

## Guest Editorial Preface

# Special Issue of Advancements in Modeling and Simulation in Logistics and Supply Chain Management

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It has advanced rapidly in the development of Logistics and Supply Chain Management in the last 20 years, which attracts extensive attention in academic, business and industry for producing in the right quantities of products and distributing them to the right locations at the right time and meeting the satisfactory requirement of low cost and high level of customer service. Logistics is the process of planning, implementing and controlling procedures for the efficient and effective transportation and storage of goods including services and related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements and includes inbound, outbound, internal and external movements. Supply Chain Management is defined as the design, planning, execution, control, and monitoring of supply chain activities with the objective of creating net value, building a competitive infrastructure, leveraging worldwide logistics, synchronizing supply with demand and measuring performance globally.

Since integrated logistics serves to link and synchronize the overall supply chain as a continuous process and is essential for effective supply chain connectivity, it is important to provide an effective framework for the firms to evaluate and optimize the efficiency of their logistics and supply chain operations. As the development of relative theories, basic technologies, and tools, modeling and simulation are widely applied to the research and practice in logistics and supply chain management. It can be used for modeling, analyzing and optimizing the operation process of the logistics and supply chain.

Logistics and supply chain systems are far more complex networks of material flow, the contemporary practice of logistics and supply chain management requires for a sustainable practice of simulation. Application of Modeling and Simulation (M&S) will demonstrate production-inventory systems consisting of production facilities which supply warehouses with various types of products. Generic models illustrate how inventory control policies regulate the flow of products between production and inventory facilities.

This special issue aims at providing a platform for both researchers and practitioners to exchange and share the latest research results, application practice, and so on in the area related to simulation and modeling in logistics and supply chain management. The introduction of the innovative ideas, methods and technologies in this special issue aims to support solving common and critical problems in SCS, which ultimately enhances the performance and competitiveness of Supply Chain systems in the global market. In this special issue, we select four papers, which constitute an overview of the important modeling and simulation technologies in logistics and supply chain management:

- *Supply Chain Buyback Contract Based on the Different Expectations of Market Demand Distribution* by Yang Gao, Meiou Wang and Qiang Hou: This paper focuses on investigating the buyback contract in a supply chain consisting of a single manufacturer and a single retailer. By comparing the predicted demand of the manufacturer and the retailer with the real demand, four quadrants about the difference of the market demand forecasts are presented and the closed-form optimal market models are developed. By solving the models, the authors find that the non-contract decentralized mode model cannot successfully coordinate the supply chain, while the buyback contract mode allows for the coordination of the supply chain and the generation of more profit from the supply chain;
- *Coordination and Decision of Supply Chain under Price-Dependent Demand and Customer Balking Behavior* by Guang-Dong Liu, Tian-Jian Yang, Yao Wei And Xue-Mei Zhang: this paper investigates supply chain coordination and decision under customer balking and stochastic demand. By developing models for both centralized and decentralized system, three contracts are designed to coordinate supply chain and the optimal price and customer balking strategies are obtained. Two interesting results have been achieved in this study: the revenue- and cost-sharing contract can coordinate supply chain under customer balking and price-dependent demand and achieve the Pareto-improvement; In addition, the expected sales quantity and expected reduced sales quantity are influenced conversely by the threshold of inventory and probability of a sale under customer balking;
- *Distribution and Inventory Planning in a Supply Chain under Transportation Route Disruptions and Uncertain Demands* by Himanshu Shrivastava, Andreas T. Ernst and Mohan Krishnamoorthy: This paper considers transportation disruptions and its detrimental impact on the quality of the en route shipment under different disruption risks, uncertain cost of transportation, and uncertain demands, and formulate a non-linear mathematical model to investigate a hybrid problem in which the firm needs to develop a suitable distribution strategy under disruption risks along with an optimal checking policy when faced with the supply of varying quantities of damaged items. The results show that the retailer does not need to check any item if the fault fraction is too high, while the retailer is required to check every item if the fault fraction is in between the specified range;
- *Research on Movie Box Office Prediction Model with Conjoint Analysis* by Wei Lu and Ruben Xing: Forecasting plays an important role in logistics and supply chain management. It provides necessary input data, such as demand, cost, price and so on, when modeling a supply chain system. This paper uses conjoint analysis to study movie box office (MBO) prediction from another perspective. Specifically, the authors using the conjoint-analysis method with a questionnaire survey and expert interview to determine the main index system affecting MBO, and then establishes an MBO forecast model through the neural network algorithm with BRP model. In comparison with the actual MBO status, the testing result shows a good prediction accuracy and practicability, reflects a higher research value and meets the application demand of the film market, which indicates that the proposed approach can promote the research of cultural product value and the development of the film market.

The above researches aim to provide readers with the most advanced methodologies and techniques in modeling and applied simulation and useful application examples in different fields and domains.

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