Digitalize Grid Cutoff and Meter Reading Using Cloud

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Abstract

With the increasing demand for automation in energy management, the need for an efficient and intelligent electricity monitoring system has become crucial. This paper presents the development of an Automatic Grid Cutoff and Digital Meter Reading System Using Cloud, which integrates IoT and cloud computing for real-time electricity consumption monitoring, automated billing, and remote power disconnection for non-paying consumers. The proposed system consists of a smart energy meter connected to an embedded controller that continuously records power usage and transmits data to a cloud-based server. Consumers can access their electricity usage details, receive automated bill notifications, and make payments through an online portal. If a bill remains unpaid beyond the due date, the system automatically disconnects the power supply using a relay-based cutoff mechanism. Additionally, GSM-based alerts notify users before disconnection. One of the significant challenges in electricity distribution is power theft and unauthorized meter bypassing. This system helps detect fraudulent activities and prevents illegal power usage by monitoring consumption patterns and detecting anomalies. By automating the billing and disconnection process, this project reduces manual intervention, minimizes operational costs, and ensures timely revenue collection for electricity providers. The implementation of this cloud-integrated smart electricity management system enhances efficiency, prevents financial losses, and contributes to a more reliable and secure energy network distribution network.

Keywords

Automatic grid cutoff, Digital meter reading, Cloud computing, Embedded controller, IoT, Smart energy management, GSM alerts, Remote disconnection, Real-time monitoring, Power theft prevention, Automated billing.