Fashion Supply Chain Management (FSCM) is an important topic in modern fashion business. In addition to the traditional functions of inventory management, transportation management, and facility control, FSCM puts a strong emphasis on the collaboration and partnership among channel members along the fashion supply chain. Obviously, FSCM provides a very strong area for establishing a competitive edge for fashion companies.

Traditionally, most researchers in fashion have been focusing mainly on the “art” side of fashion instead of “science.” There is hence a need to publish a book which comprehensively reports FSCM with more emphasis on scientific research.

This new research handbook focuses on reporting both quantitative research on FSCM and exploratory studies on emerging supply chain management related issues in the fashion industry. Both quantitative and qualitative analyses are included. To be specific, this handbook is organized into several sections outlined as follows:

Section 1 – Mathematical Modelling Research: This section consists of chapters that employ traditional mathematical modelling approach in conducting analytical studies. Both theoretical analysis and application-oriented papers are included. This section includes five chapter papers and they are introduced as follows.

In order to determine the optimal multiproduct flows associated with the fashion supply chain network activities, Nagurney and Yu consider in Chapter 1 a multi-criteria decision-making optimization model subject to multimarket demand satisfaction. They develop an equivalent variational inequality formulation and identify the minimal total operational cost and total time consumption. Their modeling analysis provides insight which allows decision-maker to achieve the total time minimization objective of the supply chain network for fashion products.

Supply chain coordination is a core topic in fashion supply chain management. In Chapter 2, Kurata, Yue, and Alwan explore the role played by incentive alignment contracts such as scan-back trade deal and buyback contract in fashion supply chain models. They analytically derive insights into when a fashion retailer has incentive to accept the scan-back trade deal. They also find that the manufacturer and the entire fashion supply chain can always benefit from the scan-back trade deal but it is not the case for the retailer. In order to achieve win-win situation in the supply chain upon coordination, a revised policy combining both scan-back trade deal and buyback is proposed. Managerial insights are developed.

Competition and coordination are important dimensions in fashion supply chain management. Huang, Leng, and Liang study in Chapter 3 a two-echelon single-supplier single-retailer multi-period supply chain model. Under a price-discount sharing scheme with the supplier’s wholesale price being a linear function of the retail price, they develop a stochastic game and show that a unique Nash equilibrium ex-
ists (for each period). They further show that over the infinite horizon, the supplier chooses a stationary base stock policy whereas the retailer’s equilibrium can be non-stationary. Afterwards, they derive the condition for achieving supply chain coordination via a wholesale pricing scheme. Analytical insights are derived.

Radio frequency identification (RFID) technology is a very useful tool in fashion supply chain management. In fact, a lot of large scale fashion retailers, such as Marks and Spencer, have been driving RFID adoption. In order to study the impact of the relationship between small manufacturers and large retailers on the small manufacturers’ RFID adoption decisions, Tajima develops in Chapter 4 a two-by-two gaming model and conducts outcome stability analysis. Some interesting results and insights are generated. For instance, it is found that the retailer’s opportunistic behaviour is unlikely to occur (due to the strong stability associated with the manufacturer’s do-nothing option) and the retailer’s pressure tactic is not effective in persuading the small manufacturer to adopt RFID.

Risk analysis is timely issue in fashion supply chain management. Inspired by the popularity of the Value-at-Risk (VaR) objective in finance, Chiu, Zheng, and Choi examine and review its application in fashion retail pricing and inventory decision making problems in Chapter 5. They first review a formal optimization model for the problem, in which the fashion retailer’s goal is to optimize an VaR objective function. After that, they explore the detailed solution schemes and demonstrate the applications of the proposed models via numerical examples. Finally, they investigate the performance of buyback contract and wholesale pricing contract in enhancing the supply chain’s efficiency when the fashion retailer takes an VaR objective. They analytically find some counter-intuitive insights which include the failure of buyback contract in enhancing the supply chain’s efficiency with an VaR retailer.

Section 2 – Quantitative Empirical Research: This section includes papers that employ empirical data for quantitative analysis. The approaches include data-driven research and survey-based statistical analysis (and its review). There are five chapter papers in this section, and they are briefly described below.

Quality management and environmental challenges are pertinent issues in fashion supply chain management. In Chapter 6, Lo conducts an empirical study to explore the impacts to fashion and textiles companies (FTCs) brought by quality management systems and environmental management systems. By investigating the adoption of ISO 9000 (a quality management system) and ISO 14000 (an environmental management system) by 284 publicly listed FTCs in the U.S., many important insights are revealed. For example, he shows that the operating cycle time has been shortened by about two weeks (in a five-year period). He also finds that the early adopters of ISO 9000 and high-tech textiles related firms tend to enjoy more supply chain benefits.

Focusing on the U.S. Textile and Apparel industry, Divita, Cassill, and Ludwig explore the value and fairness issues in strategic partnerships in Chapter 7. Based on the social exchange, transactional cost analysis, and distributive justice theories, a national quantitative questionnaire and case study research was conducted. They prove that there exists a statistically significant relationship between social value and fairness. Implications for industry and future research directions are discussed.

Strategic sourcing and supplier selection are crucially important in managing fashion supply chains. In the literature, the use of survey-based empirical research is one of the popular research methodologies in addressing sourcing and supplier selection problems. Motivated by the importance of the topic, Su and Gargeya conduct a review in Chapter 8 on the current state-of-the art survey-based empirical research on strategic sourcing and supplier selection in fashion. They examine the latest development and trends in the related areas and establish an agenda for future research.
The use of intelligent systems can enhance the performance of fashion supply chains. Lo and Hong study in Chapter 9 a three-level e-multi-agent early warning mechanism for preventing loss of customers in fashion supply chains. The system includes three levels, namely data mining, ontology, and decision support. At each level, different agents would execute different tasks in order to achieve integration in the fashion supply chain with less human intervention. The proposed framework also enhances transparent connections among businesses and assists in information sharing, thereby helping to prevent customer loss.

Due to the ever-changing features of customer demands, fashion sales forecasting is a challenging problem. Traditionally, in order to yield accurate forecasting results, sophisticated tools, such as artificial neural networks (ANN), have been employed. However, the traditional ANN suffers a major drawback because it takes a very long time in order to get the forecasting result. Motivated by this limitation, Yu, Choi, and Hui propose a time-constrained forecasting model (TCFM) for fashion sales forecasting in Chapter 10. This TCFM is based on the random vector functional link (RVFL) model. Their real-data driven experiment has shown that the proposed TCFM can produce quality forecasting within the user specified time constraint.

Section 3 – Exploratory Study and Case Research: Most scientific research in fashion supply chain management is inspired by real cases and industrial exploratory studies. This section presents a number of different studies, including cases, on many timely and emerging issues related to fashion supply chain management. It is expected that more future research, including many probable quantitative analyses, will be motivated by these cases and exploratory studies. To be specific, this section includes eight chapters and they are stated in the following.

In fashion supply chain management, fast fashion is one prominent industrial trend, and it is known that fast fashion retailers are facing two important challenges, namely high demand uncertainty and the strategic consumer behaviours. Motivated by the importance of fast fashion, Jin, Chang, Matthews, and Gupta explore in Chapter 11 what a fast fashion model is, why a fast fashion business model is becoming prominent in fashion business, and how the fast fashion supply chain is managed. They address these questions by examining the strategies of Zara and H&M, two highly successful fast fashion retailers. Suggestions for non-fast fashion retailers and future research directions are discussed.

Network process re-engineering (NPR) is an important issue in many textile and clothing companies. Based on a case study on Stella, an Italian home textile manufacturer, Baraldi and Nadin illustrate the challenges of engaging other firms into NPR projects in Chapter 12. They explore the importance of the connection between inter-organizational activities that need to be redesigned and coordinated. They suggest that the highly-complex coordination tasks can only be completed if there are strong integrative relationships between the involved parties. Insights on how the pivotal firms of a network can support NPR projects are also discussed.

In fashion supply chains, interdependencies have long been established with reference to the manufacturer-retailer interactions. In many cases, since fashion retailers aim at reducing the inventory risk from unsold merchandise, markdown, and stockouts, they interact with and rely on the manufacturing suppliers to adopt effective measures to help fulfill orders flexibly and replenish quickly. In Chapter 13, Guercini examines the implications of these interactions and discusses further developments. One important insight is the probable shifting of channel relationship from a perspective of supply to one of demand.

Mass customisation (MC) is an industrial trend in fashion retailing. In Chapter 14, Pan develops a new conceptual model of MC that aligns the activities and interests of the collective fashion supply chain producers. This model takes a consumer-centric approach, and places designers as the instrument for MC. This model aims to enable the prospect for small-to-medium sized fashion companies to imple-
ment MC in a more efficient, coordinated, and responsive way. The probable benefits and insights of this new model are discussed.

Fashion supply chain management is characterized by an increasing global competition and pressure to improve product quality, and respond quickly to changing customer needs with a shortened product lifecycle. These requirements are increasingly fulfilled by applying the product lifecycle management (PLM) approach. As an exploratory study, Bandinelli and Terzi conduct an analysis in chapter 15 on PLM in the Italian leather luxury industry (ILLI) by investigating 20 companies. They identify some differences that exist between ILLI and other more PLM-oriented sectors in several dimensions (such as the adopted information and communication technology). Insights are generated.

In Chapter 16, Cho identifies a variety of important consumer perceptions of online apparel customization (OAC). As an exploratory study, Cho conducted a survey and the survey-participants needed to visit apparel customization websites and customize a pair of jeans before answering the survey questions. The respondents’ inputs were analyzed and categorized into eight dimensions representing the major benefits and costs of OAC. Insights regarding why people are willing or unwilling to customize apparel online are generated. Future research directions are discussed.

Azevedo and Carvalho review in Chapter 17 the benefits, disadvantages, and barriers associated with the radio frequency identification (RFID) technology in fashion supply chain management. The focal point is on RFID’s implementation in fast moving fashion supply chains. A cross-case analysis is also conducted to generate additional insights regarding how RFID technology affects fashion supply chain management.

Corporate social responsibility (CSR) is a hot topic in fashion supply chain management. Even though there is evidence of a rising consumer demand for low cost fashionable clothing sourced through socially responsible supply chains, the nature of the “high street” fashion industry is not conducive to the implementation of CSR. Motivated by the importance of CSR in fashion supply chain management, Perry and Towers explore in Chapter 18 obstacles and drivers of CSR implementation in Sri Lankan export garment manufacturers. They propose that in a fashion supply chain, a partnership approach that encourages collaboration on CSR initiatives is more likely to promote supplier engagement with CSR issues than coercive compliance-based mechanisms. Many important insights are generated.

I am pleased to see that this handbook contains new analytical and empirical results with valuable insights, which will help both the academicians and the practitioners to understand more about the latest development and solution schemes in FSCM. In particular, this handbook positions itself as a pioneering text that reports many important research results in quantitative FSCM. As a result, researchers and practitioners who are interested in FSCM should find this book a valuable reference.

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