

ANALYSIS AND COMPARISON OF VARIOUS LOWER-BOUNDS ON
SCHEDULE TIMES FOR THE SOLUTION OF FLOW-SHOP PROBLEMS

by *GPQ*

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Bhopal, (M.P.), India, 1966

A MASTER'S REPORT

submitted in partial fulfillment of the
requirements for the degree

MASTER OF SCIENCE

Department of Industrial Engineering

KANSAS STATE UNIVERSITY

Manhattan, Kansas

1969

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R4
1969
937

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ACKNOWLEDGEMENT

I wish to express my deep sense of appreciation to my Major Professor, Dr. Said Ashour, for his guidance, constructive criticism, helpful suggestions and the personal interest taken in the preparation of this master's report.

My thanks are also due to Dr. Frank A. Tillman, Head Department of Industrial Engineering; Dr. L. E. Grosh, Department of Industrial Engineering and Professor Alley H. Duncan, Department of Mechanical Engineering for their kind patronage.

I appreciate and thank Miss Kathleen Bergman and S. F. Quadri for their assistance in the proof reading.

I greatly acknowledge and thank Mrs. Marie Jirak for her valuable assistance in typing.

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CHAPTER I

INTRODUCTION

The importance of the production scheduling problems has long been recognized by various types of industrial organizations. The control of production in industry usually centers around two distinct types of manufacturing processes: batch; and continuous. These two types are usually represented by the classic models of the job-shop and the assembly-line production systems. Consequently, production scheduling problems may be classified as Shop Production Scheduling and Line Production Scheduling. This research is concerned with a special class of the shop production scheduling problem.

The job-shop usually consists of a limited number of multi-purpose machines. A finite number of jobs are to be processed on one or more of these machines. In processing these jobs, certain technological requirements may be specified in advance. These requirements are usually referred to as machine ordering or routing. The most common and frequently referred to scheduling problem consists of finding the job sequence for processing J jobs on M machines such that a certain criterion is optimized. Among the criteria usually considered are: (1) minimization of the total time required to process all jobs on all machines, i.e., minimization of schedule time or make-span; (2) maximization of the profit by meeting the dead lines or due-dates; (3) minimization of the in-process inventory; (4) minimization of the total idle time on all machines; (5) maximization of the facility utilization; and (6) minimization of the total cost. However, the criterion considered in this research is that of minimizing the schedule