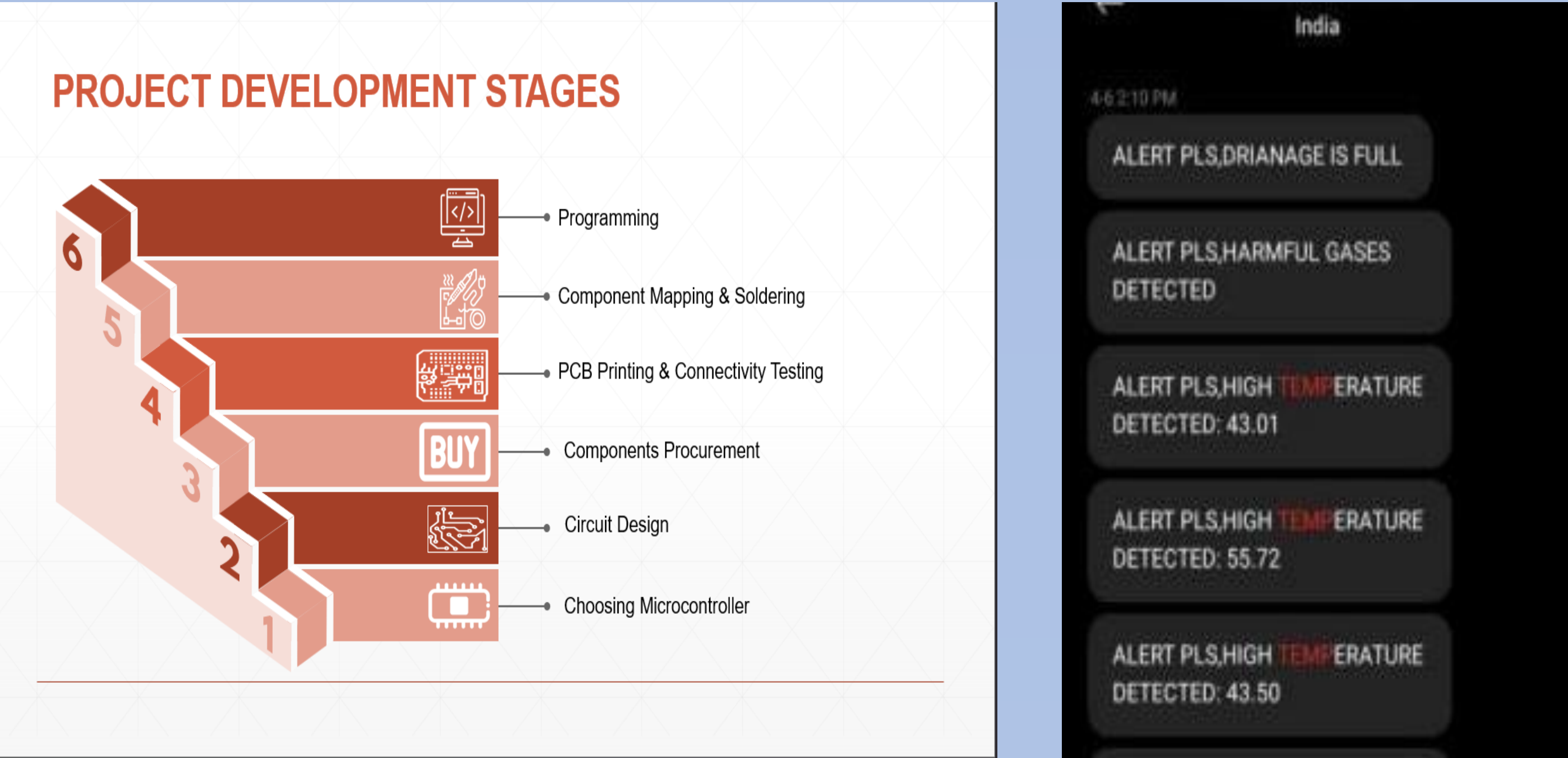


Fig 1. The project development stages with alert massage system

Implementation

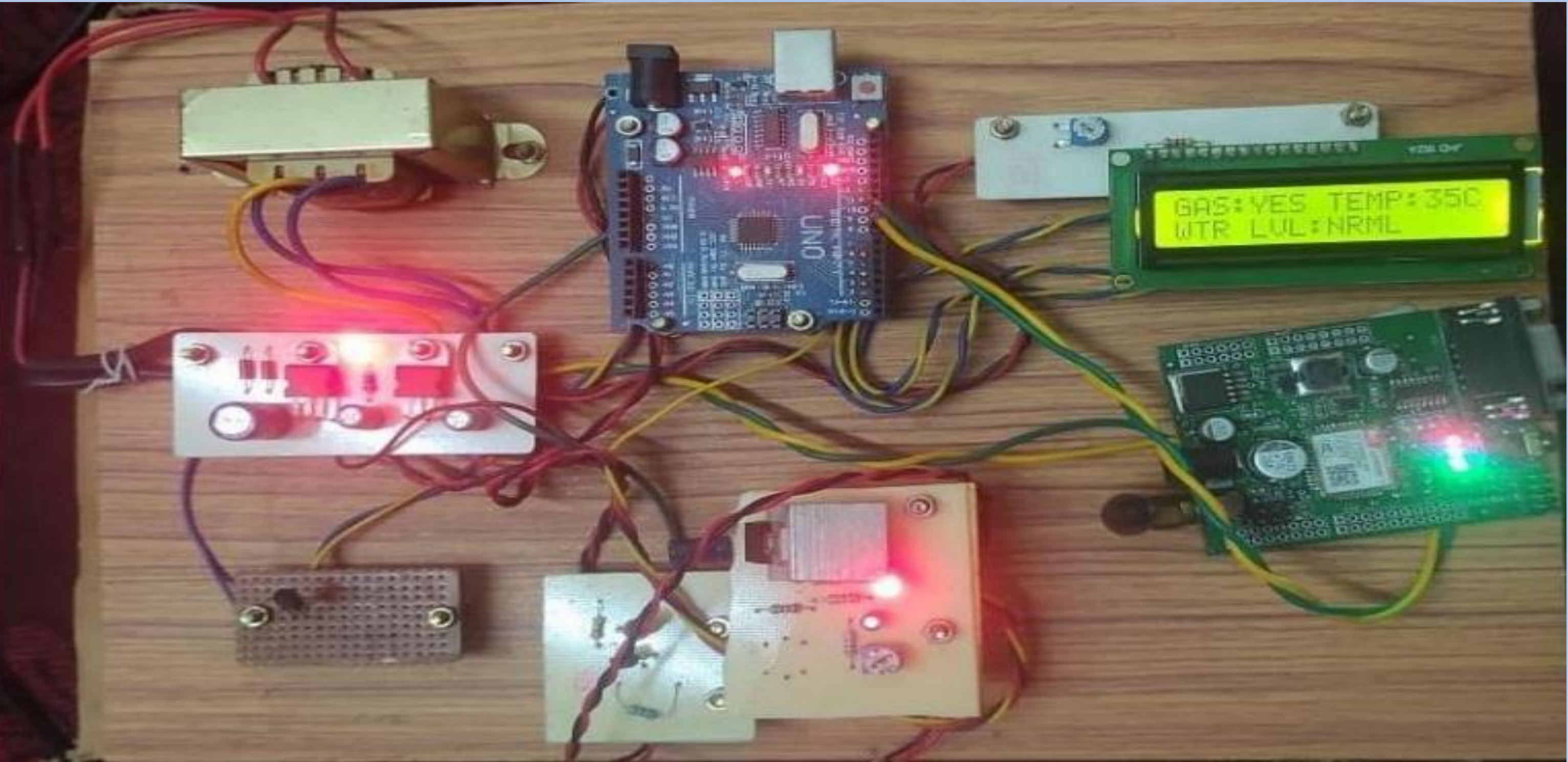


Fig 5. Arrangement of Circuit Components

Block Diagram Of Drainage Monitoring System

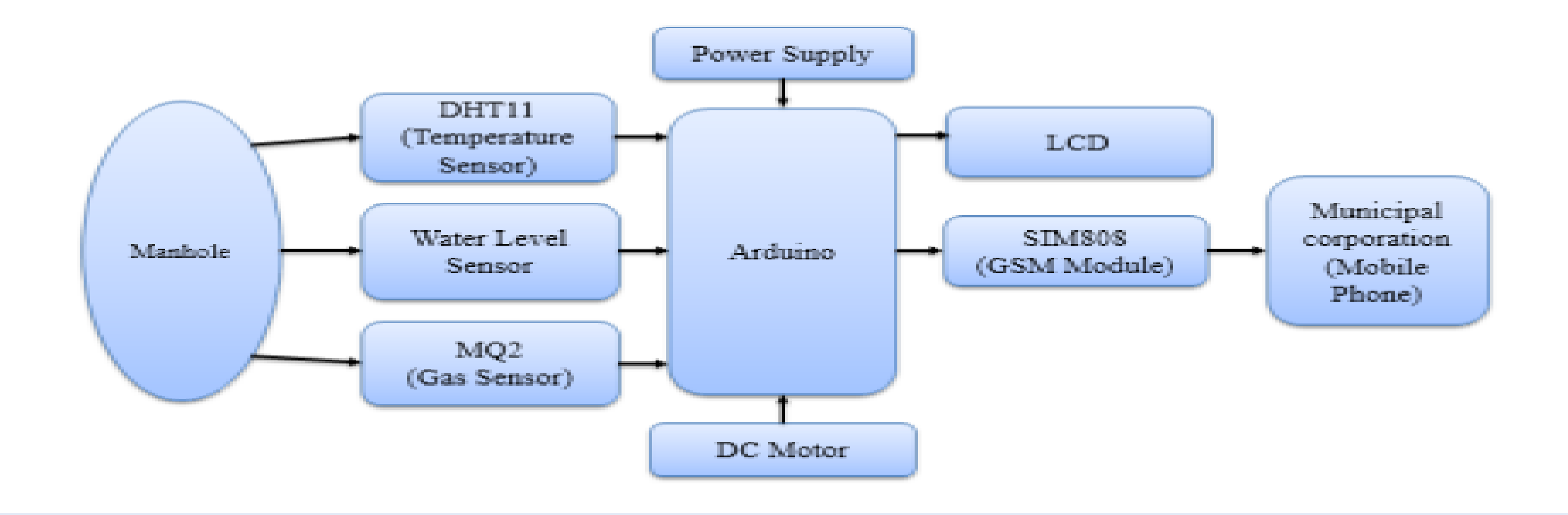


Fig 2. Block Diagram Drainage Monitoring System

Flow diagram of Proposed System

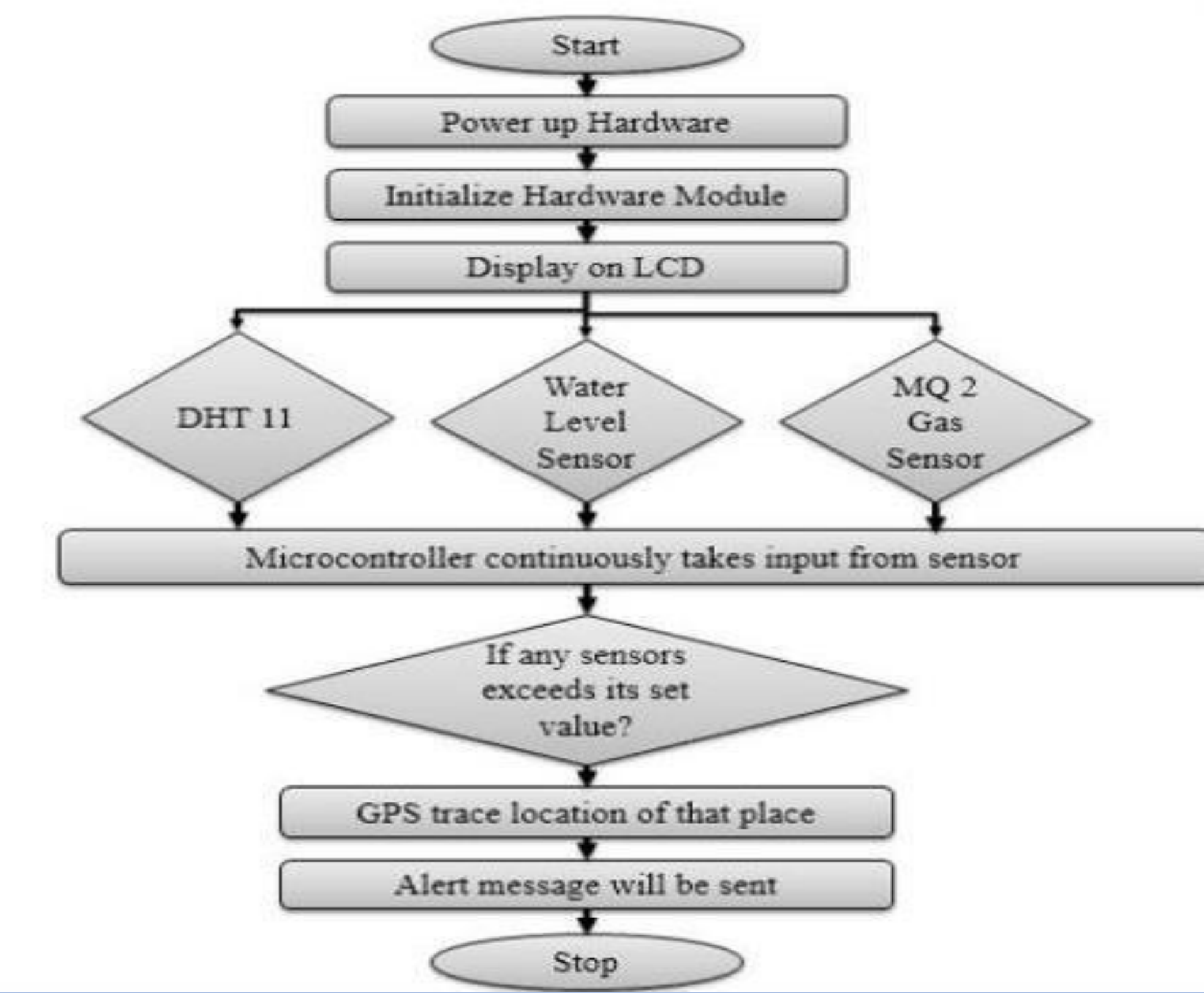


Fig 3. Flow Diagram of Proposed System

Circuit Diagram

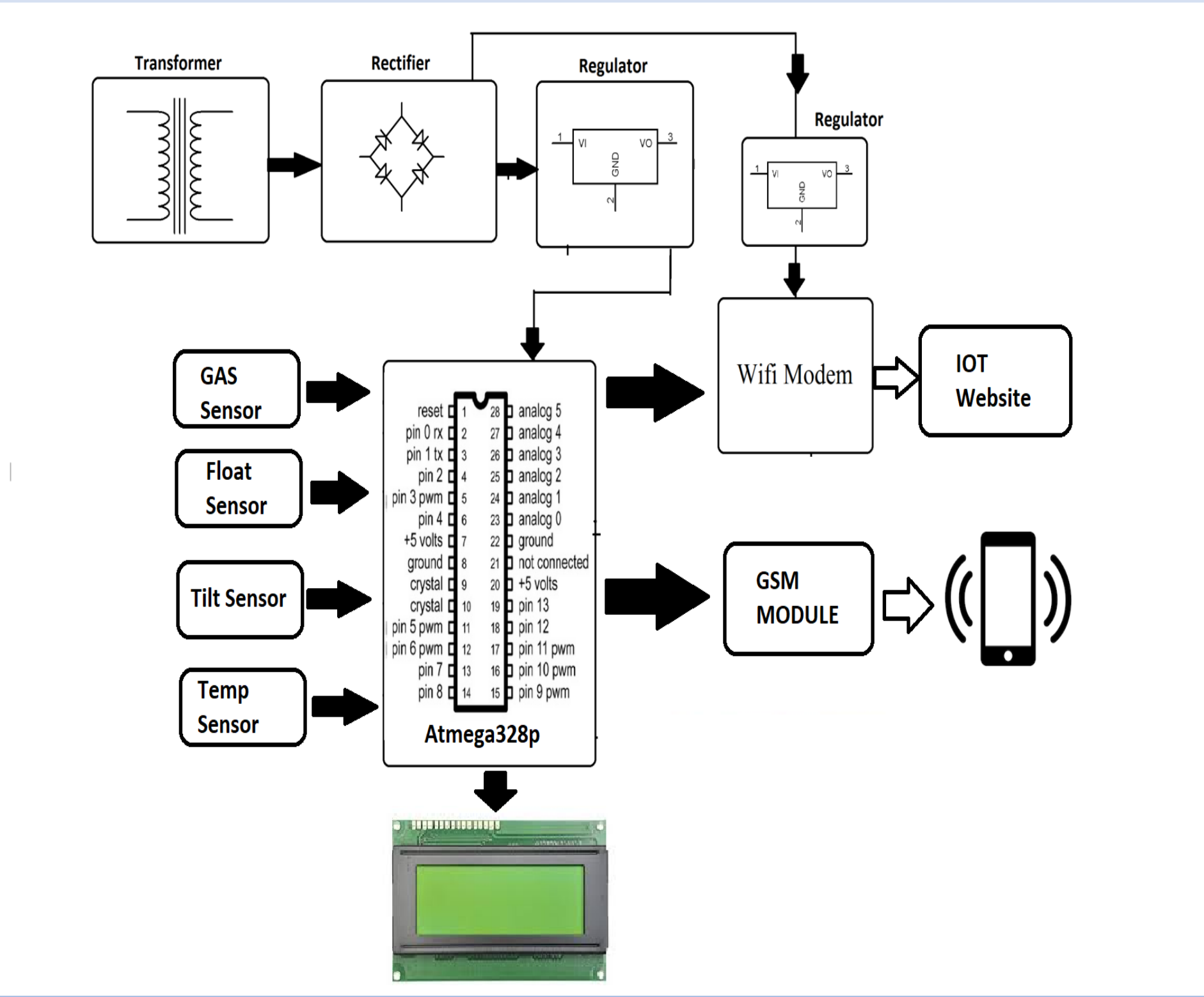


Fig 4. Circuit Diagram

Conclusions

- This project proposes techniques for monitoring and controlling subsurface drainage systems' oxygen levels using real-time manhole detection and the Internet of Things. It uses temperature, oxygen, flow, and water levels to reduce unnecessary manhole visits and ensure regular drainage checks, preventing potential hazards.
- Ultimately, the drainage system's suggested design helped save people's lives. The primary goal of this research was to lessen the danger associated with the drainage system in cities and to cut down on the amount of work that the municipal corporation had to perform.

References

[1] G. Ramesh, D. A. Kumar, P. M. Khan, G. V. K. Teja and B. Singh, "Electronic Sniffing Mask -A Smart Drainage Worker Safety System," 2021 International Conference on Advance Computing and Innovative Technologies in Engineering (ICACITE), Greater Noida, India, 2021, pp. 674-677, doi: 10.1109/ICACITE51222.2021.9404751.

[2] R. Dronavalli, K. Seelam, P. Maganti, J. Gowineni and S. D. Challamalla, "IoT-based Automatic Manhole Observant for Sewage Worker’s Safety," 2022 International Conference on Automation, Computing and Renewable Systems (ICACRS), Pudukkottai, India, 2022, pp. 310-316, doi: 10.1109/ICACRS55517.2022.10029252.

[3] Y. Nandini, K. V. Lakshmi, T. I. S. Srujan, M. Yasheswi and K. S. Jagadish, "Design of Real-Time Automatic Drainage Cleaning and Monitoring System using IoT," 2023 7th International Conference on Computing Methodologies and Communication (ICCMC), Erode, India, 2023, pp. 1291-1296, doi: 10.1109/ICCMC56507.2023.10084257.

[4] S. P. K. Ramadhin, S. Anand, R. Aishwarya and Y. R, "Smart Drainage and Health Monitoring System of Manual Scavenger using IoT," 2021 5th International Conference on Intelligent Computing and Control Systems (ICICCS), Madurai, India, 2021, pp. 412-416, doi: 10.1109/ICICCS51141.2021.9432211.