Editorial

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1   Introduction

Recent years have seen high levels of turbulence; companies that were market leaders a decade ago have in many cases encountered severe reversals of fortune. Rapid advances and complexity in technology, and the accompanying growing uncertainty in the business environment have brought about mergers and takeovers, and these have changed the shape of many markets. Traditional barriers between industries are breaking down. Inevitable, this has given to a very high level of competition and complexity. There is also a growing demand from the marketplace for ever-higher levels of service and quality. In response for this changing business environment, there has been a search for an instrument that would offer a sustainable competitive advantage. In other words, companies are now seeking a position of superiority over competitors in terms of customer preference. The emphasis in business has swung towards business strategies that have the creation of long-term customer loyalty as their central focus. Business

leaders are pursuing new business paradigms that allow their companies to work to adapt to rapidly changing marketplace.

Procurement means understanding and defining the long-term business objectives and strategies of the potential parties. Procurement is the process of acquiring new services or products and includes contract strategies, contract documentation and supplier selection. It extends to all members of the supply chain, including those responsible for operation and maintenance. In the modern world, customer satisfaction is increasingly seen by all concerned to be largely dependent upon the selection of the most appropriate procurement strategies, and failure to select an appropriate procurement approach is now well recognised as a primary cause of plan failure. It has been recognised that the selection of the most appropriate strategy for large and/or complex developments, particularly those involving multiple stakeholders, is a difficult and complicated process dependent upon the interaction of many variables and incorporating a high degree of subjective and in many cases intuitive judgement. We should also note that the problems of complexity tend to be magnified greatly where the overall complexity of the development depends not only upon the technical complexity of the work but also upon the complexity of the context in which the project is to be developed and constructed.

There are many procurement strategies and variations, in use by different organisations. Overall, adopting a few key best practices for business's procurement strategy can truly make the difference between success and disappointment when it comes to implementation. Moving forward, the procurement activity should be seen as an opportunity to make vendors/suppliers share the responsibility for achieving overall outcomes rather than just engaging them on a transactional basis. The traditional procurement paradigm is fraught with issues. Therefore, this special issue is dedicated to procurement strategies, which aimed at promoting effective procurement across the whole organisation. It strikes a balance between setting out a detailed plan for reforming procurement, with specific targets and a flexible planning framework.

2   Overview of the papers included in the special issue

We have encouraged authors to submit their papers with both theoretical and practical implications, with their results redefining the procurement strategies for the past and highlighting the need for procurement strategies for the present and for the future. Total ten papers were selected after a peer review process. These ten papers were revised in accordance with the suggestions and recommendations from the reviewers.

The first paper by Jayaraman addresses the cross-functional role of purchasing in a sustainable supply chain environment. The literature reflects remarkably little effort to develop a framework for understanding the cross-functional role of purchasing in this environment. Product returns have existed from the first time anyone manufactured a product or opened a store. What has changed in recent years is the attention that businesses are paying to costs involved in returns, as it has become a multi-million dollar problem for most companies. The author provide a foundation for future research in purchasing strategies by clarifying the environment dealing with product returns and constructing a framework that shows the critical cross-functional role of purchasing in a sustainable supply chain environment.

The second paper by Kameshwaran and Narahari considers an industrial procurement of large volume of a single good such as a raw material or a sub-component. The

procurement is implemented using volume discount auctions, in which the bids are non-convex piecewise linear cost functions. The winner determination problem faced by the buyer is an NP-hard non-linear knapsack problem. They propose a mixed integer linear formulation for the problem which has the following primal structure: if the integer variables are fixed at some feasible values, then solving the remaining linear variables is a continuous knapsack problem. Exploiting this feature, Benders' decomposition algorithm is developed and various techniques are proposed to accelerate the convergence of the algorithm. Experimental results for the random test data show the efficacy of the accelerating techniques.

The third paper by Salmador, Bueno and Maranhão addresses the high levels of competition and complexity in the procurement issues for airline industry. According to the authors, in this particularly ever-changing environment, procurement, i.e. understanding and defining the long-term business objectives and strategies of all potential parties becomes crucial. The aim of this paper is to explore how this process develops in high velocity environments. Their research focuses on whether and how the planning process unfolds and adapts from corporate planning to new strategic orientations for facing critical and very turbulent environments over time, what happens to the front line level of organisation when these systems fail and what line managers do to develop strategy when the planners fail. In particular, they focus on whether and how the front-line organisation perceives such new strategic orientations, as existing works mainly study the conceptualisation of top management. They use a case study methodology with a real-time longitudinal study in the airline industry. The research shows the main findings and discusses the main implications as well as future lines of research.

Supplier selection represents one of the most important functions to be performed by the purchasing department that determines the long-term viability of a company. The fourth paper by Jain, Benyoucef and Deshmukh discusses the role of strategic sourcing in supply chain planning. The supplier selection is a multi-criteria problem, which includes both qualitative and quantitative criteria. In order to select the best suppliers it is necessary to make a trade off between tangible and intangible criteria, some of which may conflict. This paper provides an overall picture of research on supplier selection process and practices. It deals with the 'supplier selection problem' where a state of the art is presented. The authors summarise the different selection criteria, the various problems of suppliers' selection and the existing methods to solve the problem. Furthermore, emerging issues and challenges resulting to scope for future works on supply chain procurement activities are identified and some clear guidelines for future research are proposed. It is aimed that the findings will lead to new research settings together with directions for future research.

The fifth paper by Mohan, Viswanadham and Trikha deals with the procurement risk. In all the food supply chains around the world, the biggest risk that hits the supply chain is the procurement risk or the input risk, i.e. contaminated or infected raw materials such as meat cattle infected with mad cow disease or birds with flu, etc. Due to the non-availability of track and trace mechanisms, mass culling or killing happens when detected. Frequently, food products are sold before there is a realisation of input contamination. Thus, in most food supply chains the biggest risk factor is the procurement risk more so because the downstream food processing and retailing activities are generally standardised with certified processes. The 'avian influenza' or 'bird flu' threat during early 2006 in India had resulted in losses to the tune of over

INR 2200 crores to the Indian poultry industry. Realising that this is more than a healthcare issue, the authors study the impact of the outbreak on entire poultry supply chain from a risk perspective. Even though the poultry industry in India is a success story, it is largely characterised by supply chain inefficiencies and inadequate infrastructure. This paper aims to analyse the risks faced by the poultry supply chain in the event of an epidemic. The authors investigate the impact of the bird flu on the poultry supply chain by identifying risk factors, the losses/gains and mitigation strategies used by different players in the supply chain. Authors conjecture is that the integrity of supply chain partners in reporting to their respective upstream/downstream players of the outbreak of disease is a crucial factor which needs to be monitored closely thus improving visibility in the supply chain and making it more resilient.

The sixth paper by Pochampally, Nukala and Gupta focuses on eco-procurement. Eco-procurement is about integrating environmental considerations into purchasing decisions. The advantages of this practice include cost savings, conservation of natural resources and energy and compliance with environmental laws and regulations. While eco-procurement traditionally refers to customers (including companies) buying products containing *recycled* content, production of those products requires involvement of environmentally conscious manufacturers that must procure and reprocess used products containing *recyclable* content. In other words, eco-procurement in a supply chain refers as much to manufacturers as it does to customers. To this end, this paper addresses the following two crucial issues, and proposes a quantitative decision-making strategy for each of them: (1) which products must be chosen from a set of candidate used products containing recyclable content and (2) which suppliers, viz. companies that collect and sell the chosen used products, must be selected for eco-procurement?

The seventh paper by Marcotte, Grabot and Affonso deals with the cooperation models of supply chains. Working in Supply Chains or Supply Networks (SN) requires to efficiently manage the information flow all along the network, and as a consequence, to define efficient coordination/cooperation mechanisms between partners. This problem is usually considered according to two main points of view: centralised planning of the SN using an Advanced Planning System (APS) or point-to-point relationship, each point being possibly managed by an Enterprise Resource Planning (ERP) system. The autonomy of each partner often makes the centralised planning solution questionable, whereas point-to-point relationship seems to implicitly consider that a high level plan (the Sales and Operation Planning – SOP) is generated by the final assembler, like in the automotive or aircraft industry, and is used for building a procurement planning which is sent as forecasts to the partners/suppliers. Iteratively, this procurement planning should allow the suppliers building their own S&OP, and then generating forecasts for their suppliers. Therefore, the main stream of the information flow should cross the chain from its end to its beginning, whereas the material flow goes in the reverse direction. This global framework seems to be considered as independent from the characteristics of the involved partners. After having performed a number of case studies in various SN, the authors do believe that the characteristics of the companies involved in the SN have a deep influence on information processing, and especially on the way the procurement planning is processed, setting into question the ideal case of a quasi-unidirectional information flow. In this paper, the authors suggest to define a taxonomy of collaboration situation which in our opinion influences information processing all along the SN. The authors also suggest reference models for coordination, based on this taxonomy. Typical coordination situations are discussed in order to show that these models may provide an

efficient way to choose adapted information processing methods, with the final goal to define more realistic procurement plans within the SN.

The eighth paper by Yadav, Ghorpade, Mahajan, Tiwari and Shankar presents a robust optimisation technique, viz. Endosymbiotic Evolutionary Algorithm (EEA) for a multi-stage, multi-period logistics system. The optimisation problem corresponds to a combinatorial cum integer optimisation problem where decision variables attended are option selections and service times. As the problem corresponds to one with two interrelated sub-problems, there are ample prospects for EEA. The logistics optimisation model incorporates inventory holding costs, packaging and handling costs, finishing and transportation costs in order to resemble recent advances in logistics research. EEA which works on the biological coevolution phenomenon based on the serial reciprocal changes in two or more cooperative interacting species has rarely been applied to a logistics optimisation problem. For the undertaken case study, it performs well and produces better or compatible solutions, in most of the cases, as compared to genetic algorithm. The solution methodology utilised in the paper is a promising one and can be employed to resolve many other logistics and supply chain optimisation problems.

The ninth paper by Badiyani and Raja describes the system, which was developed as a part work of joint ERDF-DTI funded B2B-MC project. The world of mass customisation and globalisation has forced manufacturing industry towards outsourcing of manufacturing and product development activities resulting into formation of synchronously operating collaborative networks. Within such collaborative environment there is a need for Information and Communication Technology (ICT) infrastructure that integrates all the processes within supply chain; right from effective collaboration with partners, bidding/gaining contract, procurement, processing to the final delivery of product. This paper presents description and discusses the components of a developed system with a scenario, which depicts innovative way of integrating existing collaborative bidding and supply chain management process within manufacturing industry.

Finally, the tenth paper by Viswanadham and Gaonkar discusses the increasing competitive forces and the business transformation brought about by internet-based technologies, the structure and landscape of the logistics industry that has changed drastically in the last few years. A new breed of logistics service providers are emerging, who have developed and adopted a new operating model, which the authors termed as Integrated Knowledge-Based Logistics (IKL). An IKL is characterised by its complete shift in focus, from the asset intensive operational aspects of moving goods to a variety of knowledge-based tasks such as synchronising activities between various parties in the supply chain, and ensuring supply chain continuity even in the face of disruptions. In this paper, the authors present the structure of such an entity, discuss its attributes and identify critical factors that impact its success. The authors also show how mathematical modelling tools can be employed to solve some decision-making problems the logistics companies face in synchronising various activities across the network.

As mentioned the contributions cover both aspects of theoretical and practical development regarding the procurement strategies. It is hard to draw precise conclusions and trends across the papers included in this special issue, but there is no doubt that the papers elaborate and refine many of the trends presented in the introduction of this note. As guest editors, we are very satisfied both with the quality of the papers presented in this issue and with the relevance of the themes we hoped to put focus on via this special issue.

Acknowledgements