Final Year Project Report

Full Unit – Final Report

Smart Home Automation System with Mobile App

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Bachelor in Computer Science

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Introduction:

The proposed project aims to develop a smart home automation system that can optimize energy use, reduce electricity bills, and automate the water management system for a building in Karachi, Pakistan. The system will use various sensors and machine learning algorithms to control devices and appliances, without requiring an internet connection. In addition, a mobile app will be developed to enable users to track their energy usage and manage their devices remotely.

Objectives:

- To design a smart home automation system that can optimize energy use, reduce electricity bills, and automate the water management system
- To develop a mobile app that enables users to track their energy usage and manage their devices remotely
- To implement the system using Raspberry Pi or Arduino board, MQTT protocol, and machine learning libraries such as Scikit-Learn or Tensorflow
- To test and evaluate the system in a real-world environment

Methodology:

The proposed system will consist of various sensors and devices, including temperature sensors, light sensors, humidity sensors, motion sensors, water level sensors, and switches. These sensors will be connected to a Raspberry Pi or Arduino board, which will run the machine learning algorithms to optimize energy usage and automate the water management system.

The MQTT protocol will be used for data communication between devices on the local network, without requiring an internet connection. The system will be designed to work offline, with local rules and schedules for controlling devices.

A mobile app will be developed using a cross-platform framework such as React Native or Flutter. The app will allow users to view their energy usage, control their devices remotely, and set their estimated budget for energy usage. The app will communicate with the smart home automation system using MQTT, enabling users to control their devices without the need for an internet connection.

Evaluation:

The proposed system will be tested and evaluated in a real-world environment, in a building in Karachi, Pakistan. The system's performance will be evaluated based on its ability to optimize energy usage, reduce electricity bills, and automate the water management system. The mobile app's usability and functionality will also be evaluated, based on user feedback.

Conclusion:

The proposed project aims to develop a smart home automation system that can optimize energy use, reduce electricity bills, and automate the water management system, without requiring an internet connection. By developing a mobile app, users can track their energy usage and manage their devices remotely, enabling them to control their energy usage and save money on their electricity bills.