Ana Paula Cabral Seixas Costa
Jason Papathanasiou
Uchitha Jayawickrama
Daouda Kamissoko (Eds.)

LNBIP 447

Decision Support Systems XII

Decision Support Addressing Modern Industry, Business, and Societal Needs

**8th International Conference on Decision
Support System Technology, ICDSST 2022
Thessaloniki, Greece, May 23–25, 2022, Proceedings**

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Decision Support Addressing Modern Industry, Business, and Societal Needs

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Editors
Ana Paula Cabral Seixas Costa 🄳
Federal University of Pernambuco
Recife, Brazil

Jason Papathanasiou 🄳
University of Macedonia
Thessaloniki, Greece

Uchitha Jayawickrama 🄳
Loughborough University
Loughborough, UK

Daouda Kamissoko
Ecole des Mines d'Albi
Albi, France

Preface

This twelfth edition of Decision Support Systems published in the LNBIP series presents a selection of reviewed and revised full papers from the Eighth International Conference on Decision Support System Technology (ICDSST 2022), held in Thessaloniki, Greece, during May 23–25, 2022. The conference's main theme was "Decision Support Addressing Modern Industry, Business and Societal Needs" and the principal aim was to investigate how the new business models in the digital age accentuate the demand for customized and intelligent decision support capable of meeting the needs of modern industry, business, and society.

The Euro Working Group on Decision Support Systems (EWG-DSS) planned the ICDSST series, starting with ICDSST 2015 in Belgrade, to consolidate the tradition of annual events organized by the EWG-DSS in offering a platform for European and international DSS communities, comprising the academic and industrial sectors, to present state-of-the-art DSS research and developments, to discuss current challenges that surround decision making processes, to exchange ideas about realistic and innovative solutions, and to co-develop potential business opportunities.

Building on this tradition, ICDSST 2022 included the following scientific topic areas:

- Decision Support Systems: Advances and Future Trends
- Multi-Attribute and Multi-Criteria Decision Making
- Knowledge Management, Acquisition, Extraction, Visualization, and Decision Making
- Multi-Actor Decision Making: Group and Negotiated Decision Making
- Collaborative Decision Making and Decision Tools
- Discursive and Collaborative Decision Support Systems
- Mobile and Cloud Decision Support Systems
- GIS and Spatial Decision Support Systems
- Data Science, Data Mining, Text Mining, and Sentimental Analysis
- Big Data Analytics
- Imaging Science (Image Processing, Computer Vision, and Pattern Recognition)
- Human-Computer Interaction
- Internet of Things
- Social Network Analysis for Decision Making
- Simulation Models and Systems, Regional Planning, Logistics, and SCM
- Business Intelligence, Enterprise Systems, and Quantum Economy
- Machine Learning, Natural Language Processing, Artificial Intelligence
- Virtual and Augmented Reality
- New Methods and Technologies for Global Crisis Management
- Analytics for Mitigating the Impact of Pandemics
- Intelligent DSS for Crisis Prevention
- Innovative Decision Making During Global Crises
- New DSS Approaches for Post-Crisis Recovery of Economy

- Decision Making in Modern Education
- Decision Support Systems for Sports
- General DSS Case Studies (Education, E-Government, Energy, Entrepreneurship, Environment, Healthcare, Industrial Diversification and Sustainability, Innovation, Logistics, Natural Resources, etc.)

These topics reflect some of the essential areas of study within Decision Support Systems, as well as the research interests of the group members. This rich variety of themes, advertised not only to the (more than three hundred) members of the group, but to a broader audience as well, allowed us to gather contributions regarding the implementation of decision support processes, methods, and technologies in a large variety of domains. Hence, this EWG-DSS Springer LNBIP volume collates contributions of full papers, selected through a single-blind paper reviewing process. In particular, at least two members of the Program Committee reviewed each submission in the first part of a rigorous two-stage process. The second stage involved the volume editors judging whether the revised versions did indeed address the issues that the reviewers had raised. Papers that didn't address properly all the issues were either accepted to the conference but not included in this volume or were not accepted at all. Finally, we selected 15 out of 46 submissions, which corresponds to a 32% acceptance rate, to be included in this twelfth edition of Decision Support Systems.

We proudly present the selected contributions, organized in three sections:

1. *Decision Support Addressing Modern Industry:* This section explores the application of contemporary technologies to decision support in modern industry. First, "Blockchain Technology Potential to Transform Global Value Chains" by Zoran Wittine, Antea Barisic, and Sanja Franc deals with the governance of global value chains, using blockchain technology as a new way of organizing global production. Then, Mathieu Lega, Corentin Burnay, and Stéphane Faulkner present "Predicting the Rating of an App Beyond its Functionalities: Introducing the App Publication Strategy", exploring whether a publication strategy has an impact on the success of a mobile app, in order to support companies decisions regarding their publication strategy, using machine learning techniques. Next, "Improving Machine Self-Diagnosis with an Instance-Based Selector for Real-Time Anomaly Detection Algorithms", by Philip Stahmann, Jon Oodes, and Bodo Rieger, prototypically implements a real-time anomaly detection algorithm selector to support decision making regarding machine self-diagnosis. Following this, "Blockchain and Artificial Intelligence in Real Estate" by Christos Ziakis offers a systematic review of the literature related to the usage of the blockchain technology and machine learning in the real estate industry. Finally, Nikolaos Nousias, George Tsakalidis, Sophia Petridou, and Kostas Vergidis present "Modelling the Development and Deployment of Decentralized Applications in Ethereum Blockchain: A BPMN-based approach", proposing a BPMN approach to design blockchain-based applications.
2. *Decision Support Addressing Business and Societal Needs:* This section applies decision support approaches, methods, and systems addressing societal and business needs. First, "Strengthening EU Resilience: Labor Market Integration as a Criterion for Refugee Relocation" by Anastasia Blouchoutzi, Georgios Tsaples, Dimitra

Manou, and Christos Nikas supports the decision of relocation, based on migrant labor market integration prospects, favoring social inclusion. Then, "Towards an Inclusive Europe: Ranking European Countries Based on Social Sustainability Indicators" by Jelena Stankovic, Marija Dzunic, and Ivana Marjanović assesses the state of social sustainability throughout Europe, based on the inclusion of various indicators reflecting the social dimension of sustainable growth. Next, Jonas Kirchhoff, Christoph Weskamp, and Gregor Engels present "Decision Support Ecosystems: Definition and Platform Architecture", an architecture of a shared platform for a decision support ecosystem and an application for regional energy distribution network planning. Following this, "A systematic research methodology for business model decision making in commercialising innovative healthcare diagnostic technologies", by Aira Patrice Ong, Shaofeng Liu, Genhua Pan, and Xinzhong Li, proposes a new methodology to develop business models for healthcare incorporating multidimensional implications of various stakeholder perspectives in decision making. Finally, Chenhui Ye, Pascale Zaraté, and Daouda Kmissoko present "A DSS based on a control tower for supply chain risks management", a decision support system for supply chain risk management in a multi-source data and risk environment.

3. *Multiple Criteria Approaches:* This section presents multicriteria models and methods applied in different contexts of societal, business, and modern industry decisions. First, "Using the FITradeoff Method for solving a truck acquisition problem at a midsize carrier", by Mariana Wanderley Cyreno, Lucia Reis Peixoto Roselli, and Adiel Teixeira de Almeida, explores the FITradeoff method that integrates holistic evaluation with elicitation by decomposition to solve a truck acquisition multicriteria decision problem. Next, "Maturity assessment in the context of industry 4.0 - an application using FITradeoff method in a textile industry" by Duan Ferreira and Ana Gusmão proposes and applies a maturity assessment procedure, in the context of industry 4.0, based on the FITradeoff multicriteria method. Then, Glykeria Myrovali and Maria Morfoulaki present "Sustainable Mobility Engagement and Co-planning: a Multicriteria Analysis-based Transferability Guide", which exploits multicriteria analysis for evaluating the transferability potential of good practice in citizens' sensibilization and engagement in sustainable mobility. The next paper, "A DSS for the multi-criteria vehicle routing problem with pickup and delivery and 3d constraints" by Themistoklis Stamadianos, Magdalene Marinaki, Nikolaos Matsatsinis, and Yannis Marinakis, proposes a DSS that combines optimization and a multicriteria model for solving a particular case of a vehicle routing problem. The last paper in this section, "A multicriteria tool to support decision-making in the early stages of energy efficiency investments" by Aikaterini Papapostolou, Filippos Dimitrios Mexis, Charikleia Karakosta, and John Psarras, presents a decision tool based on the ELECTRE TRI multicriteria method to evaluate energy efficiency investments.

We would like to thank the many people who contributed to the success of ICDSST 2022 and this LNBIP book. First of all, we would like to thank Springer for providing us with the opportunity to guest edit this edition of Decision Support Systems, and we wish to express our sincere gratitude to Ralf Gerstner and Christine Reiss, who dedicated their time to guide and advise us during the volume editing process. Secondly, we need to thank all the authors for submitting their state-of-the-art work for consideration to

this volume, managing to overcome all the obstacles that arguably affected scholars around the globe. From our point of view, this is yet another confirmation that the DSS community is vivid, active, and has a great potential for contributions to society. It really gives us courage and stimulates us to continue the series of International Conferences on Decision Support System Technology. Finally, we express our deep gratitude to the reviewers — members of the Program Committee who volunteered to assist in the improvement and the selection of the papers under (to be honest) a tight schedule. We believe that this EWG-DSS Springer LNBIP volume has made a rigorous selection of high-quality papers addressing the conference theme. We hope that readers will enjoy the publication!

April 2022
<div align="right">

Ana Paula Cabral Seixas Costa
Jason Papathanasiou
Uchitha Jayawickrama
Daouda Kamissoko
</div>

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