Guest editorial

Fuzzy approaches in production research and information management
Part-1

Production is the process of transforming inputs such as raw-materials and/or semi-finished materials into finished goods in order to provide goods and services humans require. Briefly, production is a process of transformation. All kinds of research aiming at developing and using new analysis methods for production problems such as improvement of production schedules, development of maintenance programs and management of stocks are called production research. Modeling risk and uncertainty in production research can be realized in two ways: modeling under probabilistic environment and modeling under possibilistic environment.

This special issue of *Journal of Enterprise Information Management* aims at presenting the recent theoretical developments and real-world applications in the field of fuzzy systems for production research. Most of the papers in this special issue have been selected from the presented papers at the 16th Production Research Symposium on October 12–14, 2016, in Istanbul, Turkey. The selected papers will be published in two issues: Part-1 and Part-2. All articles have been peer-reviewed by expert reviewers according to the journal's standards.

The first paper presents a methodology which enables to measure and analyze the performance of sub-processes and overall system of a cargo company. Fuzzy network data envelopment analysis method is used for performance measurement which considers the sub-process efficiency simultaneously together with the overall efficiency and also the uncertainty included in input-output data.

The second paper develops an integrated methodology including TOPSIS and intuitionistic fuzzy analytic hierarchy process (AHP) to determine the best production strategy. The paper also presents comparative and sensitivity analyses.

The third paper proposes a hesitant fuzzy AHP-based multi-criteria decision making system for CNC router selection in small- and medium-sized enterprises in woodwork manufacturing. It develops a hierarchical model consisting of four main criteria (technical, personnel, economic and vendor) and eleven sub-criteria for woodwork manufacturing.

The fourth paper develops the Pythagorean fuzzy extension of Combinative Distance-based Assessment (CODAS) method. Its application to a supplier selection problem is presented. The paper also presents comparative and sensitivity analyses.

The fifth paper aims at evaluating the usability of Augmented Reality goggles with respect to multiple criteria. It uses the MULTIMOORA method which is an effective multi-objective optimization solution method.

The sixth paper develops a risk analysis methodology in order to explore the undesired events together with their main reasons. The paper performs a risk analysis for these events. A fuzzy approach is used to obtain the important inferences about the hazardous processes by identifying the critical risk points.

The seventh paper aims to categorize slow-moving items in order to help organizations to manage their resources effectively. The problem is solved by using a Type-2 fuzzy AHP method. The weights obtained from fuzzy AHP are used to classify slow-moving items in ABC analysis.

The eight paper aims at evaluating existing data collection technologies. Technology evaluation problem is handled as a multi-criteria decision-making problem. A decision model containing four criteria and eight sub-criteria and four alternatives are constructed. The problem is solved using hesitant AHP and trapezoidal fuzzy numbers.

We hope that this issue will provide a useful resource for ideas, techniques and methods for fuzzy production research area. We are grateful to the referees whose valuable and highly appreciated works contributed to selecting the high-quality articles published in this issue. We are also very thankful to the Editor-in-Chief, Professor Zahir Irani, for his patience, support and efforts during the whole process.

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