Editorial

K. Ganesh*

IBM India Private Limited,
Global Business Services – Global Delivery,
B255, 4th Floor, The IL&FS Financial Center,
Plot No: C22, G Block, Bandra Kurla Complex,
Bandra (East), Mumbai – 400051, Maharashtra, India
E-mail: koganesh@yahoo.com
E-mail: ganesh.ko@in.ibm.com
*Corresponding author

S.P. Anbuudayasankar

Department of Mechanical Engineering,
Amrita School of Engineering,
Amrita Vishwa Vidyapeetham,
Amrita Nagar, Coimbatore – 641112, TamilNadu, India
E-mail: spanbu@yahoo.com
E-mail: spanbu@rediffmail.com

Mukesh Kumar Barua

Department of Management Studies,
Indian Institute of Technology Roorkee,
Roorkee – 247667, Uttarakhand, India
E-mail: baruafdm@iitr.ernet.in
E-mail: barua71@yahoo.co.in

Tom Page

Loughborough Design School,
Loughborough University,
Leicestershire, LE11 3TU, UK
E-mail: T.Page@lboro.ac.uk

Biographical notes: K. Ganesh is currently working as a Senior Consultant at Global Business Services, Global Delivery, IBM India Private Limited, Mumbai, India. He holds a Doctorate from Indian Institute of Technology Madras, Chennai, India. His research interests lie in the application of heuristics, meta-heuristics, multivariate statistical techniques and multi-criteria decision-making tools to logistics and supply chain management. His consulting exposure includes supply chain network and inventory optimisation. His teaching interests include combinatorial optimisation, green supply chain, knowledge management and balanced scorecard. He has published several papers in leading research journals such as the *European Journal of Operational Research*, *International Journal of Systems Science* and *International Journal of Advanced Manufacturing Technology*.

S.P. Anbuudayasankar is an Associate Professor at the Department of Mechanical Engineering, Amrita School of Engineering, Amrita Vishwa Vidyapeetham, Coimbatore, TamilNadu, India. He holds a Bachelor in Mechanical Engineering, Master in Industrial Engineering and Management degree in Production. He holds a Doctorate in Supply Chain and Logistics. His research interests include meta-heuristics application to single and multi-objective optimisation and supply chain location and allocation problems. He has published several papers in national and international journals and conferences.

Mukesh Kumar Barua is currently working as an Assistant Professor at the Indian Institute of Technology Roorkee, India. He received his Doctorate from the Indian Institute of Technology Madras, Chennai, India. He has 15 years of teaching experience. He has published around 20 research papers in various journals and conferences. He teaches courses like operations research, production management, market research, ERP and project management to UG as well as PG students.

Tom Page is a Lecturer in Electronic Product Design in the Department of Design and Technology at Loughborough University, UK. He is an External Examiner on Engineering and Manufacturing Programmes at Sheffield Hallam University. His research interests are in the areas of the research and development of computer applications for design and technology education, logistics and supply chain management and electronic design.

The best word to describe today's global marketplace is volatile. Expectations, innovations, creativity, collaboration and partnering demand more from the supply chain. Supply chains have grown more global and interconnected and at the same time exposure to shocks and disruptions are also incremental. Even minor missteps and miscalculations can have major consequences as their impacts spread like viruses throughout complex supply chain networks. The key areas to focus in the current volatile supply chain are:

- Globalisation and localisation – contrary to initial rationale, globalisation has proven to be more about revenue growth than cost savings.
- Transparency and visibility – flooded with more information than ever, it is an ever greater struggle to visualise and act on the right information.
- Collaboration and risks on the technology, demand and supply front demand more attention.
- Customer closeness – despite demand-driven mantras, companies are better connected to their suppliers than their customers.
- Cost control and service improvement – rapid and constant change is rocking this traditional area of strength and expect to adapt for growth.

As compliance mandates, suppliers and information flows multiply, supply chains are becoming more complex, costly and vulnerable. And executives are finding it increasingly difficult to respond to these challenges, especially with conventional supply chain strategies and designs. This is not to say companies have ignored these issues. But it is no longer enough to build supply chains that are efficient, demand-driven or even

transparent. Supply chain of the future should be envisioned with technology driven, communication driven and intelligent driven.

Building this kind of supply chain is a strategic undertaking; it implies a different roles and set of responsibilities for supply chain executives. The supply chain executives must become strategic thinkers, collaborators and orchestrators who optimise complex networks of global capabilities. In their increasingly significant positions, it is mandate to create a smarter supply chain.

Smarter supply chains call for research in various fronts. In order to understand the process and people alignment in the organisation and to drive the globalisation and localisation effects, empirical research is essential. Experimental research is required to revitalise the requirements in the technology of machine and materials front and to bring the transparency and visibility in the supply chain. Exploratory research is critical to understand the collaboration, risks and partnering needs for resilient supply chain to elevate the customer closeness. Analytical research is pertinent with the aim of cost reduction and service improvement in the supply chain.

Accordingly, this special issue is aimed at reducing the gap between the researchers and practitioners active in this area. High quality contributions are received from academicians, researchers, practitioners and professionals. Particular interest are paid to significant success in the use of the most effective technology and supply chain best practices in industries to yield substantial value to the business.

We are glad to offer six articles in this issue of the *International Journal of Value Chain Management* to address these matters.

The first article by T. Prabaharan, N. Jawahar and Balan Sundarakani scheduled the machine and tool simultaneously for a flexible manufacturing system (FMS) using different heuristics. Their main aim is to consider three off-line scheduling algorithms that generate optimal or near optimal simultaneous machine-tool finite production schedules (time table) for 'n' jobs to be processed on 'm' work centres (WCs) using 'T' tools stored in a common tool magazine (CTM) for the FMS model with makespan criterion. In this context, they proposed three heuristics namely priority dispatching rule algorithm (PDRA), simulated annealing algorithm (SAA) and genetic algorithm (GA). They claim that GA-based heuristic provides better results with reasonable computational time.

The second article by Ajay Verma, Nitin Seth and Nisha Singhal analysed the relational aspects to identify the enablers of supply chain competitiveness (SCC). The interpretation of enablers of SCC was carried out in terms of their driving power and dependence powers. The authors had employed an interpretive structural modelling (ISM) approach to develop an interrelationship among the enablers in a hierarchal form. Their contribution in this article is of two fold viz.:

1 identification and introduction of enablers of SCC

2 introduction and use of a modeling tool, i.e., ISM.

The model developed by the authors provides a hierarchy of the actions to be taken for the achievement of SCC in terms of their driving power and dependence powers.

The third article by Rika Ampuh Hadiguna, Harlina Suzanna Jaafar and Sabariah Mohamad had proposed a system for performance measurement of sustainable supply chain in automotive industries. Their proposed system explain the relationship between the critical control functions, performance indicators and consist of balance scorecard

(BSC) method and supply chain operations reference (SCOR) method. Both the methods are appropriate to be integrated because of complementing each other hence made into a hybrid system that addressed the performance measurement of sustainable supply chain in automotive supply chain management.

The fourth article by I. Alfred Ebenezer, S.R. Devadasan, C.G. Sreenivasa and Päivi Iskanius had studied the application of failure mode and effects analysis (FMEA) in tea industry through literature study. They studied the traditional as well as advanced models of FMEA and their salient features. In their study, they infer that total failure mode and effects analysis (TFMEA) could be a right technique for carrying out failure analysis in tea industry which has not been applied and studied yet and filling this research domain will aid tea industries to continuously improve the quality of tea and achieve core competitiveness.

The fifth article by Kelly Ayumi Funo, Jorge Muniz Jr., Fernando Augusto Silva Marins and Valerio A.P. Salomon aimed to identify the risk factors of a typical aircraft manufacturers supply chain, using data of the most important Brazilian aeronautical company. The research can be classified as qualitative and a single case study. The nine identified factors – quality, productivity, supply chain, business strategy, organisation, environmental and natural political, indicators, product management, and information system – were prioritised using AHP method. The risk factors associated to quality, productivity and supply chain were classified as the most relevant.

The sixth article by R.A. Malairajan, K. Ganesh, M.N. Qureshi, P. Sivakumar and Yves Ducq proposed an extended variant of mixed capacitated arc routing problems (MCARP) with upper bound on number of vehicle is considered in this study for the application of waste collection problem and it is termed as integrated resource allocation and routing problem with upper bound (*IRARPUB*) problem. Composite heuristic leveraging Dijkstra's algorithm and local search inherent genetic algorithm (DIALING) is proposed to solve both MCARP and IRARPUB. Extensive comparisons of the proposed heuristic with the existing benchmarks or the available lower bound show that it can produce excellent results, outperforming the existing best or yielding results with minimal deviations.

The seventh article by Janet H. Sanders and Leslie R. Pagliari presents a conceptual application of integrating Six Sigma into the supply chain by evaluating the calculation of the DPMO for the efficiency of the supply chain using a macro (defects per unit) and micro (defects per opportunity) perspective. This paper detailed two different methods for calculating the sigma levels for a supply chain. The macro approach focused on the overall defects per unit approach using the yield for the on-time delivery metric. The micro approach calculated the sigma level by taking into consideration the complexity of each entity for the on-time delivery metric.

We anticipate that the readers will appreciate the work of these impressive researchers and practitioners as we have. Our team welcomes comments and suggestions from our visitors, and greatly values your feedback.