

Preface for Volume 1

Welcome to the proceedings of the Ninth International Conference on Management Science and Engineering Management (ICMSEM2015) held from July 21 to 23, 2015 at Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany.

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, 971 papers from 35 countries were received and 132 papers from 15 countries were accepted for presentation or poster display at the conference after a serious review. These papers are from countries including Spain, Australia, Germany, Russia, Saudi Arabia, Turkey, UK, Canada, Pakistan, China, USA, Japan, Portugal, Iran, and Azerbaijan. They are classified into eight parts in the proceedings which are Intelligent Systems, Logistics Engineering, Information Technology, Risk management, Computing Methodology, Project Management, Industrial Engineering and Decision Making Systems. The key issues of the Ninth 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, ISMSEM Advancement Prize for MSEM will be awarded at the conference for these researchers.

A total of 132 papers were accepted and they were divided into two proceedings with 66 papers in each proceedings. To find out the research topics among the accepted papers, the NodeXL was applied. To begin with, keywords from the first proceedings were excerpted as follows: Coupled technology, Poly-cell local support, Finite element method, Elasticity, Behavioral research, Intelligent systems,

Work result, Qualitative research, Demographic Characteristics, Educational Interaction, Social Media, Matter element model, Extension set, Entrepreneurship education, Quality management, Projection pursuit, Combined model, Discharged patients forecasting, Earthquakes, Marking System, Multidimensional Scene, Principal component analysis, Executive compensation, Performance, Decision Making, Efficiency, Decision trees, Binary decision diagrams, Forecasting, Stochastic systems, Fuzzy control, Dynamic programming, Supply chain management, Distribution of goods, Bi-level modeling, Genetic algorithms, Logistics engineering, Buyback contract, Equilibrium model, Variational inequalities, Fuzzy demand price, Integrated inventory model, Carbon mission trade, Economic order quantity (EOQ), Vehicle routing, Uncertain demands and traveling time, Particle swarm optimization (PSO), Supplier selection, Gray relational analysis method, Entropy, Knowledge Flow, Collaborative Innovation, Running Mechanism of Water resources, Fuzzy sets, Life cycle, Condition monitoring, Wind power, Offshore Wind Turbines, Perspective of spatial structure, Selection, Risk assessment, Aviation, Prognostics, State of health, State estimation, Adaptive learning, Uncertainty analysis, Green supply chain, Information technology, Public security perception, Influencing factors, Mobile internet, Linear bi-level programming, Random fuzzy variable, Chance constraints, Interactive programming technique, Web forum, Message board, Tourist products, Public transport status, Assurance system, Economic fluctuation, Asymmetry, Markov Regime-switching model, Big data, University brand, Harnessing and boosting, Electronic commerce, Repeated game, Price competition, Multiple attribute decision making (MADM), The 2-tuple linguistic model, Group decision making, Integrated model, Factor analysis, Performance improvement, Maintenance, Net Present Value (NPV), Regression analysis, Increasing number of parameters, Least squares approximations, Confidence band, Sensor optimization selection, Aircraft engines, mHealth, Health care, Mobile IT, Patient-centered, Research and development management, Portfolio selection, Multiobjective optimization, Mixed integer programming, Large engineering, Pollution, Risk management, Game theory, Distributive justice, Banking employees, Knowledge chain, Innovation, Adverse selection, Mixed asymmetric information, Incentive contract, Small and medium-sized enterprises, Multiple attribute decision making, Structural equation modeling.

The significance of the keywords not only lies in its frequency or ratio. The connection between the keywords is 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, a total of 306 keywords involved in the 66 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 the words including the meaning of similar keywords have been unitized. Such as “multiobjective problems”, “multiobjective models,” and “multiobjective optimization” have finally been unified to “multiobjective optimization.” Through the preliminary processing, the keywords have reduced to 284, making it possible to constitute network efficiently.

These processed keywords represented as the vertexes in NodeXL will be visualized in a network diagram. In the network diagram, the vertex sizes have been set to depend on a 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 vertex 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 aim 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 can be demonstrated in Fig. 1. It shows that intelligent systems, information technology, multiobjective optimization, logistics engineering, supply management, risk management, and genetic algorithms are key concepts as the important nodes which connected with other research topics. In other words, they are key issues about MS in the accepted 66 papers in this volume.

In this volume, the proceedings concentrate on intelligent systems, logistics engineering, information technology, risk 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, Gen et al. introduce how to design hybrid genetic algorithms (HGA) and multiobjective hybrid genetic algorithms (Mo-HGA) for solving practical manufacturing scheduling problems for the hard disk device (HDD) and the thin-film transistor-liquid crystal display (TFTLCD) manufacturing systems,

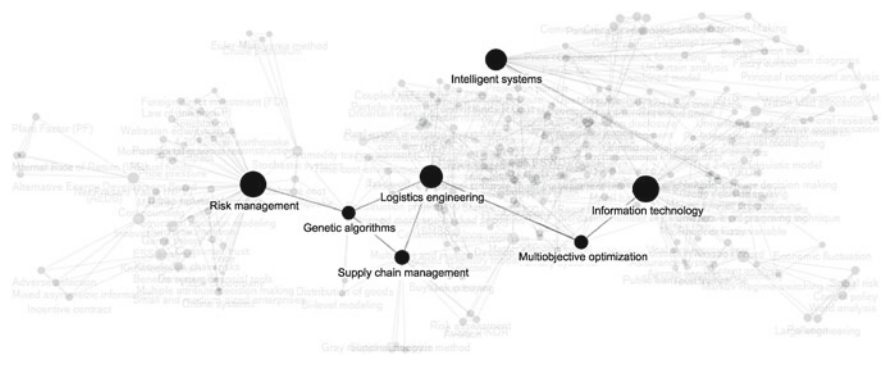


Fig. 1 Research topics in MS for the ninth ICMSEM

respectively. Mushtaq and Rehman address the use of social media for educational interaction and explore the influence of demographic characteristics on the use of social media in faculty members. Zhang et al. propose a projection pursuit combinatorial model (PPCM), which is applied to forecast the numbers of daily discharged patients through 3 years' time series data. Comparing with the forecasting results from ARIMA model, the new model produces a better forecasting performance. Ma and He propose a new method named as MPG/FEM method which is constructed by coupling the meshfree poly-cell Galerkin method (MPG) with the finite element method (FEM) for the analysis of elasticity problems.

Logistics engineering, the second part, is a field of engineering dedicated to the scientific organization of the purchase, transport, storage, distribution, and warehousing of materials and finished goods. Scholars in this section tend to focus on the accomplishment of desired goals and objectives by using restricted resources efficiently and effectively. Ping et al. demonstrate that a buyback contract can coordinate the supply chain under group buying, and how its contract terms critically depend on the quantity threshold above which group buying deal is activated. Segura et al. present a novel maintenance management research based on an economic study of the Life Cycle Cost (LCC) of CMS for offshore wind turbines. Yan et al. study the vehicle routing optimization problem with uncertain demands and traveling time. Xu et al. study the dynamic optimal allocation of irrigation water resources for multi-crop in multiple agricultural subareas and employ the fuzzy random simulation to deal with the uncertainty of seasonal inflow and rainfall.

The third part is information technology. Information technology (IT) is the application of computers and telecommunications equipment to store, retrieve, transmit, and manipulate data, often in the context of a business or other enterprise. IT is playing an increasingly dominant part in modern society. Hajiyeve and Narmina suggest a new method for estimating of unknown parameters, choice of an optimal number of unknown parameters, and construction of a confident band for unknown function in these models. Görlitz proposes an mHealth concept for stroke patients and their caregivers that combines individual information with mobile IT and serious games to support the rehabilitation, therapy adherence, and secondary stroke prevention. Wu et al. present an intergraded multiple attribute group decision-making (MADGM) approach combining the consensus process and VIKOR method. Zhou et al. employ the interactive programming technique to deal with a class of linear bi-level programming with random fuzzy coefficients, which has no mathematical meaning because of the uncertain factors.

Risk management, the last part, is the identification, assessment, and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities. In this part, Tahir and Sabir aim to highlight an error in the prevailing present value (PV) approach with compounding for bond evaluation providing evidence regarding inappropriate use of compounding and through analyzing the two difference cases with illustrations. Akram et al. aim to determine the relationship between organizational justice and employee job satisfaction. The results showed that distributive justice has positive and

significant impact on job satisfaction. Liu shows arbitrage equilibrium exists in a non-competitive context and explicit the role of elasticity in the relation of arbitrage and equilibrium in the non-Walrasian market. Zhang applies multiple attribute decision-making method of SMEs to four enterprises in risk assessment, and the results show that the multiple attribute decision-making method is effective and feasible.

The four parts containing 66 papers were hot research topics in MS. In addition to the high-quality proceedings, the conference also provides a suitable environment for discussions and exchanges of research ideas among participants during its well-organized conference. Although we will present our research results in technical sessions and participate in round table discussions during the conference period, we will 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 participants who have worked hard to make this conference a success. We appreciate the help from International Society of Management Science and Engineering Management and Sichuan University in conference organization. We also appreciate Springer-Verlag London for the wonderful publication of the proceedings. We are also grateful to Prof. Stefan Nickel for being a General Chair and Dr. Roland Görlitz for being the Organizing Committee Chair. Besides, we appreciate 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. Finally, we want to appreciate all authors for their excellent papers to this conference. Due to these excellent papers, ISMSEM Advancement Prize for MSEM will be awarded again at the conference for the papers which describe a practical application of Management Science and Engineering Management. The Tenth International Conference on Management will be hosted by Azerbaijan National Academy and Ministry of Communication and High Technologies of Azerbaijan, Baku, Azerbaijan in July 2016. Professor Dr. Asaf Hajiyevev will be the Organizing Committee Chair for 2016 ICMSEM. We sincerely hope that you can submit your new findings on MSEM and share your ideas in Azerbaijan.

Karlsruhe, Germany
May 2015

Jiuping Xu
Stefan Nickel
Virgilio Cruz Machado
Asaf Hajiyevev

Preface for Volume 2

Welcome to the proceedings of the Ninth International Conference on Management Science and Engineering Management (ICMSEM2015) held from July 21 to 23, 2015 at Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany.

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, 971 papers from 35 countries were received and 132 papers from 15 countries were accepted for presentation or poster display at the conference after a serious review. These papers are from countries including Spain, Australia, Germany, Russia, Saudi Arabia, Turkey, UK, Canada, Pakistan, China, USA, Japan, Portugal, Iran and Azerbaijan. They are classified into 8 parts in the proceedings which are Intelligent Systems, Logistics Engineering, Information Technology, Risk Management, Computing Methodology, Project Management, Industrial Engineering and Decision Making Systems. The key issues of the Ninth 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, ISMSEM Advancement Prize for MSEM will be awarded at the conference for these researchers.

132 papers were accepted and they were divided in two proceedings, with 66 papers in each proceedings. In order to find out the research topics among the accepted papers, the NodeXL was applied. To begin with, key words from 66 papers were excerpted as follows: Decision making Systems, Safety assessment, Industrial clusters, Knowledge based companies, Fuzzy dematel, Project

management, Risk management, Maintenance management, Cooperative game, Computing methodology, Allocation strategy, Group decision-making, Customer satisfaction index, Perceived equity, Customer loyalty, Institutional policy, Industrial engineering, Automobile market, Targeted effect, Spillover effect, Logistics engineering, Development strategy, Path model, Internal resources, Brand status, Entropy-fuzzy comprehensive evaluation model, Relationship diagram, Perceptive value, Store image, Consumer satisfaction, Functional mechanism, Dynamic value chain, Fuzzy analytic hierarchy process (FAHP), Time-cost-environment, Construction project, Genetic algorithm, Capital stork, Energy project selection, Fixed-capital price index, Inventory, Depreciation, Energy project selection, Supplier selection, Logistics outsourcing, Automotive manufacturing, Science parks, Water quality, English heritage, Uncertainty, National trust, Concentrated solar plants, Wavelet transform, Perceived price, Index system, Water quality, Evaluation, Catastrophe theory, R&D project, Portfolio selection, Mixed integer programming, Industry structure, Optimization model, Low-carbon economy, Sustainable development, Brand marketing strategy, Marketing performance, Real-time scheduling, Hierarchical medical examination, Simulation, Empirical analysis, Entropy method, Differentiation strategy, Breakthrough innovation, Contribution rate, Technological progress, Coal enterprise, Soft sandstone, Remixing soil, Land reclamation, Resource utilization, Salvage cost, Error correction model, Stochastic game, Economic efficiency, DEA method, Pay strategy, Organizational performance, Industrial relations, Organization climate, Financial characteristic, Wind turbines, Fast Fourier transform, Factor analysis, Electricity industry, Economic development, Contribution ratio, Lean, Assessment tool, Fuzzy evaluation, Customer value attribute, Experimental research, Corporate value, Construction industry, Analytic hierarchy process, Resource uncertainty, Cooperative mechanism, Control system, Perceived opportunities, Travel intention, Contingent contract, Evolution characteristics.

The significance of the keywords not only lies in its frequency or ratio. The connection between the keywords is very important in our study of how these papers revolve around the theme of Engineering Management (EM). The field of EM 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 EM as a key component. Using the NodeXL, the total 407 keywords involved in the 66 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 the words including the meaning of similar keywords have been unitized. Such as “Industrial engineering,” “Industry engineering,” and “Industrial project” have finally been unified to “Industrial engineering”. Through the preliminary processing, the keywords have reduced to 361, making it possible to constitute network efficiently. These processed keywords represented as the vertexes in NodeXL will be visualized in a network diagram. In the network

diagram, the vertex sizes have been set to depend on the number of other vertices associated with it. The more the vertex connects with other vertices, the higher its centrality would be, which reflects that the keyword's important status in the field of EM. In other words, this keyword is likely to represent an important issue in EM. At the same time, the vertex 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 aim is to find out some key concepts in the field of EM, 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 can be demonstrated in Fig. 2.

Figure 2 shows that decision-making systems, industrial engineering, project management, computing methodology, multiobjective optimization, scheduling, entropy method, simulation, innovation, and evaluation are key concepts as the important nodes which connected with other research topics. In other words, they are key issues about EM in the accepted 66 papers in this volume.

In this volume, the proceedings concentrate on computing methodology, project management, industrial engineering, and decision-making system. To begin with, computing methodology is the theoretical foundation of dealing with problems in management science and engineering management. In this part, Yüzbaşı and Ahmed suggest shrinkage ridge regression estimators for a multiple linear regression model, and compare their performance with some penalty estimators which are lasso, adaptive lasso, and SCAD. Jafarova and Aliyev use Oracle Data Mining to investigate k -means clustering algorithm. The result of investigation allows to group 40 banks with 18 parameters in 10 centralized clusters, and at the same time shows the attributes and rules of clustering. This allows for comparison of parameters of banks and the association of banks in their specialization. Chen et al. provide a new CSI model on the basis of the present research achievements and the characteristics of consumer behavior in China. Zhou and Yang focus on the model of third-party rating results in connection with the performance control system of MFIs, to provide a reference for the establishment a comprehensive evaluation system for MFIs institutions.

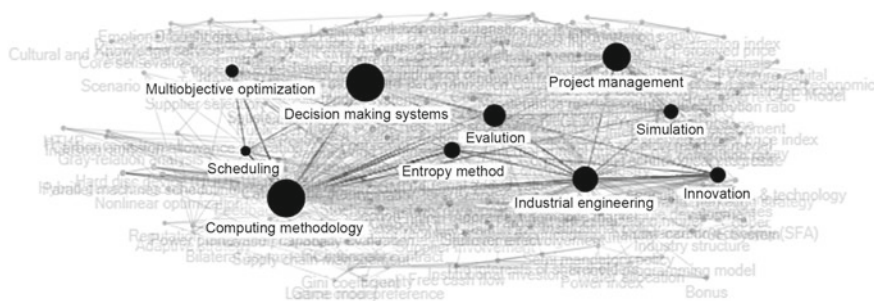


Fig. 2 Research topics in EM for the ninth ICMSEM

The second part is project management. Project management is the discipline of planning, organizing, securing, and managing resources to bring about the successful completion of specific project goals and objectives. Scholars in this part tend to focus on the accomplishment of desired goals and objectives by using restricted resources efficiently and effectively. Gómez et al. propose a novel approach for FDD based on long-range ultrasonic technology, together with a signal processing of ultrasonic waves employing wavelet transforms using a variable window size. Aleksandra and Oleg consider the realization of “compromise” through the scenario approach as effective choice of feedback coefficients of trading strategy. Luo et al. research on the technological transition of soft sandstone from a single control object to a comprehensive resource utilization object and propose a feasible resource utilization method for soft sandstone in the Mao wu su Sand Land based on the Land Consolidation Project practice and experimental analysis. Cao et al. calculate the optimal effort level of management fund institution with taking reputation into account using multi-stage dynamic game model of financing. It helps to resolve the moral hazard problem of fund managers and provides theory guide for raising of post-disaster reconstruction fund.

Industrial engineering, the third part, is the branch of engineering which deals with the optimization of complex processes or systems. In this part, Raúl et al. focus on the successful application of dependable embedded computer systems for the reliable implementation of wind turbine condition monitoring and control technologies. Schröders and Machado develop an assessment tool that helps an organization to implement lean in a sustainable way. Initially, the success factors of a lean approach have been identified and different business models have been reviewed. The research has shown that there are four main categories of crucial factors, including 24 criteria in total. Wang and Yu take the listed companies in construction industry as research samples. It has unscrambled the development rules of internal control quality in construction enterprises from two aspects: self-evaluation and verification, and goal achievement, and has further analyzed the impact of the internal control quality on the corporate value. Li et al. examine the effectiveness of an institutional policy-tax-reduction for low-emission vehicles policy-implemented in China automobile market and find that the institutional policy has positive targeted effect on small-engine cars and negative spillover effect on big-engine cars.

The fourth part focuses on decision-making systems. It is computer-based information systems which support knowledge management, decision making, and management reporting and assist managers in making decisions in highly uncertain and complex environments that Decision-Making Systems emphasize on. Rehman et al. highlight the moderating role of decisional intelligence in predicting the relationship among work-family conflict and decision-making styles. They also describe both academic and professional issues and its findings can be comprehensively utilized for the betterment of higher education sector of Pakistan. Pliego and García present an approach employing Binary Decision Diagram applied to the Logical Decision Tree, which allows addressing a Main Problem by establishing different causes, called Basic Causes and their interrelations. Liu and Liu establish a

mechanism model on how store image influences consumers and loyalty in drug retail. They discover that store image influences brand loyalty through four different approaches, in which there are three mediating variables of perceptive value, consumer satisfaction, and brand trust. Guo et al. propose a dynamic group decision approach with intuitionistic fuzzy entropy and lattice order preference, where preference relations' possibility with respect to decision makers is represented by intuitionistic fuzzy number.

The four parts containing 66 papers were hot research topics in EM. Except the high-quality proceedings, the conference also provides a suitable environment for discussions and exchanges of research ideas among participants during its well-organized conference. Although we will present our research results in technical sessions and participate in round table discussions during the conference period, we will have extra and fruitful occasions to exchange research ideas with colleagues in this relaxed and enjoyable atmosphere of sightseeing.

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