

# Preface

Welcome to the *Proceedings of the Eighth International Conference on Management Science and Engineering Management (ICMSEM2014)* held from July 25 to 27, 2014 at Universidade Nova de Lisboa, Lisbon, Portugal.

The International Conference on Management Science and Engineering Management is the annual conference organized by the International Society of Management Science and Engineering Management (ISMSEM). The goals of the Conference are to foster international research collaborations in Management Science and Engineering Management as well as to provide a forum to present current research results in the forms of technical sessions and round table discussions during the conference period in a relaxed and enjoyable atmosphere. This year, 1,337 papers from 37 countries were received and 138 papers from 14 countries were accepted for a presentation or poster display at the conference after a rigorous review. These papers are from countries including Spain, Australia, Germany, France, Canada, Pakistan, China, USA, Japan, Portugal, Iran, The Netherlands, Korea, and Azerbaijan. They are classified into eight parts in the proceedings, which are Intelligent Systems, Decision Making Systems, Manufacturing, Supply Chain Management, Computing Methodology, Project Management, Industrial Engineering, and Information Technology. The key issues of the eighth ICMSEM cover various areas in MSEM, such as Decision Making Methods, Computational Mathematics, Information Systems, Logistics and Supply Chain Management, Relationship Management, Scheduling and Control, Data Warehousing and Data Mining, Electronic Commerce, Neural Networks, Stochastic models and Simulation, Heuristics Algorithms, and Risk Control. In order to further encourage the state-of-the-art research in the field of Management Science and Engineering Management, the ISMSEM Advancement Prize for MSEM will be awarded at the conference to these researchers.

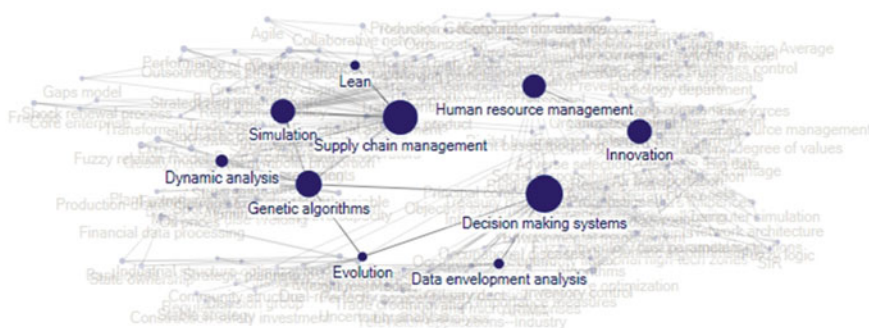
A total of 138 papers were accepted and they were divided into two proceedings with 69 papers in each proceeding. To find out the research topics among the accepted papers, the NodeXL was applied. To begin with, keywords from 69 papers were excerpted as follows: Genetic algorithms, Simulation, Decision Making Systems, Innovation, Human resource management, Supply Chain Management, Hazards, Risks, Occupational accident, Occupational diseases, Exogenous influence, Scale invariant, Network architecture, Computer simulation, Neural networks, Hardware product, Defects, Functional assessment, Genetic

algorithms, Medical problems, Game theory, Mixed payment, Statistical process control, Autocorrelation, Chart, Mathematical programming, Production-distribution problem, Fuzzy random variable, Multi-attribute auction, Reverse auction, Data envelopment analysis, Television applications-Industry, Evaluation, Empirical analysis, National high-tech zones, VIKOR method, Prediction, Transfer learning, Empowerment of personnel, Fuzzy sets, Fuzzy Analytic Hierarchy Process (FAHP), Regional innovation system, Innovation, Principal component analysis, Transactive memory system, Multiactivity task, Feedback control, Simulation, Group learning, Construction safety investment, Regulation, Evolution, Stable strategy, Lurker, Computing, SMEs, ARIMA, Forecasting, Mathematical models, Traffic control, Decision trees, Infrastructure, Integration, Decision group, Complex network, Superiority index, Fuzzy logic, SIR, GEMS, Strategic transformation, Mechanisms, Transformation process, Financial development, Regression analysis, AHP, Agent based modeling, Agribusiness, Dynamic analysis, Competitive advantage, IT strategy, Business strategy, Organizational aspects, Environmental management, life support system, Big data, Enterprise resource management, Statistics, Corporate governance, Organizational effectiveness, Economic analysis, Financial risk, Purchasing, Lean, Trade credit, Uncertainty analysis, Multiobjective optimization, Inventory control, Air transportation, Profit allocation, Preventive maintenance, Knowledge management, Fractals, Green supply chain, Performance, Talent management, PSO, Organization, Replacement policy, Quality improvement.

The significance of the keywords does not lie only in its frequency or ratio; the connection between the keywords is also very important in our study of how these papers revolve around the theme of Management Science (MS). The field of MS provides a set of concepts and metrics to systematically study the relationships between the keywords. The methods of information visualization have also become valuable in helping us to discover patterns, trends, clusters, and outliers, even in complex social networks. In the preface, the open source software tool NodeXL was designed especially to facilitate learning the concepts and methods of MS as a key component.

Using the NodeXL, all of the 487 keywords involved in the 69 papers were analyzed. To begin with, the preliminary processing was executed on all the keywords. Except for a unified expression of words, all the keywords with the same meaning and words including the meaning of similar keywords have been unitized. For example, “decision making systems,” “decision making,” and “decision support systems” have finally been unified to “decision making systems.” Through the preliminary processing, the keywords have been reduced to 443, making it possible to constitute the network efficiently.

These processed keywords represented as the vertexes in NodeXL will be visualized in a network diagram. In the network diagram, the vertexes’ sizes have been set to depend on the number of other vertexes associated with it. The more the vertex connects with other vertexes, the higher centrality it would be, which reflects the keyword’s important status in the field of MS. In other words, this keyword is likely to represent an important issue in MS. At the same time, the



**Fig. 1** Research topics in MS for the Eighth ICMSEM

vertexes' shapes have been set to depend on their betweenness and closeness centrality. When the degree of a vertex's betweenness and closeness centrality is beyond a certain value, the shape of this vertex would be square. The goal is to find out some key concepts in the field of MS. These key concepts are likely to be the important nodes that connect with other research topics.

Through the above steps, a network constituted by the keywords representing the relationship between them is demonstrated in Fig. 1. It shows that decision making systems, supply chain management, genetic algorithms, simulation, innovation, and human resource management are key concepts which are the important nodes connected with other research topics. In other words, they are key issues about MS in the accepted 69 papers in this volume.

In this volume, the proceedings concentrate on Intelligent Systems, Decision Making Systems, Manufacturing, and Supply Chain Management. To begin with, Intelligent Systems are the basic MSEM tools, as they provide a foundation for the discussion of practical management problems. Genetic algorithms and simulation are their key concepts. In this part, Safari et al. propose a new model based on Fuzzy AHP and VIKOR methods to rank bank branches in the field of employee empowerment issues. Matos et al. present a methodology to be applied when the data exhibit autocorrelation and, in parallel, to illustrate the strong capabilities that simulation can act as a key tool to determine the best control chart, taking into account the process's dynamic behavior. Zheng et al. explore the assessment on hardware design defects. Through the fuzzy neural network-based genetic algorithm, the assessment model had excellent capabilities with a high accuracy and good training speed, thus providing an effective tool for assessing design defects of the hardware product. Ferreira et al. demonstrate that the integration of harmonized classifications allows comparisons of data and statistics, at national and European levels, which were impossible before. The research in this section shows an excellent combination of computer-based techniques and practical guidance.

Part II is focused on Decision Making Systems. Decision Making Systems emphasize on computer-based information systems that support knowledge management, decision making, and management reporting and that assist managers in

making decisions in highly uncertain and complex environments. In this part, Alberto et al. investigate complex logistical and operational systems. Decision Trees (DT) and Binary Decision Diagrams (BDD) are used to find the best solution to the main problem. Applying the aforementioned methodology provides the company with a powerful method in the DM process and also an approach to increase the reliability. Asaf et al. introduce a mathematical model of moving particles and apply it to the traffic area. Chen et al. examine the portfolio approach in terms of multiple delivery method integration, technology, and centralized control system, and evaluate the replicability of the new model. Practices and lessons learned from the case are then presented and summarized so that they can be applied to the township sewage treatment facility development. Miyamoto explores a relationship between each of the five forces and IT strategies, as well as the relationship between those and business strategies among Japanese SMEs.

Manufacturing is the use of machines, tools, and labor to produce goods that meet a customer's expectations or specifications, and innovation and human resource management are their key concepts. Lucas and Tenera propose a methodology to deal with the variability inherent to systems, resorting to statistical inference methods: hypotheses testing. These methods are a vigorous tool on the analysis of data collected from the system. Cabrita et al. analyze to which extent technological and organizational innovation concepts are diffused in Portuguese manufacturing companies. They also analyze how the use of technological innovation concepts which are interrelated to the use of organizational innovation concepts based on previous studies developed in Europe and from data collected from the European Manufacturing Survey (EMS). Zhou and Wang investigate the impulse responses of different macroeconomic variables and financial variables to the oil price shock as well as the effect of interest rate changes and the use of Granger Causality Test to evaluate the correlation between oil prices, stock markets, and gold prices. Zhang and Liu apply DEA to analyze the Jiangsu province's productivity of shipbuilding both in the aspects of technology and scale. The excess capacity caused by over-input of personnel, material, and poor management led to the inadequate productivity of shipbuilding in Jiangsu.

Part IV focuses on Supply Chain Management (SCM). It is an interconnected businesses network which is involved in the ultimate provision of product and service packages required by end customers. In this part, Duarte and Machado explore how to reach benefits on supply chain performance, considering the lean and green performance measures through the traditional BSC perspectives. It is possible to recognize that lean and green initiatives influence the linkages between performance measures. These linkages in the scorecard are an example of how to evaluate the organization's supply chain. Chantarachalee et al. provide perspectives on how to design lean supply chains. It describes a real case study related to construction materials supply chain. The case study considers a supply chain setting where the dealers have dominant bargaining power over the manufacturer. Wang et al. investigate the problem of profit allocation under bilateral asymmetric information environment and analyze the relationship between the expected information rents and the realized supply chain profit. By using the idea of the

R-S-K bargaining solution, the realized total chain's profits are allocated reasonably. Hanif et al. analyze the previous studies, and take qualitative input and feedback from senior HR experts of the telecom sector to scroll the importance of integration of diversity management and talent management practices.

The four parts containing 69 papers were hot research topics in MS. In addition to the high-quality proceedings, the conference also provides a suitable environment for discussions and exchange of research ideas among participants during its well-organized conference. Although we present our research results in technical sessions and participate in round table discussions during the conference period, we will also have extra and fruitful occasions to exchange research ideas with colleagues in this relaxed and enjoyable atmosphere of sightseeing.

We want to take this opportunity to thank all the participants who have worked hard to make this conference a success. We appreciate the help from Universidade Nova de Lisboa and Sichuan University in conference organization. We also appreciate Springer-Verlag London for the wonderful publication of the proceedings. We are also grateful to Rector António Manuel Bensabat Rendas for being the General Chair and Prof. Dr. Fernando Santana for being the Local Arrangement Committee Chair. In addition, we appreciate the great support from all members of the Organizing Committee, Local Arrangement Committee, and Program Committee as well as all participants who have worked hard to make this conference a success. We also want to appreciate all the authors for their excellent papers in this conference. Due to these excellent papers, the ISMSEM Advancement Prize for MSEM will be awarded again at the conference for the papers that describe a practical application of Management Science and Engineering Management. The Ninth International Conference on Management Science and Engineering Management will be hosted by Karlsruhe Service Research Institute (KSRI), Karlsruhe Institute of Technology, Germany in July, 2015. Prof. Dr. Stefan Nickel will be the Organizing Committee Chair for 2015 ICMSEM. We sincerely hope that you can submit your new findings on MSEM and share your ideas in Germany.

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Jiuping Xu  
Virgílio António Cruz-Machado  
Benjamin Lev  
Stefan Nickel

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