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## **Preface of the proceedings ICDSST 2023 : 9th International Conference on Decision Support System Technology**

Shaofeng Liu, Pascale Zaraté, Daouda Kamissoko, Isabelle Linden, Jason  
Papathanasiou

► **To cite this version:**

Shaofeng Liu, Pascale Zaraté, Daouda Kamissoko, Isabelle Linden, Jason Papathanasiou. Preface of the proceedings ICDSST 2023 : 9th International Conference on Decision Support System Technology. ICDSST 2023 - 9th International Conference on Decision Support System Technology, May 2023, Albi, France. pp.vii-x. hal-04428772

**HAL Id: hal-04428772**

**<https://imt-mines-albi.hal.science/hal-04428772>**

Submitted on 31 Jan 2024

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# Preface

This thirteenth edition of the EWG-DSS Decision Support Systems published in the LNBIP series presents a selection of high-quality papers from the 9th International Conference on Decision Support System Technology (ICDSST 2023), held in Albi, France, during May 30 – June 1, 2023, with the main theme “Decision Support Systems in An Uncertain World: The Contribution of Digital Twins”. This event was organized by the Euro Working Group on Decision Support Systems (EWG-DSS) in collaboration with the University of Toulouse 1 – IMT Mines Albi.

The EWG-DSS series of International Conferences on Decision Support System Technology (ICDSST), starting with ICDSST 2015 in Belgrade, were planned 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.

The scientific topic areas of ICDSST 2023 include:

- Decision Support Systems: Advances and Future Trends
- Multi-Attribute and Multi-Criteria Decision Making
- Knowledge Management, Acquisition, Extraction, Visualisation, and Decision Making
- Multi-Actor Decision Making: Group and Negotiated Decision Making
- Collaborative Decision Making and Decision
- Discursive and Collaborative Decision Support Systems
- Mobile and Cloud Decision Support Systems
- GIS and Spatial Decision Support Systems
- Data Science, Data Mining, Text Mining, Sentiment Analysis, and Process Mining
- 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
- Immersive Analytics for Decision Making
- Digital Twins for Decision Making
- General DSS Case Studies

This wide range of topics allowed us to present various solutions regarding the decision-making process and decision support in a great number of domains, and to highlight the main trends and research evolution. This EWG-DSS LNBIP Springer edition includes contributions selected via a double-blind evaluation process, maintaining the society's high-quality profile. Each selected paper was reviewed by at least three internationally known experts from the ICDSST 2023 Program Committee. Through its rigorous review and revision, 21 out of 65 submissions were selected for publication in this 13th EWG-DSS Springer LNBIP Edition, which represents a 32% acceptance rate.

The selected papers are representative of the current and recent DSS research and application advancements. The papers are topically organised in four sections:

- (1) DSS models, methods, and tools. The five papers in this section present innovative decision models, methods, and tools. The first paper, written by Boris Delibašić, Draženko Glavić, Sandro Radovanović, Andrija Petrović, Marina Milenković, and Milija Suknović, discusses the multi-actor VIKOR method for highway selection in Montenegro, followed by a tool to support decisions for the trace clustering problem with a non-compensatory approach from Nikolaos Zapoglou and Pavlos Delias. Papers 3 and 4 propose two important DSS models: an asset-based causal loop model (authored by Romain Ben Taleb, Matthieu Lauras, Mathieu Dahan, Aurelie Montarnal, and Romain Miclo) and a time-aware optimisation model by Herwig Zeiner. The last paper in this section provides a comprehensive study of emerging technologies for prevention and detection of network attacks, authored by Tauheed Khan Mohd, Paul Addai, Ryan Freas, Elnatan Mesfin Tesfa, and Max Sellers.
- (2) DSS solutions for improving business performance and engaging stakeholders. This section includes six papers focusing on the provision of DSS solutions to improve different aspects of business performance and stakeholders' engagement. Firstly, the paper by Emna Masmoudi, Laurent Piétrac, and Séverine Durieux analyses the impact of Industry 4.0 on OEE improvement. Then, the paper from He Huang, Shiqi Sun, Lina Liu, Koen Mommens, and Cathy Macharis provides a data-driven stakeholder-based decision-support system that considers uncertainties. George Tsakalidis, Nikolaos Nousias, and Kostas Vergidis developed a BPR Assessment Framework staging business processes for redesign using cluster analysis. This section includes two papers discussing the role of knowledge in DSS: the paper of Jiang Pan, Shaofeng Liu, Sarah Tuck, and Aira Ong explores Lean Knowledge Management Processes for improving the performance of manufacturing supply chain decisions, and the paper of Charikleia Karakosta, Zoi Mylona, Jason Papatthasiou, and John Psarras integrates existing knowledge to accelerate building renovation rates in Europe. The last paper in this section explores equity-based allocation criteria for water deficit periods with a case study in South Africa.

This paper is authored by Sinetemba Xoxo, Jane Tanner, Sukhmani Mantel, David Gwapedza, Bruce Paxton, Denis Hughes, and Olivier Barreteau.

- (3) DSS applications for sustainability: health, energy and transportation. The third section is about DSS applications to achieve sustainability ambitions in various areas. The first paper, by Aikaterini Papapostolou, Charikleia Karakosta, Filippos Dimitrios Mexis, and John Psarras, tackles financing issues in green energy projects. The second paper, from Sarra Samet and Ridda Laouar, deals with health sustainability issues through building risk prediction models for diabetes decision support systems. The last three papers in this section all address sustainability issues in transportation. Jean Baptiste Rakotoarivelo's paper applies AHP method to the evaluation of costs and pollution emitted by combined means of transport. The paper by Eva Petitdemange, Sam Ban, Matthieu Lauras, and Srang Sarot evaluates the potential of the physical internet for last-mile delivery in developing countries. Finally, the paper of Xiaofang Wu, Shaofeng Liu, Shaoqing Hong, and Huilan Chen focuses on port sustainability assessment.
- (4) DSS users and successful adoption. The final section is formed by five papers on DSS users and successful adoption of DSS systems and technologies. The first paper investigates cloud ERP adoption using technology-organisation- environment (TOE) and diffusion of innovation (DOI) theories, authored by Sin Ting Cheung, Uchitha Jayawickrama, Femi Olan, and Maduka Subasinghage. The paper from Christer Carlsson and Pirkko Walden provides insights into young elderly DSS users - some reasons for successful adoption. The third paper presents behavioral studies for the use of visualization in holistic evaluation for multicriteria decision problems decision. The paper is authored by Evanielle Barbosa Ferreira, Tarsila Rani Soares de Vasconcelos, Lucia Reis Peixoto Roselli, and Adiel Teixeira de Almeida. Sean Eom's paper discusses digital distance learning critical success factors for conducting learning analytics research. Finally, the paper from Peter Keenan and Ciara Heavin elicits past trends and future opportunities for scientific authorship in DSS research.

We would like to thank many people who greatly helped the success of this LNBIP book. First of all, we would like to thank Springer for giving us the opportunity to guest edit the DSS book, and we especially wish to express our sincere gratitude to the Springer staff who have provided us with timely professional guidance and advice during the volume editing process. Secondly, we need to thank all the authors for submitting their state-of-the-art work to be considered for the LNBIP volume. All selected papers are of high quality. It was a hard decision for the guest editors to select the best 21. Thirdly, we wish to express our gratitude to all reviewers, who volunteered to help with the selection and improvement of the papers.

We believe that this EWG-DSS Springer LNBIP volume has selected a collection of high-quality and interesting research papers addressing the conference's main theme and related topics. We hope the readers will enjoy the publication!

March 2023

Shaofeng Liu  
Pascale Zaraté  
Daouda Kamissoko  
Isabelle Linden  
Jason Papathanasiou