OPTIMIZING SUPPLY CHAIN PERFORMANCE THROUGH EFFECTIVE TRANSPORTATION SCHEDULING AND LOADING DOCK ALLOCATION IN FMCG COMPANY

UNDERGRADUATE FINAL PROJECT

Submitted as one of the requirements to obtain Sarjana Teknik (S.T.)

By
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ID No. 004201900020

FACULTY OF ENGINEERING
INDUSTRIAL ENGINEERING STUDY PROGRAM
CIKARANG
SEPTEMBER, 2023

PANEL OF EXAMINER

The Panel of Examiners declares that the undergraduate thesis entitled **"Optimizing Supply Chain Performance Through Effective Logistic Scheduling and Capacity Allocation: A Case Study in FMCG Company"** that was submitted by Putri Nurhaliza majoring in Industrial Engineering from the Faculty of Engineering was assessed and approved to have passed the Oral Examination on September 1st 2023.

Panel of Examiner

Andira Taslim, S.T., M.T.

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Dr. Ir. Mohamad Toha, M.T.

Examiner I

OPTIMIZING SUPPLY CHAIN PERFORMANCE THROUGH EFFECTIVE LOGISTIC SCHEDULING AND LOADING DOCK ALLOCATION: A CASE STUDY IN FMCG COMPANY

By

Putri Nurhaliza

ID No. 004201900020

Approved by

Ir. Hery Hamdi Azwir, M.T.

Final Project Advisor

Ir. Andira, S.T., M.T.

Head of Study Program

ADVISOR APPROVAL FOR INSTITUTION'S REPOSITORY

As an academic community member of the President's University, I, the undersigned:

Name	: Ir. Hery Hamdi Azwir, M.T.
ID number	: 0402026803
Study program	: Industrial Engineering
Faculty	: Engineering

Declare that following thesis:

Title of thesis	: Optimizing Supply Chain Performance Through Effective Logistic Scheduling and Loading Dock Allocation: A Case Study in FMCG Company
Thesis author	: Putri Nurhaliza
Student ID number	: 004201900020

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Cikarang, September 26th 2023

(Ir. Hery Hamdi Azwir, M.T.)

THESIS ADVISOR
RECOMMENDATION LETTER

This thesis entitled **"Optimizing Supply Chain Performance Through Effective Logistic Scheduling and Loading Dock Allocation: A Case Study in FMCG Company"** is prepared and submitted by **Putri Nurhaliza** in partial fulfillment of the requirements for the degree of bachelor's degree in the Faculty of Engineering has been reviewed and found to have satisfied the requirements for a thesis fit to be examined. I therefore recommend this thesis for Oral Defense.

Jakarta, Indonesia, August 29th, 2023

Ir. Hery Hamdi Azwir, M.T.

ACKNOWLEDGEMENT

This report took a long time and intense effort to be done with the great support of those who have provided assistance, advice, and encouragement. First and foremost, I would like to express my gratitude to Allah SWT who has been there for me since day one. And many other supports, namely:

1. My family always understands and never puts pressure on me.
2. Sir Ir. Hery Hamdi Azwir, M.T. as my Final Project Advisor who always gives guidance, direction, and advice to accomplish this report.
3. All the lecturers in the Industrial Engineering Faculty of President University.
4. Bu Amendha as my supervisor in the company. Also, Ka Tika, Ka Melva, and Ka Bayu that accompanied me since the beginning of my internship in the Logistic Transport department.
5. Annisa Rahmat, Aulia Pranagita, and Elvivani Sari who have always been there with me during every hardship since semester 3. Thank you so much for giving me emotional and mental support.
6. Lastly, my Industrial Engineering batch in 2019 always fought together and supported each other in all semesters.

Cikarang, August 29th 2023

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STATEMENT OF ORIGINALITY

In my capacity as an active student of President University and as the author of the thesis/final project/business plan (underline that applies) stated below:

Name	: Putri Nurhaliza
Student ID number	: 004201900020
Study Program	: Industrial Engineering
Faculty	: Engineering

I hereby declare that my thesis entitled **"Optimizing Supply Chain Performance Through Effective Logistic Scheduling and Loading Dock Allocation: A Case Study in FMCG Company"** is to the best of my knowledge and belief, an original piece of work based on sound academic principles. If there is any plagiarism detected in this thesis, I am willing to be personally responsible for the consequences of these acts of plagiarism, and will accept the sanctions against these acts in accordance with the rules and policies of President University.

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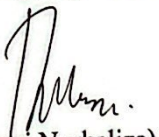

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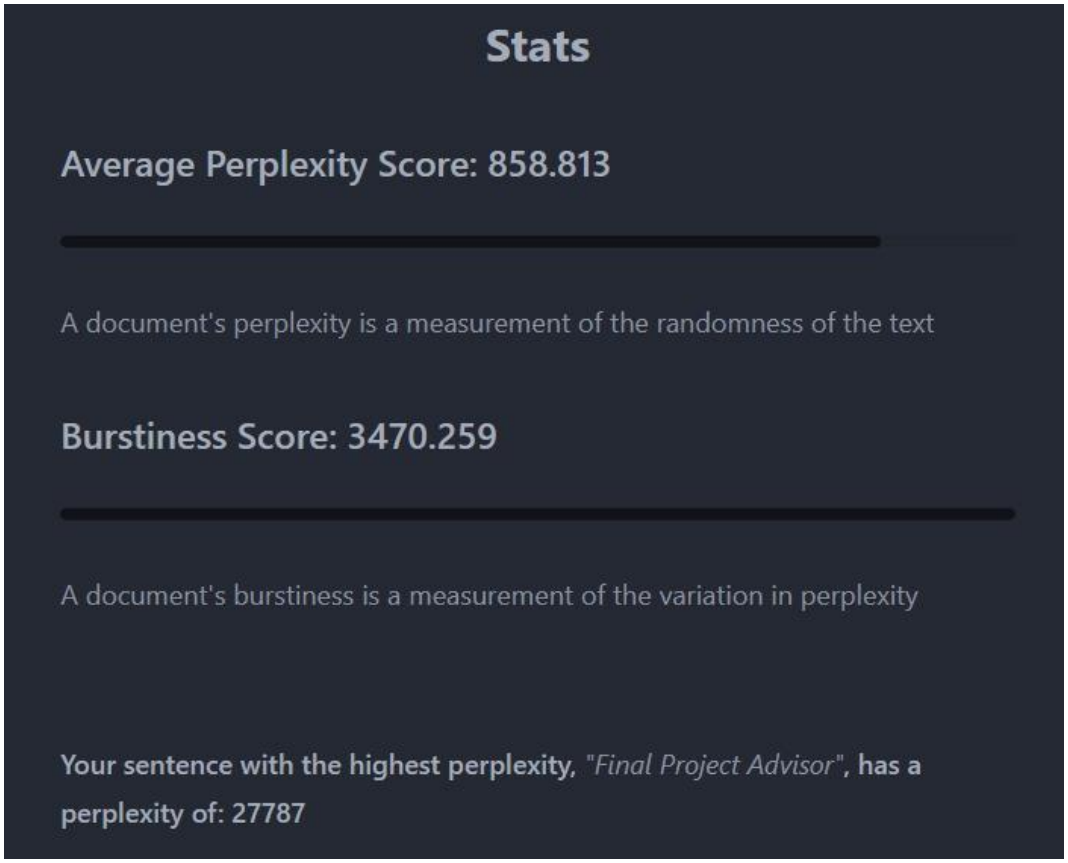

ABSTRACT

This research is centered on PT SM, an FMCG company specializing in home care products, which is facing challenges in outbound processing, resulting in unfulfilled daily delivery targets. The process loading time for a single shipment is 3 hours, posing a hindrance to handling 120 shipments daily. Consequently, the company achieves only 100 deliveries per day and resorts to weekly overtime. To address this issue, the study adopts the Business Process Improvement (BPI) method and deploys Business Process Model Notation (BPMN) to identify bottlenecks. The results highlight the necessity to regulate Vendor arrivals to enhance the preparedness of warehouse operators. The research introduces a truck regulation arriving system based on the available loading docks and shipment plans in generating the time of arrival for the shipping trucks, intending to reduce the loading time per shipment. Following implementation, the loading time to process a single shipment decreased to 2.7 hours resulting in an increase of delivered shipments per day by 11.35%. Notably, the improvement results in an annual saving of 12% (IDR 1,095,000,000) for PT SM, thus justifying investments by eliminating overtime expenses. This study highlights significant enhancements in PT SM's outbound processes and overall cost-efficiency.

Keywords: Business Process Improvement (BPI), Business Process Model Notation (BPMN), Outbound Logistic, FIFO, Warehouse Operation.

ACKNOWLEDGEMENT

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Cikarang, August 29th 2023

(Putri Nurhaliza)

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF TERMINOLOGIES

Daily Shipment Planning	: The process of planning shipments on a daily basis to ensure that goods are delivered to DC on time and efficiently.
Loading Dock	: An area outside of the warehouse where materials are placed on to be taken off to the truck by forklift.
Overtime	: Additional time worked by an employee outside the working hour. Usually, the pay rate is based on the additional working hours.
Loading Duration	: Amount of time taken to load a truck with goods for shipment delivery.
Handover Period	: A period of information exchange from the previous shift to the next shift.
Material Handling Equipment	: Tools or equipment that are used exclusively to transport materials within the facility.