

# Tourism Research: A 20-20 Vision



**Edited by**

**Douglas G. Pearce and Richard W. Butler**

## **Tourism supply chain forecasting: a collaborative approach**

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Published by Goodfellow Publishers Limited, Woodeaton, Oxford, OX3 9TJ  
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Design and setting by P.K. McBride

# 9 **Tourism supply chain forecasting: a collaborative approach**

Haiyan Song, Stephen F. Witt and Xinyan Zhang

## **Introduction**

Since demand plays a key role in determining the profitability of tourism businesses, estimates of the future demand for tourism constitute a very important element in all tourism planning activities. As a result, tourism demand forecasting has attracted much attention in both the academic literature and from tourism practitioners (Song and Turner, 2006). Tourism products are often configured from a variety of service providers such as accommodation, transportation and attractions, which form tourism supply chains (TSCs). The fragmented nature of the tourism industry implies that individual firms often rely on cooperating with other private or public organizations, which creates a need for collaboration in tourism demand forecasting.

Unlike traditional forecasting methods, collaborative forecasting is an approach that breaks down the units of analysis and involves reliance on supply chain partners to provide specific and timely information. It is based on cooperation and information sharing between the links in the chain. Accordingly, collaborative forecasting for a TSC requires a variety of people from various echelons of the chain to work together.

This chapter first examines the current situation of tourism demand forecasting and then discusses the potential benefits as well as challenges of collaborative forecasting for the tourism industry. After that, practical solutions for setting up collaborative forecasting in tourism supply chains are put forward. The forecasting methodology and the design of a collaborative TSC forecasting system are described in detail. In order to facilitate the collaborative forecasting process and information sharing, the system is designed as a web-based system and can be established using ASP.NET technology. It should be noted that the discussion in this chapter only relates to a TSC that deals exclusively with package holidays and does not consider supply chains for independent travel.

## Tourism demand forecasting: current status

The past two decades have witnessed great advances in tourism demand forecasting research in terms of the diversity of research focus, depth of theoretical foundation, and advances in forecasting methods. Numerous researchers have been involved in the area of tourism demand forecasting and a wide variety of techniques has been used. Many advanced quantitative tourism demand forecasting models have been developed in the academic literature. This section aims to provide a brief overview of the recent developments in tourism demand forecasting approaches.

Tourism demand forecasts are traditionally generated by either quantitative or qualitative approaches. According to a comprehensive review by Li *et al.* (2005), 420 studies on the topic of tourism demand forecasting were published during the period 1960–2002. Most attention was directed at the development of advanced statistical forecasting methods including both time-series and econometric approaches. Time-series methods use past patterns in data to extrapolate future values and whilst time-series approaches are useful tools for tourism demand forecasting, a major limitation of these methods is that they cannot be used for policy evaluation purposes. By contrast, econometric models, which estimate the quantitative relationship between tourism demand and its determinants, can be used for policy evaluation. The large body of literature that has been published on tourism demand forecasting using modern econometric techniques is reviewed by Li *et al.* (2005).

In a more recent survey, Song and Li (2008) review 121 studies on tourism demand modelling and forecasting published since 2000. In this review, the latest developments in quantitative forecasting approaches are summarized in three categories: time-series models; the econometric approach; and other emerging artificial intelligence (AI) methods such as artificial neural networks, rough set approaches, fuzzy time-series methods, genetic algorithms, and support vector machines. The main advantages of AI techniques is that they do not require any preliminary or additional information about data such as distribution or probability, but their limitations include lack of a theoretical underpinning and being unable to interpret tourism demand from the economic perspective.

Collaborative supply chain forecasting, an approach facilitated by supply chain management (SCM) concepts, has become popular in the non-tourism-related SCM literature (Småros, 2003; Li, 2007). The value of collaborative forecasting lies in the broad exchange of information to improve forecasting accuracy when supply chain members collaborate through joint knowledge of sales promotions, pricing strategies, marketing, and production information. Unlike traditional forecasting, collaborative forecasting is an approach that breaks down the ‘island of analysis’ and involves supply chain partners in providing specific and timely information (Helms *et al.*, 2000). It is based on cooperation and the sharing of information between the links in the chain. However, recent research has mainly focused on conceptual research (Mentzer and Kahn, 1997; Fosnaught, 1999; Helms *et al.*, 2000; Wilson, 2001; Småros, 2003) with scant attention being paid to empirically testing

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