Editorial

Rajesh Piplani

Centre for Supply Chain Management,
Nanyang Technological University,
50 Nanyang Avenue,
Singapore 639798, Republic of Singapore
E-mail: mrpiplani@ntu.edu.sg

Biographical notes: Rajesh Piplani is the Director of the Center for SCM at Nanyang Technological University, Singapore. He is the Program Manager, Integrated Manufacturing and Service Systems (IMSS) for Singapore research funding agency A*Star, managing the SGD 8 Million research programme. He sits on the eSCM council of Singapore Manufacturers Association and council of Supply Management Institute of Germany. His interests are in the area of supply chain management of manufacturing enterprises, logistics planning, and design and analysis of manufacturing systems. He has over seven years of industry experience in India and USA and has been on the Faculty of NTU since 1998. He has offered customised training programmes for DHL, TNT, Phillips, and Maxtor, and for all the three branches of Singapore Armed Forces. He consults with the local industry and has worked on supply chain modelling projects for companies in the pharmaceutical, automotive, electronics and beverage industries.

Integrated manufacturing and service systems refer to the network of manufacturers, suppliers, retailers, distributors and other service providers who are organised to enable information flow critical to the movement of materials and/or services through the supply chain, and effective coordination of activities to address various stages of the product life cycle.

Increasingly products are being offered as a service that must be provided over certain duration, at a pre-specified quality, price and level. Typical examples of such services include leasing of photo-copying machines, and service arrangements between airlines and engine manufacturers. Manufacturers provide such products as part of a service package, where they are responsible for maintaining the product during its contracted period.

The delivery of a service, and not just a product, requires that the supply chain behind it be designed and operated to deliver products initially, maintain them, accept returns, refurbish and deliver again the same service over and over again. The refurbished products also need to be taken out of the supply chain once they reach the end-of-life and/or are replaced by newer generations.

Design and operation of such integrated supply chains require the development of methodologies and frameworks to support delivery of integrated products and services. Some of the interesting issues that such integrated supply chains throw up include:

1 pricing of services that are offered

2 design and operation of service networks to support these services

3 management of product and spare parts inventory, considering the product life cycles

4 design of products for refurbishability.

Competitive pricing of services would help the development of such models; service networks, on the other hand, need to be designed to support both the forward and reverse flow of components and end products. Inventory management in these integrated supply chains has its own challenges, dealing as it does not only with new products/components but also refurbished ones. Finally, product life cycles have a great impact on the operation of these integrated supply chains, as does the design for refurbishability.

The effort towards integrated supply chains is also driven by increasing environmental concerns, as well as the economic opportunities inherent in the reuse (of components) and refurbishment of products. Going forward, such imperatives would take a more central stage in the design and operation of supply chains, creating new avenues for researchers and practitioners in the field.

For this Special Issue, we had received a total of 17 papers, out of which 11 were considered suitable for the issue and underwent the peer-review process. Each paper was reviewed by two independent reviewers as well as the Special Issue editor. After the rigorous review process lasting over a year, five papers were finally accepted for publication in the Special Issue.

Xanthopoulos et al. present an optimisation model for planning the disassembly processes of end-of-life building, taking into account its bill of material. Their model considers the entire construction and demolition supply chain, from on-site deconstruction and demolition, to the delivery of collected components and materials to recyclers and landfills.

Jaggi, Aggarwal and Verma investigate partial trade credit financing by modelling a two-level supply chain; they show that it is beneficial from the retailer's point of view to stimulate their demand and optimise their inventory costs.

Leong and Cheong apply combinatorial auction as a coordination mechanism to smooth demands placed on suppliers' limited production capacities. A fourth-party service provider acts as the auctioneer to coordinate bids and perform price iterations; the authors recommend three different price revision methods depending upon the problem type.

Ramírez et al. relook at the classical two-echelon supply chain optimisation problem, specifically a retailer's replenishment problem, facing stochastic demand. To solve this problem, they design a Markov state game, and apply fictitious play, claiming to produce better results than found in the literature.

Finally, Saccani considers four servitisation strategies, namely product-support, cash-generator, business-generator and brand-fostering, depending on a firm's financial and customer-interaction perspectives. Using four examples from three different durable goods companies, the author argues that the management of service delivery and sourcing decisions of the firm are dependent on the servitisation strategy adopted.

I hope that this Special Issue would provide the readers with new developments and stimulate further discussions in this important area. Finally, I would like to thank the Editor of *IJISE* for providing an opportunity to bring out this Special Issue, the authors for their contributions and the reviewers for their valuable time and effort in the review process.