

ABSTRAK

Audit energi merupakan proses untuk mengetahui tingkat efisiensi penggunaan energi listrik pada bangunan serta mengidentifikasi peluang penghematan. Proses audit yang masih dilakukan secara manual dapat menyebabkan pengelolaan data, perhitungan, klasifikasi, dan penyusunan laporan membutuhkan waktu lebih lama serta berisiko terjadi kesalahan. Penelitian ini bertujuan merancang dan membangun sistem audit energi berbasis web yang mampu mengelola data audit secara terpusat, melakukan perhitungan Intensitas Konsumsi Energi (IKE), mengklasifikasikan tingkat efisiensi, menyediakan rekomendasi penghematan, dan menghasilkan laporan audit. Metode pengembangan yang digunakan adalah *Agile Development Model Scrum* melalui tahapan *product backlog*, *sprint planning*, *sprint execution*, *sprint review*, dan *sprint retrospective*. Sistem dikembangkan menggunakan *framework Laravel* dengan basisdata *MySQL*. Hasil penelitian berupa sistem audit energi berbasis web dengan dua hak akses, yaitu *Admin* dan *Auditor*. Sistem mendukung tiga jenis audit, yaitu Audit Energi Awal, Audit Energi Singkat, dan Audit Energi Rinci, serta menyediakan fitur pengelolaan data Gedung, konsumsi energi, inventaris peralatan, pengukuran lapangan, perhitungan IKE, klasifikasi efisiensi, rekomendasi Peluang Penghematan Energi (PPE), analisis finansial pada audit rinci, dan pembuatan laporan PDF. Berdasarkan *Black Box Testing*, seluruh fitur utama yang diuji berhasil berjalan sesuai dengan fungsi yang diharapkan. Hasil *User Acceptance Testing* menunjukkan bahwa sistem memperoleh penilaian keputusan keseluruhan sebesar 91%. Hasil perbandingan juga menunjukkan bahwa sistem mampu mempercepat proses audit melalui input data terpusat, perhitungan IKE otomatis, klasifikasi efisiensi, dan pembuatan laporan PDF terstandar. Dengan demikian, sistem yang dibangun dapat digunakan sebagai alat bantu untuk mendukung proses audit energi secara lebih terstruktur, efektif, efisien dan terdokumentasi.

Kata Kunci: Audit Energi, Sistem Informasi, Intensitas Konsumsi Energi, *Agile Scrum*, *Laravel*

ABSTRACT

Energy audit is a process to determine the level of efficiency of electrical energy use in buildings and identify savings opportunities. The audit process that is still carried out manually can cause data management, calculation, classification, and report preparation to take longer and risk errors. This research aims to design and build a web-based energy audit system that is able to centrally manage audit data, calculate Energy Consumption Intensity (IKE), classify efficiency levels, provide savings recommendations, and produce audit reports. The development method used is Agile Development Model Scrum through the stages of product backlog, sprint planning, sprint execution, sprint review, and sprint retrospective. The system was developed using the Laravel framework with a MySQL database. The results of the research are in the form of a web-based energy audit system with two access rights, namely Admin and Auditor. The system supports three types of audits, namely Initial Energy Audit, Short Energy Audit, and Detailed Energy Audit, and provides features for building data management, energy consumption, equipment inventory, field measurement, IKE calculation, efficiency classification, Energy Saving Opportunity (PPE) recommendations, financial analysis on detailed audits, and PDF report creation. Based on Black Box Testing, all the main features tested successfully ran according to the expected function. The results of the User Acceptance Testing showed that the system obtained an overall decision rating of 91%. The results of the comparison also showed that the system was able to speed up the audit process through centralized data input, automated IKE calculations, efficiency classification, and the creation of standardized PDF reports. Thus, the system built can be used as a tool to support the energy audit process in a more structured, effective, efficient and documented manner.

Keywords: *Energy Audit, Information System, Laravel, Website, Energy Consumption Intensity, Black Box Testing.*