Guest editorial

Promoting sustainable decision-making

Policymakers are facing issues that are increasingly complex, trying to navigate the different objectives of multiple and diverse stakeholders, while attempting to take decisions that are robust under different circumstances and do not produce undesirable consequences. As a result, policy makers are in need to generate knowledge from information as well as from models relying on that information. However, in order for the knowledge to be multi-dimensional and provide recommendations that are truly actionable, the information should be considered under various multiple criteria (Arnold, 2013; Dutta *et al.*, 2014). To their aid, an entire research field has emerged: the discipline of decision support systems (DSS). These are specialized Information Systems that are used to support complex processes of decision-making (Shim *et al.*, 2002) and in their core they rely on mathematical programming models.

This special issue is related to the International Conference on DSSs Technology that was organized in Crete on 2018 (ICDSST-PROMETHEE Days 2018). The ICDSST is a yearly conference dealing with the latest technological and research advances in the development of up-to-date effective decisional support systems. The focus of the ICDSST'18 conference and of the EURO Working Group on DSSs was to provide the latest trends and cutting-edge research on this important topic with a special focus on data-driven and evidence-based decision support.

As a result, the papers of this special issue address high-level open issues that policy makers commonly come across. However, the articles are not merely applications to particular case studies. They address methodological issues that can lead to new types of decision support and at the same time they apply established tools and methods to new areas of research. For that reason, the papers that are presented here are classified into two groups: those that are focused on applying models to analyze a diverse array of fields and those that are focused on technical and methodological issues of information systems (in general) and DSSs (in particular).

In the first group of papers, Xu and Zhang (2020) use evidential theory and a fuzzy cognitive map to explore the factors that affect pre-school education services. Aretoulis *et al.* (2020) apply the well-known MCDA method PROMETHEE to identify and rank efficient project managers based on personality traits. Shaaban, Nojavan and Mohammaditabar are focused on flare gas recovery methods in refineries and apply a fuzzy hybrid approach to rank them. In the work of Tsioptsia *et al.* (2020), the authors use a generalized autoregressive conditional heteroskedasticity (GARCH) model to examine the impacts of the Greek economic crisis on the sustainability of the Turkish economy. Li *et al.* (2020) investigate the effects of carbon permits allocation on a two-echelon supply chain under different contracts and scenarios, while Yu *et al.* (2020) utilize Stackelberg game theory to analyze the impacts of attempting to reduce costs related to environmental emissions in supply chain.

In the second group of papers, Kitsios *et al.* (2020) explore the critical factors that managers have to consider when they develop Information Systems in the logistics sector. Covaci and Zarate (2020) propose an algorithm for automated supply chain formation and test it in the petroleum industry, while Yazdani *et al.* (2020) develop a decision aid model to assess the green suppliers under legislation and risk factors. The authors tested their model in a case study of a Spanish construction company.

Kybernetes
Vol. 49 No. 4, 2020
pp. 1061-1063

0368-492X
DOI 10.1108/K-04-2020-855

A different area of research is covered in the work of Delias and Kazanidis, where the authors present a methodology to reveal complex underlying structures determining certain political events, hence aiming to provide a systemic framework to analyze them. On another subject, He *et al.* (2020) propose a new approach to solve the classic vehicle routing problem. The authors use mixed integer linear programming combined with metaheuristics to the problem when there are dynamic customers.

The Special Issue closes with two papers that address important technical aspects of Information and DSSs. In Vafaei *et al.* (2020) the authors investigate how normalization techniques can affect the results of decision aid methods and illustrate the differences in a case study of selecting suppliers in collaborative networks. Finally, Antonelli *et al.* (2020) propose a framework to obtain tests during software development by using existing requirement artifacts.

The guest editors of this journal are glad to have included in this special issue a number of high quality and interesting manuscripts, with the authors being highly regarded researchers in their international scientific communities of reference. All of the included papers were subjected to a rigorous review process and we would sincerely like to thank the reviewers for their contribution to the successful completion of this special issue. We finally would like to thank the editorial board of Kybernetes, the publisher and of course all of the authors for their support, patience and confidence during this lengthy process and for their valuable contribution to our shared vision!

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Xu, L. and Zhang, Y. (2020), "Study on factors affecting preschool education service quality", *Kybernetes*.

Yazdani, M., Chatterjee, P., Pamucar, D. and Abad, M.D. (2020), "A risk-based integrated decision-making model for green supplier selection", *Kybernetes*.

Yu, C., Wang, C. and Zhang, S. (2020), "Advertising cooperation of dual-channel low-carbon supply chain based on cost-sharing", *Kybernetes*.

Further reading

Delias, P. and Kazanidis, I. (2020), "Exploiting higher-order dependencies for process analytics. The case for political events' analysis", *Kybernetes*.

Shaaban, N., Nojavan, M. and Mohammaditabar, D. (2020), "A fuzzy hybrid approach for ranking and allocation of flare gas recovery methods", *Kybernetes*.