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Evaluasi dan Pengembangan Sistem Pemeliharaan Aset Bangunan Gedung Berbasis BIM (Studi Kasus Kantor Fungsi HSSE PT Pertamina EP CEPU Regional 4 di Patra Jasa Office Tower)
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

INTISARI

Pemeliharaan gedung perkantoran sangat penting untuk menjaga keandalan dan keselamatan operasionalnya. Namun, di Kantor Fungsi HSSE PT Pertamina EP Cepu Regional 4 (Patra Jasa Office Tower), sistem eksisting masih bersifat administratif dan terpisah antara pengelola gedung dan penyewa (*tenant*), sehingga memicu fragmentasi informasi dan tidak adanya basis data terintegrasi. Oleh karena itu, penelitian ini bertujuan mengevaluasi efektivitas sistem pemeliharaan eksisting serta merumuskan rancangan konseptual sistem pemeliharaan aset berbasis *Building Information Modeling* (BIM) guna mendukung integrasi informasi secara terstruktur.

Penelitian ini menerapkan metode deskriptif-evaluatif melalui pendekatan studi kasus. Data primer dihimpun dari observasi lapangan, wawancara, dan kuesioner skala *Likert* terhadap 30 responden, sedangkan data sekunder meliputi gambar kerja (*as-built drawings*), daftar inventaris, dan catatan riwayat kerusakan (*corrective maintenance*). Analisis diawali dengan mengidentifikasi kesenjangan sistem eksisting, dilanjutkan dengan pemodelan digital komponen struktur, arsitektur, dan utilitas menggunakan Autodesk Revit (LOD 300 dan LOD 500 terbatas), serta sinkronisasi database Microsoft Excel menggunakan kode unik Asset_ID.

Hasil evaluasi menunjukkan sistem eksisting berjalan cukup baik (skor rata-rata 3,82), namun memiliki kesenjangan kritis pada aspek persebaran informasi kerusakan yang masih tersebar (skor 3,37). Implementasi prototipe BIM-Excel terbukti memangkas waktu pencarian data aset secara signifikan dari 15–20 menit menjadi 2–5 menit, mempercepat pembuatan laporan pemeliharaan dari 15–25 menit menjadi 5–10 menit, meningkatkan kelengkapan informasi hingga 90–100%, serta memperoleh skor kepuasan sempurna (5,00) pada pengujian keterimaan pengguna (*User Acceptance Testing*/UAT). Penelitian ini menyimpulkan bahwa sistem pemeliharaan terintegrasi berbasis BIM-Excel mampu mengatasi sekat informasi operasional antara pengelola dan penyewa secara efisien.

Kata Kunci: Asset_ID, Autodesk Revit, Building Information Modeling (BIM), Microsoft Excel, Patra Jasa Office Tower, Pemeliharaan Aset.

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ABSTRACT

Office building maintenance is crucial to preserve its operational reliability and safety. However, at the HSSE Function Office of PT Pertamina EP Cepu Regional 4 (Patra Jasa Office Tower), the existing system is still administrative and split between building management and the tenant, triggering fragmented information and the absence of an integrated database. Therefore, this study aims to evaluate the effectiveness of the existing maintenance system and formulate a conceptual design for a Building Information Modeling (BIM)-based asset maintenance system to support structured information integration.

This study applies a descriptive-evaluative method with a case study approach. Primary data were gathered through field observations, interviews, and Likert-scale questionnaires involving 30 respondents, while secondary data included as-built drawings, asset inventory lists, and corrective maintenance logbooks. The analysis began by identifying the performance gaps in the existing system, followed by digital modeling of structural, architectural, and utility components using Autodesk Revit (LOD 300 and limited LOD 500 information), as well as database synchronization with Microsoft Excel using a unique Asset_ID code.

The evaluation results indicate that the existing system generally performs well with an average score of 3.82, yet exhibits a critical gap in the aspect of damage information dispersion, which remains fragmented with the lowest score of 3.37. The implementation of the BIM-Excel prototype is proven to significantly reduce asset history search times from 15–20 minutes to 2–5 minutes, accelerate maintenance report generation from 15–25 minutes to 5–10 minutes, and increase asset information completeness up to 90–100%. Additionally, the prototype achieved a perfect satisfaction score of 5.00 in the User Acceptance Testing (UAT). This study concludes that the integrated maintenance system based on BIM-Excel successfully overcomes the operational information barrier between the building management and the tenant efficiently.

Keywords: *Asset_ID, Autodesk Revit, Building Information Modeling (BIM), Microsoft Excel, Patra Jasa Office Tower, Asset Maintenance.*