Progress in Tourism Management

Tourism supply chain management: A new research agenda

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\textbf{A B S T R A C T}

This paper reviews current research on supply chain management (SCM) within the context of tourism. SCM in the manufacturing industry has attracted widespread research interest over the past two decades, whereas studies of SCM in the tourism industry are very limited. Stakeholders in the tourism industry interact with each other to resolve their divergent business objectives across different operating systems. The potential benefit of considering not only individual enterprises but also the tourism value chain becomes evident. The paper examines the characteristics of tourism products, and identifies and explores core issues and concepts in tourism supply chains (TSCs) and tourism supply chain management (TSCM). Although there is an emerging literature on TSCM or its equivalents, progress is uneven, as most research focuses on distribution and marketing activities without fully considering the whole range of different suppliers involved in the provision and consumption of tourism products. This paper provides a systematic review of current tourism studies from the TSCM perspective and develops a framework for TSCM research that should be of great value not only to those who wish to extend their research into this new and exciting area, but also to tourism and hospitality decision makers. The paper also identifies key research questions in TSCM worthy of future theoretical and empirical exploration.

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1. Introduction

During the last two decades, the tourism industry has evolved and modernized considerably. The highly competitive environment of the industry has forced tourism firms to look for ways to enhance their competitive advantage. For example, there has been considerable growth in the implementation of new information technologies and the development of new commercial formats such as eTourism. In addition to these technological measures, one of the strategies that tourism firms could adopt to increase their competitiveness is effective tourism supply chain management (TSCM). Although academics debate whether or not tourism can be viewed as an industry, the term “tourism industry” is used throughout this paper as it is commonly used by both researchers and practitioners.

Adversarial relationships are the norm in the tourism industry (Sinclair & Stabler, 1997), but TSCM entails a new perspective. TSCM can be referred to as a set of approaches utilized to efficiently manage the operations of the tourism supply chain (TSC) within a specific tourism destination to meet the needs of tourists from the targeted source market(s) and accomplish the business objectives of different enterprises within the TSC. The TSCM philosophy requires moving away from arms-length relationships toward coordination across organizations throughout a TSC.

Tourism products are often viewed by consumers as value-added chains of different service components that form service networks. Therefore, identifying ways to manage these networks is vital, especially for large tourism firms that are keen to maintain a competitive advantage over their equally efficient rivals. Many tourism researchers have used a systematic approach based on the marketing perspective to investigate tourism distribution channels, including Buhalis (2000), Middleton and Clark (2001), Pearce and Schott (2005), Pearce, Tan, and Schott (2007), and Stuart, Pearce, and Weaver (2005).

The supply side of the tourism industry, however, has largely been neglected (Sinclair & Stabler, 1997). Whereas distribution channels involve promotional and marketing activities, supply networks involve inter-firm relationships and product development. The lack of attention to supply networks is not unique to tourism research. Most service industry studies focus on the marketing rather than the supply side (Smith, 1994). In contrast, product development and the actions of interrelated firms in the manufacturing industry have generated a considerable number of published studies.

Improvement of the distribution side alone is insufficient to benefit individual tourism enterprises or the tourism industry as...
a whole. The industry needs to be analyzed from an integrated perspective, that is, as a network of tourism supply chains (TSCs). Until very recently, studies of TSCs or their equivalents, such as tourism value chains or tourism industry chains, have been limited (see, for example, Alford, 2005; Kaukal, Höpken, & Werthner, 2000; Page, 2003; Tapper & Font, 2004; Yilmaz & Bititci, 2006).

Originating in the manufacturing industry, supply chain management (SCM) has since been implemented in a number of industries, and has drawn widespread research attention. However, comparatively little research attention has been paid to SCM in the tourism industry. This is surprising considering the amount of research into SCM in other service industries, such as the retail industry. Retail researchers and practitioners have investigated SCM strategies to counter the increasing uncertainty and complexity of the marketplace and increase efficiency by reducing inventories along the entire supply chain (Ellram, LaLonde, & Weber, 1989; Fernie, 1995; Gimenez & Ventura, 2003; Hugos & Thomas, 2006; Tan, 2001). Researchers have also examined inventory management policies, such as vendor management inventory (VMI) solutions, which have been popularized by Wal-Mart and Procter & Gamble (Waller, Johnson, & Davis, 1999), the application of information technologies (Kämäräinen & Punakivi, 2002; Prater, Frazier, & Reyes, 2005), information sharing and supply chain coordination (Clark, Crosno, & Schiano, 2001; Han, Kwon, Bae, & Sung, 2002; Hill & Scudder, 2002; Hornbrook & Fearne, 2002), supply chain relationships (Duffy & Fearne, 2004; Fearne, 2000), and collaborative forecasting (Smáros, 2007).

It is believed that SCM practices that are successful in other industries could be useful in the tourism industry. The key is to determine the SCM issues that are pertinent to the tourism industry, bearing in mind its specific nature and characteristics. Because of the complex interactions among numerous stakeholders in the tourism industry, all of which have different objectives and operating systems, the potential benefits of adopting best practices of TSCM are enormous. This paper makes an early attempt to identify various subject areas of TSCM after an investigation into the nature and characteristics of tourism and its supply chain. These areas are demand management, two-party relationships, supply management, inventory management, product development, TSC coordination, and information technology.

An examination of the existing studies shows that there is an emerging literature on TSCM or its equivalents, especially from the perspective of tourism distribution channels. However, consensus has not yet been reached on how best to characterize a TSC, and the limited literature does not provide guidance for tourism and hospitality researchers and managers. A clear definition of a TSC and a conceptual framework for TSCM are needed to advance the field. In the process of developing a common framework, we examine and summarize published studies of tourism management related to the diverse issues mentioned above. Currently, the contributions from the various studies exist in isolation, but they include many of the critical elements necessary for successful TSCM. This study is the first comprehensive analysis of current tourism studies from the perspective of TSCM, and makes several notable contributions, the first of which is the coherent presentation and classification of the current body of knowledge that should be useful for TSCM research.

The second contribution is the development of a research framework for TSCM, which is shown in Fig. 2. As stated above, the literature and practice do not provide a consistent view of what TSCM is or should be. There is a pressing need for a conductive and instrumental tool for further research into TSCM. The framework illustrated in Fig. 2 can help us to understand better the scope of both the challenges and opportunities associated with TSCM. It shall also be of great value not only to researchers who desire to extend their research into this new and promising area, but also to tourism and hospitality decision makers who are interested in TSCM strategies.

This work makes a third contribution in addressing the need for theory building in tourism management. The critical issues identified herein contribute to the development of TSCM theory. The research framework developed in this study can be further refined or extended into various theoretical models, allowing researchers to test the validity of and relationships among the critical issues along with their impacts on TSC performance, and ultimately, to create a coherent theory of TSCM.

The rest of this paper is organized as follows. Section 2 presents an overview of SCM, conceptualizes a TSC, and describes some of the critical issues associated with TSCM. These issues are analyzed in Section 3. The development and justification of the research framework are presented in Section 4. Section 5 provides several suggestions for future studies of TSCM, and Section 6 concludes the study.

2. Supply chain management in tourism

2.1. Overview of supply chain management

Fierce global competition in the 21st century has resulted in a focus on supply chains rather than individual companies. From the macro perspective, a supply chain is a network of enterprises that are engaged in different functions, ranging from the supply of raw materials through the production and delivery of end products to target customers. From the micro perspective of a firm, a supply chain is a network of nodes that perform functions such as the procurement of raw materials, fabrication of parts, assembly and subassembly of components, final assembly of end products, and delivery of finished products to regional distribution centers/customers. A supply chain is characterized by a forward flow of goods and a backward flow of information, and comprises seven main business processes: customer relationship management, customer service management, demand management, order fulfillment, manufacturing flow management, procurement, product development, and commercialization (Cooper, Lambert, & Pagh, 1997).

Although there is no systematic way of defining the scope of a “firm-specific” supply chain problem, Simchi-Levi, Kaminsky, and Simchi-Levi (2000) propose a simple approach that is based on the three levels – strategic, tactical, and operational – of the decision hierarchy. The class of supply chain problems encountered at the strategic level involves decisions concerning long-term issues such as demand planning, strategic alliances, new product development, outsourcing, supplier selection, pricing, and network configuration decisions. Although most supply chain problems are strategic by nature, there are also tactical problems that involve medium-term decisions such as inventory control, production/distribution coordination, material handling, and equipment selection. Problems that occur at the operational level concern weekly or daily events such as vehicle scheduling, routing, workforce allocation, and process planning.

Supply chain management (SCM) has been used extensively in the manufacture of products to improve efficiency across the value chain, including the efficiency of logistics and planning activities and material and information control, both internally, within companies, and externally, between companies (Christopher, 1992; Cooper et al., 1997; Fisher, 1997). SCM has become widely known since the concept was first proposed by Houlihan (1985). However, despite the popularity of the concept both in academia and practice, there is no commonly accepted definition of SCM. The most popular definition is that given by Simchi-Levi et al. (2000), who
define it as “a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize system-wide costs while satisfying service level requirements.”

The key SCM concerns are recognition of the interdependency of members in the supply chain and the generation of strategies that support the efficient integration of the various links. In other words, SCM takes a systems approach, viewing the supply chain as a whole (Simchi-Levi et al., 2000) and emphasizing the need for the integration of the various links of the chain (Cooper et al., 1997; Lambert, Stock, & Ellram, 1998). Various subject areas include strategic, inter-organizational issues (e.g., Cox, 1997; Harland, Lamming, & Cousins, 1999), vertical integration (e.g., Hakansson & Snehota, 1995; Thorelli, 1986), the supplier relationship (e.g., Helper, 1991; Hines, 1994; Narus & Anderson, 1995), and purchasing and supply (e.g., Morgan & Monczka, 1996; Farmer, 1997). In addition, a number of surveys of the SCM literature have been published in academic journals (see, for example, Ganesan, Jack, Magazine, & Stephens, 1999; Min & Zhou, 2002; Tan, 2001).

2.2. Concept of a tourism supply chain

Much of the SCM literature focuses on the manufacturing industry, with little attention paid to the service sector. From the perspective of the tourism industry, this lack of research attention is somewhat surprising. As early as 1975, the United Nations World Tourism Organization (UNWTO) published a report on the distribution channels of the tourism industry (UNWTO, 1975). A distribution channel is essentially one type of supply chain, and can be narrowly defined as a supply chain that involves mainly the distribution and marketing activities in the chain.

The attention paid by the academic community and industrial sectors to tourism supply chains has not kept pace with the rapid development of the tourism industry in recent decades. Nevertheless, several studies have appeared on these supply chains, including those of Buhalıs and Laws (2001), Page (2003), Sinclair and Stabler (1997), and UNWTO (1994). Sinclair and Stabler (1997) emphasize the importance of the supply side of the tourism industry. Tourism Distribution Channels: Practices, Issues and Transformations, a key text edited by Buhalıs and Laws (2001), consists of 23 chapters written by various contributors, and many of these chapters are related to distribution networks in the tourism industry. Page (2003) points out that the provision of tourism products and services involves a wide range of interrelated tourism suppliers, and plots a structure of a tourism supply chain. Descriptive studies of tourism supply chains include those of Alford (2005), Scavarda, Lustosa, and Scavarda (2001), Tapper and Font (2004), and Yılmaz and Bititci (2006).

Although studies of tourism supply chains are limited, some authors have alluded to or touched on the concept or its equivalents, such as tourism value or tourism industry chains. Kaukal et al. (2000) note that a typical tourism value chain consists of four components, the tourism supplier, tour operator, travel agent, and customer, which are all in a single linked chain. Alford (2005) gives a visual presentation of a tourism supply chain produced by the Business and Cost Analysis Working Group to analyze pressure points at which costs can be stripped out. Yılmaz and Bititci (2006) develop a tourism value chain model to manage the tourism product as an end-to-end seamless entity. In their report, Tapper and Font (2004) define a TSC as a chain that “comprises the suppliers of all the goods and services that go into the delivery of tourism products to consumers.”

According to Porter (1980), every industry has an underlying structure, or set of fundamental economic and technical characteristics, that gives rise to its operational and competitive characteristics. That is, every supply chain varies according to the type of products supplied. Thus, identifying the features of the tourism industry and its products is of great importance in describing a TSC. For instance, tourism products are normally based in a specific territory and provided to tourists from a specific source market; so they often vary according to destination and source market. Based on the existing definitions of TSCs in the literature and taking into consideration the characteristics of the tourism industry, the following definition of a TSC is advanced.

A tourism supply chain (TSC) is defined as a network of tourism organizations engaged in different activities ranging from the supply of different components of tourism products/services such as flights and accommodation to the distribution and marketing of the final tourism product at a specific tourism destination, and involves a wide range of participants in both the private and public sectors.

2.3. Supply chain management in tourism

To identify the key challenges for successful TSCM, understanding of the characteristics of tourism products and the tourism industry is of central importance. A part of the service sector of the global economy, tourism possesses a number of characteristics that distinguish it from the manufacturing and primary sectors. Six characteristics of tourism are outlined as follows.

First, tourism is a coordination-intensive industry in which different products/services (transportation, accommodation, and so on) are bundled together to form a final tourism product. Second, as services cannot be stored for future use, a tourism product is perishable. Third, tourists need to travel to the destinations where tourism products are produced to consume these products. Tourism products normally cannot be examined prior to their purchase, which means that the sale of tourism products very much depends upon the presentation and interpretation of the products. Therefore, the tourism industry is a very information-intensive, or information-dependent, industry (Ujma, 2001). Fourth, tourism products are complex in nature. In general, tourism products are heterogeneous and compound, consisting of many different service components such as accommodation, transportation, sightseeing, dining, and shopping. Finally, the tourism industry often faces higher demand uncertainty and more complex dynamics than its counterparts because of intensive competition among service providers. Many factors contribute to market uncertainty in terms of the demand for tourism products. For example, effective advertising can attract more tourists, whereas negative word-of-mouth effect can lead to a fall in demand. The economic conditions in tourist-generating countries and regions often serve as a push factor, influencing the demand for tourism products in a particular destination.

Based on these characteristics of the tourism industry, the following seven key management TSCM issues are identified: demand management, two-party relationships, supply management, inventory management, product development, TSC coordination, and information technology. Because of space limitations, detailed explanation of how these issues are identified is omitted. Instead, the rationale for the identification of these issues is presented in Fig. 1, through the presentation of the relationships among the tourism characteristics and issues identified. These key TSCM issues are discussed in greater detail in the sub-sections that follow.

3. Critical issues in TSCM

To facilitate a better understanding of both the critical elements and activities associated with TSCM research, a framework that
Fig. 2. The development and justification of the framework are provided in Fig. 2. The development and justification of the framework are presented in greater detail in Section 4. Critical issues in TSCM are analyzed in terms of their contribution to TSCM research.

3.1. Demand management

Demand management is a vital part of SCM that links the processes within the chain. Generally speaking, demand management includes demand forecasting, marketing, and sales planning based on the projected demand and service/production capacity. Demand management is crucial in successfully implementing TSCM. From a strategic point of view, tourism investment decision making, especially investment in destination infrastructures such as airports, highways, and rail-links, relies on demand estimation because long-term financial commitment is required, and the sunk costs can be very high if investment projects fail to fulfill their designed capacities. In addition, government macroeconomic policies largely depend on the relative importance of individual sectors within a destination. From the operational point of view, the activities of supply chain members such as airlines, tour operators, hotels, cruise ship lines, and recreation facility providers are directly driven by tourism demand. The success of many businesses depends largely or entirely on the state of tourism demand, and market failure is quite often due to the failure of the firms to meet the market demand. Because of the key role of demand as a determinant of business profitability, estimation of expected future demand constitutes a very important element in all TSC planning activities.

As an important area in the tourism-related literature, tourism demand forecasting has attracted considerable research interest. According to a comprehensive review by Li, Song, and Witt (2005), about 420 studies on this topic were published during the 1960–2002 period. Most studies of tourism demand forecasting are based on statistical methods, especially econometric and time-series approaches (for detailed reviews of the tourism demand forecasting literature, see, for example, Li et al., 2005; Song & Li, 2008; Witt & Witt, 1995). Although many advanced quantitative demand forecasting models have been developed in the literature, tourism practitioners usually have little interest in scholarly journals, so they are either unfamiliar with modern forecasting methods that have been presented in the literature or simply do not have the time to be involved in the design and development of models to generate more accurate forecasts. Hence, a new kind of forecasting mechanism that facilitates the mutual transfer of information and knowledge between tourism forecasting experts and tourism industry practitioners is highly desirable.

For a TSC to be managed effectively, demand management clearly has to have a central position in the chain. In recent years, collaborative supply chain forecasting has become popular. The value of collaborative forecasting lies in the broad exchange of information to improve forecasting accuracy, as supply chain members collaborate through joint knowledge of sales promotions, pricing strategies, marketing, and production information. Although there is a wide body of literature concerning collaborative forecasting within supply chains for physical goods, this type of forecasting has not yet been considered in the tourism literature except in the study of Song, Zhang, and Witt (2008).

3.2. Two-party relationships

The term “supply chain” implies two-party relationships in which all organizations have relationships with other entities, including suppliers, distributors, competitors, partners, governments, and other firms carrying out complementary activities, to better accomplish their operations and fulfill customer needs. For this reason, the effective management of two-party relationships within a TSC is a crucial issue in TSCM.

Relationships in a supply chain are categorized into two groups according to their direction – vertical or horizontal. Vertical relationships exist among heterogeneous players, which do not have overlap capabilities. An example is a travel agency’s relationship with its suppliers. In contrast, horizontal relationships exist among homogeneous players in the same echelon of the supply chain, which usually have overlapping capabilities. An example is the relationship between two hotels supplying similar hotel...
accommodation. Based on the market structure of each echelon within the supply chain as well as the power and dependency between players and among a number of players, the relationships can be classified into four types: many-to-many, one-to-many, many-to-one, and one-to-one relationships. Additionally, the relationships in a supply chain can take a variety of forms, such as arms length, strategic alliance, vertical integration, cooperation, coordination, and competition.

Effective supply chain management, therefore, relies greatly on the success of relationship management. As mentioned, a TSC is a complex network involving a wide range of sectors, each of which has its own market structure. Tourism organizations need to consider not only their market structure but also that of others. In addition, a very important phenomenon in the tourism industry is its dynamic structure, which allows players to change business partners from time to time to maximize their profitability and competitiveness. For example, the relationships between governments and tourism firms, and between tourists and the environment, evolve over time. The involvement of various players together with the evolution of TSC relationships makes relationship management in a TSC even more difficult, but a good understanding of the relationships in a TSC is critical to achieving efficient and effective TSCM.

In tourism research, significant efforts have been directed to understanding the relationships in the industry. Existing studies cover topics including: integration in TSCs (Lafferty & von Fossen, 2001; Theuvsen, 2004); competition issues related to hotels (Chung, 2000; García & Tugores, 2006; Mazzeo, 2002), tour operators (Baum & Mudambi, 1994; Caccomo & Solonandrashana, 2001; Taylor, 1996), and attractions (Candel & Cellini, 2006; Wie, 2004, 2005); relationships between the local government and tourism organizations (Accinelli, Brida, & Carrera, 2006; Piga, 1999, 2003a, 2003b), tour operators and destinations (Baloglu & Mangalaglu, 2001; Carey, Gountas, & Gilbert, 1997; Curtin & Busby, 1999; Klemm & Parkinson, 2001), and tourism organizations and tourists (Han, Dellaert, Van Raaij, & Timmermans, 2004; Taylor, 1998); and the evolutionary relationship between tourists and residents (Accinelli, Brida, Carrera, & Punzo, 2006; Bimonte & Punzo, 2007). A review of the literature shows that attention has tended to concentrate on competitive interactions between tourism firms, which may reflect the current situation in many tourism markets. Tour operators often have market power to directly interact with tourists and, therefore, play a key role in the development of sustainable TSCs in destinations. Theuvsen (2004) points out that coordination among enterprises could benefit the tourism industry as a whole.

3.3. Supply management

Supply management emphasizes the buyer–supplier relationship in a supply chain (Leenders, Pearson, Flynn, & Johnson, 2002). Because suppliers have a profound impact on the costs and quality of the buying firms in supply chains, supply management has been of great interest among SCM researchers. Topics of supply management include long-term relations, supplier selection, supplier base reduction, supplier involvement, and supplier certification (Chen & Paulraj, 2004). Although a few tourism studies have addressed supply management issues, these studies are scattered and lack a clear focus. Existing studies of supply management in the tourism industry fall into three broad categories: (1) investigation of the relationships between suppliers (hotels, resorts, attractions, and airlines) and travel agencies/tour operators, (2) examination of the relationships between wholesale and retail travel agencies, and (3) identification of supplier selection problems.

Research into supply management in tourism has focused on the relationship between tour operators and hotels (Bastakis, Buhalis, & Butler, 2004; Buhalis, 2000; García-Falcón & Medina-Muñoz, 1999; Karamustafa, 2000; March, 1997; Medina-Muñoz & García-Falcón, 2000; Medina-Muñoz, García-Falcón, & Medina-Muñoz, 2002, Medina-Muñoz, Medina-Muñoz, & García-Falcón, 2003; Tse, 2003). March (1997) finds that Australian travel suppliers are extremely dependent upon travel buyers. García-Falcón and Medina-Muñoz (1999) examine the diversity in and major characteristics of the relationships between hotels and travel agencies in the United States through an empirical survey. The results show that having good relationships with travel agents is an important element for the success of hotels. Karamustafa (2000) notes that hotels in Turkey depend heavily on package tour operators, and that the success of hoteliers relies on the willingness of tour operators to work with the local lodging industry. Buhalis (2000) studies conflict in the relationships between hotels and tour operators in the context of Mediterranean summer seaside resorts through in-depth interviews. He finds that Mediterranean hotels consider the market power of tour operators from Northern European countries very challenging. Medina-Muñoz and García-Falcón (2000) are the first to try to identify the determinants of successful relationships between hotels and travel agencies, and the most cost-effective way for a hotel to extend its sales and marketing efforts. Their empirical results show that trust, commitment, coordination, communication quality, information exchange, participation, use of constructive resolution techniques, and similar relative dependence are the key factors that affect successful relationships between hotels and travel agencies. Tse (2003) investigates the relationship between travel agents and hotels when the latter take distribution back into their own hands by setting up Web sites allowing online bookings. The possible responses of agents are analyzed and suggestions for improving the quality of the buyer-seller relationship are put forward. Medina-Muñoz et al. (2003) look at the control that German and British tour operators exercise over the accommodation companies with which they do business and the characteristics of the two groups of companies that influence this control. The study helps tour operator managers to gain suitable control over accommodation companies and identifies possible actions to be taken by accommodation providers in improving their relationship with tour operators.

Other studies discuss the relationships between airlines and travel agencies (Alamdari, 2002; Appelman & Go, 2001) and wholesale and retail travel agencies (Tsaur, Yung, & Lin, 2006). Alamdari (2002) explores the interactions between airlines and travel agents by analyzing the distribution strategies of major carriers in the United States, Europe, and Asia. Appelman and Go (2001) describe the beginning of the transformation of the relationships between worldwide airlines and travel agencies engaged in international travel. Tsaur et al. (2006) examine a relational behavior model of wholesale and retail travel agencies in Taiwan. Several influencing factors of the relationship are identified through surveys.

Selecting suppliers for specific services is critical for most tourism organizations, as tourists often view a tourism product as a seamless entity. Supply performance can, therefore, have direct financial and operational impacts on business. Recognizing this, some tourism researchers investigate supplier selection issues (see, for example, Cobanoglu, Corbaci, Moreo, & Ekinci, 2003; March, 2000; Pearce, 2007). Cobanoglu et al. (2003) survey 612 Turkish business travelers to determine the importance they place on hotel selection attributes. March (2000) examines the purchasing attitudes of tour operators regarding three types of tourism products: hotels, coach companies, and restaurants. He surveys 26 inbound tour operators in Asia who deal with inbound tourists to Australia.
3.4. Inventory management

Supply chains can be divided into two categories: push and pull supply chains. In push supply chains, the production of a product is authorized based on demand forecasting of customer purchases. Demand is forecast based on historical sales data. The demand for products by end users can be met through inventory. In contrast, in pull supply chains, the final assembly of the product components is triggered by customer purchasing orders. Inventories are minimized in pull supply chains, and flexible capacities are required to meet variations in demand. The type of supply chain is determined by the nature of the product produced and the production process. A TSC can be categorized as a push system because the production of tourism products is normally based on demand forecasting. Therefore, inventory plays a key role in a TSC.

Because tourism products are perishable and have relatively high fixed costs that are paid in advance to build up a fixed level of capacity, the variable costs incurred during the production process are relatively low. This makes it difficult for tourism managers to balance supply and demand in the short run by varying production capacity. Additionally, many tourism products are often produced well before the existence of the demand (in the push system), and the demand is usually realized by inventory. That is, demand uncertainty and variation can be treated by inventories, which represent financial expenditures. Therefore, developing effective inventory management strategies is crucial for achieving efficient TSCM.

In a TSC, hotels and airlines often collaborate with a number of tour operators whose offices are located in various destinations. The agreements on inventory allocations from hotels and airlines to different tour operators are usually assigned on a regular basis. In the tourism literature, inventory management problems, such as overbooking and revenue/yield management, have been addressed in the context of the hotel sector (Baker & Collier, 1999; Bitran & Mondshein, 1995; Holder, 1991; Lambert, Lambert, & Cullen, 1989; Liberman & Yechiali, 1978; Rothstein, 1974) and airline sector (Belobaba, 1987, 1989; Rothstein, 1971, 1985; Shlifer & Vardi, 1975; Smith, Leimkuhler, & Darrow, 1992). Overbooking is a practice used to deal with cancellations or no-shows (Rothstein, 1974). Revenue management is a profit maximization method that “can help a firm sell the right inventory unit to the right type of customer, at the right time, and for the right price” (Kimes, 1989). Weatherford and Bodily (1992) provide a review of research related to the above topics. However, to the best of our knowledge, studies of TSC inventory issues have not been published.

3.5. Product development

SCM aims to satisfy customer needs at the right time with the right products. Therefore, product development plays a critical role in the supply chain. Effective product development can speed time to market, improve the quality of products, reduce production costs, and smooth out demand variation. Product development, however, is not an easy task. It is a complex process that requires joint efforts from different players within the supply chain. It also requires a good understanding of customer needs, and involves a careful analysis of product components and elements to identify potential products that will suit continuously changing consumer tastes.

Although product development is the focus of numerous manufacturing industry studies, it is a relatively neglected area of research within the tourism context. This lack of attention may be due to the composite nature of tourism products (Smith, 1994). Discussion of tourism product formulations began with Medlik and Middleton (1973). However, with very few exceptions, notably the studies of Agarwal, Ball, Shaw, and Williams (2000), Bramwell (1998), and Smith (1994), there has been very little analysis of tourism product development, in contrast to the significant research efforts directed toward tourism marketing.

In tourism, as in all service industries, satisfying customer needs with the appropriate products is of the utmost importance. If tourists are satisfied with a travel product, then they will purchase the product again, and there is a better chance that they will recommend it to others (see, for example, Kozak, 2001b; Tian-Cole & Cromption, 2003). Hence, the issue of tourism product development is worth further investigation.

3.6. TSC coordination

Tourism is a coordination-intensive industry in which different service products (transportation, accommodation, excursions, and so on) are bundled together to form a final tourism product. Coordination is a pattern of decision making and communication among a set of interrelated players who perform tasks to achieve goals such as maximizing their utilities or the overall profit of the supply chain (Malone, 1987). It requires that each actor within a supply chain perform its task by considering the impact of its actions on the other players. Researchers generally agree that through coordination, redundant activities and repetitive efforts can be reduced to achieve a sustainable and competitive supply chain. For example, many studies of manufacturing supply chains (e.g., Chen, Federgruen, & Zheng, 2001; Corbett & de Groote, 2000; Jeuland & Shugan, 1983; Parlar & Wang, 1994; Weng, 1995) show that coordination can result in improved performance and greater profitability for the entire supply chain and its participants.

To maintain a competitive advantage over equally efficient rivals, many large tourism firms have already adopted supply chain coordination strategies (Buhalıs & Laws, 2001; Sinclair & Stabler, 1997). Supply chain coordination can take a variety of forms, ranging from full or partial integration of business processes to contractual arrangements between individual firms, either horizontally or vertically. In the context of TSC, coordination occurs between service providers such as hotels and airlines, and tour operators and travel agencies, within the same echelon and/or among different echelons. For example, major European tour operators are highly vertically integrated with airlines, hotels, and other travel intermediaries (Theuvsen, 2004). The existing research into TSC coordination reveals that much effort has been directed toward full integration. For instance, Gomez and Sinclair (1991) examine vertical integration and contractual relationships between tourism enterprises in different sectors of TSCs in the UK and Spain through interviews with participants of the major firms in these supply chains. Lafferty and van Vossen (2001) discuss both the horizontal and vertical integration of tourism’s component sectors, particularly in relation to airlines and hotels. Theuvsen (2004) conducts an empirical analysis of the vertical integration of European travel operators and points out that coordination among the operators could greatly benefit the tourism industry.

Unlike their counterparts in manufacturing supply chains, TSC players are heterogeneous organizations that often have conflicting objectives. In this case, full vertical integration is the most apparent and efficient way to achieve coordination. Nevertheless, as Simchi-Levi et al. (2000) point out, achieving full integration in supply chains is never easy. In addition, full integration in TSCs is normally associated with increased fixed costs and reduced flexibility in meeting market changes (Gomez & Sinclair, 1991; Sinclair & Stabler,
Coordination in the form of contractual arrangements between individual firms in a TSC provides a new research opportunity.

3.7. Information technology

The salient feature of tourism products is that they usually cannot be examined prior to purchase. Tourists have to travel to the destinations where the tourism products are produced, which means that their purchase decisions depend upon the presentation and interpretation of these products. Thus, information is “the lifeblood of the travel industry” (Sheldon, 1994), which holds together activities within the tourism supply chain in terms of both interfirm links and tourism product distribution. It is hardly surprising that since its emergence, information technology (IT) has played a significant role in the tourism industry. Developments such as computer reservation systems (CRSs), global distribution systems (GDSs), the World Wide Web, and the Internet have transformed the ways in which tourists travel and tourism firms operate (Bennett, 1993; Buhalis, 2003; Buhalis & Main, 1998; Connolly, Olsen, & Moore, 1998; Emmer, Tauck, Wilkinson, & Moore, 1993; Klein, 2002; Lu & Lu, 2004; O’Connor, 1999; Prideaux, 2001). Buhal (1998) adopts a strategic perspective to develop a framework for the utilization of IT in tourism. Bahaire and Elliott-White (1999) examine the progress that tourism organizations have made toward the application of geographical information systems (GISs) and their integration with sustainable development policies in the UK. Frew (2000) explores the interaction between IT and tourism and provides a research framework to characterize the utilization of IT in the tourism industry. O’Connor and Murphy (2004) review recent research on IT in the hospitality industry. More recently, Buhal and Law (2008) comprehensively review and analyze the published studies of Internet applications in tourism over the past 20 years.

In addition to transforming business operations, IT can also enhance the coordination of activities regionally, nationally, and globally, creating new opportunities for tourism businesses and enhancing their competitive advantage (Porter & Millar, 1985). As the key driving force for moving material management to supply chain management, IT is found to be an effective means of promoting collaboration between and among supply chain members and enhancing supply chain efficiency through providing real-time information regarding product availability, inventory levels, shipment status, and production requirements (Radstaak & Ketelaar, 1998). It allows upstream TSC suppliers, that is, airlines and hotels, to monitor, manage, and control their capacities through communicating with intermediaries, that is, tour operators and travel agencies, and tourists. For example, authorized tour operators can access a hotel’s in-trace to check on room rates and availability for their customers. The transparency and communication achieved through IT reduce unit operating costs and enhance firm competitiveness, efficiency, flexibility, and cooperation throughout the entire TSC.

Although the literature has been dominated by investigations into how to effectively apply IT to tourism organizations, there is a growing interest in the importance and necessity of IT usage in TSCs. Go and Williams (1993) discuss the changes in the tourism channel system in terms of demand and supply and the ways in which IT can affect and market tourism distribution channels. O’Connor, Buhalis, and Frew (2001) examine the effect of changes in IT on tourism distribution channels and highlight the key areas of concern for tourism suppliers. The impacts of the Internet (Wynee, Berthon, Pitt, Ewing, & Napoli, 2001) and computer reservation systems (Alamdari, 2002; Duliba, Kauffman, & Lucas Jr., 2001) on tourism distribution channels have also been discussed. Recent research into IT emphasizes its vast potential to facilitate collaborative planning and forecasting among supply chain partners by information sharing on demand forecasts and production schedules that dictate supply chain activities (Karoway, 1997). However, to the best of our knowledge, little research has been done in the tourism context except for that of Song et al. (2008).

4. Theoretical research framework

TSCM is a novel management topic in the tourism industry. Fig. 2 depicts a theoretical framework for TSCM research. This framework is developed to guide research efforts and provide insights for managerial practices. The theoretical support for the framework is offered below. Because of space limitations, detailed analysis of the relevant literature is omitted. Instead, a brief taxonomy of the literature is given in Table 1.

4.1. Objectives of TSCM

Goal setting is the first step of TSCM. To set goals, the major driving forces (objectives) behind TSC linkages need to be identified. These drivers can include, but are not limited to, tourist satisfaction, tourism sustainability, monetary value, demand uncertainty, and inventory reduction.

The ultimate goal of a TSC is tourist satisfaction, or more generally, customer satisfaction. Tourist satisfaction is the degree to which tourists are satisfied with the tourism products and services received, and can be examined from two perspectives. One is the overall satisfaction with the tourism product and the other is the level of satisfaction with the individual service attributes of a specific tourism service encountered. However, tourists usually see a tourism product as a combination of a number of different service components; therefore, the service attributes of a tourism product/service, such as those defined by the SERVQUAL model (Parasuraman, Zeithaml, & Berry, 1988) are treated as linked and interdependent. If the service attributes of a particular tourism product component such as the airline service fails to satisfy tourists, then the overall tourist satisfaction level is negatively affected.

The tourism industry relies heavily on environmental resources, which are freely available and potentially subject to degradation through excessive use. An associated research area is sustainable tourism development. The central problem is to find an equilibrium point between the use and preservation of resources to maintain sustainable tourism development in the destination.

Monetary value is defined as the ratio of tourist revenue to the total cost incurred in the development of the tourism product. It can be enhanced through either increases in sales revenue, market share, and labor productivity or reductions in expenditures and operational costs. Because such value directly reflects the cost efficiency and profitability of a supply chain, it is the most widely used objective of supply chain management. Monetary value is of special importance for a TSC. As noted, tourism products tend to be perishable and have relatively high fixed costs that are paid in advance to build up a fixed level of capacity. Therefore, increasing monetary value through revenue generation and cost reduction is a key concern of TSCM.

Uncertainty about future demand is one of the most significant characteristics of the tourism industry (Gomez & Sinclair, 1991). It is beyond dispute that demand uncertainty can bring significant monetary losses for the business entities that are involved in a TSC if it is not managed properly. Demand uncertainty is also related to inventory problems in a TSC. As the global economy grows and more and more options exist for tourists, the uncertainty and complexity of the tourism marketplace will increase.
conditions of increased uncertainty and alternatives, organizations in a TSC are more likely to resort to collective action to stabilize their environment.

4.2. Network structure

Understanding of the network configuration of a TSC is a prerequisite for successfully analyzing and managing the TSC. Most of the studies listed in Table 1 propose a TSC structure. Among these structures, that developed by Page (2003) is the most representative. On the basis of Page’s work, we propose a more general TSC network within a destination (see Fig. 3). The downstream end includes tourists from the target market. Travel agents are the retail branches of tourism products, and deal with tourists and tour operators. Travel agents and tour operators can be the same or separate business entities. Tour operators have enormous influence over all of the activities involved in the TSC. They buy individual travel services (such as transport and accommodation) from their suppliers (such as carriers and hotels) and assemble them into holiday packages, which are sold to the public directly or through travel agents (Ujma, 2001).

The first tier of the upstream end of a TSC includes direct suppliers, which directly supply tourism services to intermediaries. Typical direct suppliers include theme parks, shopping centers,

<table>
<thead>
<tr>
<th>Study</th>
<th>Network structure (region)</th>
<th>Main study area (TSC decision)</th>
<th>Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accinelli, Brida, and Carrera et al. (2006)</td>
<td>Local government and tourism organizations</td>
<td>Two-party relationship (tourism industry investments)</td>
<td>Quantitative</td>
</tr>
<tr>
<td>Accinelli, Brida, Carrera, and Punzo et al. (2006)</td>
<td>Tourists and residents</td>
<td>Two-party relationship</td>
<td>Conceptual</td>
</tr>
<tr>
<td>Alford (2005)</td>
<td>The entire TSC (Europe)</td>
<td>Performance measurement</td>
<td>Empirical</td>
</tr>
<tr>
<td>Baloglu and Mangaloglu (2001)</td>
<td>Tour operators and the destinations (USA)</td>
<td>Two-party relationship</td>
<td>Empirical</td>
</tr>
<tr>
<td>Baum and Mudambi (1994)</td>
<td>Tour operators (UK)</td>
<td>Two-party relationship (pricing strategy of tour operators)</td>
<td>Quantitative</td>
</tr>
<tr>
<td>Bimonte and Punzo (2007)</td>
<td>Tour operators and residents</td>
<td>Two-party relationship</td>
<td>Conceptual</td>
</tr>
<tr>
<td>Cacceano and Sarroldi (2001)</td>
<td>Tour operators</td>
<td>Two-party relationship</td>
<td>Quantitative</td>
</tr>
<tr>
<td>Carey et al. (1997)</td>
<td>Tour operators and destinations (UK)</td>
<td>Two-party relationship</td>
<td>Conceptual</td>
</tr>
<tr>
<td>Chung (2000)</td>
<td>Accommodation suppliers</td>
<td>Two-party relationship (pricing strategy of hotel rooms)</td>
<td>Quantitative</td>
</tr>
<tr>
<td>Cobanoglu et al. (2003)</td>
<td>Hotels and tourists (Turkey)</td>
<td>Supply management (supplier selection)</td>
<td>Empirical</td>
</tr>
<tr>
<td>Curtin and Bushy (1999)</td>
<td>Tour operators and destinations (UK)</td>
<td>Two-party relationship</td>
<td>Empirical</td>
</tr>
<tr>
<td>Duliba et al. (2001)</td>
<td>Airlines and travel agencies</td>
<td>Information technology</td>
<td>Case study</td>
</tr>
<tr>
<td>Garcia and Tugores (2006)</td>
<td>Accommodation suppliers</td>
<td>Two-party relationship (choice of quality and prices in hotel services)</td>
<td>Quantitative</td>
</tr>
<tr>
<td>Go and Williams (1993)</td>
<td>The entire TSC</td>
<td>Information technology</td>
<td>Conceptual</td>
</tr>
<tr>
<td>Gomez and Sinclair (1991)</td>
<td>Travel agencies and tour operators (UK)</td>
<td>TSC integration</td>
<td>Case study</td>
</tr>
<tr>
<td>Hadjimilica and Panayi (1997)</td>
<td>One hotel and multiple tour operators</td>
<td>Supply management (supplier selection)</td>
<td>Quantitative</td>
</tr>
<tr>
<td>Han et al. (2004)</td>
<td>Tourism organizations and tourists</td>
<td>Two-party relationship (tourist activity planning decisions)</td>
<td>Quantitative</td>
</tr>
<tr>
<td>Kambustafa (2000)</td>
<td>Hotels and travel agencies (Turkey)</td>
<td>Supply management</td>
<td>Empirical</td>
</tr>
<tr>
<td>Klemm and Parkinson (2001)</td>
<td>Tour operators and the destinations (UK)</td>
<td>Two-party relationship</td>
<td>Conceptual</td>
</tr>
<tr>
<td>Lafferty and van Fossen (2001)</td>
<td>Hotels and airlines</td>
<td>TSC coordination</td>
<td>Case study</td>
</tr>
<tr>
<td>March (1997)</td>
<td>Hotels and travel agencies (Australia)</td>
<td>Supply management</td>
<td>Empirical</td>
</tr>
<tr>
<td>O’Connor et al. (2001)</td>
<td>Airlines/hotels and tour operators</td>
<td>Information technology</td>
<td>Conceptual</td>
</tr>
<tr>
<td>Pearce et al. (2007)</td>
<td>Tour operators and travel agencies (New Zealand)</td>
<td>Supply management</td>
<td>Case study</td>
</tr>
<tr>
<td>Scavarda et al. (2001)</td>
<td>The entire TSC</td>
<td>Performance measurement</td>
<td>Quantitative</td>
</tr>
<tr>
<td>Tapper and Fost (2004)</td>
<td>The entire TSC</td>
<td>Overall management of TSC</td>
<td>Conceptual</td>
</tr>
<tr>
<td>Taylor (1998)</td>
<td>Tourism organizations and tourists (UK)</td>
<td>Two-party relationship</td>
<td>Quantitative</td>
</tr>
<tr>
<td>Taylor (1998)</td>
<td>Tourism organizations and tourists (UK)</td>
<td>Two-party relationship (pricing behavior in package tour industry)</td>
<td>Quantitative</td>
</tr>
<tr>
<td>Thevesen (2004)</td>
<td>Tour operators (Europe)</td>
<td>TSC coordination</td>
<td>Conceptual</td>
</tr>
<tr>
<td>Tsai et al. (2006)</td>
<td>Tour operators and travel agencies (Taiwan)</td>
<td>Supply management</td>
<td>Empirical</td>
</tr>
<tr>
<td>Tse (2003)</td>
<td>Hotels and travel agencies</td>
<td>Supply management</td>
<td>Conceptual</td>
</tr>
<tr>
<td>Wae (2004, 2005)</td>
<td>Excursions</td>
<td>Two-party relationship (capacity investment in the cruise line)</td>
<td>Quantitative</td>
</tr>
<tr>
<td>Wynee et al. (2001)</td>
<td>Travel agencies and tour operators (South Africa)</td>
<td>Information technology</td>
<td>Conceptual</td>
</tr>
<tr>
<td>Yilmaz and Bititci (2006)</td>
<td>The entire TSC</td>
<td>Performance measurement</td>
<td>Conceptual</td>
</tr>
<tr>
<td>Note: the items in parentheses are given only when they are available from the study being considered.</td>
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</tbody>
</table>

**Table 1:** Review of the TSCM literature.
hotels, bars and restaurants, handicraft shops, and transportation operators. A more complex TSC may also include second-tier suppliers, which supply services or products to first-tier suppliers. As noted, non-business entities are also involved in the TSC, one of which is the natural environment or scenery. Another typical player in the TSC is the local government or business association that facilitates public and private sector collaboration through policy intervention.

In addition to the identification of TSC members, issues such as the power relationships and business links among members should also be considered when analyzing the TSC structure.

4.3. Decision variables

TSCM decisions span a large spectrum of an organization’s activities, and can be strategic, tactical, or operational.

- Strategic decisions have long-lasting effects on organizations, and include decisions regarding the tourism taxation policies of the local government, capital investment in the tourism industry, capacity building of tourism facilities, and the entry or deterrence of potential tourism businesses.
- Tactical decisions are made on a medium-term (quarterly or annual) basis by tourism organizations and include purchasing and production decisions, pricing strategies, product differentiation, advertising, and inventory policies.
- Operational decisions mainly concern the weekly or daily endeavors of tourism organizations in tour scheduling, route planning, and issuing quotations on tour products.

4.4. Performance measurement

Effective performance measurement is essential for TSCM. Not only does it influence the activities throughout the chain, it also evaluates the efforts made by TSC members. Given the inherent complexity of a TSC, selecting appropriate performance measures for TSC analysis is particularly critical. Despite the wealth of literature on performance measurement of manufacturing supply chains, little attention has been paid to such measurement in the tourism industry. Most of the relevant literature focuses mainly on the hotel sector (Yilmaz & Bititci, 2006). In their conceptual study, Yilmaz and Bititci (2006) compare performance measures of the manufacturing and tourism industries from a TSC perspective, and propose a general framework for TSC performance measurement.

Performance measures that have been used in supply chain analysis can be categorized as follows.

<table>
<thead>
<tr>
<th>Financial performance</th>
<th>Operational performance</th>
<th>Overall supply chain performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Total cost</td>
<td>- Customer response</td>
<td>- Customer satisfaction</td>
</tr>
<tr>
<td>- Distribution cost</td>
<td>- Manufacturing lead</td>
<td>- Supply chain flexibility</td>
</tr>
<tr>
<td>- Manufacturing cost</td>
<td>- Manufacturing lead time</td>
<td></td>
</tr>
<tr>
<td>- Inventory cost</td>
<td>- Product quality</td>
<td></td>
</tr>
<tr>
<td>- Return on investment (ROI)</td>
<td>- Product availability</td>
<td></td>
</tr>
<tr>
<td>- Total revenue</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>- Profit</td>
<td></td>
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</tr>
</tbody>
</table>

It is clear that the overall performance measurement of a supply chain system involves not just financial or operational measurement. Given the complexity of assessing such a flexible system, various frameworks have been proposed (Chen & Paulraj, 2004). As in other service industries, customer satisfaction (tourist satisfaction, TS) is one of the most important performance measures for the TSC. Tourism researchers have investigated the measurement of overall TS with a particular destination (e.g., Alegre & Cladera, 2006; Kozak, 2001a; Yu & Goulden, 2006) and TS with specific service sectors, such as accommodation (Saleh & Ryan, 1992), restaurants (Chadee & Mattsson, 1996), attractions (Dorfman,
planning and forecasting has become popular in supply chain literature shows that collaborative supply chain sharing among links in a chain. The existing non-tourism related by SCM concepts. It is based on cooperation and information sharing across organizations through a TSC.

are all in agreement with the TSCM philosophy of coordination and forecasting support systems to facilitate the forecasting process and information sharing among the players within a TSC.

5. Opportunities for future investigation

The emerging literature on TSCM has concentrated largely on tourism distribution channels, and especially, on the roles of providers including governments, tourists, and the natural environment. Articles providing an integrated perspective on TSC are currently very limited (see Table 1). However, in the existing studies of SCM in other industries, quantitative methods are those most widely used (see Ganeshan et al., 1999 and Min & Zhou, 2002 for comprehensive reviews of the research methodologies in SCM research). The lack of quantitative studies in TSCM research may be due to the inherent complexity of TSCs and difficulty in establishing quantifiable standards. It is worth mentioning one quantitative method, game theory (GT), which is able to deal with the complexity of TSCM problems. GT has been widely used to understand decision making in economic and social situations in which outcomes depend upon the decisions of two or more decision makers. Many researchers have used GT to study supply chain problems. Cachon and Netessine (2004) provide a comprehensive overview of the application of GT to SCM problems. Research into TSCM using GT has begun to appear recently in the tourism literature and includes the studies of Chung (2000), Song and Yang (in press), Wie (2004, 2005), Yang, Huang, and Song (in press), and Yang, Huang, Song, and Liang (2008).

5.1. Collaborative TSC planning and forecasting

Collaborative planning and forecasting is an approach facilitated by SCM concepts. It is based on cooperation and information sharing among links in a chain. The existing non-tourism related supply chain literature shows that collaborative supply chain planning and forecasting has become popular in supply chain demand management. For example, retailers have initiated collaborative agreements with their supply chain partners to establish collaborative planning and forecasting processes (Li, 2007). However, to the best of our knowledge, this topic has not yet been considered in the TSC literature.

Most studies of tourism demand forecasting have been based on statistical methods and had to rely on the availability and quality of historical data. However, current knowledge about special events or information about the marketing activities of TSC partners is difficult to find for inclusion in statistical models. Two benefits that can be expected from collaborative TSC planning and forecasting are a reduced reliance on historical records and enhanced information sharing among TSC partners. The focus of collaborative TSC planning and forecasting is, therefore, not only on improving forecast accuracy but also on breaking down functional silos and smoothing the information flow along the TSC to benefit the entire TSC and its members.

However, achieving collaborative TSC planning and forecasting is not an easy undertaking. It requires that a variety of participants from various echelons of the chain work together. The first challenge is to establish a trusting relationship among TSC partners, which will encourage them to help each other. The design of the forecasting process and the steps for effective implementation of the process constitute another challenging task. Last but not the least, are technical considerations, such as the establishment of forecasting support systems to facilitate the forecasting process and information sharing among the players within a TSC.

5.2. TSC coordination

Coordination is the opposite of an arms-length relationship in which both parties in a deal act in their own self interest and make their own decisions without consideration of the impacts of these decisions on the other party. Coordination is also different from the fully integrated relationship in which both parties in a deal are integrated as one entity with common objectives. In general, coordination can be regarded as a decision-making strategy of firms to perform tasks to achieve supply chain goals (e.g., maximizing supply chain profit) through contractual arrangements.

In the past two decades, various empirical tourism studies have investigated the integration of businesses within a TSC (e.g., Lafferty & van Fossen, 2001; Theuvsen, 2004). Leaving aside the issue that integration in a real TSC is not easy, full integration of tourism businesses leads to the problem of increased fixed costs and reduced flexibility (Gomez & Sinclair, 1991; Sinclair & Stabler, 1997). In addition, TSC participants are often autonomous and independent enterprises frequently having conflicting objectives. Coordination taking the form of contractual relationships among individual firms in a TSC provides a new opportunity for further research.

As mentioned, TSC coordination can take a variety of forms, ranging from full or partial integration of business processes to contractual arrangements between or among individual firms, either horizontally or vertically. Therefore, studies can be conducted to investigate different programs of TSC coordination. Coordination schemes have been extensively studied in research into supply chains in the manufacturing industry. It would be very interesting and practical to investigate how different types of coordination schemes can help improve the performance of individual enterprises and the entire TSC in different market situations.

5.3. TSC dynamics

Supply chains are dynamic systems that evolve over time. One well-known phenomenon is the fluctuation and amplification of
demand from the downstream to the upstream channel of a supply chain (Forrester, 1961), which is called the bullwhip effect (Lee, Padmanabhan, & Whang, 1997). This effect is due mainly to a lack of information sharing among enterprises (Simchi-Levi et al., 2000; Sterman, 1989). Information sharing can improve interactions among enterprises in supply chains and thus facilitate successful coordination among supply chain participants. Given that tourism is a dynamic industry characterized by changing customer demand, and that tour operators have far greater power to influence the activities throughout the TSC and direct demand than have their counterparts in other industries, the bullwhip effect may be more severe in TSCs. Therefore, the strategy of information sharing in TSCs is worthy of investigation.

TSC dynamics can also be caused by evolving TSC relationships, which, as discussed in Section 3.2, are a very important phenomenon in the tourism industry. A better understanding of such relationships in TSCs would be very helpful for tourism decision makers to achieve efficient and effective TSCM. Studies reviewed in Section 3.2 (Accinelli, Brida, Carrera, & Punzo et al., 2006; Bimonte & Punzo, 2007) have already investigated the evolution of tourist-resident interactions in a destination. More in-depth analysis of TSC dynamics is necessary in the future.

5.4. Integrated product and TSC design

In today’s buyer’s market, many industries face the challenges of providing sufficient product variety to meet diverse customer requirements and responding quickly to dynamic customer needs while maintaining economies of scale and scope within the service provision process. Stan Davis coined the term “mass customization” to describe this new paradigm in his book Future Perfect (Davis, 1987).

To shorten product delivery times and achieve a balance between product customization and an economy of scale, many firms are pursuing specific product design strategies. The most popular product design strategy in the manufacturing industry has been the utilization of the product family and modular product architecture. A product family is a range of products that share a collection of common elements and architecture. The positive impacts of product commonality have been widely demonstrated in a number of studies. For example, it has led to simplified planning and scheduling (Berry, Tallon, & Boe, 1992), lower setup and holding costs (Collier, 1982), lower safety-stock levels (Baker, 1985), and order quantity economies (Gerchak & Henig, 1989). However, utilizing commonality often requires a company to bear the additional costs involved in substitutions and thus reduces profitability (Krishnan & Gupta, 2001) or the range of customer choices (Robertson & Ulrich, 1998). Modular product architecture, however, retains an optimum number of options for a module in configuring the necessary product variety but without leading to such problems as increased supply chain complexity and high inventory levels, which are often associated with product proliferation. In terms of TSCs, the products normally consist of different service components, and the concepts of product families and modular product design are suitable for tourism product development.

Extensive research has shown that coordination among supply chain partners in the early stage of product development benefits the successful development of new products in the era of mass customization (Monczka, Ragatz, & Handfield, 1997; Petersen, Handfield, & Ragatz, 2005; Ragatz, Handfield, & Petersen, 2002; Ragatz, Handfield, & Scannell, 1997). Recent research also shows the advantages of optimizing the product design, process design, and supply decisions in an integrated and simultaneous manner (Huang, Zhang, & Lian, 2005; Rungtusanatham & Forza, 2005). Supplier integration has been well documented in the manufacturing industry. In today’s competitive environment, the sheer number of tourism service suppliers provides abundant input possibilities for tour operators to assemble tour packages, and it is believed that effective integration of suppliers with tourism product development processes could increase the competitive edge of tour operators as well as benefit the TSC as a whole.

6. Concluding remarks

This paper extends the SCM research by focusing on the tourism industry from the systematic perspective of tourism supply chains. TSCM has emerged as an important area in tourism research, and is attracting increasing attention from both the academic and practitioner communities. The paper has set out a new agenda for TSCM research. Under the proposed conceptual framework, the relationships among and performance of individual tourism firms in a tourism supply chain can be investigated based on different cooperation, coordination, and competition strategies and different power and channel structures and market demand functions. In addition, the decision dynamics of enterprises and the supply chain can be studied at the strategic, operational, and tactical levels.

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