

ABSTRACT

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Study Program : Master of Civil Engineering
Title : “Cost Performance Improvement Based on Blockchain-BIM with The Implementation of Green Buildings PerMen PUPR in Modern Shopping Center Buildings”

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Transformation towards Net Zero Emissions (NZE) in 2060 must be our collective commitment, and Green Buildings are one of the efforts to reduce carbon or gas emissions. The Green Building Regulations through the Ministry of Public Works and Public Housing have provided their Performance Assessment Standards. However, the problem of cost for Green Buildings in the retail sector of 6% is quite a burden for the developer. Then, based on Structural Equation Modeling (SEM)-Partial Least Square (PLS) analysis of Green Buildings in the retail sector, the ten most influential factors were obtained; Building Orientation, Air Conditioner energy efficiency, Building envelope energy efficiency, Building integrated data, Monitoring of construction equipment, K3 Plan, Identification of material needs, Main equipment warranty certificate, Waste water treatment to canals, and Regulations on Energy conservation. And to overcome cost constraints, the Blockchain-BIM method is applied to increase the Cost Performance of Green Buildings in Modern Shopping Center Buildings by 3.01% in the Primary Rating, while for the Middle and Main ratings it is 2.1% higher.

Keywords; Green Buildings, Blockchain-BIM, SEM-PLS, Modern Shopping Center Buildings, Cost Efficiency.

ABSTRAK

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Program Studi : Magister Teknik Sipil
Judul : “Peningkatan *Cost Performance* Berbasis
Blockchain-BIM Dengan Penerapan Bangunan
Hijau PerMen PUPR pada Gedung Pusat
Perbelanjaan Modern”
Dosen Pembimbing : Dr. Ir. Albert Eddy Husin, M.T.

Transformasi menuju *Net Zero Emission (NZE)* ditahun 2060 harus menjadi komitmen kita bersama, dan Bangunan Gedung Hijau merupakan salah satu usaha untuk mengurangi jumlah karbon atau emisi gas. Regulasi Bangunan Gedung Hijau melalui Kementerian Pekerjaan Umum dan Perumahan Rakyat telah memberikan Standar Penilaian Kinerjanya. Namun masalah biaya yang dibutuhkan untuk Bangunan Gedung Hijau di sektor retail sebesar 6% cukup membebani pihak pengembang. Kemudian, berdasarkan analisa pemodelan *Structural Equation Modeling (SEM)-Partial Least Square (PLS)* tentang Bangunan Gedung Hijau pada sektor retail, didapatkan 10 faktor yang paling berpengaruh; Orientasi Bangunan, Efisiensi energi Air Conditioner, Efisiensi energi selubung bangunan, Membangun data yang terintegrasi, Pemantauan peralatan konstruksi, K3 Plan, Identifikasi kebutuhan material, Sertifikat garansi peralatan utama, Pengolahan air limbah ke kanal, dan Aturan tentang konservasi Energi. Dan untuk mengatasi kendala biaya, metode *Blockchain-BIM* diterapkan dan dapat meningkatkan *Cost Performance* Bangunan Gedung Hijau pada Gedung Pusat Perbelanjaan Modern sebesar 3.01 % pada Peringkat Pratama, sedangkan untuk Peringkat Madya dan Utama lebih tinggi 2.1%.

Kata Kunci; Bangunan Gedung Hijau, *Blockchain-BIM*, *SEM-PLS*, Gedung Pusat Perbelanjaan Modern, Efisiensi Biaya