

SISTEM MONITORING KWh LISTRIK DENGAN MEDIA KAMERA BERBASIS INTERNET Of Things (IoT)

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ABSTRAK

Transformasi digital di sektor ketenagalistrikan merupakan konsekuensi logis dari perkembangan teknologi informasi dan otomatisasi saat ini. Namun, pada praktiknya, penggunaan KWh meter analog masih mendominasi di berbagai wilayah, termasuk di bawah naungan Unit Pelaksana Pelayanan Pelanggan (UP3) Ambon. Sistem pencatatan data konsumsi energi pada perangkat analog masih bergantung pada metode konvensional melalui visitasi petugas lapangan, yang memiliki prevalensi tinggi terhadap kesalahan manusia (human error), inefisiensi operasional, hingga isu privasi konsumen. Penelitian ini bertujuan untuk merancang sebuah sistem monitoring KWh meter analog yang terintegrasi dengan teknologi Internet of Things (IoT) berbasis transmisi citra visual. Metodologi pengembangan sistem difokuskan pada penggunaan modul kamera sebagai sensor akuisisi data visual yang kemudian ditransmisikan menuju server pusat secara real-time. Implementasi teknologi ini memungkinkan pemantauan konsumsi energi secara jarak jauh tanpa memerlukan intervensi manual di lokasi pelanggan. Hasil penelitian diharapkan mampu memberikan solusi teknis yang presisi dalam meningkatkan akurasi data tagihan, mengoptimalkan manajemen sumber daya manusia pada instansi penyedia layanan listrik, serta memberikan kontribusi dalam percepatan modernisasi infrastruktur ketenagalistrikan di Indonesia.

Kata Kunci: *KWh Meter Analog, Internet of Things (IoT), Monitoring, Akurasi Data, Efisiensi Operasional.*

ELECTRICITY KWh MONITORING SYSTEM USING CAMERA MEDIA BASED ON the Internet of Things (IoT)

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ABSTRACT

Digital transformation in the electricity sector is a logical consequence of current developments in information technology and automation. However, in practice, the use of analog KWh meters still dominates in various regions, including under the auspices of the Ambon Customer Service Implementation Unit (UP3). The data recording system for energy consumption on analog devices still relies on conventional methods through field officer visits, which have a high prevalence of human error, operational inefficiency, and even consumer privacy issues. This study aims to design an analog KWh meter monitoring system integrated with Internet of Things (IoT) technology based on visual image transmission. The system development methodology focuses on the use of a camera module as a visual data acquisition sensor, which is then transmitted to a central server in real-time. The implementation of this technology enables remote monitoring of energy consumption without requiring manual intervention at the customer site. The expected results of this research are to provide precise technical solutions to improve billing data accuracy, optimize human resource management at electricity service providers, and contribute to the acceleration of modernization of the electricity infrastructure in Indonesia.

Keywords: *Analog KWh Meter, Internet of Things (IoT), Monitoring, Data Accuracy, Operational Efficiency.*