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

THESIS

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



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YOGYAKARTA
2008**

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, June , 2008
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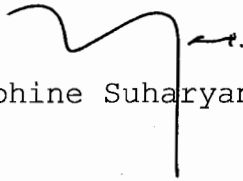


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INTERNATIONAL INDUSTRIAL ENGINEERING THESIS
On
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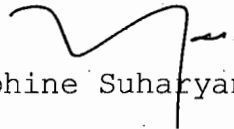
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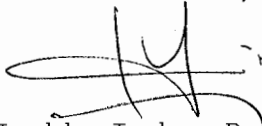
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TIKI BATCH 2004

Thank you for everything.....

Dedicated to:

My parents, mom and dad

My brother & sisters

My niece & nephew

FOREWORD

First of all, I want to thank God of his everlasting bless which have accompanied the writer through her research of Final Project and of His blessing in the writer's work of this Final Project report.

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The writer also realized that this paper includes many errors and weaknesses technically and materially, therefore the writer sincerely apologizes and will gladly accepts for critics and suggestions from the reader for future improvements.

The writer hopes that the Final Project report will be useful for either the writer or all who needs and reads the report.

Yogyakarta, June 2008

Writer

TABLE OF CONTENTS

Title Page	i
Statement of Work's Originality	ii
Approval	iii
Acknowledgement	iv
Foreword	v
Table of Contents	vii
List of Tables	viii
List of Figures	ix
Abstract	x
Chapter 1 Introduction	
1.1. Background	1
1.2. Problem Statement	2
1.3. Research Objectives	2
1.4. Scope of Research	2
1.5. Research Methodology	3
1.6. Report Outline	5
Chapter 2 Literature Review	6
Chapter 3 Basic Theory	
3.1. Bill of Materials	7
3.2. Routing File	10
3.3. Production Scheduling	11
3.4. Gantt Chart	13
3.5. Hypothesis Test	14
Chapter 4 Data Generation and Simulation	
4.1. Product Structure	20
4.2. Routing File Data	21
4.3. Gantt Chart Simulation	26
4.4. Statistical Test	29
Chapter 5 Data Analysis	
5.1. Gantt Chart Analysis	32
5.2. ANOVA Single Factor Analysis	39
Chapter 6 Conclusion and Suggestion	
6.1. Conclusion	41
6.2. Suggestions	41
References	
Appendices	

TABLE LIST

Table 3.1. Analysis of Variance for the One-Way ANOVA	17
Table 4.1. Routing Files for Replication 1	22
Table 4.2. Routing Files for Replication 2	23
Table 4.3. Routing Files for Replication 3	24
Table 4.4. Routing Files for Replication 4	25
Table 4.5. Routing Files for Replication 5	26
Table 4.6. Result Table of 1 st Product Structure (category A-D)	29
Table 5.1. Routing File for Replication 1 (category A-D)	33
Table 5.2. Result of Gantt Chart Simulation	37
Table 5.3. Ratio Table	38
Table 5.4. ANOVA Single Factor Table	39

FIGURE LIST

Figure 1.1. Research Step Flowchart	4
Figure 3.1. Bill of Material	7
Figure 3.2. Gantt Chart Example	14
Figure 4.1. Generation of Product Structure	20
Figure 4.2. Microsoft Excel	27
Figure 4.3. Blank Gantt chart	27
Figure 4.4. Gantt chart Block	28
Figure 4.5. Part of Gantt chart	28
Figure 4.6. Ratio Table (Microsoft Excel)	29
Figure 4.7. Microsoft Excel Tools	30
Figure 4.8. Data Analysis Tools	30
Figure 4.9. input ANOVA	31
Figure 4.10. ANOVA Single Factor Result	31
Figure 5.1. 1 st Product Structure Generation	33
Figure 5.2. 1 st Operation of Part D	34
Figure 5.3. 2 nd Operation of Part C	34
Figure 5.4. Optimum Lot Size Curved by 1 st Replication of 1 st Product Structure	35
Figure 5.5. 2 nd Operation of Part B (2 nd lot)	36
Figure 5.6. 2 nd Operation of Product MC (1 st lot)	36

ABSTRACT

Scheduling is one of the important parts of manufacturing and engineering. There are a lot of factors should be considered before taking the best scheduling approaches. The Production System Laboratory of UAJY has a long-term research project about the effect of product structure complexity, process routing complexity, and setup time-run time ratio on makespan minimization in multilevel product scheduling. The writer takes a part of this long-term research project. The writer concerns to product structure which is limited on 3 levels and maximum 3 parts in one level. The objective of this research is to define the optimum lot size by evaluating the effect of product structure complexity.

There are 6 possible combinations of product structure which have been generated. The routing file is generated to shows step-by-step set of instructions describing how the product is made. The routing files generated to create 5 replications for each product structure, all routing files have the same operations and work centers, the difference is on setup time and run time according to the random number generation. Makespan is found by Gantt chart simulation using Microsoft Excel program. There are several lot size examined, they are 4, 8, 16, and 32. Setup-run time ratio is the function of lot setup time divided by lot size times unit run time. Setup-run time ratio represents optimum lot size in ANOVA test.

Based on Gantt chart simulation, every case has its own optimum lot size; number of optimum lot size is randomly distributed. Most of optimum lot size is defined when lot size = 8 or lot size = 16. Based on ANOVA Single Factor result, writer concludes that there is no significant difference between variation of product structure and optimum lot size.

