An integrated model of cellular manufacturing and supplier selection for product quality

Iraj Mahdavi and Habib Heydari
Department of Industrial Engineering
Mazandaran University of Science and Technology
Babol, Mazandaran Province, Iran
irajarash@rediffmail.com, habib.heydari09@yahoo.com

Mohammad Mahdi Paydar
Department of Industrial Engineering
Babol University of Technology
Babol, Mazandaran Province, Iran
paydar@nit.ac.ir

Abstract

Today's business environment, has forced manufacturers to produce high-quality products at low cost and the shortest possible delivery time. To cope with this challenge manufacturing organizations need to optimize the manufacturing and other functions in logical association with one another. Therefore, manufacturing system design and supplier selection process are linked together as two major and interrelated decisions involved in viability of production firm. As a matter of fact, production and purchasing functions interact as an organization's overall operation and jointly determine corporate success. In this research we tried to show the relationship between designing cellular manufacturing system (CMS) and supplier selection process by providing product quality considerations. A unified mathematical model is established to integrate procurement and production planning and to obtain the advantages of CMS with product quality and reduction of total cost. Computational results show the efficiency of proposed model in integrated manner as compared with separately taken into account.

Keywords
Cellular manufacturing, supplier selection, product quality

Biography

Iraj Mahdavi is the Professor of Industrial Engineering at Mazandaran University of Science and Technology and Vice President of Graduate Studies and Research. He received his PhD from India in Production Engineering and Post-Doctorate professor from Hanyang University, Korea. He is also in the editorial board of five journals. He has published over 200 research papers. His research interests include cellular manufacturing, digital management of industrial enterprises, intelligent operation management and industrial strategy setting.

Habib Heydari is a Master of Science in Industrial Engineering. He received his MS from Mazandran University of Science and Technology. His research interests are cellular manufacturing systems and fuzzy systems.

Mohammad Mahdi Paydar is an assistant professor in Industrial Engineering at Babol University of Technology. He received his PhD in Industrial Engineering from Iran University of Science and Technology. His research interests are cellular manufacturing systems and modelling of manufacturing applications. He has published articles in journals such as Computers and Industrial Engineering, Computers and Operations Research, Expert Systems with Applications, International Journal of Advanced Manufacturing Technology, Journal of Manufacturing Systems, International Journal of Production Research and International Journal of Operational research and 20 papers in international conferences.