AUTHENTICTY STATEMENT

For the sake of Allah, I confess that this research was conducted by me except for the summaries of the sources that have been cited and mentioned. If in the future my confession is proved to be wrong and dishonest resulting in the violence of legal regulation of the papers and intellectual property rights, then I am willing to return my degree I received to be withdrawn by Universitas Islam Indonesia.
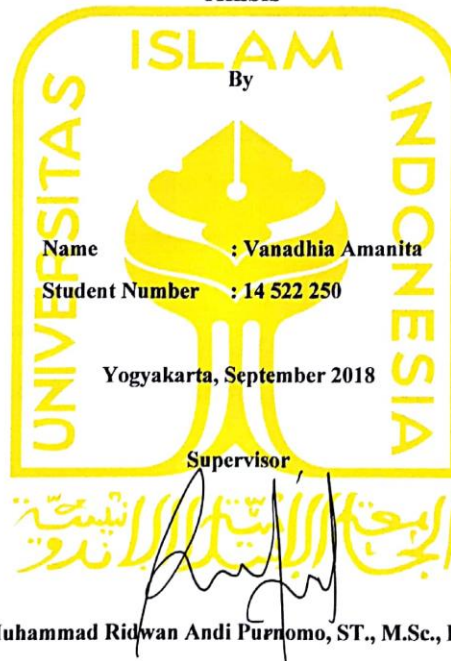
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THESIS APPROVAL OF SUPERVISOR

SUSTAINABLE SUPPLIER SELECTION AND ORDER ALLOCATION USING MULTI-OBJECTIVE LINEAR PROGRAMMING AT PT. YOSKA PRIMA INTI

THESIS

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DEDICATION

This thesis is dedicated to my loving parents, my mom Ir. Yunita Kaiulani, my dad Ir. Tunggul Hari, my brother and sister. I also dedicate this thesis to my supportive best friends Gema, Astri, Syahla. Beloved friends of Industrial Engineering International Program UII 2014 Family.

MOTTO

"*Allah does not burden a soul beyond that it can bear"* QS Al- Baqarah (02): 286

"…*Then when you have taken a decision, put your trust in Allah, certainly, Allah loves those who put their trust (in Him).*" QS Al-Imran (03):159

PREFACE

Assalamualaikum Wr. Wb

All praises to Allah SWT for his grace and mercy, so that the writer is able to finish this thesis. Thanks to Allah SWT's grace, the thesis has finished with the title "Sustainable Supplier Selection And Order Allocation using Multi-Objective Linear Programming at PT. Yoska Prima Inti". This thesis couldn't be finished without the guidance, help, and support from many entities and because of that the author would like to express gratefulness. Therefore, the author wants to give a special thanks to :

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The author realizes that there are still many shortcomings existed and full of weaknesses. Therefore critics and suggestions are expected. The author hopes that this report would give advantages and inspiration for the readers.

Wassalamualaikum Wr. Wb.

Yogyakarta, September 2018

Vanadhia Amanita

ABSTRACT

The importance of supplier selection and order allocation has given the advantage to manufacturer to improve the flow of supply chain and reduce cost. Although, recent several studies have been accomplished to incorporate environmental sustainability for supplier selection, but there is still much less attention to consider the supply risk. In this study, those aspects will be taken into consideration. Sustainability has been considered as the most decisive criteria for selecting the most suitable supplier. For supplier selection, AHP analysis is used to determine the weight of supplier based on supplier evaluation of environmental criteria. For order allocation, multi-objective linear programming (MOLP) is proposed to determine the initial order allocation considering the aspect of economic and environmental criteria, which the objective function consists of minimizing total purchasing cost and maximizing supplier evaluation. Then, risk management is used to mitigate supply risk by transferring the product from risky supplier to a least risky supplier. The problem of supplier selection and order allocation is applied to PT. Yoska Prima Inti, an automotive component manufacturer. There are 4 suppliers and 5 materials to be analyzed in determining the supplier selection and order allocation. Result shows, for the supplier selection, based on the assessment of environmental criteria, supplier 4 is the best supplier, followed by supplier 3, supplier 2, and supplier 1. Then, for the order allocation, the optimum order allocation is obtained. The last, based on supply risk criteria, the optimum revised order allocation is obtained corresponding to risk rating.

Keywords: Sustainabile Supplier Selection, Order Allocation, AHP, MOLP, Risk Management.

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