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Supplier selection and order allocation using modified fuzzy AHP-based approach in manufacturing networks

Nan Li, Felix T S Chan and S H Chung
Hong Kong Polytechnic University, Hong Kong

Due to the economy recession all around the world, the performance of manufacturing industry has been significantly affected. The question of how to generate fast response to customers, maintain the high quality, accurate delivery rate and low risk becomes the crucial issue of keeping a company competitive. Supplier selection, one of the key factors for a successful production process has attracted more attention in the recent decade. This research aims to understand the supplier selection procedure in manufacturing networks. Fuzzy Analytical Hierarchy Process (FAHP) and Genetic Algorithms (GA) are applied to evaluate suppliers and optimize the combinations of suppliers for various orders, respectively. The data and information are collected from a central company, which coordinates manufacturing networks of SMEs as an industrial case study. A statistical analysis method for supplier evaluation with respect to quantitative criteria is proposed to visually assist decision makers and reduce the potential bias in the decision making process. For practical application, this paper, first of all, proposes a weighting system for SMEs manufacturing networks. Since data and information are collected from an experienced system integrator, the criteria and their corresponding weights could be used as a reference for similar industries and companies. Secondly, this research helps aid the decision making process in supplier selection and order allocation.

Biography

Nan Li received his BE degree from the Department of Mechanical Engineering, University of Birmingham, UK. He then completed an MPhil degree from the same University. Currently, he is a PhD candidate in the Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University, Hong Kong. His research interests are in inventory management, production control, simulation optimization and demand forecasting.

linanaiesec007@gmail.com

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