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Report

on

Mini Project (BCS-554)

SMART HEALTH PRIDECTION USING DATA MINING

Submitted In Partial Fulfilment of the Requirement for the Degree of

Bachelor of Technology

In

Computer Science and Engineering (IOT)

BY

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Problem Statement (Point-wise Format)

1. **Lack of Remote Monitoring and Control**
    - Users are unable to monitor or control electrical circuits from remote locations, limiting convenience and responsiveness.
2. **Electrical Safety Concerns**
    - Traditional systems do not detect overloads or electrical faults in real-time, increasing the risk of damage, fire, or accidents.
3. **Absence of Real-Time Alerts**
    - Electrical issues often go unnoticed until significant damage occurs due to a lack of instant notifications.
4. **No Remote Switching Capability**
    - Users must physically access switches to operate circuits, which is inefficient and inconvenient, especially in large setups.
5. **Untracked Power Consumption**
    - Energy usage is not monitored, making it difficult to identify wastage or optimize power consumption.
6. **High Manual Effort**
    - Frequent physical inspections and manual operations are required, which is time-consuming and labor-intensive.
7. **Limited Automation and Integration**
    - Existing systems lack compatibility with smart home or industrial automation platforms, reducing overall efficiency and smart control capabilities.

Objective

1. **Enable Remote Monitoring and Control**

- Provide users with the ability to monitor and control electrical circuits from anywhere using a smartphone or web interface.

2. **Enhance Electrical Safety**

- Integrate real-time fault detection and overload protection to prevent damage and ensure user safety.

3. **Deliver Instant Notifications**

- Send real-time alerts to users in case of electrical anomalies or system failures.

4. **Support Remote Circuit Switching**

- Allow remote ON/OFF control of individual circuits for increased convenience and accessibility.

5. **Track Power Consumption**

- Monitor energy usage at the circuit level to promote efficiency and reduce electricity waste.

6. **Minimize Manual Intervention**

- Automate routine checks and operations to reduce the need for physical inspections and manual control.

7. **Integrate Smart Automation**

- Ensure compatibility with existing smart home or industrial automation systems for seamless integration and control.

Abstract

This project presents the design and development of a **Smart Electrical Monitoring and Control System** aimed at enhancing the efficiency, safety, and convenience of managing electrical circuits. The system enables **remote monitoring and control** through a user-friendly smartphone or web-based interface, allowing users to operate and supervise their circuits from any location.

Key features include **real-time fault detection**, **overload protection**, and **instant notifications** to ensure quick responses to potential hazards, thereby improving electrical safety. Additionally, the system supports **remote switching** of circuits, reducing the need for physical interaction and manual operations. By integrating **power consumption tracking**, users can monitor and optimize their energy usage to reduce electricity waste.

The system is also designed to **seamlessly integrate with smart home and industrial automation platforms**, enabling smarter and more efficient operations. This solution addresses modern demands for safety, automation, and energy management, making it ideal for both residential and industrial applications.

Introduction

In today's fast-paced world, the demand for smart technologies that enhance safety, efficiency, and convenience is rapidly increasing. One critical area where innovation is needed is in the **monitoring and control of electrical systems**, both in residential and industrial environments. Traditional electrical setups often require manual inspections, lack real-time visibility, and are prone to undetected faults or inefficiencies that can lead to high energy bills or even hazardous situations like electrical fires.

As the adoption of smart technologies continues to grow, the integration of **smart monitoring and control systems** into electrical infrastructure has become not just beneficial, but essential. These systems provide a more intelligent way of managing power usage, reducing energy waste, and ensuring electrical safety. They offer the ability to monitor circuits in real-time, control them remotely through a smartphone or web application, and receive instant notifications in case of irregularities such as overloads or faults.

This project proposes the development of a **Smart Electrical Monitoring and Control System** designed to address these challenges. The system enables users to remotely switch electrical circuits ON or OFF, monitor real-time power consumption, and receive alerts about potential issues. It drastically reduces the need for manual checks and physical interaction with electrical panels, making it particularly useful in large buildings or remote installations.

Moreover, the system is designed with flexibility in mind—it can seamlessly integrate with smart home systems or industrial automation platforms, making it a scalable solution for a wide range of applications. By empowering users with control, data, and automation, the system not only enhances operational efficiency but also promotes energy conservation and safety.

Ultimately, this project reflects a significant step toward smarter, safer, and more sustainable energy management solutions in the digital age.

S.No	Title	Technology Used	Key Features
1.	Smart Circuit Breaker using IoT	Arduino, Wi-Fi Module, Blynk App	Remote control, fault detect
2.	IoT-Based Power Monitoring System	NodeMCU, ThingSpeak, Current Sensors	Real-time energy tracking, d
3.	Home Automation with Smart Breaker	Raspberry Pi, IoT Cloud Platforms	Full automation, circuit cont
4.	Smart Energy Meter with IoT	ESP8266, IoT Dashboard, Sensors	Energy monitoring, bill estim
5.	IoT-Based Electrical Fault Detection	Arduino, GSM, Sensors	Fault alerts, SMS notificatior