Editorial

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Companies must constantly contend with rapidly changing business conditions. Mergers and acquisitions, accelerated new product introductions, changing customer bases, offshore manufacturing and fluctuating fuel costs are among the many challenges they face.

Globalisation trends have significantly increased the scale and complexity of the modern enterprise. The enterprise has been transformed into a global network consisting of multiple business units and functions. The enterprise is exposed to internal and external uncertainties. Examples of internal uncertainties include success prospects of research and development projects due to technological risks; production upsets such as batch failures and plant shutdowns. External uncertainties include pricing related uncertainties for raw materials and products, exchange rate fluctuations, market size and demand uncertainties due to competition and macro-economic factors.

Planning, scheduling and optimisation are forms of decision-making that play an important role in most manufacturing and services industries to resolve the business uncertainty. The planning, scheduling and optimisation functions in a company typically use analytical techniques and heuristic methods to allocate its limited resources to the activities that have to be done in order to manage the uncertainty.

Optimisation challenges in the enterprise begin to answer the question of how to bridge the gap from mathematical modelling and optimisation techniques to practical solutions of enterprise operations. Mathematically distinct from classical supply chain management, this burgeoning research area has proven to be useful and applicable to a wide variety of industries; for example, pharmaceutical, chemical, transportation, and shipping, to name but a few. There is a need for high quality research which may serve as a 'one-stop shop' to learn about various industrial problems and logistics challenges, and solution techniques using recent advances in computational optimisation.

Accordingly, this special issue is aimed at meeting the challenges posed and overcoming the existing gaps. It includes state-of-the-art manufacturing and services industries on some critical research issues pertaining to, scheduling and optimisation. This special issue covers areas in planning, scheduling and optimisation in manufacturing and services and systems development and implementation. It is intended for practitioners from industry who use techniques from a wide range of fields: mathematical programming, supply chain and logistics management, and process systems and operations engineering. The practical applications in the form of quantitative and qualitative case studies based on planning, scheduling and optimisation are also the focus of this special issue. The papers of this special issue have real value relevance, be primarily focused on real-time implementation and the target audience of this special issue are researchers, managers, practitioners and consultants.

We are delighted to offer six articles in this issue of the *International Journal of Enterprise Network Management* to address these matters.

The first review article by Shoban Babu and Srinivasan discussed about the impact of the factors batch size, setup times, priority dispatching of jobs, machine failures, rework, volume, routing and product flexibility on the performance of a job shop. Authors have measured the performance of the simulation models in four dimensions: mean flow time, average work-in process, percentage throughput of the shop and the percentage of jobs meeting their due-dates. Simulation results of authors show that the routing flexibility and machine selection rules have significant impact on the system performance. Authors have also found that the system performance starts to deteriorate when the level of routing flexibility increases.

The second research article by Mukesh Kumar Barua, Jyoti Sagar Rao, S.P. Anbuudayasankar and Tom Page explained that the demand for high quality and fully automated production focuses attention on the surface condition of the product, especially the roughness of the machined surface, because of its effect on product appearance, function, and reliability. Authors set the objective of paper as to develop a better understanding of the effects of cutting parameters such as speed, depth of cut and cutting feed rate on the surface roughness and to build a response surface regression model. Authors attempted to obtain optimum cutting conditions with respect to centre line average roughness considered in the present study with the help of response optimisation technique. The design of experiment (DOE) has been used carry out the modelling and analysis of the influence of process variables on the response. Finally, the effect of speed, feed rate and depth of cut on surface roughness of aluminium samples was studied for coated carbide tool. The model generated is found ninety percent confident for milling aluminium using coated carbide tool.

The third article by J. Edwin Raja Dhas and Somasundaram Kumanan addresses that a new way of thinking is necessary in order to change and improve the existing technology and to develop products at economical price. Authors have addresses the optimisation of the welding process parameters. They claimed that the existing measurement and parameter optimisation tools for obtaining welding quality are limited in application. Authors have modelled the parameters of submerged arc welding (SAW) using particle swarm optimisation technique. The model is developed in the MATLAB platform, which is highly reliable, adaptable and user friendly.

The fourth research manuscript by Anjali Saxena, Yves Ducq, R.A. Malairajan and P. Sivakumar presented an approach for simulation of supply chain using a simulation package. Authors have attempted to develop general modules for the simulation of supply chain, which can be used for simulation of complex supply chain. Simulation model developed by the authors has flexibility of using different ordering policies and different set of parameters for different nodes of supply chain. Numbers of simulation experiments are performed to generate knowledge. In particular, based on a cost and time performance analysis, the different configurations are analysed by the authors in order to support the selection of suitable polices and parameters of the operations network.

The fifth research paper by M. Saravanan investigated the deflection due to the development of thermal stress along the part and a suitable numerical model was derived by the author to find out the temperature distribution. Authors verified the model using the finite element analysis model. Authors claimed that the deflection of the part due to thermal stress can be controlled by selecting the optimum base thickness, road width and the method of removal of the support material from the part.

The last sixth article by S. Nagarajan, A. Sam Nallathambi, P.L.K. Palaniappan and Balan Sundarakani explained that the today's organisations are competing in complex environments so that an accurate understanding of their goals and the methods for attaining those goals is vital. Authors have highlighted that the companies are in the midst of a revolutionary transformation and they proposed a conceptual framework and model for the implementation of balanced scorecard with the focus on customer relationship based strategic planning. Authors have successfully implemented the conceptual framework for a case company and it is discussed in detail with the focus on architecture for balanced scorecard.

We hope that our readers are able to benefit as much from the work of these impressive researchers and practitioners as we have. Our team welcomes comments and suggestions from our visitors, and greatly appreciates your feedback. We look forward to building on this special issue with many more issues over the coming years, as we engage in productive dialogue that confronts the dynamic social science challenges faced in today's world.