Canterbury Christ Church University's repository of research outputs

http://create.canterbury.ac.uk

Please cite this publication as follows:

Ivanov, S. and Russell, C. (2018) Worth it? The usefulness of information technology to read ID cards and passports for hoteliers in Bulgaria. Tourism and Hospitality Management, 24 (2). ISSN 1330-7533.

Link to official URL (if available):

http://dx.doi.org/10.20867/thm.24.2.1

Contact: create.library@canterbury.ac.uk

STANISLAV IVANOV, PhD, Professor
Varna University of Management,
School of Hospitality and Tourism Management
Oborishte 13A, 9000 Varna, Bulgaria
Phone: +359 885 398 602
E-mail: stanislav.ivanov@vumk.eu

CHRISTOPHER RUSSELL, PhD, Director
Christ Church Business School, Canterbury Christ Church University, North Holmes
Road, Canterbury, Kent CT1 1QU, UK
Phone: +44 1227 921979
E-mail: christopher.russell@canterbury.ac.uk

WORTH IT? THE USEFULNESS OF INFORMATION TECHNOLOGY TO READ ID CARDS AND PASSPORTS FOR HOTELIERS IN BULGARIA

WORTH IT? THE USEFULNESS OF INFORMATION TECHNOLOGY TO READ ID CARDS AND PASSPORTS FOR HOTELIERS IN BULGARIA

Stanislav Ivanov
Christopher Russell

Abstract

Purpose – The case study investigates whether a particular IT is worthwhile, in view of its perceived, potential and actual usefulness. It answers two research questions: *How necessary is an automated ID card/passport reader for hoteliers?* and *Which characteristics of such software do hoteliers most favour?*

Design – Data collection took place in 2013 through an online questionnaire. The sample includes 70 hotel managers in Bulgaria.

Methodology – Kruskal-Wallis χ^2 test and Wilcoxon signed ranks test were used in the data analysis.

Approach – The case study adopted survey as a research strategy. The sample includes only respondents from Bulgaria. Hence, findings are generalisable only in this cultural setting.

Findings – Findings revealed that the most important software characteristics desired by hotel managers are: quality, price, easy to use interface, speed, integration with the existing hotel software and completeness of the extracted data. However, results suggest that there is little necessity of an automated ID card reader due to limited time savings offered by the new technology and few mistakes during the manual entry of ID card/passport data in the information systems of hotels.

Originality of the research – This empirical research practically assesses the viability of specific technology adoption by hoteliers in Bulgaria. This research was implemented by the authors in response to a request by a company that produces software for ID card/passport readers. The results helped the company in its product launch and follow-up marketing strategy.

Keywords technology adoption; automation; card reader; hotels; Bulgaria

INTRODUCTION
Background

This case study presents the results of an applied research project implemented in 2013 on request by a company in Bulgaria that produces software for ID card/passport readers. The company gave the authors permission to present the survey findings in this case study without identifying its name. The company was planning the introduction of a specialised software package that could be installed on any computer with minimal hardware requirements and could transform any scanner into an ID card/passport reader. The target customers were accommodation establishments because they need to input the ID card/passport data of their numerous guests into their information systems correctly and quickly in order to save the time of both customers and employees. The company considered that manual input of data was time consuming and prone to mistakes. Therefore, the company's assumption was that machine reading and automatic input of ID card/passport data into a hotel's information system would eliminate (or at least significantly decrease) the mistakes, speed up the service process and increase tourists' satisfaction with their stay in the hotel. At the time of the research the machine

reading of ID card/passport data required specialised hardware – a card/passport reader – that cost money to purchase, install and maintain. The value proposition of the company was that its software did not require accommodation establishments to invest in additional hardware but they could use their existing scanners and transform them into ID card/passport readers. Before releasing the product, the company wanted to investigate the market potential for automated card reader software in the country and the software package characteristics that customers would consider most valuable. The results from this applied research helped the company improve its product to better suit the needs of its customers, adjust its marketing communications and pricing strategies, and establish itself as one of the current market leaders in Bulgaria. The case study outlines the key findings of this research.

Research rationale

Information technology (IT) can positively impact upon many parts of accommodation establishments' business, from marketing, making reservations, checking-in, catering for customer preferences and checking-out to gathering feedback. However, it does not always: a given technology in a specific hotel may not have a positive impact. As Law *et al.* (2013) suggest, re-phrasing Buhalis and Main (1998)'s finding that hoteliers have been reluctant to adopt IT: 'Perhaps more accurately, the industry has adopted technology when its benefits clearly exceed the expense' (Law *et al.*, 2013, p. 11). Similarly so, Bilgihan *et al.* (2011) state that 'not all IT investments may result in positive outcomes… Hotel companies need to be selective in their IT investment decisions'. In accord with this, this case study researches whether a particular IT is worthwhile, in view of its perceived, potential and actual usefulness. It seeks to answer two research questions:

1. How necessary is an automated ID card/passport reader for hoteliers?
2. Which characteristics of such software do hoteliers most favour?

RELEVANT CONSIDERATIONS FROM THE LITERATURE

In order to help answer these research questions, the extant literature was mined for relevant insights and considerations. With reference to the first research question, whilst studies to date have not considered the use of an automated ID card/passport reader by hoteliers, the broader automation of the registration process through the use of IT has featured. It has been found to increase employee productivity through one or both of: reducing the inputs into the process, i.e. the staff required to check-in guests (Melián-González & Bulchand-Gidumal, 2016); increasing the outputs from the process by enabling staff to focus more on service and meeting clients' requirements rather than the manual process of registration itself (Chathoth, 2007). When combined with less scope for human error (Chathoth, 2007), 'IT will increase the efficiency of registration-related activities of the guest cycle in full service hotels leading to a reduction in transaction costs' (p. 399).

This proposition, of course, is based upon automation of the registration process in its entirety, e.g. through online check-in or check-in kiosks, rather than the automation of tasks within the process via use of a specific IT. It may not therefore prove to be correct for an automated ID card/passport reader. As this proposition also suggests, these studies focused on a particular category of hotel: Chathoth chose full service hotels as they 'amplify the impact of IT' (Chathoth, 2007, p. 396); Melián-González & Bulchand-

Gidumal (2016) focused on the category of four star hotels with more than 200 rooms and 100 employees 'because of its tested IT penetration' (p. 33). Whilst purposely seeking out samples that use such technology can give insight into the costs and benefits associated with its use, it cannot reveal why other categories of hotel might not value such technology.

A more sceptical focus on specific tasks, across a range of hotels in terms of category and current IT, could establish how real those benefits might actually be. That is what this case study seeks to do. Rather than assuming automation of check-in will reduce the staff required to check-in guests (Melián-González & Bulchand-Gidumal, 2016) one could establish the time required to perform the particular tasks of the registration process. Rather than assuming a self-evident reduction in errors (Chathoth, 2007) one could establish how frequently mistakes are made, and how important it is that they are not. Given such benefits one could establish what price hoteliers might be prepared to pay to realise them. The methodology will therefore seek to establish these so as to judge the necessity of an automated ID card/passport reader for hoteliers.

With reference to the second research question, it is important to ascertain which characteristics of such software hoteliers most favour as it may not be possible to deliver all of them at a price they are prepared to pay; there are 'trade-offs between different software qualities' (Wohlin, Lundberg, & Mattsson, 2005, p. 327). Poor quality software might be near useless, as its quality increases it may first become useful and may then have a competitive advantage due to its quality. However, further quality is surplus to requirements and eats into the vendor's profit margins, as the customer has reached the limit of what they are prepared to pay (Barney *et al.*, 2012). Establishing the right prioritisation of software qualities for a product is therefore essential.

In order to provide for the assumed business benefits of increased efficiency and reduced error (Chathoth, 2007), the speed of the software in extracting data from the ID card/passport reader would be key as would the quality of its recognition of data and the completeness of its data extraction. Much software assumes English is the global language (Avgerou, 2002) however, in non-English speaking countries recognition of the local language by an ID card/passport reader could be vital. Technical considerations could also be significant: the compatibility of the reader with ordinary scanners, the need for specialised hardware, the ability to process documents in parallel and the integration of this software with other hotel software packages. Finally, an interface which is easy to use and free from effort could also be important (Davis, 1989). In view of the potential importance of these characteristics for hoteliers, they will feature in the following methodology.

METHODOLOGY
Data collection and instrument
Data collection took place in May and June 2013 by distributing an online questionnaire to the managers of 2025 accommodation establishments in Bulgaria. The contact details of the managers were collected through the country's registry of accommodation establishments, intensive internet searching and utilising industry contacts. The questionnaire included 4 blocks of questions. The first block evaluated the necessity of an automated ID card/passport reader by measuring the time needed to serve guests at

reception during check-in, the frequency of mistakes in inputting their ID data in the information system of the hotel and the importance of accurate data extraction from the ID cards. The second and the third block measured the level of importance of, and the level of satisfaction with, various characteristics of the reader software, namely:

- ✓ *Speed* – how much time is needed to extract the data from the ID card/passport of the guest
- ✓ *Quality* – flawless recognition of data from the document
- ✓ *Completeness* – extraction of all data from the document
- ✓ *Language* – extraction of data in Bulgarian language
- ✓ *Compatibility* – of the reader with ordinary scanners
- ✓ *Parallel processing* – reading several documents simultaneously
- ✓ *Hardware* – need of specialised hardware – reader
- ✓ *Integration* – possibility of quick and easy integration with other hotel software packages
- ✓ *Interface* – intuitive and easy to use interface
- ✓ *Price*

The fourth block collected data about the category, size and location of the accommodation establishment. The questionnaire also measured the respondents' willingness to pay for software for automated ID card/passport data extraction.

Two reminders were sent two and four weeks after the initial invitation. Following Illum, Ivanov and Liang (2010)'s recommendations, all respondents that completed the questionnaire received a link to a complimentary presentation on hotel revenue management prepared by the first author in order to stimulate participation in the survey. Furthermore, no financial and other data that respondents might consider sensitive were collected. The final sample included 70 questionnaires that were used in the analysis, yielding a 3.45% response rate. The low response rate might be attributable to the managers' suspicion of online surveys, inconvenient timing of the research, or the topic being of little interest to the respondents. In any case, the low response rate is typical for hotel managers in this country. Similar response rates from Bulgarian hoteliers were reported in other studies as well (Ivanov, Stoilova and Illum, 2015; Ivanova and Ivanov, 2015; Ivanov, Ivanova and Iankova, 2014). The sample's characteristics are presented in Table 1.

Table 1: Sample characteristics

Grouping criteria	Groups	Number of respondents
Category	1 star	5
	2 stars	11
	3 stars	26
	4 stars	24
	5 stars	4
Location	Urban	32
	Seaside	14
	Mountain	22
	Other/rural/countryside	2
Size	Up to 50 rooms	40
	51-100 rooms	10
	101-150 rooms	9

Over 150 rooms		11	
Total		70	

Data analysis

The Kolmogorov-Smirnov z-test revealed that the responses of hoteliers were not normally distributed for all questions in the survey. That is why the role of category, size and location of the hotel was analysed through the nonparametric Kruskal-Wallis χ^2 test, instead of the parametric ANOVA (Baggio and Klobas, 2011). Wilcoxon signed ranks test was used to identify differences in respondents' answers to some questions.

DISCUSSION OF FINDINGS
Necessity of an automated ID card/passport reader

The necessity of an automated ID card/passport reader in a hotel is determined by three factors: the time to serve the guests at check-in, the importance managers give to complete and accurate ID card/passport data in their hotel's information system, and the frequency of mistakes in inputting such data into the information system. The need for an automated process would be highest:

- ✓ When the time to serve guests during check-in is long and, therefore, there would be huge time savings from the automation of the process;
- ✓ When managers put high emphasis on the completeness and accuracy of the ID card/passport data;
- ✓ When manual data entry leads to numerous mistakes.

If the time to serve guests during check-in is very short, the managers are more tolerant towards incompleteness and inaccuracy of ID card/passport data and there are few negligible mistakes from the manual data entry, the automation of the process would not lead to significant benefits (huge time savings and/or improved data accuracy), meaning that the managers would not be eager to spend money for new software.

Table 2: Necessity of an automated ID card reader

Differences by category, size, and location

	Total mean	Standard deviation	Kruskal-Wallis χ^2 test		
			Category	*Size*	*Location*
Time to serve one guest during check-in [a]	2.91	1.629	3.379	4.700	1.834
Time to input guest's ID card/passport data into hotel's information system [a]	1.17	0.801	18.806***	18.724***	5.173
Time to fill in the address card of the guest [a]	1.48	1.414	26.064***	15.358***	7.196*
Frequency of mistakes when inputting the ID card/passport data into the information system of the hotel [b]	2.49	0.864	7.115	3.748	9.703**
How important is it that the ID card/passport data are correctly input into the information system if the hotel [c]	4.37	0.951	5.463	3.382	1.889
How much would you be willing to pay to automate the process of data extraction	341.07	287.04	12.891**	9.095**	2.588

from the guests' identification documents? [d]	

Research results in Table 2 show that the average time to serve guests during check-in is less than 3 minutes and no statistically significant differences were found among respondents in terms of category, size and location of the accommodation establishment. Filling in the address card and inputting guests' ID card/passport data into hotel's information system take less than 1.5 minutes, meaning that there might not be huge time savings in an eventual automation of the process.

However, the service duration varies by category and size: the managers of the lower category hotels (1 and 2 stars) and the smallest properties (less than 50 rooms) reported longer time to fill in the address cards and to input guests' ID card data into the information system of the hotel and these differences were all significant at $p < 0.01$. Therefore, the time saving potential of automation is highest in small and low category hotels. This variation shows the value of surveying all sizes and categories of hotels rather than only high category(e.g. Chathoth, 2007) and/or large hotels (e.g. Melián-González & Bulchand-Gidumal, 2016).

Respondents reported very high significance of the correctness of ID card/passport data entered into the information system of the hotel (m=4.37) and relatively infrequent mistakes in inputting the data – about 3-4 times a year (m=2.49). Size and category do not seem to influence neither the level of importance nor the frequency of mistakes. On the other hand, managers of seaside accommodation establishments reported less frequent mistakes than the managers of mountain properties ($\chi2=9.703$, $p < 0.05$), probably due to the better training of receptionists at seaside hotels.

In summary, findings revealed that there is little necessity of an automated ID card reader in accommodation establishments in Bulgaria due to two main reasons: first, the time savings the accommodation establishments would benefit from if they adopt the new technology are small, and second, the mistakes during the manual entry of ID card/passport data in the information system of the hotel are too few. Therefore, the marginal benefits of the adoption of the technology (time savings and elimination of mistakes) might not be worth the marginal costs the hotels need to make to adopt this technology (the software licence fees). This might explain the very low average amount of money hoteliers were willing to spend for an automated ID card reader and its software (m=341.07 BGN=174.39 euros), although unsurprisingly the managers of higher category ($\chi2=12.891$, $p < 0.05$) and largest (over 150 rooms) hotels ($\chi2=9.095$, $p < 0.05$) were willing to pay more for licence fees than the manager of lower category and smallest (up to 50 rooms) properties.

Software characteristics

Table 3 presents the preferred characteristics of an automated ID card system according to the respondents, while Table 4 shows the level of satisfaction of the respondents with the characteristics of the software they currently use.

Table 3: Preferred characteristics of an automated ID card reader system
Differences by category, size, and location

Characteristics	Total mean	Standard deviation	Kruskal-Wallis χ2 test		
			Category	*Size*	*Location*
Speed	4.41	0.925	2.972	5.684	1.449
Quality	4.57	0.809	3.683	5.614	2.072
Completeness	4.23	0.995	6.562	3.111	1.173
Language	3.84	1.072	5.270	3.913	1.084
Compatibility	3.91	0.847	4.028	1.467	5.248
Parallel processing	3.66	0.849	7.225	1.395	1.869
Hardware	3.71	1.206	3.948	2.141	1.054
Integration	4.30	1.068	19.420***	11.527***	3.596
Interface	4.43	0.894	19.669***	5.603	6.354*
Price	4.44	0.911	3.703	0.097	2.139

Notes: 1. N=70; 2. Responses on a 5-point scale: 1-completely unimportant, 5-completely important; 3. Grouping of respondents: *Size* (up to 50, 51-100, 101-150 rooms, and over 150 rooms), *Location* (urban, seaside, mountain, other/rural/countryside), *Category* (1, 2, 3, 4, and 5 stars); 4. *** Significant at 1% level; * Significant at 10% level.

Table 4: Level of satisfaction with characteristics of the currently adopted ID card reader system
Differences by category, size, and location

Characteristics	Total mean	Standard deviation	Kruskal-Wallis χ2 test		
			Category	*Size*	*Location*
Speed	3.52	1.110	8.822*	9.738**	5.935
Quality	3.46	1.110	9.419*	10.671**	6.858*
Completeness	3.11	1.215	7.356	0.400	5.149
Language	3.35	1.079	11.733**	5.141	7.031*
Compatibility	3.17	0.973	5.173	1.510	8.238**
Parallel processing	2.91	1.050	2.999	1.361	4.255
Hardware	3.24	1.037	5.315	2.348	5.251
Integration	3.50	1.111	10.237**	7.043*	6.815*
Interface	3.50	1.130	9.470**	5.444	9.556**
Price	3.20	1.088	2.444	5.474	7.312*

Notes: 1. N=46; 2. Responses on a 5-point scale: 1-completely unsatisfied, 5-completely satisfied; 3. Grouping of respondents: *Size* (up to 50, 51-100, 101-150 rooms, and over 150 rooms), *Location* (urban, seaside, mountain, other/rural/countryside), *Category* (1, 2, 3, 4, and 5 stars); 4. ** Significant at 5% level; * Significant at 10% level.

Expectedly, quality (m=4.57), price (m=4.44), easy to use interface (m=4.43), speed (m=4.41), integration with the existing hotel software (m=4.30) and completeness of the extracted data (m=4.23) were regarded as the most important and preferred characteristics of the software, and the Wilcoxon signed ranks test values between them and the less important characteristics (compatibility, language, hardware and parallel processing) were all significant at $p<0.01$. Respondents were quite uniform in their answers and only a few statistically significant differences were identified: the managers of 2-star hotels were less concerned with the integration of the ID card reader software with the other software packages used in the hotel ($\chi2=19.420$, $p<0.01$) and the interface ($\chi2=19.669$, $p<0.01$) than the managers of higher category hotels, while managers of hotels with up to 50 rooms put less emphasis on the software integration than the managers of largest hotels with over 150 rooms ($\chi2=11.527$, $p<0.01$). The explanation for these differences might be the more complex software packages used by high category and large hotels, which make their managers more sensitive towards the integration of new packages with existing ones.

Looking at respondents' level of satisfaction with their currently used software we found that in general the respondents were not satisfied – their level of satisfaction varied from m=2.91 for parallel processing to m=3.52 for speed. Therefore, companies developing software packages for automated ID card/passport readers used by accommodation establishments in Bulgaria need to improve all these characteristics. Minor differences in respondents' answers were identified but as a rule the managers of higher category, largest and urban properties showed higher levels of satisfaction compared to the managers of lower category, smallest and non-urban hotels, probably because the former used more expensive and sophisticated software packages that better suited their needs than the latter. Another explanation might be the greater number of guests served by large, urban and high category hotels, leading to high potential and visible benefits (time savings and minimised mistakes) of an automated ID card reader. This might have created a potential halo effect – the benefits of the software observed by the managers of large, urban and high category hotels might have influenced their level of satisfaction with its characteristics. However, the data set does not allow us to confirm or reject this conjecture which should be subject to future research.

CONCLUSION
Research contribution
This case study contributes to the research literature on IT adoption by hoteliers in two key ways. First, studies to date have tended to focus on the adoption of IT in general terms (Buhalis & Main, 1998; Law *et al.*, 2013, p. 11), for the automation of an entire process (Chathoth, 2007), or have focused on high-end hotels (Chathoth, 2007; Melián-González & Bulchand-Gidumal, 2016); this study looks at a specific IT applied to tasks within a process across the entire range of accommodation establishments of a country. In so doing, this case study reveals a far finer balance of costs and benefits of adoption (Law *et al.*, 2013) than the extant literature suggests (Chathoth, 2007; Melián-González & Bulchand-Gidumal, 2016), and, further, one which varies according to the category and size of establishment. Second, the case study identifies the most important and preferred characteristics of automated ID card/passport readers desired by managers of accommodation establishments. This is important as there are trade-offs between

different software characteristics (Wohlin *et al.*, 2005); the wrong balance can harm a vendor's profit margins (Barney *et al.*, 2012).

Managerial implications
On the supply-side, for managers at software vendors this research reveals the difficulty of their task in selling automated ID card/passport readers, at least within Bulgaria but also possibly in other countries with relatively low labour costs. Larger accommodation establishments already have software which automates the reading of ID cards and passports; smaller accommodation establishments perceive less benefits of such software and are prepared to incur less cost to realise them.

This research also, however, aids software vendors in their task by identifying the most important characteristics desired by managers of accommodation establishments: quality, price, easy to use interface, speed, integration with the existing hotel software and completeness of the extracted data. These should be prioritised in design and development over the less important characteristics of compatibility, language, hardware and parallel processing. Interestingly, the managers of higher category and the largest hotels were more concerned with the integration of the ID card/passport reader software with the other software packages used in the hotel. When combined with the finding that the managers of higher category and the largest hotels were also willing to pay more for licence fees this suggests scope for differentiating a 'pro' or upgraded version targeted at this segment for a premium price. This is what actually happened after the research findings were presented to the company. It developed its product in line with customers' preferences and offered two versions of its product – basic and professional. Product pricing and licencing fees were adjusted to reflect the product's features and customers' willingness to pay. The marketing communications emphasised the product's ease of use, intuitive interface, quick and free integration with existing software packages, reliability and saving of users' time. In fact, the graphic interface of the product was extremely simplified with only three buttons (Scan front, Scan back and Save) in order to allow minimal efforts and avoid human mistakes. The company invested in educating customers to use the software and expanded its target market to banks and law firms. Currently it is one of the leaders in the card reader market in Bulgaria.

On the demand-side, for managers at accommodation establishments this research enables them to compare their views to those of others, and also consider the costs and benefits of ID card/passport reader software which they may not otherwise have done. In contrast to the literature on IT adoption by hoteliers to date, this research suggests a slightly sceptical gaze at new IT on the part of hoteliers may actually be best.

Limitations
The main limitation of this case study is the small sample size. Although the questionnaire required less than 5 minutes to complete, no sensitive data were collected and the respondents were offered an incentive to participate in the survey, only 70 of the contacted potential respondents actually completed the questionnaire. Having said this, it is comparable to other surveys of hoteliers in Bulgaria (e.g. Ivanova and Ivanov, 2015) and other surveys of information technology adoption by hoteliers beyond Bulgaria (e.g. Karadag & Dumanoglu, 2009; Sigala, 2003).

The sample includes only accommodation establishments from Bulgaria and, therefore, the results are generalisable only for this context (Lee & Baskerville, 2003); they will be even less relevant to countries without a legal requirement to capture guests' ID card/passport data (e.g. the United Kingdom). Finally, the case study focuses on the view point of individual hotels' managers, not all of which will have direct, recent, experience of serving a guest during check-in, inputting their ID card/passport data into the hotel's information system and filling in their address card. This limits the accuracy of their estimates of the time required to perform these tasks, and likewise for the frequency of mistakes when inputting the ID card/passport data into the information system of the hotel.

Future research directions

Future research could minimise the limitations of this case study. First, research could focus on the potential halo effect experienced by managers when they use various software packages – the benefits they have from using the software might influence their level of satisfaction with the software characteristics. Second, research could focus, at the other end, on how age and lack of training, identified as significant by Buhalis and Main (1998), and gender, identified as significant by Zhang *et al.* (2014), might influence managers expectancy of the performance of a new information technology and the effort required to use it (Venkatesh *et al.*, 2003). Third, similar research on automated ID card/passport reader could be undertaken with accommodation establishments in other countries. Fourth, future research could survey the perspective of check-in staff, or observe them serving a guest during check-in, inputting the guest's ID card/passport data into the hotel's information system and filling in the guest's address card. Such data could be compared with the perspective of managers in order to more accurately estimate the time required to perform these tasks.

REFERENCES

Avgerou, C. (2002), *Information Systems and Global Diversity*, Oxford University Press, Oxford.

Baggio, R. and Klobas, J. (2011), *Quantitative methods in tourism. A handbook*, Channel View Publications, Bristol.

Barney, S., Petersen, K., Svahnberg, M., Aurum, A. and Barney, H. (2012), "Software quality trade-offs: A systematic map", *Information and Software Technology,* Vol. 54 No. 7, pp. 651-662. https://doi: 10.1016/j.infsof.2012.01.008

Bilgihan, A., Okumus, F., Nusair, K. K., & Kwun, D. J. W. (2011), "Information technology applications and competitive advantage in hotel companies", *Journal of Hospitality and Tourism Technology*, Vol. 2 No. 2, pp. 139-153. https://doi:10.1108/17579881111154245

Buhalis, D., and Main, H. (1998), "Information technology in peripheral small and medium hospitality enterprises: strategic analysis and critical factors", *International Journal of Contemporary Hospitality Management*, Vol. 10 No. 5, pp. 198-202. https://doi:10.1108/09596119810227811

Chathoth, P. K. (2007), "The impact of information technology on hotel operations, service management and transaction costs: A conceptual framework for full-service hotel firms", *International Journal of Hospitality Management*, Vol. 26 No. 2, pp. 395-408. https://doi:10.1016/j.ijhm.2006.03.004

Davis, F. D. (1989), "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology", *Management Information Systems Quarterly*, Vol. 13 No. 3, pp. 319-340. https://doi:10.2307/249008

Illum, S. F., Ivanov, S. and Liang, Y. (2010), "Using virtual communities in tourism research", *Tourism Management*, Vol. 31 No. 3, pp. 335-340. https://doi:10.1016/j.tourman.2009.03.012

Ivanov, S., Ivanova, M. and Iankova, K. (2014), "Sustainable tourism practices of accommodation establishments in Bulgaria: an exploratory study", *Tourismos*, Vol. 9 No. 2, pp. 175-205. https://doi:10.2139/ssrn.2161586

Ivanov, S., Stoilova, E. and Illum, S. F. (2015), "Conflicts between accommodation establishments and travel agencies", *Tourism and Hospitality Research*, Vol. 15 No. 1, pp. 54-70. https://doi:10.1177/1467358414553870

Ivanova, M. and Ivanov, S. (2015), "Affiliation to hotel chains: Requirements towards hotels in Bulgaria", *Journal of Hospitality Marketing & Management*, Vol. 24 No. 6, pp. 601-608. https://doi:10.1080/19368623.2014.915782

Karadag, E. and Dumanoglu, S. (2009), "The productivity and competency of information technology in upscale hotels: The perception of hotel managers in Turkey", *International Journal of Contemporary Hospitality Management*, Vol. 21 No. 4, pp. 479-490. https://doi:10.1108/09596110910955712

Law, R., Leung, D., Au, N., and Lee, H. A. (2013), "Progress and development of information technology in the hospitality industry: evidence from Cornell Hospitality Quarterly", *Cornell Hospitality Quarterly*, Vol. 54 No. 1, pp. 10-24. https://doi:10.1177/1938965512453199

Lee, A. S. and Baskerville, R. L. (2003), "Generalizing generalizability in information systems research", *Information Systems Research*, Vol. 14 No. 3, pp. 221-243. https://doi:10.1287/isre.14.3.221.16560

Melián-González, S. and Bulchand-Gidumal, J. (2016), "A model that connects information technology and hotel performance", *Tourism Management*, Vol. 53, pp. 30-37. https://doi:10.1016/j.tourman.2015.09.005

Sigala, M. (2003), "The information and communication technologies productivity impact on the UK hotel sector", *International Journal of Operations & Production Management*, Vol. 23 No. 10, pp. 1224-1245. https://doi:10.1108/01443570310496643

Venkatesh, V., Morris, M. G., Davis, G. B. and Davis, F. D. (2003), "User acceptance of information technology: Toward a unified view", *Management Information Systems Quarterly*, Vol. 27 No. 3, pp. 425-478. https://doi:10.2307/30036540

Wohlin, C., Lundberg, L. and Mattsson, M. (2005), "Special issue: trade-off analysis of software quality attributes", *Software Quality Journal,* Vol. 13 No. 4, pp. 327-328. https://doi:10.1007/s11219-005-4249-7

Zhang, L., Nyheim, P., & Mattila, A. S. (2014), "The effect of power and gender on technology acceptance", *Journal of Hospitality and Tourism Technology*, Vol. 5 No. 3, pp. 299-314. https://doi:10.1108/JHTT-03-2014-0008