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ABSTRACT

An Optimal Job Shop Model
with Multiple Objectives

by

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The study considered a multiple objective job shop model that considers tardiness among jobs, idleness among workstations, and changeover cost due to sequence-dependent set-up times. Model accounted for precedence constraints for each of the required operations and non-interfering constraints within a workstation.

The job shop model adopts a static, non-preemptive, infinite intermediate storage, with multiple workstations. Workstations act as multi-tasking systems which can handle any pre-assigned operations from any jobs.

Linear and nonlinear formulations resulted from this study. The linear model is a result of the transformation done on the nonlinear model. The



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transformation was done to prove the convexity of the model.

The model was validated through a numerical problem. A 2X2 job shop was formulated based on the formulated model. The model resulted to 25 variables and 38 constraints. This was solve through the use of an MILP88 software package. The resulting solution is an optimal sequence for the 2x2 job shop with sequence-depedent set-up times.

