

MULTIPLE ORDERS PER JOB SCHEDULING PROBLEMS

John Fowler, Erhan Kutanoglu, and Scott Mason

Arizona State University, The University of Texas at Austin, The University of Arkansas

Abstract: In this presentation, we introduce a new class of scheduling problems called Multiple Orders per Job Scheduling problems. In these problems, multiple orders (items) are combined into individual jobs (job formation) and then the jobs are scheduled. We provide an overview of this new class of problems and present issues that need to be addressed to solve these problems.

Key words: Multiple Orders Per Job, Semiconductor Manufacturing.

1. OVERVIEW

This paper introduces, models, and develops solution approaches for challenging problems found in manufacturing and logistics applications. At the core of these problems is the requirement to combine multiple entities, each with its own unique attributes, customers, and cost/quality/service sensitivities, into one or more containers for deployment or processing. The “filled” containers become *jobs* that must be scheduled efficiently throughout various segments of machines, factories, or supply chains to meet desired objectives. The resulting performance is a function of both entity-to-container assignment and container scheduling decisions. Considering that the scheduling-only portion is already a challenge for most problems, we are interested in problems that integrate job formation (multiple entities of different attributes are grouped to “form” jobs) and scheduling (jobs are scheduled in complex manufacturing and supply chain environments) as shown in Figure 1. We call these problems multiple orders per job scheduling (MOJS) problems. We are interested in MOJS problems in both manufacturing and logistics applications.

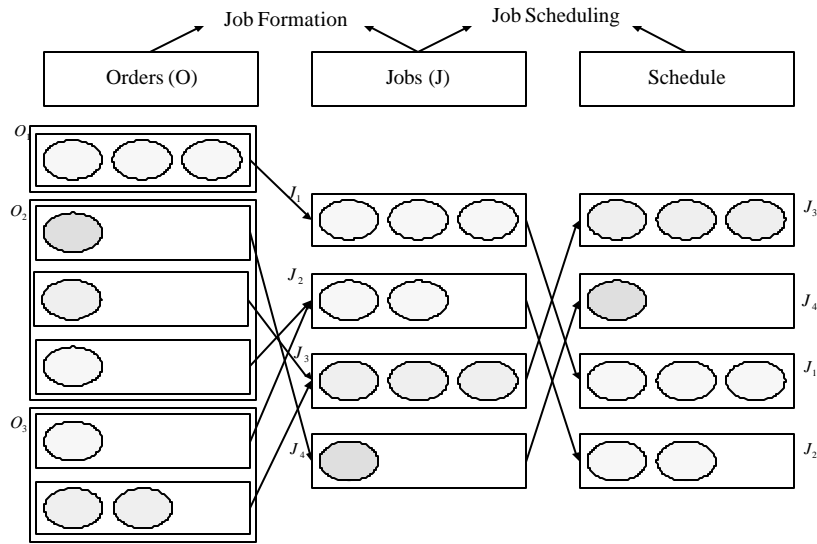


Figure 1 Multiple orders per job scheduling problems (patterns represent different product types)