Featured issue on collaborative decision processes and analysis

Pascale Zaraté¹ · Fátima Dargam²

Published online: 9 November 2015

© Springer-Verlag Berlin Heidelberg and EURO - The Association of European Operational Research Societies 2015

Collaboration together with organizational context is extremely important within decision-making processes. While organizations have to get ready to cope with high technology standards to face competition in the current era of decision making, heavily driven by large-scale data, there is a clear need to enforce the importance of Decision Support Systems to exploit the potentiality of Collaborative Decision Processes and Analysis.

Decision processes include an organizational and a cognitive dimension. Businesses need to be reactive in order to stay abreast with the fast-changing technology evolution lead to constant adaptations in those organizational and cognitive processes. While the organizational processes evolve and tend towards having more actors involved in the decision making, the responsibilities and the processes tend to be more distributed. On the other hand, the necessity to report and inform stakeholders about the decision processes is an increasingly strong requirement.

These collaboration aspects invite us not only to review the classical model of decision making, but to redesign the decision support which focuses on essential elements like: the plethora of multiple information, the added value needed by the processes of innovation and design, and finally the importance of the decision

✉ Fátima Dargam
F.Dargam@simtechnology.com

Pascale Zaraté
Pascale.Zarate@ut-capitole.fr

¹ IRIT, Toulouse University, Toulouse, France

² ILTC, SimTech Simulation Technology, Graz, Austria

analysis and the consensus in the collaboration and negotiation processes, instead of just referring to the final choice of classical models.

Zarató (2013) has shown that the processes of decision making in organizations have evolved from a cognitive point of view to a Collaborative Decision making one. Indeed, beginning with Simon's model (1977), it is shown that there is a strengthening of the feedback loops from the "review" last phase, back to the "choice" and "intelligence" phases. This process has also evolved in organizational terms, since we have migrated from the context of a single decision maker to contexts in which there are multiple decision makers and in which stakeholders work in distributed and asynchronous environments.

Across most application areas, several trends and technologies are making it possible for decision makers at different levels of organizations to reach decisions faster by improving their collaborative decision processes (Dargam et al. 2014; Linden et al. 2015; Delibasic et al. 2015; Hernández et al. 2012, 2013). These processes involve much more information than before, and they are also increasingly decentralized and distributed. Moreover, experiences from best practices in making decisions on business applications suggest that collaborative platforms need to be equipped with strong analytical capabilities in order to make the most use of available data. In this setting, the EURO Journal of Decision Processes (EJDP) with this Featured Issue explores methodological advances on the topic of "Collaborative decision processes and analysis", via the selection of six key papers.

Specifically, the papers in this issue deal with a wide palette of topics, including: strategic conflict resolution analysis; structuring of collaborative problems; recommender systems based on multi-criteria learning group preferences, voting and decision analysis; collaborative risk management; cooperative negotiation; as well as business process analytics.

The first paper entitled "Strategic analysis of a Brownfield revitalization conflict using the grey-based graph model for conflict resolution", authored by Hanbin Kuang, M. Abul Bashar, Marc Kilgour and Keith W. Hipel, proposes a definition of grey preference, based on grey numbers, incorporated into a multiple decision maker graph model for conflict resolution, in order to model human behaviour in a strategic conflict.

The second paper, authored by Guido Arjan Veldhuis, Peter van Scheepstal, Etiënne Rouwette, and Tom Logtens, is entitled "Collaborative problem structuring using MARVEL". It deals with problem structuring methods (PSMs) and uses an integrated approach named MARVEL (Method to Analyse Relations between Variables using Enriched Loops), to share some PSMs techniques with system dynamics and fuzzy cognitive maps. The paper also presents a case study that uses MARVEL in a collaborative setting to facilitate stakeholders' assessment of tactical military actions during stabilization operations.

The third paper is entitled "A group package recommender based on learning group preferences, multi-criteria decision analysis, and voting", and authored by Hanan A. Mengash and Alexander Brodsky. It describes a Group Package Recommender (GPR) framework which provides recommendations on dynamically defined packages of products and services. It focuses on extending recommender

systems in three ways: (1) to consider composite, rather than atomic, recommendations; (2) to deal with multiple, rather than single, criteria associated with recommendations; and, most importantly, (3) to support groups of users rather than individual users.

The fourth contribution—authored by Matthias Dehmer, Silja Karen Meyer-Nieberg, Goran Mihelcic, Stefan Pickl, and Martin Zsifkovits—is entitled “Collaborative risk management for national security and strategic foresight”. It focuses on the challenges that public decision makers have to face in detecting and identifying risks, and proposes a risk management framework to identify, analyse and evaluate future risks so that concrete actions can be set to tackle the threats. In their framework, a collaboration of experts of several disciplines constitutes an important part of the process.

The fifth paper entitled “Pre-negotiation framework to promote cooperative negotiations in water resource conflicts through value creation approach”, authored by Marcella Maia Urtiga and Danielle Costa Morais, deals with the allocation of water resources which is a matter of considerable tension in many parts of the world. Yet we all need water, however, and thus the allocation of water resources should invite cooperation rather than conflict. The authors propose a framework for pre-negotiation by value creation in water resource conflicts using a Valued-Focused Thinking (VFT) approach.

The sixth and last contribution of this issue is entitled: “Business process analytics: a dedicated methodology through a case study”, and is authored by Pavlos Delias, Michael Doumpos, Nikolaos Matsatsinis. They propose a methodology based on the process mining approach, to guide the implementation of process analytics projects. Following a conceptual analysis of existing methodologies, they extract the common methodological steps and present a practical synthesis. The proposed methodology reaches the business need of exposing more than just a static, marginal snapshot of performance by considering a process perspective.

As guest editors of this Featured Issue, we are quite pleased to have attracted and organized this interesting set of high quality papers. We take this opportunity to express our gratitude to all those who contributed to this edition, including the authors and specially the reviewers for their prompt and accurate reviews on previous versions of the selected papers. Special thanks also go to the Editor-in-Chief of this Journal, our colleague Ahti Salo, for inviting us to guest-edit this issue and for guiding us along the way. All in all, editing this EJDP Issue was a pleasure for us. We hope that its contents can serve as constructive references for further research projects on collaborative decision processes and analysis.

References

- Dargam F, Hernández JE, Zaraté P, Liu S, Ribeiro R, Delibasic B, Papathanasiou J (eds) (2014) Decision support systems III—impact of decision support systems for global environments. Springer Series LNBIP 184 lecture notes in business information processing. ISBN: 978-3-319-11363-0

- Delibasic B, Hernández JE, Papathanasiou J, Dargam F, Zaraté P, Ribeiro R, Liu S, Linden I (eds) (2015) Decision support systems V—big data analytics for decision making. Springer Series LNBIP 216 lecture notes in business information processing. ISBN: 978-3-319-18532-3
- Hernández JE, Zaraté P, Dargam F, Delibasic B, Liu S, Ribeiro R (eds) (2012) Decision support systems—Collaboration models and approaches in real environments. Springer Series LNBIP 121 lecture notes in business information processing. ISBN: 978-3-642-32190-0
- Hernández JE, Liu S, Delibasic B, Zaraté P, Dargam F, Ribeiro R (eds) (2013) Decision support systems II—recent developments applied to DSS network environments. Springer Series LNBIP 164 lecture notes in business information processing. ISBN: 978-3-642-41076-5
- Linden I, Liu S, Dargam F, Hernández JE (eds) (2015) Decision support systems IV—information and knowledge management in decision processes. Springer Series LNBIP 221 lecture notes in business information processing. ISBN: 978-3-319-21536-5
- Simon H (1977) The new science of management decision. Prentice Hall, Englewood-Cliffs
- Zarató P (2013) Tools for collaborative decision-making. Wiley, New York. ISBN: 978-1-84821-516-0