Capstone Project Phase I

REVIEW I

PROJECT TITLE

Domain

Supervisor Name

TEAM MEMBERS :

INDUSTRY NAME

CONTENT

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ABSTRACT

- Design an IoT-based lavatory automation system to enhance efficiency, user comfort, and sustainability.
- Provide real-time monitoring and control of key features like temperature, lighting, and air quality.
- Develop a mobile application for remote control and notifications.

INTRODUCTION

- Traditional lavatories in public or commercial buildings often rely on manual control systems, which are inefficient and prone to human error.
- Lights and fans are often left running unnecessarily, leading to increased energy consumption.
- Poor air quality due to lack of ventilation can negatively impact users, and delayed maintenance often results in equipment breakdowns.
- As the use of smart technology becomes more prevalent, the need for automated lavatory systems has increased to provide better management, comfort, and operational efficiency.

LITERATURE REVIEW
(4 -6 slides)

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PROBLEM IDENTIFICATION

- Energy Wastage: Lights and fans are often left on even when the lavatory is unoccupied, leading to unnecessary electricity consumption.
- Lack of Occupancy Tracking: Without a people counting system, lavatories can become overcrowded, and cleaning schedules aren’t optimized based on usage.
- Inconsistent Air Quality: Poor ventilation can lead to the build-up of unpleasant odors and potentially harmful gases, creating a suboptimal environment.
- Manual Maintenance: Faulty equipment, such as broken lights or malfunctioning fans, is often reported late, leading to extended downtimes and user dissatisfaction.

METHODOLOGY

- Uses temperature sensors to automatically control the fan based on room temperature.
- Activates lights using motion sensors when people enter, and turns them off when they leave.
- Adjusts light brightness depending on the ambient light to save energy.
- Tracks the number of people entering and exiting the lavatory using IR sensors for occupancy management.
- Monitors air quality and triggers ventilation when needed using air quality sensors.
- Sends maintenance notifications automatically when issues are detected, such as poor air quality or system malfunctions.

BLOCK DIAGRAM

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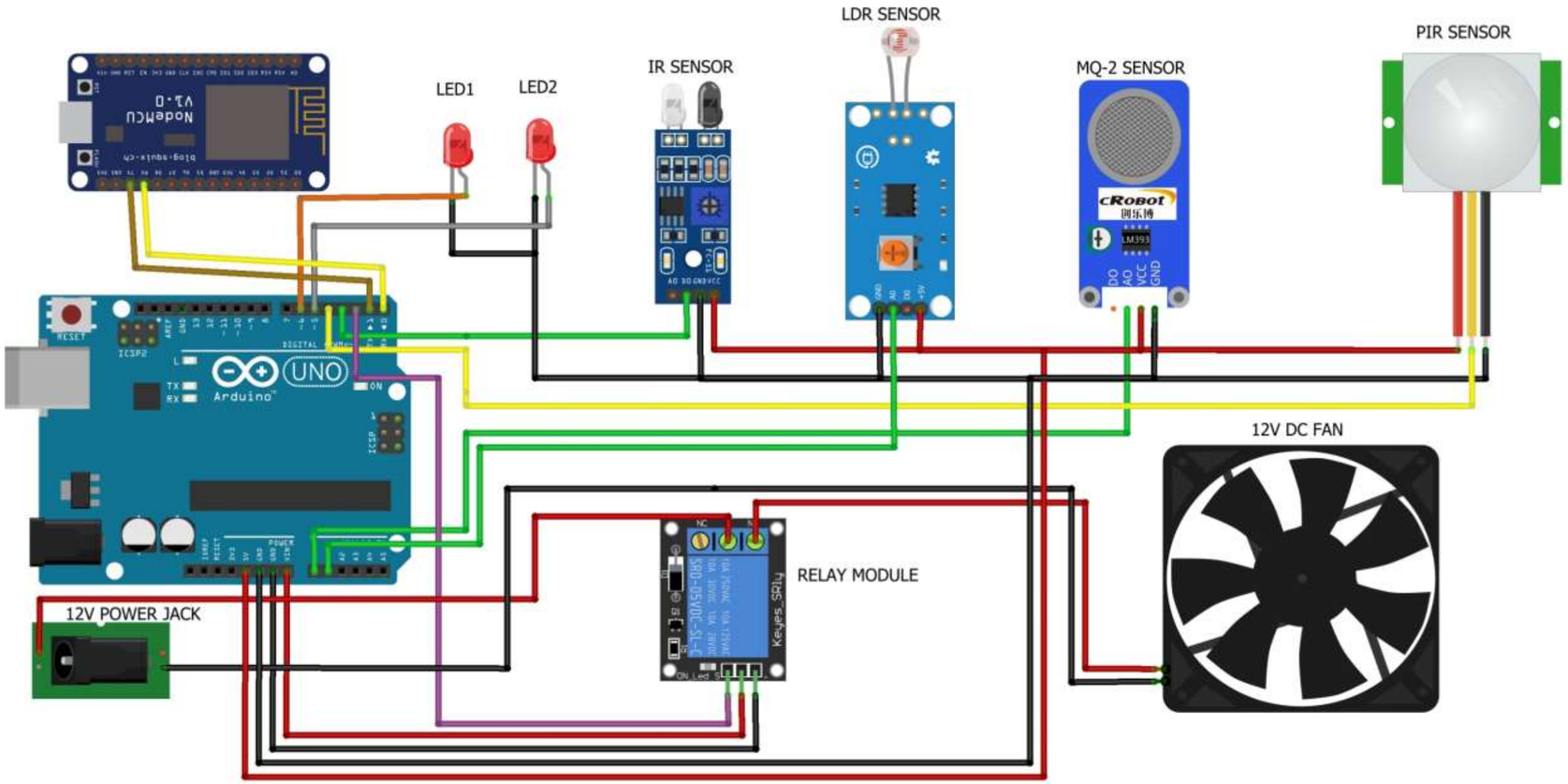
CIRCUIT DIAGRAM



SIMULATION / EXPERIMENTAL SETUP

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RESULTS AND DISCUSSION

- The implementation of the IoT-based Lavatory Automation System led to improved energy efficiency by automatically controlling fan and light usage based on occupancy and ambient conditions, resulting in significant electricity savings.
- Enhanced user comfort was achieved through real-time monitoring of temperature and air quality, creating a more pleasant environment for lavatory users.
- The people counting feature enabled efficient management of cleaning schedules.
- Automatic notifications for maintenance issues.

REFERENCES