# ICT for external use in Croatian four- and five-star hotels

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# ICT FOR EXTERNAL USE IN CROATIAN FOUR- AND FIVE-STAR HOTELS

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**Abstract**
The Purpose – The objective of the paper is to examine the implementation of advanced technology and promotional supports in hotel companies and to compare their performance in four- and five-star hotels. More specifically, ICT for external use are analysed, i.e. customer relationship management (CRM), communication with customers, promotional supports, and online order receptions.
Design/Methodology/Approach – The empirical research took place in 38 upscale (26 four and 12 five-star) hotels located in Croatia, in the regions of Dalmatia, Istria, and Kvarner, and in the city of Zagreb. The data were collected through a structured questionnaire administered mainly during personal interviews with hotel and marketing managers. The SPSS software was used for data analysis.
Findings – Findings reveal a relatively high implementation of technology solutions, reaching promotional supports the highest scores. Four-star hotels perform significantly better than five-star hotels in most of the ICT items.
Originality – The study provides insights into the external role of ICT for upscale hotels from the standpoint of customer relationship management (CRM), communication with customers, promotional supports, and online order receptions as tools for enhancing hotel promotion. These can be used as a valuable source of information between academics and can be additionally useful to marketing managers in hotels that intend to find as more as innovative ways for hotel promotion.
**Keywords** ICT for external use, advanced technology, promotional supports, upscale hotels, Croatia

## INTRODUCTION

Information and Communication Technology (ICT) advancement represents an important source of competitive advantage that provides companies with new management possibilities (Berenguer Contrí, Gil Saura and Ruiz Molina 2009). It is considered as "*the extent to which a firm adopts the most sophisticated technology. It measures the degree of proactive adoption and implementation of advanced IT to find customer solutions ahead of competitors*" (Wu et al. 2006, 495). More specifically, it is "*a term that encompasses all forms of technology utilized to create, capture, manipulate, communicate, exchange, present, and use information in its various forms (business data, voice conversations, still images, motion pictures, multimedia presentations, and other forms, including those not yet conceived*)" (Ryssel, Ritter and Gemünden 2004).

Different ICT devices and solutions such as personal computers (PCs), laptops, tablets, smartphones, social networks and many others have been applied in tourism and hospitality in recent decades. These applications are recognized as contributors to the effectiveness of all hotel processes, particularly to the communication flow efficiency, hotel marketing activities, and guest relationship management (DiPietro and Wang 2010).

Minazzi (2015) identified and categorized the following ICT applications that highly impact tourism and hospitality: Computer Reservation Systems (CRS) in 1970s, Global Distribution Systems (GDS) in 1980s and networking facilities developed via Internet, Extranet, and Intranet in 1990s. The hotel industry has also been taking advantage of social software (i.e. Web 1.0, Web 2.0, and Web 3.0) which enable hotels creating network of countless partners, following the approach of cooperation that furthermore results in inevitable support to marketing strategy reinforcement (Berthon et al. 2012).

Chronologically, more than 20 years ago, ICT in general and Internet technologies in particular have been recognized as the means with a potential to change the modalities of planning, controlling, operating and integrating a majority of hotel activities, including its marketing strategies (Kasavana, Knuston and Polonowski 1997). Since then, numerous research studies have been focusing on the role of ICT in hotel processes, claiming that implemented applications enhance operational effectiveness (Law and Jogaratnam 2005). Accordingly, ICT is considered as an integrated part of hotel marketing strategies which can influence tourists' experience and purchasing behaviour (Chiang and Jang 2006) with a significant potential to change the roles of "play" in the hospitality sector (Gretzel 2010).

Hotel marketing processes are complex and depend on many other associated activities such as customer/guest relationship management, communication with guests, global hotel promotion and hotel reservation process quality. Advanced technology solutions affect these marketing related activities, as further explained. The main purpose of this work is to examine the implementation of different ICT applications for external use that hotels adopt in their marketing strategies in order to attract their (potential) customers.

## 1. LITERATURE REVIEW

### 1.1. Empirical research on Information and Communication Technology (ICT) in upscale hotels

ICT represents one of key investments that are made by hotel firms to enhance their performance (Tsai, Song and Wong 2009). Orientation toward customers and benefits arising from the functionalities of technology applications are stimulating a growing interest in ICT within the entire information-oriented hospitality sector (Buhalis, 2003).

Existing research recognizes the critical role played by ICT in upscale (i.e. four- and five-star) hotels. Some studies approached behavioural intention of employees to adopt ICT (e.g. Lam, Cho and Qu 2007, Kim, Lee and Law 2008), while others considered

the use of social software on the Internet (e.g. Dwivedi, Shibu and Venkatesh 2007). Thus, for example, Lam, Cho and Qu (2007) studied employees' behavioural intentions of ICT adoption in upscale hotels in China and Hong Kong and found that attitude, self-efficacy, and subjective norm have a positive and significant influence on behavioural intention regarding the ICT adoption. Similarly, Kim, Lee and Law (2008) examined an extended technology acceptancy model and confirmed the relevance of a number of variables, such as perceived ease of use, perceived usefulness, attitude towards use, information system quality and perceived value. Further, in their qualitative study on two five-star hotels, Dwivedi, Shibu and Venkatesh (2007) approached the repercussion of social media in the upscale hotel environment and found that hotels are increasingly losing control over the comments that guests leave on social software communities.

Some other studies considered the impact that ICT exerts on hotel performance (e.g. Ham, Kim and Jeong 2005; Šerić and Gil Saura 2012; Šerić, Gil-Saura and Mollá-Descals 2016). Thus, Ham, Kim, and Jeong (2005) approached this topic in 13 five-star hotels and eight four-star hotels in Seoul, Korea. The results revealed that most of the ICT applications, i.e. front and back-office applications and restaurant and banquet management systems, affected significantly and positively the performance of lodging operations, while only guest related interface applications were not significant. Šerić and Gil Saura (2012) showed that, from hotel guests' point of view, ICT effects indirectly customer based brand equity dimensions, i.e. hotel brand image, perceived quality, and brand loyalty. In addition, Šerić, Gil Saura and Mollá Descals (2016) made a step further and examined the direct impact of ICT on these variables on a sample of 335 guests of upscale hotels. They found a positive and significant impact of advanced technology on brand image and perceived quality, but the results failed to demonstrate a direct significant relationship between ICT and brand loyalty.

Moreover, several papers approached the implementation of different ICT solutions in upscale hotels (e.g. Daghfous and Barkhi 2009, Garbin Praničević, Alfirević and Indihar Štemberger 2011, Šerić and Gil Saura 2011, 2012, Ruiz Molina, Gil Saura and Šerić 2013). Daghfous and Barkhi (2009) analysed the adoption of Total Quality Management (TQM), Customer Relationship Management (CRM) and Supply Chain Management (SCM) in UAE four- and five-star hotels and concluded that TQM and CRM were implemented rather similarly among the two hotel categories, while the use of SCM was not as consistent. The study of Garbin Praničević, Alfirević and Indihar Štemberger (2011) examined the state of the information system appliance in large Croatian hotels owned by an upscale hotel chain. The results revealed that 47% of them provided a broadband Internet connectivity, 61% offered some form of integrating guest electronic equipment with the hotel's technology systems, whereas 69% used centralised reservations system. The internal integration of all activities was realised at the level of 47%, while all the others have implemented just a few ICT functionalities, depending on the priorities determined by management. Šerić and Gil Saura (2011) examined the implementation of ICT in eight four-star and nine five-star hotels located in Dalmatia and found a relatively high degree of technology employment for the improvement of internal efficiency of hotel firms. When the two hotel categories were compared, five-star hotels scored higher than four-star hotels regarding the use of some hardware ICT applications (e.g. laptops, personal digital assistants, digital telephones,

touchscreens, point of sale systems) and some equipment for guest service (e.g. interactive TV, DVD and stereo in rooms, ambient intelligence). On the other hand, four-star hotels adopted more of the Internet connection items and some other hardware and software dimensions (e.g. home automation systems, software, security systems, information analysis, simulators, video surveillance). One year after, Šerić and Gil Saura (2012) compared the employment of ICT in upscale hotels in Italy and Croatia and found that upscale hotels in Croatia performed better in ICT. When a single hotel category was considered, ICT performance was better in five-star hotels in Italy, compared to those located in Croatia. However, when only four-star hotels were examined, hotel properties in Croatia showed higher levels of ICT employment. Similarly, Ruiz Molina, Gil Saura and Šerić (2013) compared the implementation of ICT in upscale hotels located in established (i.e. Spain) and emerging (i.e. Croatia) tourist destinations. Although the findings did reveal significant differences in the degree of ICT adoption among hotels located in Spain and Croatia, the authors concluded that these differences were due to the hotel category rather than its location.

Although all these studies represent valuable contributions to the ICT hospitality literature, almost all of them centred on technology applications for internal use or ICT equipment for guest service during their stay in the hotel, meaning that the research on ICT employment for external use remains rather neglected. Only Daghfous and Barkhi (2009) examined some aspects of ICT used for external purpose, but used a rather limited number of items which were unable to provide a more detailed and holistic view on these ICT applications, an issue that is approached in this study.

Further, some papers discussed website features (e.g. Akin, Askin and Tarcan 2002, Blaoglu and Pekcan 2006) and e-mail customer service (e.g. Scheeg, Murphy and Leuenberger 2003) provided by upscale hotels. Akin Askin and Tarcan (2002) found that upscale hotels in the Antalya region in Turkey used their own websites for advertising and easier accessibility. The same study revealed that (i) upscale hotels managers mostly agreed that having questionnaire at websites gave the opportunity to better assess the hotel services in light of customers' expectations and that (ii) the success of hotel was evaluated by the customers, while the success of each department was evaluated separately according to the results achieved. On the other hand, Baloglu and Peckan (2006) claimed that the performance of Turkish upscale hotels in navigation was good, while the interactivity and functionality of their websites were rather questionable. From the marketing standpoint, most of the analysed hotels focused on "tangibilizing their offerings" (p. 173) on their websites, instead of using effectively marketing mix variables, which means that the examined hotel firms implemented rather basic and simple website features. Nevertheless, these studies focused only on website as a promotional support and did not provide insights on other ICT solutions that serve to this purpose, such as promotional CDs and DVDs, informative e-leaflets, e-magazines and multimedia applications, which are all embraced in this study.

Finally, the research of Scheeg, Murphy and Leuenberger (2003) was focused on the quality of e-mail customer service in international luxury hotels, considering two stages of organizational adoption: initiation and implementation. The results demonstrated that North American hotels have passed the initiation stage, reflected by their

significantly higher level of response within e-mail communication. They also revealed that neither North American nor South American hotel properties have moved to the implementation, as showed by rather similar findings regarding the quality of reply. Still, this paper did not consider other aspects of communication with hotel guests, whether through means different than e-mail, whether through different activities adopted through customer relationship management, an aspect that is also considered in this work.

### 1.2. Customer Relationship Management (CRM)

Within the hospitality context, Customer Relationship Management **(**CRM) is considered as an interactive process that includes different business activities directed towards initiating, establishing, maintaining, and developing long-term relations with guests (Reinartz and Kumar 2002). Gebert et al. (2002) highlight that CRM technical solutions are reliable tools for upgrading activities such as: measuring inputs across hotel processes (in terms of customer revenue, profit, and value), acquiring knowledge about guests' behaviours, and applying guest knowledge to continuously improve performance through a process of learning from successes and failures.

Hotels are embracing CRM as a relevant element of business strategy within the customer-centric culture. CRM applications enable precise customer segmentation as well as profiling and targeting of customers (Gurau, Ranchhod and Hackney 2003) and as such present a great potential for any marketing operational plan. Technologies integrated in the data management system facilitate retrieving, processing, and analysing data using different data mining tools. Those data ensure hotel marketing managers to determine guest demographics, guest buying patterns, market segments, and contribution margins (Sigala 2005), and to develop and manage a proper marketing strategy accordingly. The imperative for each hotel marketing strategy should be the integration of CRM solutions across the entire customer experience chain, with intention to achieve real-time customer management by constantly innovating the value proposition to customers (Rygielski, Wang and Yen 2002) which hereafter induce hotel industry structural change (Piccoli et al. 2003).

The CRM solutions also enable data storage of guest information collected by either direct e-mail marketing, either using social networks like Facebook or Twitter as marketing techniques for the content delivery on the Internet (i.e. viral marketing). However, the real CRM implementation as an integral part of marketing strategy demands more than information and communication technology. The guests must become the focal point of the hotel. To complete it, the hospitality staff must learn, understand, and support the shared values required for CRM (Piccoli et al. 2003). In this line, Mohamed, Rashid and Tahir (2014) claim that CRM become a relevant source of competitive advantage only when CRM applications are integrated in marketing competencies required form hotel human resources.

### 1.3. Communication with clients and promotional solutions

From the overall perspective, communication with clients/guests can be managed by different technical means such as phone, fax, e-mail, CD/DVD, websites, e-brochures, e-journals, multimedia, etc. (Ruiz Molina, Gil Saura and Moliner Velázquez 2011). The supporting role of these applications to hotel business strategy and usage has been changed over time (Seybold and Marshak 2010).

In order to enhance communication with clients, hotels frequently establish Data Management Systems (DMS) to archive guest data collected from different solutions such as hotel property information system (PMS), central reservation systems (CRS), website traffic, etc. (Buhalis 2003; 2008). Sigala (2005) argues that ICT needs to be linked with the organizational infrastructure in order to use the information efficiently and avoid that the numerous systems at the customer touch points (e.g. Internet, PMS, CRS, etc.) become "islands" of useless information. Similarly, Sigala, Lockwood and Jones (2000) stress the importance of integration functionalities such as yield management (YM), customer databases, corporate and distribution systems for maximizing yield per individual guest during its travel lifetime, per distribution channel and/or per hotel chain or properties-network.

On the other hand, the purpose of any marketing strategy is to promote its company on the international markets. The technologies with the most adequate potential for achieving this derive from the Internet technologies that are Web 1.0, Web 2.0 and Web 3.0. Firstly, the Web 1.0 refers to the first generation of World Wide Web based on the static approach enabling hotels to design the web sites and limited to publishing hotel information which guest can read (Kaplan and Haenlein 2010). Secondly, the Web 2.0 is the next generation that present the new way of using Web platform and its developed web tools. As an improved web technologies generation, Web 2.0 transposes the approach from the passive mode to the dynamic one (Antonioli, Corigliano and Baggio 2004, Brethon et al. 2012). According to Musser and O'Really (2006), compared to Web 1.0, Web 2.0 is characterized by user/guest participation, openness, and network effects. Web 2.0 is also interpreted as a consumer generated media (Mangols and Faulds 2009) that enables consumers to form online communities and share user generated content (Kim, Jeong and Lee 2010). Finally, the Web 3.0 is called "”the intelligent Web" (Spivack 2013) and refers to technologies based on semantic web, natural language search, data mining, machine learning, and artificial intelligence with potential of increasing promptness of web applications, as well as graphics improvements (Eftekhari, Barzegar and Isaai 2011), three–dimensional experiences, and data interoperability (Gasser and Palfrey 2007). The appliances of Web 3.0 technologies in the tourism sector and hospitality industry are still minimal, while the usage and the relevance of the previous two are quite astonishing.

### 1.4. Hotel reservation systems

Reservation systems are supported by different technical backgrounds and mostly refer to the following ICT solutions: a) specialized applications for the reservation with or without payment options, b) Central Reservation Systems (CRS - Computer Reservation Systems), c) Global Distribution Systems (GDS), d) dynamic packages, e) m-commerce (e-commerce by mobile), f) on line tourism intermediary systems (e.g. Expedia or Booking.com), g) websites that enable comparing prices, g) website with online auctions (activities through which customers can make a reservation at a good price and depending on the offers of other participants) and h) virtual community based on Web 2.0 technologies (Ruiz Molina, Gil Saura and Moliner Velázquez 2011). These technologies present integration of technical innovation in hotel reservation process and produce different effect and benefits to reservation process (Buhalis 2003; 2005; 2008, Turban and Volontino 2010, Brethon et al. 2012).

Venkatraman (1994) developed and discussed five stages of business process transformation in which different technology solutions can support the business process. In this paper we adopt and modify the framework defined by Venkatraman (1994) in the reservation process domain.

In particular, independent/separated application module for hotel reservation system that is not connected with other systems/application modules present the lowest (first) level of ICT support to hotel reservations. Benefits are obtained only locally, i.e. in the department where technology is used. This is so-called *localized exploitation* stage (Venkatraman 1994) which assumes the use of implemented hotel software and hardware to improve the efficiency of a hotel business inducing minimal integration in the reservation process and minimal benefits for the hotel.

The second level of business transformation refers to the *internal integration* stage (Venkatraman 1994). As an extension of local application, it improves the use of automation by upgrading an internal infrastructure. Within the hospitality, it refers to the integrated hotel information systems designed to manage the hotel information from hotel database (or warehouse), allowing a high integration of information flow. The technologies belonging to the second level are related to hotel reservation system with payment options and are integrated with other hotel application modules.

The third level of hotel reservation process transformation corresponds with *business processes redesign* stage (Venkatraman 1994). At this level, benefits of information technology are achieved by changing the existing reservation processes approach. Reservation process is enabled not only through the hotel reservation system, but through other systems such as secured paying systems and global distribution systems (Galileo, Amadeus, Sabre or Worldspan/Travelport) which allow access to the authorized users only.

According to Venkatraman (1994), the fourth level of business transformation, named *restructuring of business network*, facilitates hotel's participation in the market expansion as well as in creation of an extra value added to the product/service. The integration potential and functionalities of information technology is used to extend the

network of the existing hotel reservation access points and to empower the cooperation between the guests and the hotel. Based upon transparency enabled by information technology infiltration in reservation processes in the fourth stage, hotel encourages its own brand which becomes more salient than the competitors' one. The reservation systems belonging to the forth level are related to online tourism intermediary systems (e.g. Expedia.com or Booking.com), tourism websites enabling price comparison, tourism websites enabling online auctions, virtual communities with integrated reservation system and dynamic package websites. The access to reservations systems on this level does not require authorization, i.e. it is free and available to everyone.

The last (fifth) transformation level, i.e. *business scope redefinition* stage (Venkatraman 1994) responds to a strategic question: which technologies need to be implemented to facilitate the approach to new marketing campaigns targets as well as to reach the higher accessibility to hotel reservation? The technologies related to the highest stage of reservation process transformation are hotel mobile applications with potential to support not just hotel reservation, but hotel brand and promotion activities via mobile phones. Having in mind that a number of mobile phone users is growing constantly (according to Srivastava (2014) 2 billion smartphone users are expected by 2021), the quite relevant future mobile technologies support to hotel marketing and promotion activities can be expected.

The stages associated with particular technologies as support to reservation process are enclosed in Exhibit 1.

Exhibit 1: **Stages associated with technologies as support to reservation process**

| TRANSFORMATION STAGE | TECHNOLOGIES SUPPORTING RESERVATION PROCESS |
|---|---|
| **1. Localized exploitation** | • Independent application module for hotel reservation system not connected with other systems/application modules |
| **2. Internal integration** | • Hotel reservation system with payment options and integrated with other hotel application modules only |
| **3. Business processes redesign** | • Hotel reservation systems connected with paying systems and global distribution systems (e.g. Galileo, Amadeus, etc.) |
| **4. Restructuring of business network** | • On line tourism intermediary systems (e.g. Expedia.com or Booking.com)<br>• Tourism websites enabling price comparison,<br>• Tourism websites enabling online auctions<br>• Virtual communities with integrated reservation system (e.g. TripAdvisor)<br>• Dynamic package websites |
| **5. Business scope redefinition** | • Hotel mobile applications |

Source: adapted from Venkartman (1994)

## 2. METHOD

The literature review has proved the considerable impact of ICT on the hotel industry (Daghfous and Barkhi 2009), predicting that successful companies will be those that implement new technologies effectively (Olsen and Connolly 2000). Therefore, the purpose of this study is to examine the implementation of ICT in upscale hotels in Croatia, a country whose tourism sector is at its very peak. Owing to the fact that Croatia is considering tourism as one of the main strategic tools for its development, there is an urgent need to engage new business practices, following international management standards and trends (Petrić 2012). In particular, ICT for external use are examined, i.e. those technology applications that managers use in order to attract customers. Therefore, the following research question is proposed:

*RQ1: What is the level of implementation of ICT for external use in upscale hotels in Croatia?*

We decided to focus on the high-quality, i.e. upscale hotel segment, as these properties are more likely to adopt advanced technology solutions (Sahadev and Islam 2005, Daghfous and Barkhi 2009). In addition, we consider interesting to identify and compare the ICT implementation according to the hotel star classification, which is why we propose the second research question:

*RQ2: Are there any significant differences in implementation of ICT for external use among four- and five-star hotels?*

For construct measurement, we employed the scale of Ruiz Molina, Gil Saura and Moliner Velázquez (2011) to measure ICT for external use. The purpose was to gather information on the intensity of use of ICT by hotel related to its main customer group. Specifically, the scale consisted of the following four external dimensions of ICT: a) customer relationship management, measured by four indicators; b) communication with clients, assessed through five indicators; c) promotional supports, estimated through five indicators; and d) online order reception, assessed through 11 indicators.

The questionnaire was pretested before its final submission and was mainly administered through personal interviews with hotel managers. It consisted of closed questions measured by five-point Likert type scales and was written in English, Croatian, Spanish, and Italian.
The empirical research was conducted in Croatia in the period from June until December 2012. A total of 38 upscale hotels participated in the study, 26 four-star and 12 five-star hotel, all located in the Dalmatia, Kvarner, and Istria regions, as well as in the capital of Zagreb.

## 3. DATA ANALYSIS AND RESULTS

To examine the implementation of ICT in upscale hotels in Croatia, descriptive statistics was carried out for data analysis, using SPSS software (version 17). As depicted in Table 1, from the hotel manager perspective the results reveal a relatively high degree of ICT implementation in upscale hotels in Croatia, thus answering the first research question (RQ1). In general, promotional supports receive the highest mean value (M=3.88), followed by customer relationship management (M=3.74), online order reception (M=3.62), and, finally, communication with clients (M=3.56).

In particular, regarding promotional supports, website (M=4.97) and informative e-leaflet (M=4.24) are highly evaluated, while the lowest assessed item is e-magazine (M=3.00). In addition, direct marketing (M=4.13) and customer information systems/customer database (M=3.97) perform better than the other CRM items, being loyalty programs the lowest assessed CRM aspect (M=3.24). With respect to online order reception, the following items reached high scores: a) use of searchers and metasearchers, such as Expedia and Booking.com (M=4.97), virtual Web 2.0 communities, like TripAdvisor (M=4.68), CRS - Computer Reservation Systems (M=4.55), and GDS - Global Distribution Systems, considered as an advanced application of CRS (M=4.24). On the other hand, the implementation of booking system of tourist destinations (M=2.95), the offer of dynamic packages, i.e. flight+/hotel+/car (M=2.82), and the use of m-commerce, i.e. e-commerce trough mobile (M=2.08) is rather low. Finally, e-mail (M=4.92) and telephone (4.16) are still the most frequently applied means for communication with clients, while automatic voice recognition applications are hardly even used (M=1.97).

Therefore, the results of this study suggest the real revolution within the hotel industry came with the Internet, especially due to the role it plays in information and commercialization of services. In particular, with the new Web 2.0, Internet has become an efficient tool for interaction with hotel guests through virtual communities and social blogs, which is in accordance with some previous studies (Dwivedi, Shibu and Venkatesh 2007, O'Connor 2010, Verma, Stock and McCarthy 2012).

To compare the ICT performance in four- and five-star hotel properties and to provide answer to the second research question (RQ2), the Kolmogorov-Smirnov test was first performed to check the normality of data distribution. According to the results, the data were not normally distributed, as almost all items had critical values lower than .05. Therefore, the Mann-Whitney U test was performed, comparing two independent samples. This test was used to determine whether the obtained differences between the two compared samples are statistically significant (Corder and Foreman 2009) (see Table 1).

Table 1: **Implementation of ICT for external use in Croatian hotels**

| ICT FOR EXTERNAL USE | HOTELS N=38 | | | | FOUR-STAR N=26 | | FIVE- STAR N=12 | | U test |
|---|---|---|---|---|---|---|---|---|---|
| | Min. | Max. | Mean | SD | Mean* | SD | Mean* | SD | p |
| **CRM (CUSTOMER RELATIONSHIP MANAGEMENT)** | **2** | **5** | **3.74** | **.974** | **4.08** | **0.681** | **3.00** | **1.128** | **.010**** |
| ICT1. Customer Information Systems–CIS/customer database. | 2 | 5 | 3.97 | 1.284 | 4.50 | .860 | 2.83 | 1.337 | .001** |
| ICT2. Direct marketing. | 1 | 5 | 4.13 | 1.143 | 4.46 | 1.029 | 3.42 | 1.084 | .005** |
| ICT3. Viral marketing. | 2 | 5 | 3.61 | .755 | 3.73 | .724 | 3.33 | .778 | .051** |
| ICT4. Loyalty programs. | 1 | 5 | 3.24 | 1.460 | 3.62 | 1.134 | 2.42 | 1.782 | .030** |
| **COMMUNICATION WITH CLIENTS** | **2** | **5** | **3.56** | **.577** | **3.61** | **0.511** | **3.47** | **.715** | **.576** |
| ICT5. Telephone. | 3 | 5 | 4.16 | .823 | 4.12 | .909 | 4.25 | .622 | .763 |
| ICT6. Call centre. | 1 | 5 | 3.66 | 1.820 | 4.00 | 1.649 | 2.92 | 2.021 | .079 |
| ICT7. Voice recognition applications. | 1 | 5 | 1.97 | 1.150 | 2.12 | 1.071 | 1.67 | 1.303 | .063 |
| ICT8. Fax. | 1 | 5 | 3.11 | 1.060 | 2.92 | .796 | 3.50 | 1.446 | .068 |
| ICT9. E-mail. | 4 | 5 | 4.92 | .273 | 4.88 | .326 | 5.00 | .000 | .226 |
| **PROMOTIONAL SUPPORTS** | **2** | **5** | **3.88** | **.838** | **4.01** | **.900** | **3.60** | **.627** | **.260** |
| ICT10. Promotional CD/DVD. | 1 | 5 | 3.39 | 1.516 | 3.28 | 1.627 | 3.42 | 1.311 | .796 |
| ICT11. Website. | 4 | 5 | 4.97 | .162 | 5.00 | .000 | 4.92 | .289 | .141 |
| ICT12. Informative e-leaflet. | 1 | 5 | 4.24 | 1.125 | 4.27 | 1.251 | 4.17 | .835 | .228 |
| ICT13. E-magazine. | 1 | 5 | 3.00 | 1.660 | 3.19 | 1.721 | 2.58 | 1.505 | .338 |
| ICT14. Multimedia applications. | 1 | 5 | 3.79 | 1.510 | 4.19 | 1.234 | 2.92 | 1.730 | .006** |
| **ONLINE ORDER RECEPTION** | **2** | **5** | **3.62** | **.628** | **3.63** | **.640** | **3.59** | **.629** | **.937** |
| ICT15. Hotel booking system without payment facilities. | 1 | 5 | 3.68 | 1.876 | 4.31 | 1.490 | 2.33 | 1.969 | .003** |
| ICT16. Hotel booking system with payment facilities. | 1 | 5 | 3.71 | 1.814 | 3.42 | 1.880 | 4.33 | 1.557 | .113 |
| ICT17. CRS systems. | 1 | 5 | 4.55 | 1.132 | 4.50 | 1.140 | 4.67 | 1.155 | .329 |
| ICT18. GDS systems. | 1 | 5 | 4.24 | 1.101 | 4.00 | 1.233 | 4.75 | .452 | .028** |
| ICT19. Booking system of tourist destinations. | 1 | 5 | 2.95 | 1.229 | 3.04 | 1.248 | 2.75 | 1.215 | .429 |
| ICT20. Dynamic packages. | 1 | 5 | 2.82 | 1.270 | 2.81 | 1.297 | 2.83 | 1.267 | .813 |
| ICT21. M-commerce. | 1 | 5 | 2.08 | 1.024 | 2.08 | 1.055 | 2.08 | .996 | .798 |
| ICT22. Searchers and meta searchers. | 4 | 5 | 4.97 | .162 | 4.96 | .196 | 5.00 | .000 | .487 |
| ICT23. Price comparisons/predictors. | 1 | 5 | 3.03 | 1.345 | 2.73 | 1.313 | 3.67 | 1.231 | .034** |
| ICT24. Action webs. | 1 | 5 | 3.08 | 1.531 | 3.27 | 1.710 | 2.67 | .985 | .482 |
| ICT25. Virtual Web 2.0. Communities. | 3 | 5 | 4.68 | .574 | 4.81 | .491 | 4.42 | .669 | .030** |

Notes. * For major visibility mean values are presented instead of mean ranks of the non-parametric test.
** Significance level at 5%

When hotels are compared according to their star classification, significant differences are obtained in the case of all items of CRM, some items of online order reception and one item of promotional supports (i.e. multimedia applications). Surprisingly, four-star hotels performed significantly better than five-star hotels in all CRM aspects, i.e. customer information systems (p=.001), direct marketing (p=.005), viral marketing (p=.051), and loyalty programs (p=.030). Regarding online order reception, two items reached significantly higher scores in four-star hotels, i.e. hotel booking system without payment facilities (p=.003) and virtual Web 2.0 communities (p=.030), while two items were implemented significantly better in five-star hotels, i.e. GDS (p=.028) and price comparisons/predictors (p=.034). With respect to promotional supports, the only item that showed significant difference was the adoption of multimedia applications and it was significantly higher in four-star hotels. Most of the other items of promotional supports (i.e. website, informative e-leaflet, and e-magazine) scored better in four-star than in five-star hotels, although these differences were not statistically significant. Finally, no significant differences are found regarding communication with clients, meaning that four- and five-star hotels implemented this ICT dimension rather similarly.

## CONCLUSION, IMPLICATIONS, AND FUTURE RESEARCH

In the last decade the use of new technologies in the hotel industry has started to be approached not only in terms of productivity, but also in terms of client service and satisfaction (Law and Jogaratnam 2005) and as an incentive to create intra-company, inter-company, and customer relationships (Bai, Jang and Hu 2003, Jang, Hu and Bai 2006, Daghfous and Barkhi 2009) and customer-based brand equity (Šerić, Gil Saura and Ruiz Molina 2014). In this sense, new technologies have facilitated the creation of management of information about the customer (Piccoli 2008) and development of customer loyalty programs (Palmer, McMahon and Beggs 2000, Uncles, Dowling and Hammond 2003). This is why in this study customer-oriented technology are examined, i.e. ICT for external use implemented to attract clients and prospects.

The findings reveal that Croatian hotel implement external ICT rather successfully, especially those related to promotional material. Steel, the use of promotional CD/DVD, e-magazines, and multimedia applications should be enhanced as these applications reached lower scores. In addition, although the examined hotels show a high use of customer databases, the real challenge in the context of hotel companies is not only to develop structured information systems, but to use the collected information effectively in order to customize services according to individual customers' preferences. This finding is line with the considerations of Shoemaker and Lewis, (1998) and Palmer, McMahon and Beggs (2000), who suggested that an efficient use of information on guest profiles, habits and spending patterns will provide superior value to the customer and will stimulate repeat purchase. To reinforce Customer Relationship Management, hotel managers should also develop elaborated marketing techniques using social networks such as Facebook or Twitter for "word of mouth" through Internet, thus enhancing viral marketing. Moreover, the development of loyalty programs should be encouraged as this CRM item obtained the lowest score. Finally, to stimulate online order receptions, hotel IT managers should move towards the

implementation of booking system of tourist destinations, dynamic packages, and m-commerce, as these technology applications seem to be rather neglected. This implies focusing on the fourth and fifth level proposed by Venkatraman (1994). In the first place restructuring of business network to increase the cooperation between hotel and guests. In the second place, business scope redefinition, i.e. defining those technologies that need to be implemented to facilitate the reach of new target as well as a higher accessibility to hotel reservation, paying particular attention to new mobile applications.

Our finding also suggests that, in general, four-star hotels implemented better ICT for external use. One possible explanation for this result might be related with the fact that four-star hotels in Croatia deal in a more competitive environment than five-star properties, which is why they decide to differentiate themselves from direct competitors through ICT and subsequently invest more in advanced technologies. However, it should also be considered that the sample size for four-star hotels (N=26) is substantially bigger than the one for five-star hotels (N=12). If more five-star hotel had participated in the study, different results might have been obtained, which is why the findings need to be interpreted with the caution. Still, this finding is in line with some previous studies that also revealed a better performance of four-star hotel properties instead of five-star ones regarding some ICT aspects. For example, Daghfous and Barkhi (2009) found that more four-star than five-star hotels in UAE had a formally stated ICT strategy. Šerić and Gil Saura (2011) concluded that four-star hotels perform better in some ICT items for internal use than five-star hotels. The study of Ruiz Molina, Gil Saura and Šerić (2013) demonstrated that four-star hotels in Croatia showed the highest scores in employment of the software ICT dimensions for internal efficiency.

Therefore, this study has a number of important implications for the hotel marketing and IT managers, who deal with an increasingly competitive and uniform marketplace where traditional marketing approaches are no longer sufficient to differentiate one hotel from another (Walls, Okumus, Wang, and Kwun 2011). We believe that efficient external ICT implementation should be one of the key marketing practices, especially for five-star hotel properties, and that managers should consider ICT investments in their business strategies, as well as a continuous dialogue with the final customer throughout new social software.

Finally, this study has a series of limitations that should be considered in the future research. This research is limited to hotel managers' perceptions of implementation of external ICT. However, as in the nowadays marketing environment customers are crucial to business strategies, customers' insight on ICT should also be approached. Therefore, the impact of ICT on hotel performance might be analysed from the consumer perspective. In addition, a greater number of hotels should be reached in order to obtain a more representative sample, as both four-star and five-star hotel sample size were rather limited. Finally, measurement scales of the studied concept could also be reconsidered in other geographical areas and tourism contexts.

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