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Abstract

Purpose – This paper aims to define and demonstrate the importance of crowdsourcing for the improvement of diverse functions of hotels, the advantages and disadvantages of this technique and, specifically, the relevance of crowdvoting for enhancing hotel sales, and diverse hotel performance dimensions.

Design/methodology/approach – A total of 45,103 opinions from Booking.com, a sample of 184 questionnaires addressed to hotel managers and partial least squares (PLS)-path modeling were combined to contrast the hypotheses.

Findings – The results empirically show the direct and positive impact of the opinions of the crowd on the amount of hotel sales that do not depend on physical intermediaries, and the impact that this has on the performance dimensions of hotels.

Practical implications – The paper shows the relevance of following strategies addressed at increasing the customers' recommendations in the main social media or virtual travel agencies, as a mechanism to reduce tourism and hospitality organizations' traditional weaknesses and increase their long-term performance.

Originality/value – The novelty of crowdsourcing, means that few works (although with an explosive increase and with high impact) have focused on this aspect in the literature, especially in the tourism and hospitality literature. The results of our research open new areas of research and contrast the relevance of crowdsourcing and specifically crowdvoting for the success of hotels. In addition, the methodology employed, by mixing the data from a social media, with a questionnaire addressed to managers, can open new ideas for future works.

Keywords Performance, PLS, Crowdsourcing, Booking.com, Crowdvoting, New business models

Paper type Research paper

1. Introduction

Crowdsourcing affects business and commerce both in a positive and negative way. In particular, crowdsourcing is critical for European destinations, local tourism and hospitality organizations, as it can change the power relationship against tour operators and the management of hotels. This work analyzes the importance of crowdsourcing for hotels performance.

With the eruption of new technologies and social media, the participation of people in the behavior of organizations is changing the marketing and management of organizations, and the way of dealing with production and distribution processes (Garrigos *et al.*, 2011).

Many mechanisms have been used traditionally to enhance the participation of the crowd in businesses. For instance, self-serving or other physical processes have substituted the

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employees' work. Moreover, nowadays, virtual techniques permit the participation of the crowd to improve tasks in diverse areas of firms, although the tourism and hospitality literature on open innovation and co-creation is still in its infancy.

One of the main innovative developments is crowdsourcing, conceived as a participative dispersed online process that permits the undertaking of tasks for the resolution of problems (Estellés-Arolas and González-Ladrón-de-Guevara, 2012). Crowdsourcing is critical for the competitiveness of organizations. However, the research about crowdsourcing is limited, especially in our sector.

In an attempt to fill this gap, this article aims to explain the relevance of crowdsourcing techniques for hotels and to empirically demonstrate its impact on hotels' performance, mainly through its indirect effect on changing their power relationship with tour operators and their strategic behaviors. The paper first attempts to explore the importance of the crowd and define crowdsourcing. Therefore, it describes diverse types of crowdsourcing processes, focusing on crowdvoting, the advantages and disadvantages and impacts of these techniques on financial performance. Moreover, the paper analyzes the uses of crowdsourcing by hospitality firms, focusing on the case of Booking.com. Finally, our framework explains and empirically demonstrates the incidence of diverse dimensions of crowdvoting on sales and diverse hotel performance dimensions. The study uses an analysis of 45,103 opinions in the webpage Booking.com, and a questionnaire addressed to 184 hotel managers. Partial least squares (PLS)-path modeling is used to empirically contrast the hypotheses formulated.

2. Theory

2.1 Crowdsourcing

In the new business framework, the management of customers (Garrigos *et al.*, 2012) and the integration of the crowd in the production process of content, goods, storage and server capacity, contacts, connectivity, emotions, tastes, relevance, reputation, feedback and intelligence (Fuchs *et al.*, 2010) is vital. The participation of the crowd in all the processes of a firm has been highlighted, especially with the development of the literature surrounding "crowdsourcing", and with innovative practices implemented by several organizations.

Definitions and advances in crowdsourcing are analyzed deeply by Estellés-Arolas and González-Ladrón-de-Guevara (2012); Garrigos-Simon *et al.* (2015) and recently in a manuscript by Egger *et al.* (2016) which focuses on crowdsourcing in tourism. We conceive crowdsourcing in tourism as the action of taking a specific task or job usually performed by a member of a tourism organization or more broadly termed by a "designated agent", such as an outworker or supplier, and outsourcing it to a community or a large amount of people (mass or crowd or mass) mainly over the Internet. This idea concentrates on capturing and utilizing the capabilities of the mass, as it is posited with the evolved conception of "masscapital", defined as "the capabilities from all the individuals or organizations, related closely or not to the own company or organization, which can help it to innovate or improve any of their activities or processes" (Garrigos and Narangajavana, 2014, p. 27). This does not reduce the idea of crowdsourcing to simple, inflexible open calls, the transmission of intelligence or knowledge, the medium of the Internet or the external stakeholders of organizations.

2.2 Types of crowdsourcing and impacts on performance

Crowdsourcing comprises from the design of a process or product, carrying out R&D, product configuration and development, creating content, solving problems, quality monitoring, advertising, etc., to almost every task in the value chain of an organization. Moreover, the literature relates diverse kinds of crowdsourcing schemes (Brabham, 2013;

Kleemann *et al.*, 2008). Some crowdsourcing initiatives include crowdvoting, creative crowdsourcing, micro-work, crowdfunding, crowdsource workforce management and inducement prize contests (Wikipedia, 2015).

One of the specific techniques that focus on the participation of the crowd is "crowdvoting"(Prpić *et al.*, 2015; Trifu and Croitoru, 2014), where the crowd can be activated "to vote for and give opinions on certain products" (Estellés-Arolas and González-Ladrón-de-Guevara, 2012, p. 198), topics or questions (Schildhauer and Voss, 2014). "Crowdvoting" or "crowd voting" considers that "The crowd's judgment helps organize vast amounts of information" (Noble, 2012, p. 80). As Fähling *et al.* (2013, p. 199) point out, crowdvoting can involve "platforms users for the evaluation of product, ideas, prototypes or designs". Our work analyzes crowdvoting in the hospitality sector by considering the case of Booking.com.

The relationship between crowdsourcing and the performance of the firm is complex, because of the diverse types of crowdsourcing. Considering it generally, crowdsourcing can present problems with knowledge appropriability, or difficulties of applicability with tacit knowledge and information and projects of a secretive nature. It can have ethical problems regarding low paid tasks, fraud in the participations, lack of sufficient and satisfactory contributors (Conley and Tosti, 2014; Whitla, 2009), be affected by organizational resistances (Simula, 2013) or the complexity of managing large volumes of many data with noise. More particularly, by using crowdvoting, the hotels are affected by the power of virtual operators and sometimes by higher cost as we will explain later.

Crowdsourcing is not always able to directly improve the performance of an organization. However, it can exert an indirect influence by developing distinctive competences and innovation (Xu *et al.*, 2015) or by changing organizational and customer behaviors. Moreover, if the main antecedents of hotel performance consider strategy, production, marketing, organization and information technology (IT) issues (Sainaghi, 2010), crowdsourcing can affect them in several ways. Firstly, as a new web-based business strategy (Brabham, 2008), it can affect hotel positioning. Secondly, apart from reducing the oligopolistic power of traditional distributors, crowdsourcing can be used to finance new projects and innovative actions. It can also be used for idea generation or finding novel solutions (Palacios *et al.*, 2016); improving production processes; or generating open innovations or execute tasks, in almost all the processes of a service or product service life-cycle (Estellés-Arolas and González-Ladrón-de-Guevara, 2012; Garrigos *et al.*, 2012). Furthermore, crowdsourcing can provide relatively low costs, high quality and faster solutions. It can foster positive network externalities, reduce the dependence and information asymmetries with suppliers or enhance motivation and incentives, as it implies voluntary participation (Brabham, 2008; Kleemann *et al.*, 2008). Finally, the market orientation and organizational change promoted from the participation of the crowd, and greater exposure to new technologies, produces important changes that also affect performance (Garrigos-Simon *et al.*, 2015). These factors are added to their possible effects on sales and the different behavior of customers, although these aspects have not been analyzed in hospitality yet.

More specifically, crowdvoting benefits from the advantages associated with ratings or valence (numeric value of the product rating) obtained in the crowdvoting process, together with their effects on consumer behavior and consequently firm performance (factors also explained in the literature of reviews and word of mouth, a literature that also concentrates on other aspects such as verbal reviews, variance, volume and the helpfulness of reviews). For instance, as we will explain later, the increase in reviews rating is associated in the literature with an increase in hotel sales (Öğüt and Onur-Taş, 2012; Ye *et al.*, 2009) or hotel prices (Anderson, 2012). Moreover, ratings in social platforms are related to the willingness

to recommend hotels (Stringam *et al.*, 2010); positive consumers' evaluations of perceived value and service quality (Noone and McGuire, 2013); hotel performance measures such as a hotel's revenue per available room and average daily rate (Kim *et al.*, 2015); or financial and economic profitability, for instance, in Spanish hotels (Esturillo-Ruiz, 2016).

2.3 Crowdsourcing in tourism and hospitality, the case of Booking.com

Co-creation is essential to gain a competitive advantage in tourism, as the crowd is able to create new solutions regarding society, markets and tourist organizations as well as the virtual community (Della Corte *et al.*, 2013). More specifically, crowdsourcing, with potential customers, interested parties and experts, can enhance innovation in hotels (Richard *et al.*, 2016).

Although studies on crowdsourcing in hospitality are scarce, crowdsourcing can be used to improve the design and installations of hotels (Richard *et al.*, 2016); to improve the quality of the services and products offered by hotels (Sigala and Marinidis, 2009); to reduce product defects and room maintenance issues in hotels (Richard *et al.*, 2014); to redesign processes; to improve the management of human resources (Erkinheimo and Dombowsky, 2013); to improve the management of inventories; or to spread the brand and image of the firms.

Specifically, crowdsourcing is crucial in marketing functions. Hence, crowdsourcing can be used to obtain information from tourists (Della Corte *et al.*, 2013) and to improve customer relationship management (State and Popescu, 2014); in addition, hotels can develop new models of product and service excellence, personalization and authenticity, and position themselves to successfully adapt to future trends (Richard *et al.*, 2016). This is the case of the Starbucks Idea (Sigala, 2012) used to generate ideas and suggestions, Marriot or Sheraton to generate content (Sigala and Marinidis, 2009) or Starwood Hotels and Resorts to generate marketing campaigns (Prpić *et al.*, 2015).

Moreover, crowdsourcing perspectives also include information for customers in the form of product reviews or uploading information to different networks, virtual travel agencies or specific sites, being the core of some new business models in our industry. This is the case of TripAdvisor, which bases its core business on the use of crowdsourcing and the wisdom of crowds (Lin *et al.*, 2012) to provide qualitative reviews and quantitative evaluations of hotels and other tourism organizations in relation to some issues (Herrero *et al.*, 2015). The ratings are based on reviews by tourists (Lin *et al.*, 2012). Levi and Mokryn (2014) explicitly consider this as a form of crowdvoting process.

In a similar way, and although there is no mention in the literature regarding crowdsourcing in Booking.com, this study considers the platform to be a unique and relevant example of crowdvoting for the hospitality industry. The ratings of Booking.com have been analyzed in the hospitality literature (Chaves *et al.*, 2012; Yacouel and Fleischer, 2012) and, specifically, Spanish hotels (de Albornoz *et al.*, 2011). In fact, the differences between the business model of Booking.com and other online booking engines are small. However, Booking.com concentrates more on hotels, the rooms are paid for in the hotels and the assessment system is different (Chaves *et al.*, 2012). Guest reviews and explicit votes are submitted by customers after their stay at any accommodation booked through this platform (Booking.com, 2015) (a fact that reduces fraud and review manipulation), dimensional information and rankings are broken down by service and are available by customer groups.

In addition, we choose Booking.com because crowdvoting and reviewing is not the same. Hence, Booking.com shows quantitative and direct votes from users, what we call "crowdvoting" and provides quantitative scores for different dimensions of the evaluated firms. Hence, by using Booking.com, customers can observe and monitor the votes and ranks of hotels based on pass guest scoring and compare hotels (Yacouel and Fleischer, 2012).

The importance of this process is essential for Booking.com, but also crucial for the hotels registered on the platform, as the votes about different dimensions of the hotels can affect their sales and performance.

2.4 Formulation of hypotheses

2.4.1 The importance of crowdvoting in the distribution of the sales of hotels. We posit that the hotels that have better votes through Booking.com are able to sell a higher number of their rooms through virtual media, including their own webpage and direct sales to customers.

Travelers increasingly prefer to interact with online travel firms to obtain and evaluate the amount of information about different travel choices, prices, schedules or offers (Law *et al.*, 2015; Pan *et al.*, 2007). These reviews have either negative or positive impacts on a hotel's reputation, decreasing or increasing potential customers (Zhao *et al.*, 2015). Obviously, tourists prefer to choose hotels with better recommendations and votes, which can increase the percentage of sales of the hotels through virtual or their own media. Actually, the literature shows that positive online reviews influence the attitudes and decisions of travelers (Vermeulen and Seegers, 2009). For instance, and apart from other influences of ratings on the behavior of customers, as shown above, Mauri and Minazzi (2013) show a positive correlation between the valence of the reviews and purchasing intention and expectations of the customers. Ye *et al.* (2009), using Ctrip in China, found that a 10 per cent improvement in reviewers' rating boosted online bookings by more than 5 per cent, while Öğüt and Onur-Taş (2012) found that a 1 per cent increase in online customer rating increased sales per room up to 2.60 per cent in Paris and London. Sparks and Browning (2011) stated that, although hotel customers seem to be more influenced by negative reviews, numerical rating details together with positively framed information increases trust and booking intentions. Herrero *et al.* (2015) posit that fostering user content could encourage visiting and using hotel websites. Zhao *et al.* (2015) identified the effect of negative online reviews on booking intentions. Finally, in the Spanish hospitality sector, Smithson *et al.* (2011) found that online visibility had a positive effect on the capture of new clients.

As Booking.com is the world leader travel agency in online travel reservations, and has a large number of reviews per hotel and a large number of hotels receiving reviews, in our view, better votes in this platform should be translated into an increase in the percentage of the sales of these hotels through virtual travel agencies and direct sales. Therefore:

H1. The higher the rating of the hotels in Booking.com, the greater the number of rooms reserved online or directly by the hotel.

2.4.2 The importance of direct and virtual sales for hotels. According to Beritelli and Schegg (2016), the network effect of the numerous online platforms that provide information to customer, is what drives consumer choice and, finally, bookings. Hence, apart from the specific ratings, visibility on internet enhances hotel performance by increasing the occupancy rate and through the capture of new clients (Smithson *et al.*, 2011); the amount of direct and virtual sales is also an indicator of this visibility. However, even recognizing the rising importance of online distribution channels, many hotels still do not fully exploit their own websites as a tool for selling hotel rooms directly, thereby gaining a competitive advantage (Beritelli and Schegg, 2016). This is especially important in many Mediterranean destinations.

Apart from the capture of new clients, the relevance of the amount of direct and virtual sales on hotel performance is important because of its influence on the increment of the power of small and medium hotels as opposed to traditional tour operators, affecting margins and

performance. In addition, they influence the behavior of hotels (the effect of virtual votes on virtual sales is forcing the firms more exposed to direct and virtual sales to increase the quality of their products and focus more on customer needs), which can also effect reputation, prices and, hence, the performance of hotels. This includes other effects related to the influence of the use of IT on the competitiveness and position of hotels as they affect costs or enhance efficiency, service quality and customer satisfaction (Kucukusta *et al.*, 2015; Law *et al.*, 2009; Smithson *et al.*, 2011).

2.4.2.1 Incidence of the amount of direct and virtual sales on the negotiation power of hotels as opposed to tour operators. Bypassing sales through traditional travel agencies and tour operators is especially crucial for hotels. In Mediterranean tourist destinations such as the Valencian Region, small and medium hotel enterprises dominate the market (Bastakis *et al.*, 2004). This kind of firm has certain weaknesses in their management and marketing activities that especially handicap their ability to negotiate their offer and to promote themselves adequately (Bastakis *et al.*, 2004). These weaknesses, added to the perishable characteristics of hospitality products (Zhang *et al.*, 2009), the predominance of "packaged" travel in European tourism and the purchasing power of the European tour operators, which are highly concentrated (both horizontal and vertically, with intense processes of mergers and integrations in the last decades (Berné *et al.*, 2015; Kracht and Wang, 2010) and which nowadays largely control the package tour sector (Berné *et al.*, 2015), impact negatively on the profitability and viability of hotels.

The tour operating industry is changing fast (Schwartz *et al.*, 2008). The present scenario, characterized by an increasingly complex array of intermediaries (Kracht and Wang, 2010) or by a movement toward disintermediation (Law *et al.*, 2015), can be a handicap for hotels. However, the situation in Europe is still characterized by oligopolistic tour operators that pressurize accommodation organizations during negotiations, reducing profit margins, creating coercions and dependence (Ujma, 2001) and jeopardizing their viability (Bastakis *et al.*, 2004). Additionally, the hospitality industry is a very information-dependent industry (Ujma, 2001), as their products cannot normally be examined prior to purchase (Zhang *et al.*, 2009), which has traditionally increased the power of tour operators, as they are the ones that directly interact with tourists.

These situations have forced hotels to look for ways to reduce dependence. Some of the successful ways in the Valencian region have been detailed by Claver-Cortés *et al.* (2007). Accordingly, the hotels that are better facing competitivity belong to a chain, are medium or large size, or have increased their category and base their competitive strategy on dimension and improvement. Nevertheless, nowadays, there are other mechanisms related to the implementation of new technologies (Zhang *et al.*, 2009). In an online environment with customers aiming for informed purchase decisions (Law *et al.*, 2015), these other mechanisms can strengthen hotels. Among these tools, crowdvoting can enhance hotel power, competitiveness and performance, especially for small defenseless companies. In our opinion, by using these tools, the hotels that obtain a larger proportion of their sales avoiding traditional tour operators and travel agencies can increase negotiation power against them, enhancing their margins and performance.

This is explained, firstly, because virtual sales can reduce their dependence on these operators (Porter, 1980), and secondly, because virtual platforms provide a reliable channel of information to potential guests, who can see hoteliers' past service quality and do not have to rely only on the possibly non-extensive agent's or friend's past experience (Yacouel and Fleischer, 2012) when choosing a hotel. This reduces another advantage of traditional tour operators and travel agencies: their direct interaction with tourists (distribution channels use their persuasive power and influence on the behavior of the consumer when deciding sales

(Bastakis *et al.*, 2004), and when deciding whether hotels are included in the set of decision-making models of customers).

2.4.2.2 Influence of the amount of direct and virtual sales on the behavior of hotels to better address the needs of customers. Virtual sales also affect performance by affecting the behavior of hotels. Hence, ratings in the social media, in this case, Booking.com, can force hotels to put more effort into service quality and innovation, and also increase the hotel's reputation, allowing hotels to increase their prices (Öğüt and Onur-Taş, 2012; Yacouel and Fleischer, 2012): facts that should translate into an increase in margins and performance. For instance, Anderson (2012), using Travelocity.com and composite data from online intermediaries, founds that a 1-point increase in a 5-point user review score allows hotel to increase price by 11.2 per cent. Online applications are facilitating individuals' active communication, which is influencing the tourism industry, especially hotels (Sparks and Browning, 2011; Herrero *et al.*, 2015; Zhao *et al.*, 2015). User content could be translated into the perceived image of transparency and confidence in the quality of the service provided by the hotel (Herrero *et al.*, 2015). Hence, hotels exposed to virtual sales are forced to improve quality and innovate.

These improvements are positive as the relationship between hotel ratings, service quality improvement and hotel performance (Narangajavana and Hu, 2008) (although the literature has concentrated mainly on the rating of stars of hotels), quality management, market orientation and performance in hotels (Wang *et al.*, 2012), or even between hotel innovation and performance in Spain (Campo *et al.*, 2014) has been proved. Specifically, Yacouel and Fleischer (2012) demonstrated the positive effect of the score_staff of Booking.com on room prices in London, Paris and Barcelona. The increase in score_staff level enhances reputation, and hence the prices, which could be reflected in increased margins and performance.

Moreover, greater exposure to virtual media is essential. Firstly, because the Internet is considered an important competitive tool in the tourism and hospitality industry (Doolin *et al.*, 2002), for production and marketing, and as a channel to distribute hotels' services or products directly to their clients: this provides the creation of linkages with intermediary companies (Expedia, Booking, etc.) (Buhalis and Licata, 2002), reduces distribution costs and has other effects on companies and customer behavior. For instance, distribution through the internet allows hotels to reduce their costs (O'Connor and Frew, 2004) and increase their revenues (Helsel and Cullen, 2005). According to Kucukusta *et al.* (2015, p. 186), online distribution channels promote tourism products and reaching potential customers without any time or geographical hassle and lower distribution costs. Furthermore, hotels are more exposed to technological turbulence, forcing them to innovate and allowing managers to identify opportunities in advance, face the increased rivalry in better conditions and increase hotel performance (Campo *et al.*, 2014).

Nonetheless, the large number and growing power of virtual platforms can lead to some disadvantages for hotels (Carroll and Siguaw, 2003), as they provide customers with new possibilities for booking a room (O'Connor and Murphy, 2004). In addition, and according to direct inquiries in our hotels, the average commission charged by Booking or Expedia is more that 18 per cent of the price (as they use various company sales tools), which is the average for fees charged by online agencies (ranging from 5 to 30 per cent), but sometimes higher than several traditional sources that only charge about 4 per cent. Moreover, hotels have some other costs with virtual operators (direct fraud, no shows, cancellations or non-conversion rates).

However, despite these costs, and although customers find and purchase on the websites where they find the best rates (Morosan and Jeong, 2008), the greater virtual presence allows

hotels to adapt better and earlier to the new competitive arena, minimizing the domination of intermediaries and enhancing performance by using the internet more optimally, specifically in places with mass tourism (Vich-i-Martorell, 2004). They can also better persuade their customers to book directly from their own website, as clients believe that booking directly from the hotel website is the cheapest price that can be found (Reynolds, 2008; Cronian, 2009). Actually, hotels tend to offer the best rates and incentives in the reservations via their own websites (Law *et al.*, 2015), so presence in the ranking of Booking.com and other platforms can also be beneficial even against these agencies, as some customers only use them to get information and book directly with the hotels if the prices are better. Moreover, according to our hotels, and professional sources such as www.hotelerum.com, virtual agencies are lowering commissions, because of the trend to disintermediation, rivalry and the causalities of hotels in some virtual sources. Actually, hotels will only use Booking.com if they can get more visibility on the Internet and if it is beneficial for them.

Moreover, moving clients to their webs, avoids intermediaries and their power, for instance by avoiding adding intermediaries' costs to the final prices (Jantan *et al.*, 2003), or reducing intermediaries' commissions and other distribution costs (O'Connor and Frew, 2004). This increases hotel margins, or allows hotels to reduce prices, with an effect on increasing sales and customer satisfaction (Carvell and Quan, 2008), also affecting their profitability (Morosan and Jeong, 2008). Moreover, maintaining control of sales and prices by hotels (Carroll and Siguaw, 2003) helps to build customer satisfaction (Jeong and Lambert, 2001) and loyalty and reduce the risk of losing clients to intermediaries (Sigala and Buhalis, 2002). Therefore:

H2. The greater the number of rooms reserved online or directly by the hotel, the better the performance obtained by these hotels.

In Figure 1, we show a graphical representation of the conceptual model.

3. Materials and methods

3.1 Data collection

Our model uses two sources of data. First, data provided by Booking.com (45,103 opinions), to get the rating of the hotels' characteristics from the crowd, for the hotels selected in the sample. Booking.com was chosen because it is the world leader in online hotel reservations, dealing with

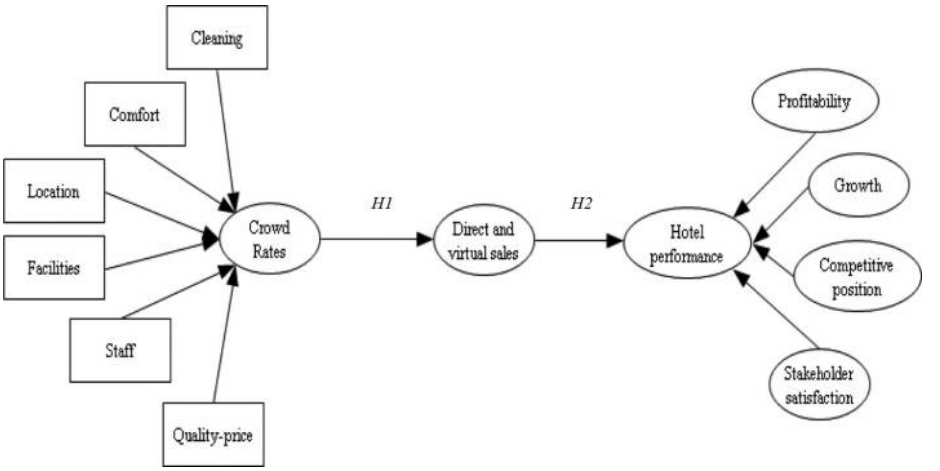

Figure 1.
Research model and hypotheses

more than 900,000 room reservations per day (Booking.com, 2015). In addition, it has a larger number of reviews per hotel and larger number of hotels receiving reviews than other platforms. Moreover, being specialized in hotel reservations, it is in its best interest to provide reliable data on the hotels (Yacouel and Fleischer, 2012). Furthermore, the web provides the quantitative assessment (for the six dimensions analyzed by crowdvotes or crowdrates) from specific votes, for each individual hotel chosen.

In addition, the sample uses data from 201 collected questionnaires, addressed to the managers of the same selected hotels to get the variables regarding the sales obtained directly or by virtual media, and the hotels' performance. As some of them were not completed properly, we used a final sample of 184 valid respondents. We also obtained information from managers about their financial relationship with Booking.com and other search engines (these data, used in the theoretical part, were not introduced in the empirical model).

3.2 Measurement

This study measured the crowdrates by an attributes set of six items from Booking.com and evaluated on a ten-point Likert scale (1 = "strongly disagree" to 10 = "strongly agree"). The factor regarding direct and virtual sales was measured using two items, adapted from O'Connor (2002) and evaluated on a five-category Likert scale ranging from "strongly disagree" (1) to "strongly agree" (5). Ten items were used to measure Hotel Performances, using a five-point Likert scale. An exploratory factor analysis (using the principal component method) with Varimax rotation was applied to the ten items of the performance variable. Results showed that four factors explained 72.32 per cent of the variance (Table I). The four factors are consistent with the measurement of performance in the literature (Profitability, Growth, Competitive position and Stakeholder satisfaction) (Garrigos *et al.*, 2005).

In the proposed research model, "Crowd rates" was conceived as a formative construct (Cleaning, Comfort, Location, Facilities, Staff and Quality-price). "Results" were operationalized as a second-order molar construct, so that its dimensions (Profitability, Growth, Competitive position and Stakeholder satisfaction) become observed variables of the construct.

Items	Profitability	Growth	Competitive position	Stakeholder satisfaction
Prof1	*0.552*	−0.028	0.417	0.481
Prof2	*0.846*	0.262	−0.126	−0.013
Prof3	*0.610*	0.589	−0.039	−0.102
Grow1	−0.186	*0.749*	0.037	0.293
Grow2	−0.074	*0.696*	−0.360	0.120
Grow3	−0.190	*0.733*	−0.196	0.345
Comp1	−0.051	0.257	*0.794*	−0.164
Comp2	0.057	0.442	*0.679*	−0.199
Sati1	−0.177	0.258	−0.009	*0.661*
Sati2	−0.241	0.290	−0.108	*0.585*
Eigenvalues	3.039	1.465	1.271	1.157
Variance explained (%)	25.918	18.129	15.722	13.554
Cronbach's alpha	0.732	0.755	0.717	0.712

Note: Factor loading > 0.50 are in italic

Table I.
Factor analysis of hotel performance

3.3 Data analysis

PLS was used to test the measurement model and the hypotheses because this technique is suitable for models including formative and reflective constructs (Diamantopoulos and Winklhofer, 2001). Smart PLS 2.0 M3 software was used to perform the analysis (Ringle *et al.*, 2008).

The PLS analysis is presented considering the recommendations of Chin (2010) and Wetzels *et al.* (2009).

4. Results

4.1 Measurement model

First, the reliability and validity of the measurement scales were evaluated. Regarding the reflective scales, the factor loadings of each item exceeded 0.6 [except for Prof1 (0.503)], and its corresponding *t*-statistic values were significant, thus considering adequate the individual item reliability (Table II).

Construct/ dimension/ indicator	Variance inflation factor	Weight	Loading	*t*-value (bootstrap)	Composite reliability	AVE
Crowd rates (formative)					n.a	n.a
Cleaning	4.233	0.157				
Comfort	4.006	0.771				
Location	1.294	0.533				
Facilities	3.503	0.967				
Staff	3.377	0.562				
Quality-price	3.184	0.978				
Hotel performance (second-order factor)					n.a	n.a
Profitability	1.348	0.175			0.83	0.71
Prof2			0.800	4.572		
Prof 3			0.877	4.767		
Growth	1.129	0.227			0.84	0.64
Grow 1			0.795	24.856		
Grow 2			0.793	19.982		
Grow 3			0.815	25.108		
Competitive position	1.256	0.502			0.82	0.69
Comp1			0.813	12.443		
Comp2			0.856	25.156		
Stakeholder satisfaction	1.117	0.928			0.80	0.67
Sati1			0.708	7.044		
Sati2			0.921	21.726		
Direct and virtual sales (reflective)					0.87	0.67
Sale1			0.873	5.214		
Sale2			0.764	3.775		

Table II.
Measurement model evaluation

Note: n.a = not applicable

Besides, construct reliability was assessed using composite reliabilities, which were above the recommended level of 0.7 (Nunnally, 1978), demonstrating high internal consistency (Table II).

Finally, discriminant validity is tested through two methods (Gefen and Straub, 2005). First, an examination of the correlations between all measurements and the constructs was performed (cross-loading) and, second, the correlations between the constructs and the average variance extracted (AVE) values of the latent variables were compared. The results indicate that all measurements loaded more highly on the intended construct than on other constructs (Table III). In addition, the AVE calculated for each construct is higher than the square of the correlations between any two constructs (Table IV).

As for the formative measurement scales, a multicollinearity test was carried out using SPSS 22.0 software. Variance inflation factor test results indicated that the values were below the recommended threshold of 5 (Kleinbaum *et al.*, 1988) (Table II).

4.2 Structural model

The structural path coefficients for the proposed model are shown in Table V. Bootstrapping was performed using 5,000 replications from the original sample to obtain t-statistic values (Hair *et al.*, 2011). Besides, the predictive capacity of the model was assessed through explained variance (R^2) for the dependent variables (sales and results), and cross-validated redundancy index (Q^2) for the endogenous reflective constructs (Chin, 2010). The results confirmed that the structural model has relevant predictive power, as Q^2 values were found to be greater than 0 (Table V) and R^2 values were 57.2 and 34.5 per cent.

The outcomes analysis shows that *H1* and *H2* are supported (Table V). Crowdsourcing has a positive and significant impact on virtual sales. Besides, virtual sales also influence positively and significantly results. We can observe that the quality-price, facilities and comfort dimensions (quality-price, weight = 0.978; facilities,

	Direct and virtual sales	Crowdrates	Growth	Competitive position	Hotel performance	Profitability	Satisfaction
Sale1	0.8089	0.5239	0.3406	0.3926	0.5404	0.3205	0.3899
Sale2	0.8357	0.5547	0.2174	0.2095	0.6039	0.2575	0.4543
Prof2	0.251	3,252	0.234	0.146	0.6457	0.7613	0.0573
Prof3	0.2165	0.2263	0.3126	0.101	0.6621	0.917	0.2066
Grow1	0.2142	0.2057	0.8577	0.2594	0.7095	0.2367	0.2272
Grow2	0.3356	0.2865	0.7811	0.3615	0.6783	0.2517	0.1182
Grow3	0.2247	0.2742	0.8137	0.3223	0.6906	0.197	0.1611
Sati1	0.3323	0.3198	0.2319	0.2947	0.7365	0.1801	0.7718
Sati2	0.2361	0.2083	0.21	0.3077	0.7885	0.1571	0.8799
Comp1	0.2949	0.2151	0.3553	0.9055	0.7259	0.1827	0.2582
Comp2	0.2091	0.2801	0.2913	0.7471	0.7358	0.0726	0.1583
Quality-price	0.5356	0.8083	0.3287	0.2269	0.4116	0.2234	0.3111
Comfort	0.5459	0.6795	0.3075	0.2135	0.4551	0.2675	0.3018
Facilities	0.4951	0.6893	0.386	0.2337	0.444	0.2239	0.2932
Cleaning	0.5685	0.5783	0.3529	0.2177	0.4058	0.2308	0.2334
Staff	0.4492	0.6421	0.326	0.2482	0.4302	0.2777	0.2955
Location	0.4783	0.5819	0.3227	0.2159	0.3141	0.207	0.2109

Table III.
Cross-loading

	Crowd rates	Direct and virtual sales	Hotel performance	Growth	Competitive position	Profitability	Stakeholder satisfaction
Crowd rates	*n.a*						
Direct and Virtual Sales	0.291	*0.96*					
Hotel Performance	0.104	0.301	*n.a*				
Growth	0.064	0.073	0.561	*0.64*			
Competitive position	0.114	0.053	0.540	0.103	*0.69*		
Profitability	0.070	0.054	0.474	0.081	0.037	*0.71*	
Stakeholder satisfaction	0.071	0.073	0.602	0.044	0.072	0.030	*0.67*

Table IV.
Discriminant validity coefficients

Notes: Diagonal elements in italic are the AVE; off-diagonal elements show correlations between constructs; n.a = not applicable; all correlations were significant at $p < 0.05$

H0	(β)	Weights	*t*-value (bootstrap)	R^2	Q^2
H1: Crowd rates → Sales	0.291***		3.860		
H2: Sales → Performance	0.301***		4.131		
Formative measures					
Profitability → Performance		0.175	2.005		
Growth → Performance		0.227	2.125		
Competitive position → Performance		0.502	2.292		
Stakeholder satisfaction → Performance		0.928	5.095		
Cleaning → Crowd rates		0.157	2.002		
Comfort → Crowd rates		0.771	3.654		
Location → Crowd rates		0.533	2.203		
Facilities → Crowd rates		0.967	4.123		
Staff → Crowd rates		0.562	2.345		
Quality-price → Crowd rates		0.978	4.526		
Effects on direct and virtual sales				0.345	0.212
Effects on hotel performance				0.572	

Table V.
Structural model results

Note: ***$p < 0.001$

weight = 0.967; comfort, weight = 0.771) contributed to the crowdsourcing evaluation more than other dimensions (staff, location and cleaning). In addition, and focusing on the results, the dimensions that contribute most to this construct were the dimensions related to stakeholder satisfaction and competitive position (stakeholder satisfaction, weight = 0.928; competitive position, weight = 0.502).

5. Discussion and conclusions

5.1 Conclusions

The findings indicate, firstly, that crowdvoting have a positive and direct influence on the increase in direct and virtual sales. Although some authors found that customers are more influenced by negative reviews or votes in hotels (Sparks and Browning, 2011; Zhao *et al.*, 2015), our results are in line with the results of previous investigations in other contexts (Herrero *et al.*,

2015; Mauri and Minazzi, 2013; Sparks and Browning, 2011; Vermeulen and Seegers, 2009; Ye *et al.*, 2009) and indicate the relevance of focusing on crowdsourcing techniques to enhance the sales of hotels.

Secondly, the results show that the amount of direct and virtual sales have a direct and positive effect on hotel performance. This conclusion supports the results from previous studies (Helsel and Cullen, 2005; Morosan and Jeong, 2008; O'Connor and Frew, 2004), and stresses the importance of the focus on the virtual landscape, as it increases market share and reduces distribution costs (Carroll and Siguaw, 2003; Kucukusta *et al.*, 2015; O'Connor and Frew, 2004), reduces intermediations (Law *et al.*, 2015), increases trust (Sparks and Browning, 2011), image and confidence (Herrero *et al.*, 2015), satisfaction (Jeong and Lambert, 2001) reputation and prices (Yacouel and Fleischer, 2012), innovation and the identification of new opportunities (Campo *et al.*, 2014) and broadly enhances relationships and performance (Buhalis and Licata, 2002; Berné *et al.*, 2015).

Moreover, results indicate an indirect influence of crowdvoting on performance. This is consistent with Xu *et al.* (2015), who found that crowdsourcing does not exert direct but indirect influence on performance, by developing innovation distinctive competences; or with Smithson *et al.* (2011) who, in the Spanish hospitality sector, found a positive effect of online visibility on organizational performance, through the capture of new clients and by increasing the occupancy rate.

5.2 Theoretical implications

Our results contrast the theoretical relevance of crowdsourcing and specifically crowdvoting for the success of hotels. In addition, it empirically demonstrates the relevance of crowdvoting on performance, the different effect of the diverse dimensions of crowdvoting on the amount of direct or virtual sales and the different effect of direct and virtual sales on diverse performance dimensions open to new theoretical areas of research.

The findings also have theoretical implications such as positing for not considering crowdsourcing or crowdvoting as homogeneous variables, and open perspectives to study their different effect on diverse measures of performance in depth. Moreover, the results emphasize the importance of crowdvoting in changing the behavior of hotels, and especially the relationship with tour operators in the European context.

In addition, the methodology employed, mixing the data from social media, with a questionnaire addressed to managers, can open new ideas for future works.

5.3 Practical implications

Our study is especially important for practitioners. The empirical results indicate how managers should to behave to improve the situations of their companies. Hence, hospitality managers should realize that the ranking of their hotels in virtual platforms is not casual, but explained by their specific strategic actions, and their focus on increasing their sales directly or through virtual agents (Beritelli and Schegg, 2016; Smithson *et al.*, 2011), and this affects hotel performance (Kim *et al.*, 2015). Therefore, managers should become conscious of the importance of expending more resources on improving quality and innovation issues, especially regarding the design and promotion of their websites, on focusing on policies to improve disintermediation through the virtual media, and especially on hiring and promoting efficient community managers, to improve their rankings. These agents can help directly, by spreading the virtual word of mouth, and with their own comments addressed at enhancing the advantages of their organizations, but also indirectly by indicating weaknesses to their hotels, as perceived

by the customers (Garrigos *et al.*, 2012), helping managers to address effective policies to fit customer requirements.

Furthermore, our results show that the most important elements affecting the amount of direct or virtual sales are those related to quality-price, facilities and comfort dimensions, so managers should concentrate on these dimensions of their internal processes to enhance customer recommendations (Noone and McGuire, 2013). Additionally, our study illustrates that the focus on direct and virtual sales mainly affects the performance dimensions of stakeholder satisfaction and competitive position. A fact which indicates that strategically direct and virtual sales are essential variables because they mainly affect the long-term situations of hotel competitiveness and can improve, for instance, reputation, prices (Anderson, 2012; Öğüt and Onur-Taş, 2012; Yacouel and Fleischer, 2012) or other customer behaviors (Stringam *et al.*, 2010). Therefore, we show the relevance of following strategies addressed at increasing the customers' votes in the main social media or virtual travel agencies, to reduce their weaknesses and increase their long-term performance.

5.4 Limitations and future research

We are conscious of the limitations of our sample and the fact of concentrating on a Spanish Mediterranean market. Further works could expand our work, theoretically or empirically, by developing or improving our model, for instance, including other variables, by concentrating on and theoretically and empirically developing or testing the relevance of some of the ideas considered in the paper, or by extending and implementing them in other geographical contexts. Important research challenges would be to analyze our model in another region; concentrating on some of the dimensions analyzed, or the particular relationship with or between variables such as power relationships, quality, satisfaction, loyalty or image; focusing on the evolution of the impact of crowdvoting in the relationships of power with tour operators; or analyzing other kinds of crowdsourcing processes.

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