Determining cycle time for a multi-product FPR model with rework and an improved delivery policy by alternative approach

Yuan-Shyi Peter Chiu(1), Hong-Dar Lin(1), Chao-Tang Tseng(1), Singa Wang Chiu(2)*

(1)Department of Industrial Engineering & Management, Chaoyang University of Technology, Gifong East Road, Wufong, Taichung 413, TAIWAN
(2)Department of Business Administration, Chaoyang University of Technology, Gifong East Road, Wufong, Taichung 413, TAIWAN, *e-mail: swang@cyut.edu.tw

Abstract

The present study determines the common cycle time for a multi-product finite production rate (FPR) model with rework and an improved delivery policy [1] by an alternative approach. Conventional method to the multi-product FPR problem employs the differential calculus to first prove convexity of the system cost function, then derive the optimal common production cycle time that minimizes the long-run average system cost per unit time; whereas the proposed approach obtains the optimal cycle time without needs to reference to differential calculus. Such a simplified method may help those practitioners, who have insufficient knowledge of calculus, to manage effectively the real life multi-product FPR problem.

Keywords: finite production rate model, algebraic approach, optimization, multi-product system, common production cycle time, rework, improved delivery policy


*Singa Wang Chiu, Dept. of Business Administration, Chaoyang University of Technology, Taichung 413, Taiwan
*Correspondence: swang@cyut.edu.tw