

PERANCANGAN TATA LETAK GUDANG DENGAN METODE *DEDICATED STORAGE* DAN *CLASS-BASED STORAGE* PADAPT XYZ

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ABSTRAK

PT XYZ, sebuah perusahaan yang bergerak di industri besi, menghadapi masalah efisiensi operasional akibat tata letak gudang yang tidak optimal. Kondisi ini ditandai dengan penempatan material yang tidak teratur, mobilitas pekerja yang terhambat, serta alur kerja yang terganggu. Penelitian ini bertujuan untuk merancang ulang tata letak gudang guna meminimalkan jarak dan waktu perpindahan material dengan membandingkan dua metode, yaitu dibutuhkan perbaikan dengan menggunakan metode *dedicated storage* dan *class-based storage*, serta usulan perbaikan disimulasikan dengan menggunakan simulasi Arena 16. Hasil penelitian menunjukkan bahwa kondisi aktual memiliki total jarak tempuh sebesar 54.407,93 meter dengan rata-rata waktu proses 62,82 detik. Usulan metode *Dedicated Storage* berhasil mengurangi jarak sebesar 45,73% menjadi 29.527,23 meter dan waktu sebesar 61,84% menjadi 23,97 detik. Sementara itu, metode *Class-Based Storage* mengurangi jarak sebesar 37,14% menjadi 34.201,19 meter dan waktu sebesar 61,80% menjadi 24 detik. Meskipun kedua metode menunjukkan efisiensi waktu yang hampir setara, metode *Dedicated Storage* terbukti lebih unggul secara signifikan dalam minimalisasi jarak tempuh. Oleh karena itu, usulan tata letak dengan metode *Dedicated Storage* direkomendasikan sebagai solusi optimal bagi PT XYZ.

Kata kunci: Tata letak gudang, *Dedicated Storage*, *Class-based Storage*, Simulasi

WAREHOUSE LAYOUT DESIGN USING DEDICATED STORAGE AND CLASS-BASED STORAGE METHODS AT PT XYZ

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ABSTRACT

PT XYZ, a company engaged in the iron industry, faces operational efficiency problems due to suboptimal warehouse layout. This condition is characterized by irregular material stacking, hampered worker mobility, and disrupted workflow. This study aims to redesign the warehouse layout to minimize the distance and time of material movement by comparing two methods, namely improvements are needed using the dedicated storage and class-based storage methods, and proposed improvements are simulated using Arena 16 simulation. The results of the study showed that the actual condition had a total distance of 54,407.93 meters with an average process time of 62.82 seconds. The proposed Dedicated Storage method managed to reduce the distance by 45.73% to 29,527.23 meters and the time by 61.84% to 23.97 seconds. Meanwhile, the Class-Based Storage method reduced the distance by 37.14% to 34,201.19 meters and the time by 61.80% to 24 seconds. Although both methods show almost equal time efficiency, the Dedicated Storage method is proven to be significantly superior in minimizing travel distance. Therefore, the proposed layout with the Dedicated Storage method is recommended as the optimal solution for PT XYZ.

Keywords: Warehouse Layout Design, Dedicated Storage, Class-based Storage, Simulation