# Guest Editorial Preface

# Special Issue on New Expansions in Decision Making

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Decision making in today's complex nature of business environment requires addressing of both quantitative and qualitative dimensions under highly uncertain domains. Multi Criteria Decision Making (MCDM) approaches have now evolved to advanced techniques that can handle the risk, possible hesitancy, vagueness and implicitness. Considered dimensions have the potential of making an impact on various stakeholders through the supply and production chains. Therefore, is necessary to construct a comprehensive MCDM procedure that is able to deal with uncertainties in a wide range of corporative fields from investment decisions to supplier selection. To be incorporated in successful decisions, uncertainties should be forecasted, resolved or transformed to certainty, which generally requires highly developed methods. Accordingly, the main objective of this special issue is to show how the novel decision-making methods are used to overcome uncertainty in various stages of operations management.

This special issue consists of one invited and three selected papers, which originally were presented and discussed at the 16th Production Research Symposium between the dates 12-14 October 2016 and subsequently extended, reviewed, and revised.

Tarik Kucukdeniz, Sakir Esnaf and Engin Bayturk try an unusual way in their paper "Extended Single-Iteration Fuzzy C-Means, and Gustafson-Kessel Algorithms for Medium-Sized ($10^6$) Multisource Weber Problem". They reformulate the uncapacitated multisource Weber problem as adding new facilities to current network of facilities and solve this by employing two different fuzzy clustering algorithms which work nested each. Each algorithm combines its original steps with inverse version which needs only and only one iteration and this feature make them very fast and unique. The speed of the algorithms allows to solve big data problems require very long time with exact algorithms.

Merve Cengiz Toklu and Harun Taşkın propose a model to evaluate the performance of small and medium enterprises under given high attention to production process with their paper "A dynamic performance evaluation model for SMEs based on fuzzy DEMATEL and fuzzy ANP". In their model, the performance criteria set is defined to reach strategic goals and objectives. Fuzzy Decision Making Trial and Evaluation Laboratory and Fuzzy Analytic Network Process methods are used to calculate the weights of performance criteria. They also apply the proposed model as a case study, and discuss the results.

The paper entitled "Firm Selection Based on Logistics Risk Factors: A Multiple Criteria Decision Making Approach" by Peker Iskender, Baki Birdogan and Korucuk Selcuk provides an integrated approach using multi-criteria decision making techniques to select a logistics firm in terms of logistics risk factors from manufacturing firms' perspectives. The approach employs Analytical Network

Process for determination of risk factors' importance levels, and VIKOR for selection of logistics firm. The proposed model provides a generic framework to managers who want to examine potential risks influencing their logistics activities.

In the paper titled as "An Assembly Line Balancing Application on Oven Production Line with Hyper-Heuristics", Gökhan Seçme and Lale Özbakır apply heuristic approaches to solve assembly line balancing problems. The study develops a mathematical programming approach covering firm-specific restrictions on direction of assembly, usage of lifter and operation type. The authors adapt a simulated annealing based hyper-heuristic approach to handle with the size of model. The paper indicates that the proposed solution approach can be easily adapted and applied to various types of ALB problems having different restrictions.

We believe that this special issue will be a great help for the researchers, academicians, industrial professionals and students for framing new expansions in decision making. We hope that the results of various research papers presented in this issue will act as milestones to further high quality theoretical and practical research. We would like to express our appreciation to Prof. John Wang for giving us the opportunity to publish this special issue and to all reviewers for their voluntary and timely work, which significantly helped to improve the quality of the manuscripts.

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