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Scheduling - Production Manag.
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
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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TIKI BATCH 2004

Thank you for everything........

Dedicated to:
My parents, mom and dad
My brother & sisters
My niece & nephew
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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 | 1 |
| 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  
1.2. Problem Statement  
1.3. Research Objectives  
1.4. Scope of Research  
1.5. Research Methodology  
1.6. Report Outline  

**Chapter 2** Literature Review  

**Chapter 3** Basic Theory  
3.1. Bill of Materials  
3.2. Routing File  
3.3. Production Scheduling  
3.4. Gantt Chart  
3.5. Hypothesis Test  

**Chapter 4** Data Generation and Simulation  
4.1. Product Structure  
4.2. Routing File Data  
4.3. Gantt Chart Simulation  
4.4. Statistical Test  

**Chapter 5** Data Analysis  
5.1. Gantt Chart Analysis  
5.2. ANOVA Single Factor Analysis  

**Chapter 6** Conclusion and Suggestion  
6.1. Conclusion  
6.2. Suggestions  

References  
Appendices
TABLE LIST

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Analysis of Variance for the One-Way ANOVA</td>
<td>17</td>
</tr>
<tr>
<td>4.1</td>
<td>Routing Files for Replication 1</td>
<td>22</td>
</tr>
<tr>
<td>4.2</td>
<td>Routing Files for Replication 2</td>
<td>23</td>
</tr>
<tr>
<td>4.3</td>
<td>Routing Files for Replication 3</td>
<td>24</td>
</tr>
<tr>
<td>4.4</td>
<td>Routing Files for Replication 4</td>
<td>25</td>
</tr>
<tr>
<td>4.5</td>
<td>Routing Files for Replication 5</td>
<td>26</td>
</tr>
<tr>
<td>4.6</td>
<td>Result Table of 1st Product Structure (category A-D)</td>
<td>29</td>
</tr>
<tr>
<td>5.1</td>
<td>Routing File for Replication 1 (category A-D)</td>
<td>33</td>
</tr>
<tr>
<td>5.2</td>
<td>Result of Gantt Chart Simulation</td>
<td>37</td>
</tr>
<tr>
<td>5.3</td>
<td>Ratio Table</td>
<td>38</td>
</tr>
<tr>
<td>5.4</td>
<td>ANOVA Single Factor Table</td>
<td>39</td>
</tr>
</tbody>
</table>
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 20
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. 1st Product Structure Generation 33
Figure 5.2. 1st Operation of Part D 34
Figure 5.3. 2nd Operation of Part C 34
Figure 5.4. Optimum Lot Size Curved by 1st Replication of 1st Product Structure 35
Figure 5.5. 2nd Operation of Part B (2nd lot) 36
Figure 5.6. 2nd Operation of Product MC (1st 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 UNY 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 show 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.