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## Editorial

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### S.C. Lenny Koh\*

Management School,  
University of Sheffield,  
9 Mappin Street,  
Sheffield S1 4DT, UK  
Fax: +44-114-222-3348  
E-mail: S.C.L.Koh@sheffield.ac.uk  
\*Corresponding author

### Angappa Gunasekaran

Department of Management,  
Charlton College of Business,  
University of Massachusetts,  
North Dartmouth, MA 02747-2300, USA  
Fax: +1-508-910-6408  
E-mail: agunasekaran@umassd.edu

**Biographical notes:** S.C. Lenny Koh is Director of Logistics and Supply Chain Management Research Group and Senior Lecturer in Operations Management at the University of Sheffield Management School, UK. She received a Doctorate in Operations Management and a First-class Honours in Industrial and Manufacturing Systems Engineering. Her research interests include ERP/ERP/II, uncertainty management, modern operations management practices, logistics and supply chain management, e-business, e-organisations, knowledge management, sustainable business and eco-logistics. She has over 185 publications and is in the Marquis Premier Edition of Who's Who of Emerging Leaders. She is Editor of several journals and Chairperson of international conferences.

Angappa Gunasekaran is a Professor of Operations Management in the Department of Management at the Charlton College of Business, University of Massachusetts-Dartmouth, USA. He teaches undergraduate and graduate courses in Operations Management and Management Science. He has 180 papers published in 40 different peer-reviewed journals. He has presented over 50 papers and published about 50 papers in conferences and given a number of invited talks in more than 20 countries. He is on the Editorial Board of 20 journals. He has organised several international workshops and conferences in the emerging areas of operations management and information systems. He edits journals in operations management and information systems areas. He has edited a number of special issues for highly reputed journals. Currently, he is interested in researching benchmarking, management information systems, e-commerce (B2B), information technology/systems evaluation, performance measures and metrics in new economy, technology management, logistics and supply chain management.

Governments in many countries are actively developing and exercising regulatory framework to promote sustainable development. Various levels of initiatives can be found and these include country memberships in the Kyoto framework; development and investment in renewable energy and resources; promotion of fair trade; development of eco-business educational programme; improvement and introduction of recycling infrastructure; effective method for waste disposal; eco-system management and many others. At the enterprise level, operations such as green supply chain management; green procurement; eco-design; ISO14000 certification; life cycle analysis; de-distribution; green packaging; eco-logistics and others, have started to raise the awareness of managers concerning the impact of these activities to the environment, community and economy.

Many businesses today have started to incorporate the issue of sustainable development in business decision making. However, not all types of enterprises could integrate sustainable development in the entire business effectively. The issue of balancing consumption and production has been continuously debated.

This Special Issue of *International Journal of Management and Decision Making (IJMDM)* on Business Decision Making for Sustainable Development aims to provide academic and practitioners with some innovative research and development in supporting business decision making for sustainable development. The objectives are twofold:

- 1 to promote the understanding and importance of sustainable development in businesses
- 2 to identify ways to integrate sustainable development in business decision making using existing and/or new methods.

This Special Issue contains seven papers discussing a range of environmental management systems, green suppliers selection, Knowledge Management Systems (KMSs), modelling and performance measurement tools that support sustainable business decision making. A mix of theory building and empirical study papers that have strong relevance to the practical world and are underpinned by scientific and sound methodologies are available. The normal *IJMDM* review guidelines were followed. We provide a brief overview of the papers, which appear in this issue.

Singh, Murty, Gupta and Dikshit in their paper, 'Integrated environment management in steel industries' argues that environmental issues in steel industry are so numerous, complex and interconnected that an ad hoc approach to problem solving is no longer considered effective. The growing pressure from all stakeholders forces steel companies to incorporate the environmental responsibility in all activities. Consequent to evolution of various environment management tools for supporting and improving environmental performance of the industry, steel companies have focused their attention towards integration of environmental strategy in their overall management system. Their study deals with an integrated approach to environmental management of the steel industry, which shall ensure a continuous improvement in environmental performance in order to increase competitiveness in the future steel market. A business model is proposed for integrating environmental issues to an overall management system. A framework has also been designed for implementing Integrated Environmental Management Systems (IEMS) in steel industry. IEMS aims at 'the greening of the industry' which integrates pollution prevention, life cycle assessment, environment management information system, green supply chain, environment performance evaluation, environmental accounting and other environmental management tools to EMS according

to ISO 14001 requirements. They claim that this approach enables the steel companies to find and implement profitable and powerful measures that avoid waste generation; reduce environmental pollution; improve consumption of natural resources and go beyond legal compliance.

The paper, 'Behaviour validity of a simulation model for sustainable development', by Qudrat-Ullah proposes that system dynamics simulation modelling is well suited for the analysis of problems related to sustainable development. This is due to their ability to take an integrative view of social, economic and environmental factors and link the observable patterns to microlevel structure and decision processes. Despite their capabilities, the acceptance of system dynamics simulation modelling by the broader community of decision makers is limited. It is argued that reluctance by the system dynamics modellers to expose their models to formal behaviour validity procedures is the main problem. This leads to an outline of formal behaviour validity procedures available but less explored in system dynamics modelling 'repertoire'. An illustration of the multiple tests and the Theil inequality statistics for behaviour validity of a system dynamics simulation model for sustainable energy policy development follows. An increased appeal of simulation modelling for sustainable development initiatives is identified.

Hua and Bian in their paper, 'Performance measurement for network DEA with undesirable factors' notes that the traditional Data Envelopment Analysis (DEA) models take Decision-Making Unit (DMU) as a 'black box' without considering the inputs/outputs of its intermediate production processes. They propose a network DEA model in the presence of undesirable factors. In the network DEA model, a DMU is composed of a set of interdependent sub-DMUs, that is, input of a sub-DMU may be an undesirable output of another sub-DMU. A method of estimating efficiency of such DMU, and analysing efficiency relationship between a DMU and its sub-DMUs, was developed. Their model provides a way of improving performance of a DMU through identifying its inefficient sub-DMUs.

The paper, 'The application of fuzzy analytic hierarchy process for supply chain decision making: a case study of original brand manufacturing of the sewing machine industry in Taiwan', by Lee, Tuan and Liu applies fuzzy Analytic Hierarchy Process (AHP) to identify the key success factors for a sustainable supply chain management guideline for the sewing machine manufacturers in Taiwan. This study focuses on the original brand manufacturing, where such an environment is claimed to be essential in avoiding bullwhip effects such as the lack of stock, overstock or unsatisfactory products that are detrimental to the development of original brand manufacturing. Their study examines the impacts on Research and Development, Production and Marketing in the case.

Kannan, Noorul Haq, Sasikumar and Arunachalam in their paper, 'Analysis and selection of green suppliers using interpretative structural modelling and analytical hierarchy process' analyses the interaction of criteria that is used to select the green suppliers which address the environmental performance using Interpretive Structural Modelling (ISM) and AHP. The effectiveness of the ISM and AHP model is illustrated using an automobile case company in southern part of India.

The paper, 'On The design of an argumentation-based knowledge management system for logistics operations', by Chow, Choy and Lee proposes an argumentation-based KMS to assist Logistics Service Providers (LSP) with dynamic operations management. The architecture of the proposed system is built using

multiagent and ontology technology. Through adopting the defeasible reasoning concept, the proposed system is capable of solving problems which contain knowledge source contradictions. Furthermore, reliable knowledge sources are defined by the system and are used to support the LSPs to make decisions in dynamic logistics operations management under the constraints of time. A system application example of decision making involving palletising is shown.

Parthiban, Ganesh, Dhanalakshmi, Parthasarathi and Arunachalam in their paper, 'Decision support system for evaluation of supply chain alternatives' presents a decision support system for customer-oriented approach to the evaluation of alternative nodes and links in a logistics network. The Analytical Hierarchy Process (AHP) is used for analysing the customer-specific requirements for logistics service and for evaluating the alternative nodes and links. The AHP-based analysis results in a customer-specific priority for each alternative. This priority describes how well a certain alternative is expected to satisfy a certain customer's requirements.

We could not have done this by ourselves and we totally appreciate the efforts and support of all who were involved in making this special issue possible, which includes the authors, referees, Chief Editor of *Inderscience*, editorial staff of *IJMDM* and the Editor of the journal. The guest editors gratefully acknowledge the assistance provided by the Chief Editor of *Inderscience*, the Editor of the *IJMDM* and the referees who reviewed the manuscripts for this Special Issue.