UNIVERSIDAD DE GUADALAJARA

CENTRO UNIVERSITARIO DE LOS VALLES

Administración de la configuración del software

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Contenido

Description

This project plans to create a smart system that makes public buildings use energy more efficiently. Using modern technologies, our goal is to cut expenses, lower our impact on the environment, and encourage eco-friendly habits.

Requeriments

Functional requeriments

➢ **Ensure Energy Efficiency:** Attain a significant reduction in overall energy consumption by optimization.

➢ **Real-time Monitoring:** Supervise energy consumption in specific areas of the buildings.

➢ **Smart Automation:** Automatically control things like lights and climate based on occupancy and conditions.

➢ **Data Analysis:** Provide analysis to identify consumption patterns and trends.

➢ **Inefficiency Detection:** Detect issues like unnecessarily lit lights or faulty equipment.

➢ **Renewable Energy Integration:** Allow the incorporation of sustainable energy sources.

Non-functional requeriments

❖ **Minimal Latency:** Ensure a maximum response time of 3 seconds in real-time monitoring and control.

❖ **Intuitive Interface:** Offer a user-friendly interface for users of varying skill levels.

❖ **Data Security:** Ensure the protection of consumption and control data with robust security measures.

❖ **Continuous Availability:** Keep your system up and running 24 hours a day.

Key benefits

• Reduction of energy consumption and operational costs.
• Contribution to a more sustainable and eco-friendly Environment.

Requeriments Analysis

The objective of this document is to provide a detailed description of the functional and non-functional requirements for the "Smart Energy Solution for Public Buildings" project. It serves as a fundamental resource to guide the design, development, and implementation of the energy management system.

Project Scope

The scope of this project encompasses the creation of a comprehensive energy management system for public buildings, enabling energy consumption optimization, real-time monitoring, intelligent automation, and the integration of renewable energy sources. This system is designed to enhance energy efficiency and reduce operational costs for public buildings.

Definitions and Acronyms

Energy Efficiency: The ability to use energy more efficiently to achieve the same results or services.

Real-time Monitoring: The capability to continuously supervise energy consumption and other resources with up-to-date information.

Intelligent Automation: The automation of devices and systems based on real-time data and predefined conditions.

Renewable Energy Management: The incorporation of sustainable and renewable energy sources, such as solar panels or wind turbines, into a building's energy system.

Desing of system

The following diagrams showcase some of the key interactions and functions of the energy management in the project. These diagrams provide a general overview of how the system interacts with the actors to carry out essential tasks in energy management.
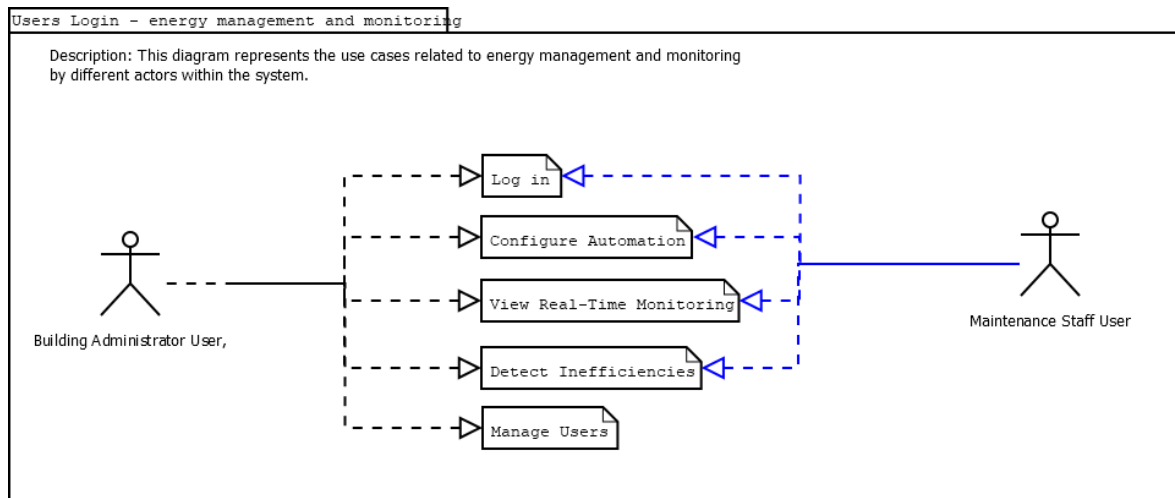

Image 1 - Energy and monitoring use case diagram.

Use Cases:

- **Log In:** Allows users to log in to the system.
- **Configure Automation:** Allows the administrator user to configure lighting and climate automation.
- **View Real-Time Monitoring:** Allows users to view real-time monitoring of energy consumption.
- **Detect Inefficiencies:** Allows users to report and manage energy inefficiencies.
- **Generate Reports:** Allows users to generate energy consumption reports.
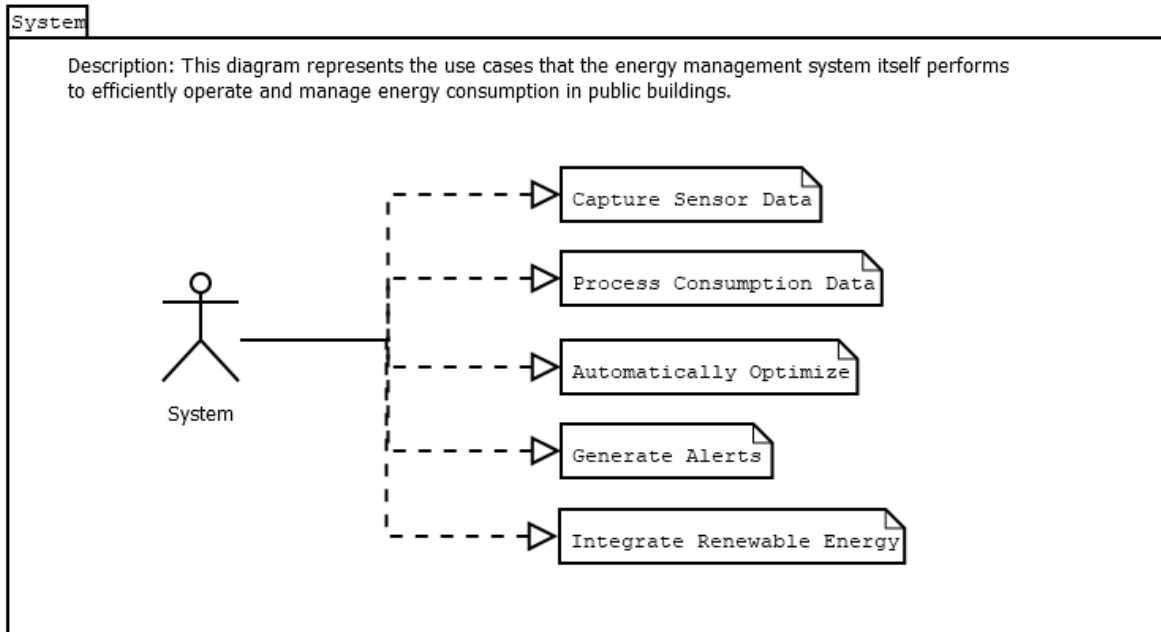- **Manage Users:** Allows the administrator user to manage user accounts and permissions.

Image 2 - System use case diagram.

Use Cases:

- **Capture Sensor Data:** Allows the system to capture data from energy consumption sensors.
- **Process Consumption Data:** The system processes consumption data for analysis.
- **Automatically Optimize:** The system makes automatic adjustments based on data and optimization algorithms.
- **Generate Alerts:** The system generates alerts in case of inefficiencies or abnormal situations.
- **Integrate Renewable Energy:** Allows the system to integrate energy from renewable sources when available.