

ABSTRACT

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Title : “Improving Cost Performance Using
Blockchain - Building Information Modeling
(BIM) in Green Retrofitting Industrial Estate”
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Currently, certain industrial estate still exist without giving a positive environmental impact. The green concept costs 10-20% more than a conventional building to plan and build. This research applies the concept of green industrial areas through statistical analysis and case studies with a cost-saving method using Blockchain-Building Information Modeling (BIM). The performance cost of green retrofitting could be reduced by applying the latest green retrofitting concepts for industrial objects, modeling using Blockchain-BIM, and understanding factors that can influence the implementation of green concepts using the Structural Equation Model – Partial Least Squares (SEM-PLS). Ten factors that influence the performance cost related to green retrofitting in industrial areas consist of electricity consumption utilization, usage of local material, communal wastewater treatment plant, utilization of green open space, 20% local material, crops, communal waste container, preservation of cultural heritage buildings, uninterrupted electricity from periodic power outage, and at least one garbage collection tool. Implementing the Blockchain-BIM method improves the green retrofitting performance cost by up to 6,06% and obtains the benefits from an eco-friendly and sustainable industrial area.

KEYWORDS: *Industrial Estate, Green Retrofitting, SEM-PLS, Blockchain-BIM, Cost Performance*

ABSTRAK

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Judul : “Peningkatan *Cost Performance* Berbasis
Blockchain - Building Information Modeling
(BIM) Pada *Green Retrofitting* Kawasan
Industri”
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Saat ini masih terdapat kawasan industri yang belum bisa memberikan dampak baik terhadap lingkungan. Dalam merencanakan dan membangun konsep hijau 10-20% lebih mahal daripada bangunan konvensional. Peneliti menerapkan konsep kawasan industri hijau melalui analisis statistik dan studi kasus dengan penghematan biaya menggunakan *Blockchain-Building Information Modeling* (BIM). Dengan penelitian keterbaruan terkait konsep *green retrofitting* untuk obyek kawasan industri, serta mencari faktor-faktor yang mempengaruhi penerapan konsep hijau dengan menerapkan *Structural Equation Model-Partial Least Square* (SEM-PLS) dan pemodelan konsep *green retrofitting* berbasis *Blockchain-BIM* untuk meningkatkan kinerja biaya *green retrofitting*. Hasil penelitian ini diperoleh “10 faktor-faktor berpengaruh terhadap *cost performance* terkait *green retrofitting* pada kawasan industri” adalah pemanfaatan konsumsi listrik, penggunaan material lokal, instalasi pengolahan air limbah komunal, pemanfaatan fungsi RTH, 20% material lokal, tanaman konsumsi, sarana pewadahan sampah komunal, pelestarian bangunan cagar budaya, listrik bebas gangguan pemadaman berkala dan terdapat minimal 1 alat pengumpul sampah. Penerapan metode *Blockchain-BIM* mampu meningkatkan *cost performance* pada *green retrofitting* tersebut dengan menghemat biaya sebesar 6,06% dapat memperoleh manfaat sebagai kawasan industri yang ramah lingkungan dan berkelanjutan.

KEYWORDS: Kawasan Industri, *Green Retrofitting*, SEM-PLS, *Blockchain-BIM*, *Cost Performance*