Guest Editorial Preface

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Special Issue on Cognitive Technologies and New Trends in Decision Support Systems

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The Knowledge Society can be defined as a space for human talent, imagination and creativity. It has two fundamental characteristics: the development of Information and Communication Technologies (ICT) and the relevance of the human factor.

This special issue aims to analyse the role that the human factor will play in the future of DSS and the development of technologies (tools and knowledge) required to respond to the new challenges and demands of the Knowledge Society. This human factor will be a fundamental element in the adoption of a new scientific method that allows decision making processes to incorporate the subjective, intangible and emotional aspects associated with the human factor, together with the objective, tangible and rational aspects that are associated to the traditional scientific methodology.

Hence, this special issue presents new technologies (tools and knowledge) that support the relevance of the human factor and cognitive orientation in decision making. The articles published have as a common characteristic that they all address the cognitive perspective in decision-making and how technology sheds light on the processes that the human brain follows when reasoning and making decisions.

This special issue consists in a selection of contributions presented during the EWG-DSS 6th International Conference on Decision Support System Technology, which was initially scheduled to be held in Zaragoza, Spain, but due to the pandemic crisis was finally held online at the end of May 2020. The six presented papers in this issue are extended from the first version presented at the ICDSST.

A first paper titled "Operational Decision-Making on Desalination Plants: From Process Modelling and Simulation to Monitoring and Automated Control With Machine Learning" by Dargam, Perz, Bergmann, Rodionova, Sousa, Souza, Matias, Ortiz, Esteve-Nuñez, Rodenas, and Zamora Bonachela details the modelling, implementation, optimization and lab-validation of a cloud-based simulation platform, including the monitoring and control of the entire process by using techniques of Machine Learning, of the MIDES (MIcrobial DESalination for low energy drinking water) project, regarding operational decisions on desalination plants.

The second contribution to this special issue deals with decisions involved on mechanisms for supply chains and is titled "Knowledge Mobilization for Agri-Food Supply Chain Decisions: Identification of Knowledge Boundaries and Categorization of Boundary-Spanning Mechanisms". In this paper, Zhao, Liu, Elgueta, Manzur, Lopez, and Chen, on the basis of a quantitative study,

make a deep research on the mechanisms that allow to deal with knowledge boundaries. Identifying knowledge is a challenge when improving the economic performance of cross-boundary projects. In fact, one of the conclusions of the paper is that a knowledge transfer department should be formulated in the agricultural research institutions/governments responsible for effectively transferring/sharing knowledge.

The third paper in this selection addresses the problem of go/no go decisions from a multi-criteria perspective that includes the management of risks. In their contribution titled "A Go/No-Go Decision-Making Model Based on Risk and Multi-Criteria Techniques for Project Selection", Kamissoko, Gourc, Marmier, and Clement propose an innovative approach for project launch decision-making in risk and multi-criteria situations that consists of providing relevant indicators that evaluate the success likelihood in a risk situation. The authors show an application of their methodology to crane construction projects.

A fourth paper titled "Rethinking Technology-Based Services to Promote Citizen Participation in Urban Mobility" by Duarte, Pinho de Sousa, and Freire de Sousa proposes, through a multidisciplinary methodological approach, some guidelines to design an integrated information system to improve citizens' participation in urban planning and mobility services. The authors employ a methodological approach based on existing service design methods adapted to the urban context and apply it in the metropolitan area of Porto, in Portugal.

The fifth paper deals with the design of a DSS for the area of Agriculture and is titled "Design Thinking and Compliance as Drivers for Decision Support System Adoption in Agriculture". In this paper Baumont De Oliveira, Fernández, del Pino and Hernández provide a prototype of a decision support system (DSS) for greenhouse farmers in La Plata, Argentina, to help farmers keep traceability records of their crops and treatments to reduce compliance risk. The proposal incorporates lessons learned from previous DSS projects and utilises design-thinking strategies to involve the end-user in the development.

The last paper titled "A Decision Support System for Improving the Inconsistency in AHP" by Escobar, Aguarón, Moreno-Jiménez, and Turón presents a DSS aimed at helping decision makers reduce and improve their inconsistency in eliciting their judgements when using the Analytic Hierarchy Process (AHP). The use of the DSS also provides the decision maker with relevant knowledge and valuable learning about the behaviour of the problem when faced with the different changes being considered.

Altogether, the selected papers demonstrate the variety and significance of issues to be dealt with in the field of decision making and innovative approaches in MCDM. We would like to thank all the authors for submitting their works to be considered for this special issue. We hope that you will enjoy and that you will find valuable information for your research and practice in this publication, and it will open the door for many new pieces of research.

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