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International Journal of Production Research >

Volume 49, 2011 - Issue 6

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Economic production order quantity and quality

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Pages 1753-1783 | Received 01 Mar 2009, Accepted 10 Dec 2009, Published online: 15 Mar 2010

G Cite this article **I** https://doi.org/10.1080/00207540903555528



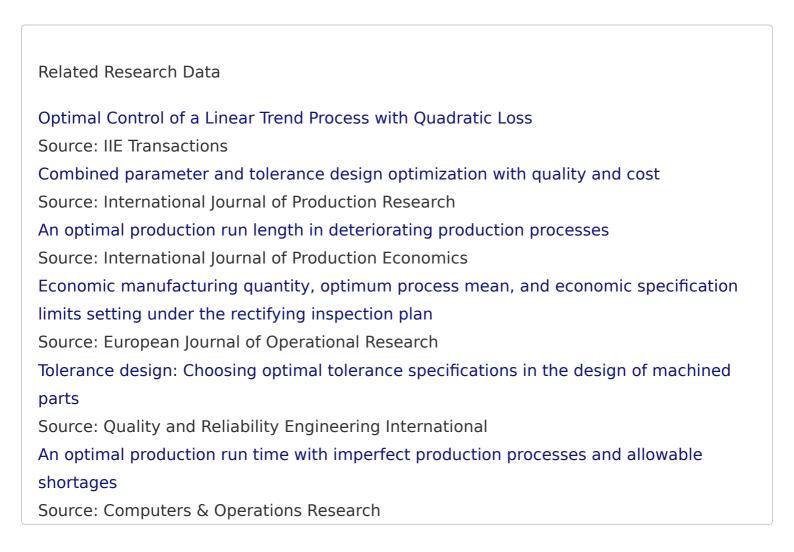
Abstract

The purpose of this study is to integrate a conventional production-inventory management approach and a process-quality design approach so as to promote quality and reduce costs. Because the integration of these two approaches into a single system is conducted under the influence of a deterioration process, estimated costs of production must be modified. Only then can these various costs be presented as a total cost for the present integrated system. This total cost includes: a setup cost for production reordering and process resetting, quality-related costs stemming from the loss of product quality along with a tolerance-related production process cost and a failure cost for product defects, backorder costs for production shortage, carrying costs generated by the storing and handling of inventory, and material costs for determining the process mean. The Taguchi quality loss function is introduced to assess quality loss in the system. The decision variables include the initial setting (process mean), process tolerance, and production order quantity. These variables need to be determined simultaneously to minimise the average total cost for a cycle time. An example is presented to demonstrate the proposed approach.

Keywords:					
initial setting	process tolerance	production order quantity	quality	cost	deterioration process
optimisation					

Acknowledgments

This research was carried out in the Design, Quality, and Productivity Laboratory (DQPL) at the Department of Industrial Engineering and Systems Management at Feng Chia University, Taichung, Taiwan, Republic of China. I would like to thank my research assistant, Mr. Yen-Pin Pai, graduate student in the I.E. Department.



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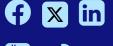
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