

**PROPOSED BUSINESS PROCESS IMPROVEMENT USING
LEAN WAREHOUSE APPROACH AT NATIONAL
DISTRIBUTION CENTER OF PT XYZ**

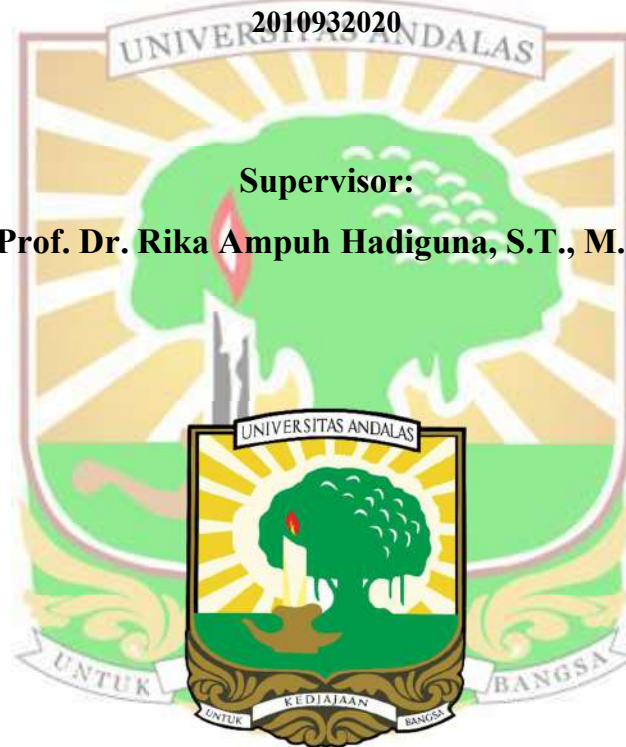
FINAL PROJECT REPORT

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**INDUSTRIAL ENGINEERING DEPARTMENT
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PADANG
2025**

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*A Report Submitted to Fulfil One of the Requirement for Completing
the Bachelor Program at the Department of Industrial Engineering,*

Faculty of Engineering, Universitas Andalas

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ABSTRACT

PT XYZ is a Fast-Moving Consumer Goods (FMCG) company specializing in cosmetics, perfumes, personal care, and skincare products. The company operates 40 Distribution Centers (DCs) to distribute its products to stores and retailers across Indonesia. Additionally, PT XYZ manages two National Distribution Center (NDC) responsible for dispatching goods to all regions of Indonesia. Warehouse operations play a crucial role in ensuring the seamless distribution of goods to the DCs. However, inefficiencies such as excessive transportation, overproduction, extra processing, waiting, and defects have been identified in the operational activities of PT XYZ's National Distribution Centers (NDCs). These inefficiencies significantly impact warehouse performance, with one of the most prominent consequences being the failure to achieve productivity targets across various warehouse functions.

This research aims to minimize these inefficiencies by applying the Lean Warehouse approach. Using tools such as Value Stream Mapping (VSM), Process Activity Mapping (PAM), Gemba Shikumi, 5 Whys, and the Fishbone Diagram, the study identifies four critical wastes within warehouse operations. The analysis revealed four critical wastes, with the highest Absolute Importance Value (AIV) found in storing activities due to excess inventory placed in aisles. Other significant wastes were identified in the checking, picking, and packing functions. Root causes included limited storage capacity, system-human resource misalignment, and redundant quality control. To address these issues, this study proposes the use of pallet racking and an RFID-based system.

The proposed improvements are estimated to reduce total processing time by approximately 47.4%, from 9,419 seconds to 4,955 seconds. Additionally, Value-Added (VA) activities increased to 89.2%, and Non-Value-Added (NVA) activities were eliminated. These findings demonstrate that Lean Warehouse implementation can significantly enhance process efficiency, reduce waste, and support better service performance.

Keywords: Improvement, Lean Warehouse, lean tools, waste minimization, warehouse efficiency

ABSTRAK

PT XYZ adalah perusahaan Fast-Moving Consumer Goods (FMCG) yang bergerak di bidang kosmetik, parfum, perawatan pribadi, dan produk perawatan kulit. Perusahaan ini mengoperasikan 40 Distribution Center (DC) untuk mendistribusikan produknya ke toko dan retailer di seluruh Indonesia. Selain itu, PT XYZ juga mengelola dua National Distribution Center (NDC) yang bertanggung jawab untuk pengiriman barang ke seluruh wilayah Indonesia. Operasional gudang memainkan peran krusial dalam memastikan kelancaran distribusi barang ke DC. Namun, telah diidentifikasi berbagai bentuk ketidakefisienan dalam aktivitas operasional NDC PT XYZ, seperti transportasi berlebih, overproduksi, pemrosesan tambahan, waktu tunggu, dan cacat. Ketidakefisienan ini berdampak signifikan terhadap kinerja gudang, salah satunya terlihat dari tidak tercapainya target produktivitas di berbagai fungsi gudang.

Penelitian ini bertujuan untuk meminimalkan ketidakefisienan tersebut melalui penerapan pendekatan Lean Warehouse. Dengan menggunakan beberapa alat analisis seperti Value Stream Mapping (VSM), Process Activity Mapping (PAM), Gemba Shikumi, 5 Whys, dan Diagram Fishbone, studi ini mengidentifikasi empat waste kritis dalam aktivitas gudang. Hasil analisis menunjukkan bahwa waste paling kritis terjadi pada aktivitas penyimpanan, yang disebabkan oleh penempatan persediaan berlebih di area aisle dan memiliki nilai Absolute Importance Value (AIV) tertinggi. Waste signifikan lainnya ditemukan pada fungsi checking, picking, dan packing. Akar permasalahan dari waste ini mencakup keterbatasan kapasitas penyimpanan, ketidaksesuaian antara sistem dan sumber daya manusia, serta duplikasi pada proses kontrol kualitas.

Penelitian ini mengusulkan penggunaan sistem pallet racking dan teknologi berbasis RFID untuk mengatasi permasalahan tersebut. Perbaikan yang diusulkan diperkirakan dapat mengurangi total waktu pemrosesan sebesar kurang lebih 47,4%, yaitu dari 9.419 detik menjadi 4.955 detik. Selain itu, aktivitas Value-Added (VA) meningkat menjadi 89,2%, dan aktivitas Non-Value-Added (NVA) berhasil dieliminasi. Temuan ini menunjukkan bahwa penerapan Lean Warehouse secara signifikan dapat meningkatkan efisiensi proses, mengurangi waste, dan mendukung peningkatan kinerja layanan gudang.

Kata Kunci: Efisiensi gudang, improvement, Lean Warehouse, lean tools, minimasi pemborosan