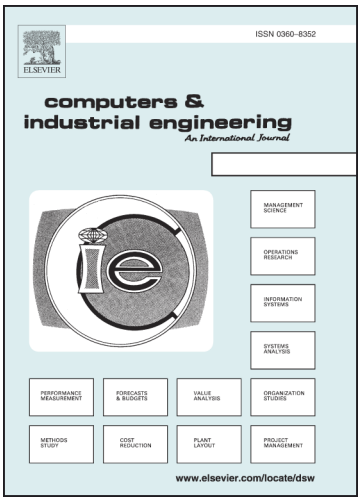

Minimizing Total Completion Time in the Assembly Scheduling Problem

Ik Sun Lee

PII: S0360-8352(18)30273-0
DOI: https://doi.org/10.1016/j.cie.2018.06.001
Reference: CAIE 5264

To appear in: *Computers & Industrial Engineering*

Received Date: 14 July 2016
Revised Date: 9 December 2016
Accepted Date: 2 June 2018

Please cite this article as: Sun Lee, I., Minimizing Total Completion Time in the Assembly Scheduling Problem, *Computers & Industrial Engineering* (2018), doi: https://doi.org/10.1016/j.cie.2018.06.001

Minimizing Total Completion Time in the Assembly Scheduling Problem

Ik Sun Lee

School of Business, Dong-A University, Seo-gu, Busan 602-760, Korea

Abstract

This paper studies a two-stage assembly problem to minimize the total completion time. The two-stage assembly system consists of multiple machines in the first stage, and an assembly machine in the second stage. Each job consists of multiple components. In the first stage each component is processed on the dedicated machine. In the second stage, the processed components of each job are shipped and assembled into a product on the assembly machine. This system is a generalization of flowshop, which has practical applications in assembly-driven manufacturing. The objective is to establish an efficient schedule minimizing the total completion time. Six lower bounds are proposed and evaluated in a branch-and-bound algorithm. Also, four efficient heuristic algorithms are developed to generate near-optimal schedules. The computational results show that the derived B&B and heuristic algorithms perform very well within reasonable time.

Keywords: Scheduling; Assembly System; Branch-and-Bound; Total Completion Time

*Corresponding author. Tel.: +82-51-200-7425
E-mail addresses: lis1007@dau.ac.kr