UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

MINIMIZING MAKESPAN OF JOB SHOP SCHEDULING PROBLEM USING MIXED INTEGER LINEAR PROGRAMMING

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TABLE OF CONTENTS

ABSTRACT

Scheduling is the practice of allocating resources to projects in order to guarantee that they are finished in a timely manner. Making decisions on a regular basis is a common practice in many manufacturing and service businesses. It means managing and improving how resources are distributed among tasks over time. In addition to being a key instrument for increasing productivity and lowering costs in the product and service system, production scheduling is also crucial to the manufacturing stage of the product life cycle. The Job Shop Scheduling Problem (JSSP), which is the most often used in schedule theory, provides a solid representation of the overall domain but is notoriously challenging to solve. To accommodate inconsistent demand, manufacturers frequently buy more production machinery. The older machines are frequently utilized to balance production when the newer ones are overworked. When a manufacturer adds multiple production capabilities, scheduling job orders becomes a vital factor. The actual earliness and tardiness of a timetable would fluctuate randomly with the makespan delay since random machine breakdown cannot be predicted in advance. A faulty schedule could result in increased production expenses or possibly customer loss. Generally, the purpose of this study is to minimize the makespan of job shop scheduling problem. The JSSP will then be modelled as a mixed integer linear programming model and solved by using Excel Solver. This study includes three phases, which starts with data acquisition, construction of mixed integer linear programming model, solution of the model and performance review. There are three sets of data (3 × 3 JSSP, 4 × 4 JSSP, and 6 × 6 JSSP) involved in this study.