
Editorial

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Decision supports systems (DSS) are increasingly contributing to the support of decision makers in several application fields, by offering a concrete framework for analysing, modelling and study complex problems with many dimensions and several involved actors. Given the complexity of the decision problems, DSS offer a holistic approach where operation research, information technology, and management science cooperate in an integrated manner. The evolution of DSS, in terms of improved decision models and adoption of new technologies, has resulted to an increased penetration, not only at the research community but also in real business world. Furthermore, DSS find their place in an era where ‘big data’ from various interconnected software applications through the internet shall be analysed and modelled in order to support efficiently the decision process in different business cases.

This special issue entitled ‘Decision support systems in commerce, logistics and transportation’ focuses on the latest advances with respect to the contributions of DSS theory, practice and tools in three very active fields covering both theoretical/methodological developments, as well as real-world case studies. The special issue has been prepared on the occasion of the 5th International Symposium and the 27th National Conference on OR, organised by the Hellenic Operational Research Society (HELORS) and held in Athens, Greece, Conference Center of Piraeus University of Applied Science during June 9–11, 2016. In addition to conference papers, several other works within the theme of the special issue have been submitted. After a rigorous reviewing process, seven papers were finally selected for publication, covering many different aspects of DSS contributions in management problems.

The first paper by Politis and Grigoroudis discusses how the concept of Six Sigma analysis is incorporated in customer satisfaction measurement by introducing the principles of Kano’s customer satisfaction model in order to derive important information for the selection of strategic actions. The proposed approach has been implemented in a real case study concerning the evaluation of customer satisfaction from Greek mobile service providers. The authors suggest that further research can consider the investigation of the effects of the parameters used in the proposed methodology (e.g., satisfaction threshold) on sigma levels, as well as the combination of Six Sigma indices with additional data, such as customer expectations.

The next two papers discuss the application of multicriteria decision models in managing and operating e-learning systems. The paper by Kytagiias et al., a decision support approach for redesigning e-learning systems through the analysis of students’ preferential structures is presented. The proposed approach supports instructional designers to take decisions during the redesign process of an e-learning system by analysing the students’ preferential structures in three dimensions. It is based on a new method from the domain of multicriteria decision-making that provides weights of individuals’ preferences which become input in a clustering process that determines groups of preferences among students. In the next paper, Georgakopoulos et al. provide a framework and a detailed case study for identifying risks factors of students’ failure in e-learning. They also discuss how a learning management system (LMS) can be transformed into a warning system and provide decision support services to decision makers, given the fact that decision makers in this area need to make decisions at various points as well as at multiple levels during the life cycle of the educational process.

As business environment is getting more and more turbulent, effective strategic management and decision-making is necessary, thus the implementation of DSS is considered crucial to sustain competitive advantage. Even though DSS have been widely applied in logistics, surveys which indicate their strategic approach are limited. Although logistics is the function which consists of the management of material and information flows and it is significant in satisfying customers’ needs, researchers have just recently started paying attention in its strategic role. In this context, Kitsios and Kamariotou propose a strategic DSS framework which combines both the strategic management process and strategic information systems planning (SISP) to provide an approach so as to achieve effective decision-making in logistics.

Ballis et al. in the fifth paper, develop a natural gas network model for testing various demand and supply scenarios in order to tackle the issue of energy security which is high in the agenda of Europe asking for the systematic investigation of all pertinent factors. The analysis performed revealed the importance of the gas corridor from Azerbaijan and

Middle East via Turkey and Greece/Bulgaria to Europe as well as the significance of the LNG port installations for the diversification of gas suppliers and the alleviation of bottlenecks or supply interruptions in the pipeline network.

The next paper by Zisos et al. focuses on how online ratings could determine hotels' improvement priorities. Large-scale survey on customers' ratings was conducted to explore the determinants of tourists' satisfaction in existing hotel categories. The application of multicriteria satisfaction analysis method to online ratings, has resulted in valuable conclusions concerning the quality of services, customers' satisfaction and prioritisation of potential changes. Data are taken from the popular hotel booking website Hotels.com and the case study concerns hotels in Chania, Greece. Final conclusions have been mainly based on the estimated global and partial value functions, weights of criteria, and the average satisfaction, demanding, improvement indices.

The last paper by Boulas et al. presents the implementation of genetic programming (GP) methodologies for the modelling and estimation of ground resistance with the use of field measurements related to weather data. The work utilises both, conventional and intelligent data analysis techniques, for ground resistance modelling. Experimental data consist of field measurements that have been performed in Greece during the previous four years. Five linear regression models have been applied to an appropriately selected dataset, as well as an intelligent approach based on gene expression programming (GEP). The latter combines the advantages of genetic algorithms (GA) and GP to avoid the coding explosion problem of GP with the use of simple genetic operations as GA. Every model corresponds to a particular grounding system. A heuristic approach using GEP was performed to produce more robust and general models for grounding estimation. Consequently, a series of larger and more complex GP models were developed to ensure higher accuracy. Results show that evolutionary techniques such as those based on GP are promising for the estimation of the ground resistance.

We would like to sincerely thank all the authors who submitted papers. Their contribution has been essential in developing this special issue. We would also like to thank all the colleagues who worked hard to review the submitted papers. Their support was crucial in assuring the high standards of this special issue.