THE EFFECT OF LOT SIZE AND PRODUCT STRUCTURE ON MAKESPAN MINIMIZATION IN MULTILEVEL PRODUCT SCHEDULING

(Due to 4 Levels of Product Structure with Maximum Parts Are 4 in Each Level)

THESIS

Submitted as Partial Fulfill of the Requirements to Obtain the Bachelor of International Industrial Engineering Degree

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YOGYAKARTA

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STATEMENT OF WORK'S ORIGINALITY

I honestly declare that this thesis which I wrote does not contain the works or parts of the works of other people, except those cited in the quotations and bibliography, as a scientific paper should.

Yogyakarta, April 2009

The Writer

Sammuel Sukamto

TEMPORARY APPROVAL

THESIS TITLED

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ACKNOWLEDGEMENT

Dedicated to my parents...

FOREWORD

Thank to God for His blessings and guidance that allow the writer to completely finish the long journey of this final project. This final project is the requirements to obtain the bachelor of International Industrial Engineering Degree in Universitas Atma Jaya Yogyakarta.

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The writer realizes that this final project still far from perfect. Therefore, all the critics or suggestions are accepted to make this report better.

The writer hopes that this report will be useful for all people, especially the readers.

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The writer

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Every company has to compete each others to survive in their business world. One of the ways is to reducing the expense cost. A good scheduling can minimize it, because production time equals with production cost. If production takes long time to be done, the production cost needed will be higher. So the scheduling which can minimize makespan is needed. Finding the effect of lot size and product structure on makespan minimization in multilevel product scheduling becomes the main theme of this research that is included in the long term research project of The Production System Laboratory of Universitas Atma Jaya Yogyakarta.

There are some data used in this research, those are product structure (BOM), lot size, setup time, and run time. Product structure used is 4 level of product structure with maximum number of parts are 4 in each level where the combinations of product structure forms are generated to fulfill that consideration. Number of item produced is 45 and lot size evaluated are 5, 9, 15, and 45. Setup time is randomly generated by random number that is varied from 5 to 10 minutes/lot, and run time is varied from 1 to 5 minutes/unit. Optimum lot size is lot size decision giving the minimum makespan. Gantt chart is simulated to obtain the makespan each product structure, lot size and replication. Optimum lot size will be evaluated using ANOVA single factor.

Based on Gantt chart simulation, there is minimum makespan for each lot size, product structure and replication. Optimum lot size resulted is lot size 9 and 15. Based on ANOVA single factor result, the conclusion is product structure complexity does not significantly affect the optimum lot size.