Pricing strategies of tour operator and online travel agency based on cooperation to achieve O2O model

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HIGHLIGHTS

- Study the pricing games based on cooperation between the TO and OTA to achieve O2O model.
- Find the optimal pricing policy for the TO and OTA to maximize the revenue.
- Compare the optimal pricings and revenues in the Stackelberg and Bertrand game.
- Give suggestions to TOs and OTAs on how to cooperate.

ABSTRACT

This paper studies the optimal pricing strategies of a tour operator (TO) and an online travel agency (OTA) when they achieve the O2O model through online sale and offline service cooperation. By constructing a competition model, cooperation conditions, pricing strategies and revenues are analyzed and compared in the Stackelberg and Bertrand game. Results indicate that service level, unit sale commission, service cost coefficient and unit service compensation coefficient have different influences on the TO's and OTA's pricing decisions. When the unit sale commission is greater than the threshold, the TO's and OTA's pricing in the Bertrand game are higher than in the Stackelberg game. Being a leader is the dominant strategy for the TO. In addition, the revenues of TO and OTA in sale and service cooperation are analyzed by numerical examples and some suggestions for establishing cooperation contract are provided.

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1. Introduction

In tourism supply chain, TOs assemble tourism attractions, restaurants, hotels, transportations and its own special services to form packages with competitive price, which are convenient when travelers purchase (Clerides, Nearchou, & Pashardes, 2008; Yang, Huang, Song, & Liang, 2009). With the rapid development of internet and information technology, more and more TOs are offering a point of contact via the World Wide Web, which enables travelers to search for appropriate travel products and services (Kim, Kim, & Han, 2007). As a matter of fact, due to the restrictions of online marketing base, technology, human and other resources, TOs are difficult to attract travelers and achieve online profits (Yao, Ma, & Li, 2014). Meanwhile, OTAs are unable to provide the corresponding store service for packages, which inhibits their further development. However, the key strength of TOs is their ability to provide professional information and personalized advice to travelers on a continuous basis (Walle, 1996). A few large OTAs, which accumulated experience and know-how of e-commerce operation, strengthen their competitive advantages in the market and build up higher entry barriers for new-comers (Huang, 2006). The advice-offering capability of TOs and the attributes of OTAs such as security, ease use are the important factors which will affect the travelers decisions in choosing their packages (Bennett & Lai, 2005; Kim et al., 2007; Law, Leung, & Wong, 2004). In China, the cooperation between TOs and OTAs has occurred, such as ZhongXin TO and Uzai (http://www.uzai.com/), JingJiang TO and Lvmama (http://www.lvmama.com). Through establishing online sale and offline service cooperation, the TOs and OTAs can play resource advantages simultaneously to achieve O2O model. The O2O model includes traditional and e-commerce distribution channels which can supplement each other to provide travelers with the greatest satisfaction (Law et al., 2004; Lu & Liu, 2016), and provide a...
business opportunity for the further development of both TO and OTA. Therefore, what is the cooperation condition for the TO and OTA? How do the TO and OTA design the cooperation contract? How do cooperation parameters impact on the TO’s and OTA’s pricing decisions, demands and revenues? The purpose of this paper is to discuss these issues.

The O2O model, as a new e-commerce business model, combining both online trading and offline experience, has become an important strategy for development of enterprises in recent years (Lu & Liu, 2016). As the major characteristic feature of tourism products is that production and consumption happen simultaneously, the cooperation between OTAs and hotels or airlines makes the tourism O2O model rapid development. Quite a few studies have examined the cooperation problem between hotels or airlines and OTAs and have given suggestions on how to achieve cooperation (Koo, Mantin, & O’Connor, 2011; Guo, Ling, Dong, & Liang, 2013; Ling, Guo, & Yang, 2014; Dong & Ling, 2015; Guo, Zheng, Ling, & Yang, 2014; Xu, He, & Hua, 2014). Although the importance of TO’s advice-offering and OTA’s attributes in travelers’ booking has been demonstrated by some scientific researchers, little literature in the hospitality and tourism fields has studied the pricing problem of cooperation between TOs and OTAs to play advantages of both and achieve O2O model.

To fill this gap and provide some suggestions for TOs and OTAs managers on establishing the O2O model through cooperation, in this paper a competition model is proposed to describe decision interactions consisting of a TO and an OTA. The TO establishes online sale cooperation with the OTA, and the OTA establishes offline service cooperation with the TO at the same time. By constructing a competition model based on O2O model, the cooperation conditions, pricing strategies and revenues of TO and OTA are analyzed and compared in the Stackelberg and Bertrand game.

The rest of this paper is organized as follows. Section 2 reviews the related literature. Section 3 describes the non-cooperation and cooperation between a TO and an OTA and obtains the model equilibriums in the Stackelberg and Bertrand game. Section 4 analyzes the model equilibriums and presents the numerical analyses results. Section 5 concludes this paper by summarizing some of the managerial implications obtained.

2. Literature review

The O2O model involves online channel and offline service, which improves the value and feeling of customer experience as well as improving the operational efficiency of enterprise value chain and utilization efficiency of social resource (Lu & Liu, 2016). A tourism online channel is a powerful platform for travelers to search for a wide variety of travel-related information, and purchase products or services conveniently (Dennis, Sandhu, & Harris, 2002). Offline channels provide much more customized advice, detailed product information by face-to-face counseling.

Considering the preferences of customers and the advantages of offline and online channels, most of firms run dual-channel simultaneously. Multichannel coordination problems and suggestions have been studied. Online channel explored by manufactures can reduce the retailer’s market prices (Hendershott & Zhang, 2006), increase consumer welfare and expand sales (Chiang, Chhajed, & Hess, 2003), improve supply chain performance (Park & Keh, 2003), but pose a threat to retailers. In order to avoid channel conflict and improve service efficiency, Xiao, Dan, and Zhang (2009 & 2010), study cooperation strategies between manufactures and retailers, in which the retailers finish all online channels’ order or manufactures outsource internet channels’ service to retailers. In consideration of the question that whether the retailer provides the same level of service in both channels, Yang and Zhang (2014) pose a service cooperation incentive mechanism in a dual-channel supply chain under service differentiation.

However, it is hard for small or medium-sized or even some large tourism firms to run their own direct online channels independently because of the low popularity, lack of e-commerce operating experience and so on. For example, China Youth Travel Service opened up its online channel AoYou (http://www.aoyou.com/) which had been continuously unprofitable for 8 years.

Online channels play a crucial role in the service and hospitality industry. According to Wu, Law, and Jiang (2013), one-third of the outbound travelers in Hong Kong search for hotel information online, and among them approximately 50% make room reservations through the websites from which they obtain the information. Furthermore, from a survey of 249 leisure travelers, Toh, Dekay, and Raven (2011) find that 80 percent of the travelers search for hotel information using web tools, with more than half making their booking through hotels’ host websites or third-party websites (i.e., OTAs). Yoon, Toon, and Yang (2006) study the impact of e-business on the distribution of airline tickets in Korea and point out that consumers may be disinterested in the Website of an individual service firm because of its small scale, especially in the hospitality industry, and suggest that airlines pay more attention to cooperation with third-party websites. Some researchers have studied the cooperation problems between hotels or airlines and the third party website (Koo et al., 2011; Guo et al., 2013; Ling et al., 2014; Dong & Ling, 2015; Guo et al., 2014; Xu et al., 2014). Koo et al. (2011) point out that the airlines are less likely to use OTA platforms if the airlines have a large loyal consumer base or if the OTA platform is highly competitive. Guo et al. (2013) and Ling et al. (2014) study the optimal pricing strategy for tourism hotels when they operate their online channel by cooperating with a third party website. Pricing is not only a key strategic lever deployed by hotels to manage revenue (Kimes & Chase, 1998) but also an important tool for building and enhancing cooperation.

Owing to the rapid development of economy and the innovation of information technology, travelers’ consumption demand has become more diverse and OTAs cannot rely only on lowering the price to attract consumers. By gathering and organizing information, offline channels can provide scene experience, personal and professional information and advice to meet travelers’ demands on a continuous basis (Kim et al., 2007; Walle, 1996). Despite the impact of technology and the advent of online bookings, this observation still stands, Bitner and Booms (1982) observe that offline channels play a pivotal role in the tourism supply chain. Moreover, opening traditional channels is also difficult for OTAs due to the capital resource, professionals and so on. For example, Uzai (http://www.uzai.com/) discontinued its offline channel, and formed an alliance with ZhongXin TO.

Facing with fierce competition in tourism market, the TOs and OTAs should develop O2O model to provide new profitability opportunity and improve tourists’ satisfaction. As a matter of fact, due to restriction of resources, the TOs and OTAs are difficult to achieve O2O model separately. The OTAs have accumulated great number of tourists, e-commerce operating experience, know-how and other resources while the TOs have many stores with experienced salesmen who can provide professional information and advice to travelers. Considering the resource advantages of both, the cooperation to achieve O2O model between the TOs and OTAs can improve their whole competition advantage and weaken competition. However, no study has addressed the problem of the TOs’ and OTAs’ O2O model by cooperating with each other. In this situation, TOs and OTAs have little information and experience regarding the
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