

NEW CHALLENGES IN DIGITALIZATION INNOVATIONS OF TOURISM SERVICES AT THE EXAMPLE OF HOSPITALITY

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Abstract: Digitization in tourism represents a big challenge. Worldwide initiatives are directed towards its application in the service of the industry. Already at the present time, their portfolio is quite broad and gives opportunities for the use of these innovations. The aim of the empirical study was to find out, analytically evaluate and describe the perception of the attractiveness of selected digital tools in hotel rooms and the interest in them. Through questionnaire research as a tool of quantitative research, it approximates the results on a sample of Slovak respondents, who participate in tourism and use the accommodation services regularly. The results point to the fact that digital tools harmonize the offer, but do not represent a highly attractive element without which the tourists could not imagine their stay in accommodation establishments.

Keywords: Digitalization; Tourism; Hospitality services; Digital technologies.

JEL Classification: L83

1. Introduction to the issue of digitization in tourism

Digitalization denotes the application of contemporary information technologies also exist in traveling. One is seeing more and more applications of the term "smart" advancements in social, economic, and technical fields which is produced by big data, open data, and sensors increased communication and sharing of information. As per Höjer and Wangel (2015), what we refer to as the technological is not "smart" technology improvement, but rather the relationship between them synchronization and co-ordinated using of different tools. The importance of digital tourism is related to supporting travel experiences through digital tools. Digitalism means the use of a communication tool, an IT solution that helps satisfy the needs of tourists and improve the competition of organizations and companies in tourism (Benyon et al., 2014). The impact of the recent COVID-19 pandemic on the hospitality industry has been dramatic. There is no doubt that it will never return to the way it was, and the future of the hospitality industry will be characterized by profound structural changes. The suspension of tourism activities has increased the use of digital technologies, and in the post-COVID-19 world, changes in the use of travel services by travellers and an increase in the use of digital tools are expected (Zeqiri et al., 2020). Today, digitization is no longer an innovative process, but a necessity, because it improves communication between entities using digital technology, refers to all economic sectors, including tourism. The digitization of a tourist destination can be viewed both from a procedural and a systemic point of view. However, they do not exclude each other, but complement each other. The authors of Karpova et al. (2020) focused on 10 types of tools: digital marketing, cloud technologies, information support, Internet of Things, virtual tourism, smart area, satellite navigation systems and geographic information systems, electronic document management, artificial intelligence,

big data and some distributed. registration tools. The ability to experience real-time travel via drones, satellite and other technologies could have a major impact on the hospitality industry and lead to new forms of travel. Virtual tourism would help reduce mass tourism and travel, although it depends on consumer understanding of technologies and satisfaction with virtual travel replacing real travel and physical presence at a destination. Virtual reality is also likely to influence travel planning, allowing visitors to visit museums, castles, galleries and other destinations before physical travel (Zeqiri et al., 2020).

1.1. New digital era of hospitality

Technology and digitization cannot be stopped. However, tourism companies can prepare for future challenges with sufficient flexibility and openness. In the tourism of the future, new consumers exhibit new priorities and demands (Miranda et al., 2015). As in any other industry, guests in hotels and restaurants expect a seamless experience – this experience should be available right from making a reservation to providing various hospitality facilities. The level of technology in each of these stages should be advanced or at least at the level of what customers have at home (EHL Insights 2023). As the author Šambronská (2024) states, innovations in the field of tourism, hospitality and destinations have a fundamental impact on their competitiveness and sustainable development. The introduction of innovations brings not only positives, such as the support of business activity (Beresecká, Svetlíková 2022), the expansion of the possibilities of using destinations and the motivation of visitors to a longer stay (Dzurov Vargová 2023), but also certain disadvantages that require a solution and elimination by the management. Innovations in tourism play an important role and often significantly expand the possibilities of businesses in tourism or the destination itself. Considering the rapidly changing trends and dynamics of the current world, it is crucial for managers in this area implement innovative approaches and procedures to successfully respond to new challenges and attract customers. Overall, it is clear that innovation is essential for the sustainable development and success of tourism and destination businesses. As stated by the author Kolesárová et al. (2024), reviewing published studies on digital technologies in the hotel sector after 2011, identified social media, mobile applications, artificial intelligence, self-service technologies and robots, virtual reality, commerce and social commerce, information systems, intelligent systems and front desk technologies as disruptive digital technologies and their applications in the hotel sector. For example, with the development of artificial intelligence (AI), service robots have become more common in the restaurant industry. The hospitality industry in general is focused on creating a more personalized and digitized experience services for consumers. It should limit mass tourism and allow individualization experience and sustainability (Ben Youssef and Zeqiri 2020).

1.2. Possibilities of using digital tools in the hospitality industry

According to Buhalis and Leung (2018), smart hospitality puts customers at the center of the process, providing personalized and contextual services and experiences, and enabling the exchange of information the value chain. Service robots are “system-based, independent and adaptive interfaces that interact, interact and provide services to an organization's customers (Wirtz et al., 2018). Tuomi et al. (2021) suggest that service robots play several roles in the production and delivery of hotel services. For example, in the production process of services, disinfection robots that emit UV rays to kill viruses and bacteria have been announced for use in airports and hotels worldwide to ensure a safe and clean environment (Greg 2020). In the service delivery process, service robots assist front-line employees when they encounter the service. For example, robotic doormen help employees greet customers upon arrival, carry luggage, guide guests and provide room service. Thanks to pre-programmed artificial intelligence and machine learning systems, service robots can

effectively respond to guests and communicate with them even in multiple languages (Zhu et al., 2021). In addition to service bots, online chat bots powered by artificial intelligence are also used to deliver quick responses to customers through real-time chat. Chatbots provide instant responses to customers via mobile apps, hotel websites or social media, greatly improving customer engagement. Chatbots can also be very useful during the current pandemic as housing has been scarce (Zhu et al., 2021). The Sitel Group (Jena 2020) found that customers believed that VR simulations were the best tool for operators in the restaurant industry to create an engaging customer experience. The restaurant industry has seen an increase in virtual reality (VR) applications in recent years. Considering the intangibles of the hospitality experience, VR can have a huge impact on the customer at the booking stage. With a digitally tailored environment, customers have a much clearer idea of what to expect, which attracts more potential customers. One example of a VR application is a virtual tour video that gives guests a first-person perspective of a property. With the click of a mouse or using a headset, guests can experience a digital walkthrough with a 360-degree view and even see the layout of the hotel's rooms. This not only gives customers the opportunity to experience before they book, it also allows the property to benefit from a "try before you buy" marketing strategy. A digital service platform allows guests to browse, select activities that suit them, facilitating seamless integration of technology into their travel experience. Ordering and reservation services, location-based services and personalized communication and social media are some examples of digital services that attract technophiles. There are a number of third-party applications that provide services that customers know and trust (Tossell 2015). Digitization makes more possible ecological "travel" and it is possible that people prefer to avoid it long journeys and multiple contact at airport hubs. To stay relevant, many hospitality companies are offering more online services and allowing virtual visits to museums, galleries, exhibitions, castles, zoos, aquariums and other destinations. Digital tools will continue to be used and developed in accommodation facilities as well. In the future, the hospitality industry will depend even more on digitization and new technologies (Zeqiri et al., 2020).

From above mentioned theoretical background there was an aim to answer the research questions:

- RQ1: Are modern digital tools designed for the hospitality sphere attractive for the tourist?
- RQ2: Are there any difference in the perceived attractiveness of selected digital tools?

2. Main aim and methodology

The aim of the study was to find out, analytically evaluate and describe the perception of the attractiveness of selected digital tools in hotel rooms and the interest in them.

Based on the method of *scientific abstraction*, the theoretical concept of the study was developed. Dominant attention was paid to the digital direction of the tourism industry. More specifically, the principles of using digital tools in the hospitality industry were theoretically described.

Based on the findings from the theoretical concept, specific digital tools that are currently used in the hospitality sphere were selected based on the use of *selection method*. These were the subject of research questions,

The research used *questionnaire research* as a main research method, which investigated the perception of the attractiveness of selected digital tools in hotel rooms and interest in them by using the examples of selected digital tools.

Through *mathematical and statistical methods*, the research results were analysed in the context of identifying differences in the perception of these digital tools in hospitality sphere in terms of selected characteristics of the respondents.

For the purpose of analytical evaluation of the results *Doornik-Hansen* test was used to verify the normality and hypotheses verification verified by *Anova* and *Kruskall Wallis* tests were used.

From the point of view of the form of the questionnaire, it was created in the MS forms platform and for older age categories it was created and distributed in physical form as well. Data collection as a basis for the research was carried out in February and March 2024. Respondents were approached personally, electronically through email addresses and social networks. The online method of collecting responses was more dominant. The available sample in various age categories in the territory of Slovakia was addressed. The sample consisted of 203 people who participated in the survey aged 18-63. The data was collected anonymously and then analysed to identify patterns and trends in the responses. In the questionnaire for specific instruments, a 7-point Likert scale was used to express attractiveness (1- extremely attractive, 2- very attractive, 3- rather attractive, 4- neither attractive - neither unattractive, 5- rather unattractive, 6- very unattractive, 7- maximum unattractive). The gender of the respondents, the age of the respondents and the education of the respondents were monitored as variables. For the purposes of this research, a total of 7 digital tools used in the hotel room were selected. Based on the aim of the study, a hypothesis was formulated.

H0: We assume that there are differences in the attractiveness of specific digital tools in hotel rooms and interest in them.

H1: We assume that there are differences in the attractiveness of specific digital tools in hotel rooms and interest in them, given to the selected characteristics of the respondents.

2.1. Research results interpretation

The research sample of the total number of respondents 203 consisted of respondents fulfilling the condition of participation in tourism and at the same time using the services of accommodation facilities created the dataset. Overall 96 men and 107 women participated in the research. The youngest respondent was in the age of 18 years and the eldest was 63 years old. For the purpose of the evaluation the age categories were divided into to four: adolescence (12-18 years), younger adults (19-29 years), middle-aged adults (30-49 years), older adults (50-64 years). The largest group was made up of respondents with a university education: of the first degree, second degree and the third degree, in total 110 respondents. Secondary education was stated by 93 respondents. As Table 1 (Descriptive statistics of the research sample) shows, the average value, which was the sum of all values in the set, of the binary gender category was 0.52239, the percentage of members of this category in the total sample was 52%. The average age of respondents was 32,070 years.

Table 1: Descriptive statistics of the research sample

	Gender	Age	Education level
Average	0,52239	32,07	1,5473
Median	1	26	2
Minimum	0	16	1
Maximum	1	64	2
Standard deviation	0,50075	12,31	0,499
Variation coefficient	0,95857	0,38386	0,32251
Skewness	-0,08964	0,76557	-0,18991
Pointiness	-1,992	-0,56663	-1,9639

Source: own processing

For testing the normality of each element, 4 different tests were input. The Doornik-Hansen test was chosen in particular. The decision rule of the p-value was the considered level of significance α equal to 0.05. The resulting values were written as a p-value.

Hypothesis H_0 was rejected if $P\text{-value} \geq 0.05$. The variable did not have a normal distribution. Hypothesis H_1 cannot be rejected if $P\text{-value} > 0.05$. The variable has a normal distribution.

If the hypothesis was rejected, the non-parametric Kruskal-Wallis test was further used. If the hypothesis could not be rejected, the parametric One-Factor ANOVA test was used in the evaluation. On the scale, the attractiveness of digital tools in accommodation services was determined using the example of hotel rooms.

H1.1: We assume that there are differences in the attractiveness of specific digital tools in hotel rooms and interest in them, given to the gender of the respondents.

Table 1: Attractiveness of digital tools in hotel rooms according to the gender

Digital tool	p-value	ANOVA X^2	Kruskal-Wallis test
Keys via mobile application	0	-	0,0007
Mobile application for booking service, table, meals, drinks	0	-	0,01
Mobile application for light control	0	-	0
Smart TV	0,0009	-	0,9114
Mobile application for controlling the thermostat, air conditioning and temperature	0	-	0
Smart artificial intelligence for opening windows	0,2567	0,0183	-
Smart artificial intelligence for controlling curtains	0,026	-	0,0857

Source: own processing

H1.2: We assume that there are differences in the attractiveness of specific digital tools in hotel rooms and interest in them, given to the age of the respondents.

Table 2: Attractiveness of digital tools in hotel rooms according to the age

Digital tool	p-value	ANOVA X^2	Kruskal-Wallis test
Keys via mobile application	0	-	0,5799
Mobile application for booking service, table, meals, drinks	0	-	0,7796
Mobile application for light control	0	-	0,9141
Smart TV	0,0009	-	0,2781
Mobile application for controlling the thermostat, air conditioning and temperature	0	-	0,6753
Smart artificial intelligence for opening windows	0,2567	0,474	-
Smart artificial intelligence for controlling curtains	0,026	-	0,7584

Source: own processing

H1.3: We assume that there are differences in the attractiveness of specific digital tools in hotel rooms and interest in them, given to the education level of the respondents.

Table 3: Attractiveness of digital tools in hotel rooms according to the education

Digital tool	p-value	ANOVA X ²	Kruskal- Wallis test
Keys via mobile application	0	-	0,0047
Mobile application for booking service, table, meals, drinks	0	-	0,781
Mobile application for light control	0	-	0,4832
Smart TV	0,0009	-	0,835
Mobile application for controlling the thermostat, air conditioning and temperature	0	-	0,2495
Smart artificial intelligence for opening windows	0,2567	0,1901	-
Smart artificial intelligence for controlling curtains	0,026	-	0,2235

Source: own processing

2.2. Discussion

As can be seen from the results, there were used different methods for evaluation of the attractiveness of the selected digital tools. Kruskal-Wallis test was used as the most effective one.

According to the gender of the respondents, the Anova test was used in one case of the smart artificial intelligence for opening windows, but did not confirm the statistically significant difference. In the case of the other tools tested by the Kruskal-Wallis test, differences in the perception of their attractiveness were found. The most attractive seems to be the Smart tv operated by customers' mobile phone. According to the age of the respondents, the variables did and did not have a normal distribution. Therefore, two tests were used: a parametric one-factor ANOVA and a non-parametric Kruskal-Wallis test. One-factor ANOVA was used for elements whose p-value under normality was higher than the significance level α 0.05. In the case of the age of respondents, there were not found significant differences. Only smart artificial intelligence for opening windows reached the value higher than 0,05. The same result was in the case of education level of the respondents. On the other hand, in the case of education level at the example of tools where the p-value of the normality of the elements were less than the significance level α 0.05 and subsequently was used Kruskal-Wallis test, the differences appeared.

Conclusion

In conclusion, it is possible to summarize that digitization in accommodation services is progressing, but the standards used so far represents an ideal model. Even though the portfolio of tools is expanding, the interest on the part of tourism participants is lower. In general, opinions on these tools are more unified and there are no significant differences in the perception of their attractiveness. Limitation of the study show the possibility to deepen the research and further expand the portfolio of researched digital tools.

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References

1. Ben Youssef, A., Zeqiri, A. (2020) *Hospitality Industry 4.0. and Climate Change*, No. 2020–23, GREDEG Working Papers.
2. Benyon, D., Quigley, A., O'Keefe, B., Riva, G. (2014) *Presence and digital tourism*, AI & Society, 29(4), 521-529.
3. Beresecká, J., Svetlíková, V. (2022) *Performances, creativity and innovation of tourism in the post-pandemic period*. Aktuální problémy cestovního ruchu. Jihlava: Vysoká škola polytechnická, 2022, 21--32. ISBN 978-80-88064-57-2.
4. Buhalis, D., Leung, R. (2018) *Smart hospitality—Interconnectivity and interoperability towards an ecosystem*, International Journal of Hospitality Management, 71 (April), 41–50.
5. Dzurov Vargová, T. (2023) *Digitálnou transformáciou riadené inovácie v turizme so zameraním na spotrebiteľské správanie*. Teoretické a praktické východiská nákupného správania a preferencií spotrebiteľov v kontexte relačného marketingu v procese elektronickej komercie Prešov: Bookman, 2023. 16-31. ISBN 978-80-8165-531-9.
6. EHL Insights. (2023) *Digital transformation in the hospitality industry driving servitization*, [Online], Available: <https://hospitalityinsights.ehl.edu/digital-transformation-facilitating-servitization> [2 Apr 2024].
7. Greg, P. (2020) *What Can Marriott, Hilton or Loews Teach Macy's And Others About COVID Customer Experience Management?* Forbes, [Online], Available: <https://www.forbes.com/sites/gregpetro/2020/09/25/what-can-marriott-hilton-or-loews-teach-macys-and-others-about-covid-customer-experience-management/?sh=5f0fad075847> [2 Apr 2024].
8. Höjer, M. and Wangel, J. (2015) *Smart Sustainable Cities: Definition and Challenges*, In: L. M. Hilty – B. Aebischer (Eds.), *ICT Innovations for Sustainability, Advances in Intelligent Systems and Computing* pp. 333–349, New York, Springer.
9. Jena, T.F. (2020) *Pandemic offers hotels opportunities for innovation*. *Hotel Management*, [Online], Available: <https://www.hotelmanagement.net/tech/pandemic-offers-innovation-opportunities-for-hotels> [1 Apr 2024].
10. Karpova, G.A., Kuchumov, A.V., Testina, Y.S., Voloshinova, M.V. (2020) *Digitalization of a Tourist Destination*, SPBPU IDE '19: Proceedings of the 2019 International SPBPU Scientific Conference on Innovations in Digital Economy, October 2019, Article No.: 39, Pages 1–6.
11. Kolesárová, S., Šenková, A., Kormaníková, E. (2024) *Applications of revolutionary digital technologies in the hotel industry - theoretical overview*, In: *Cestovný ruch: Výzvy a riešenia v riadení, kvalite a udržateľnosti služieb v cestovnom ruchu: „Perspektívy krajín V4“*, scientific collection, ISBN 978-80-555-3271-4.
12. Miranda, J., Mäkitalo, N., Garcia-Alonso, J., Beroccal, J., Mikkonen, T., Canal, C. – Murillo, M. J. (2015) *From the Internet of Things to the Internet of People*, IEEE Internet Computing, 19 (2): 40-47.
13. Tossell, D. (2015) *Developing your digital guest strategy*, [Online]. Available: https://www.hotelexecutive.com/business_review/4192/developing-your-digital-guest-strategy [12 Apr 2024].
14. Tuomi, A., Tussyadiah, I. P., Stienmetz, J. (2021) *Applications and Implications of Service Robots in Hospitality*, Cornell Hospitality Quarterly, 62(2), 232–247.

15. Šambronská, K. (2024) *Innovations and innovative management approaches: theoretical study*, In: Cestovný ruch: Výzvy a riešenia v riadení, kvalite a udržateľnosti služieb v cestovnom ruchu: „Perspektívy krajín V4“, scientific collection, ISBN 978-80-555-3271-4.
16. Wirtz, J., Patterson, P. G., Kunz, W. H., Gruber, T., Lu, V. N., Paluch, S., Martins, A. (2018) *Brave new world: service robots in the frontline*, Journal of Service Management, 29(5).
17. Zeqiri, A., Mounir, D., Adel Ben, J. (2020) *Digitalization of the tourism industry: What are the impacts of the new wave of technologies*, Balkan economic review, Vol. 2, pp. 63-82.
18. Zhu, J., Wang, Y., Cheng, M. (2021) Digital Transformation in the Hospitality Industry, [Online], Available: <https://www.bu.edu/bhr/2021/10/04/digital-transformation-in-the-hospitality-industry/> [2 Apr 2024].