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## CUSTOMER SEGMENTATION AND PERCEPTION OF SERVICE QUALITY IN DIGITAL TOURISM\*

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**Abstract.** Digital communication plays an essential role in shaping customer experience and satisfaction in tourism. This paper focuses on the perception of communication effectiveness and service quality in the context of digital tourism. The main objective is to analyse how selected forms of digital communication and service delivery affect customer perception and whether differences arise between customer segments based on digital literacy and gender. The research was conducted using a questionnaire survey among a sample of 437 respondents from the Slovak Republic. The collected data were statistically processed using the Mann-Whitney U test to verify the hypotheses regarding customer segmentation. The results confirmed that digital literacy significantly influences the perception of communication quality—digitally proficient customers perceive service communication more positively. In contrast, no statistically significant gender differences were found in service satisfaction, neither in product offerings nor in service processes. The findings highlight the importance of tailored digital communication strategies and the potential of more interactive and participative approaches in enhancing customer experience in digital tourism. From the point of view of exploratory behaviour, the exploratory information-seeking dimension turned out to be insignificant. However, the research showed that webroomers prefer exploratory acquisition. The differences between the purchasing channels in terms of other analysed factors also proved to be significant. In all cases, higher tendencies were identified for webrooming. The paper upholds the idea of integrating purchase channels and highlights the need to track the purchase journey of customers who interact with businesses through many different channels and touchpoints, both online and offline. The paper will serve marketers, as a better understanding of customers' purchasing behaviour will help businesses set up more relevant marketing and business strategies, thus improving their market position. Towards the end, the paper presents business recommendations and suggests possibilities for further research.

**Keywords:** digital communication; digital tourism; service quality; customer segmentation; digital literacy

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## 1. Introduction

In recent years, the digital transformation of society has profoundly influenced both the structure and delivery of tourism services. The growing accessibility of digital technologies has reshaped how travellers search for information, plan trips, and interact with service providers. As a result, digital communication is no longer a supplementary tool but a core element in managing customer relationships, building trust, and enhancing user experience. At the same time, the concept of service quality remains central to customer satisfaction and loyalty in tourism, yet its perception may vary across user groups with different levels of digital literacy or demographic characteristics. In this context, understanding how various customer segments perceive digital communication and service quality is becoming increasingly relevant for service providers seeking to adapt to diverse user expectations in the digital tourism landscape.

To better understand these dynamics, it is essential to anchor the analysis in relevant theoretical frameworks. The following section provides an overview of key concepts related to digital communication in tourism, perceived service quality, and customer segmentation, which together form the foundation for the empirical part of this study. These frameworks help clarify the interplay between technology adoption and user behaviour in digital environments. By integrating perspectives from communication theory, service management, and consumer psychology, a more holistic view of customer experience in tourism can be achieved. Such a multidisciplinary approach ensures that the study captures both the technological and human dimensions of service delivery.

## 2. Literature Review

The digitalisation of tourism has introduced complex challenges and opportunities that fundamentally transform how tourism services are delivered, perceived, and consumed. As digital platforms increasingly mediate the interaction between service providers and consumers, traditional paradigms of communication and quality assessment are rendered insufficient. Consequently, there is a growing imperative to reconceptualise these constructs in light of rapidly evolving user behaviours and expectations in virtual environments.

Addressing these dynamics necessitates a multidisciplinary analytical framework, drawing from marketing communication theory, service quality models, and insights from digital consumer behaviour. The tourism sector, shaped by the accelerated adoption of digital technologies, exemplifies the broader societal shift toward platform-mediated experiences, wherein customer perceptions are formed through a complex interplay of online touchpoints, user-generated content, and algorithmically curated interactions. In such a context, service evaluation no longer relies solely on tangible encounters but is increasingly influenced by digital signals, interface design, and information transparency.

This section provides a conceptual overview of three interrelated domains essential for understanding these developments: digital communication in tourism, perceived service quality, and customer segmentation. These theoretical lenses offer a robust foundation for examining the mechanisms through which consumers engage with digital tourism services and for identifying how these interactions vary according to users' digital literacy, expectations, and socio-demographic profiles.

### 2. Digital Communication in Tourism

Digital technologies have fundamentally changed the way tourism services are presented, perceived, and consumed. Communication between service providers and customers now takes place primarily through online channels such as websites, social media, and mobile applications. As a result, digital communication has gained strategic importance—not only as an informational tool, but also as a means of building trust, transparency, and a positive customer experience (Gretzel et al., 2006; Buhalis & Law, 2008; Aliffianto & Andrianto, 2022; Borrego-Basllalobre et al., 2025).

However, communication effectiveness is not universal—different customer segments may interpret the same message differently. One of the key factors here is digital literacy, which influences how users search for, process, and act on information (Krajčik et al., 2023). Customers with a higher level of digital competence are typically more responsive to online content, navigate service offerings more easily, and engage more with interactive or visual formats (Tiago et al., 2020; UNWTO, 2022; Li et al., 2021). On the other hand, less digitally skilled users may be more passive, which can lead to lower trust or satisfaction with services.

The digital transformation of society has significantly reshaped the tourism industry, influencing both operational processes and customer expectations. As noted by Stryzhak (2022), the digital economy affects all sectors, with tourism being one of the most impacted. Online platforms such as booking and itinerary services, digital payments, and review systems are now indispensable components of travel-related decision-making. The widespread use of these tools demonstrates not only technological advancement but also a fundamental shift in consumer behaviour (Xiang et al., 2015).

Digital communication, in this context, serves a dual function: it facilitates service delivery and plays a central role in shaping perceptions of quality, brand reliability, and user satisfaction (Gretzel et al., 2006; UNWTO, 2022). According to Hojehghan and Esfangareh (2011), digital infrastructure and communication technologies have evolved from simple marketing tools into drivers of value creation in tourism. This means businesses must design their digital strategies with awareness of how various customer segments—distinguished by age, gender, or digital literacy—interpret and respond to information (Xiang et al., 2015).

Importantly, the level of digital integration is uneven across regions and user groups. As highlighted by Alamoudi et al. (2025), countries with lower economic growth often leverage digitalisation to boost tourism, but access and skills remain key limiting factors (Buhalis & Law, 2008; UNWTO, 2022). Therefore, segmenting users based on digital competencies is essential for personalised and effective communication, as also suggested by Stankov and Gretzel (2020), who emphasise the emerging role of digital well-being as a core component of modern travel experience design.

In summary, digital maturity—both on the side of service providers and their customers—has become a key determinant of satisfaction, perceived value, and loyalty in digital tourism. For providers, this underscores the importance of adaptive strategies that combine technological innovation with accessible, targeted communication to meet the evolving expectations of digitally diverse customer bases (Gretzel et al., 2006; Gretzel, 2022).

### 3. Perceived Service Quality

In the context of digital tourism, customer segmentation has become an increasingly strategic practice as service providers strive to personalise user experiences across digital platforms. Traditional segmentation models based on basic demographics (e.g., age, gender, income) are no longer adequate to capture the complexity of modern traveller behaviour. The growing integration of digital technologies enables more dynamic segmentation approaches that leverage behavioural, psychographic, and technographic data (Mariani et al., 2018; Dolnicar, 2020; Ben Said et al., 2024; Xu et al., 2024).

Digital environments now generate vast volumes of user-generated content—such as reviews, comments, and ratings—representing a valuable data source for understanding customer preferences. Jardim and Mora (2021) propose a novel sentiment-based segmentation method that clusters digital tourism users based on the polarity of sentiments expressed in their online reviews. This approach, grounded in lexicon-based sentiment analysis and clustering algorithms such as K-Means, enables tourism businesses to identify customer groups with similar emotional responses and tailor services accordingly. For instance, the study by Jardim and Mora demonstrates how tourists' sentiment-based clusters can reveal generational differences in perception. Users aged 18–34 often expressed more positive sentiments toward tourism services, while older segments (e.g., 60–80 years) showed more neutral or negative reactions. This insight allows businesses to adjust their digital strategies and service offerings to engage underrepresented or less satisfied user groups better.

Advanced segmentation methods also account for varying degrees of digital literacy and technological readiness. As noted by Buhalis & Sinarta (2022) and Wang et al. (2024) digital natives tend to prioritise speed, mobile compatibility, and automation, while older or less tech-savvy users prefer simplicity and human support. Recognising these preferences is crucial for crafting inclusive digital touchpoints and communication styles. Moreover, with the emergence of AI and machine learning technologies, micro-segmentation is becoming a practical reality. These systems dynamically adjust service recommendations, marketing messages, or even interface layouts in real-time based on individual user behaviour (Tussyadiah, 2020; Ghesh et al., 2024). Such adaptive systems reflect a shift from static segmentation to responsive digital ecosystems in tourism.

Sentiment analysis and automated clustering enhance personalisation and improve strategic planning and service design. By capturing the emotional drivers behind user behaviour, tourism providers can proactively redesign underperforming offerings, refine marketing content, and strengthen customer satisfaction and loyalty (Reisenwitz & Fowler, 2019; Jardim & Mora, 2021; Adeniran et al., 2023).

In summary, effective customer segmentation in digital tourism now depends on leveraging real-time user data, advanced clustering techniques, and sentiment-based insights. These tools enable providers to better understand diverse user expectations, customise service delivery, and foster more meaningful engagement throughout the customer journey.

Recent studies have increasingly utilised fuzzy set theory and expert models to address decision-making challenges in tourism and related sectors. For example, Gavurova et al. (2023) proposed a fuzzy decision support model for evaluating healthcare projects, demonstrating fuzzy logic's flexibility in complex prioritisation scenarios. Similarly, Gavurova and Polishchuk (2025a) developed a decision-making support system for travel planning tailored to individuals with disabilities, emphasising inclusivity in tourism services through fuzzy-based personalisation. Their subsequent work (Gavurova & Polishchuk, 2025b) introduced an integrated expert model for assessing tourist safety risks, combining economic and technological criteria to enhance trip security. Other research (Skare et al., 2023a; 2023b; 2023c) has explored fuzzy multicriteria frameworks for evaluating tourism sustainability, infrastructure investments, and tourist satisfaction stratified by social class (Skare et al., 2024). These contributions collectively underscore the growing relevance of hybrid decision-support methodologies – including fuzzy models and AI-driven clustering – in refining tourism analytics and digital service design.

#### **4. Customer Segmentation in Digital Tourism**

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## 5. Methods and Methodology

The aim of the research was to analyse the impact of selected forms of digital communication and service quality on customer perceptions in the context of digital tourism, while also examining whether different customer segments (based on digital literacy and gender) exhibit variations in these perceptions.

The research focused on customers using digital tourism services, with the research sample selected through random sampling. Data collection was conducted via an online questionnaire distributed among respondents within the territory of the Slovak Republic. The collected data were processed using the statistical software Statistica, and the Mann–Whitney U test was employed to test the individual research hypotheses, given the ordinal nature of the variables and the assumed non-parametric distribution of the data. To address the research objective, the following hypotheses were formulated:

*H<sub>1</sub>: We hypothesise that there are statistically significant differences in the perception of the communication and promotional strategies of digital tourism services based on the level of customers' digital literacy.*

*H<sub>2a</sub>: We hypothesise that there are statistically significant differences in customer satisfaction with the product offerings of digital tourism services based on gender.*

*H<sub>2b</sub>: We hypothesise that there are statistically significant differences in customer satisfaction with the process-related aspects of service delivery in digital tourism based on gender.*

## 6. Survey Results

The research sample consisted of 437 respondents. The sample size was determined based on a combination of statistical calculations and practical considerations. Considering the total population of Slovakia, approximately 5.4 million inhabitants, the sample size was designed with regard to the desired confidence level and acceptable margin of error. Due to resource constraints and practical challenges associated with data collection, particularly through online surveys, the final number of respondents was set at 437. In constructing the sample, emphasis was placed on ensuring representativeness with respect to key demographic characteristics, such as age, gender, and geographic distribution. A larger proportion of the sample was composed of women, accounting for 313 respondents (71.6%), while men represented a smaller share with 124 respondents (28.4%).

The collected data provide a relevant basis for subsequent analysis in the field of customer segmentation and perception of service quality in digital tourism.

Effective communication represents a key conduit of information and a critical component of the digital environment. Within the context of this research—focused on the influence of digital communication on customer perceptions in the realm of digital tourism—one of the examined dimensions was the communication strategy. The specific aim of this research question was to determine whether customers perceive information regarding current developments (e.g., offers, services, or changes) as being communicated regularly and reliably.

**Table 1.** Perception of the Regularity of Information Disclosure

	Frequency	Cumulative Frequency	Relative Frequency (%)	Cumulative Relative Frequency (%)
Definitely yes	112	112	25.51	25.51
Rather yes	213	325	48.52	74.03
I don't know	53	378	12.07	86.10
Rather no	50	428	11.39	97.49
Definitely no	11	439	2.51	100
Total	439	439	100	100

Source: Own processing

The rapid development of digital tourism requires flexible and transparent communication with customers. The results presented in Table 1 indicate that the majority of respondents perceive communication from digital tourism service providers as reliable and consistent, with nearly three-quarters (74.03%) responding positively (somewhat agree or strongly agree). This suggests that the core informational communication practices—such as publishing offers, updates, or service changes—are functioning well and are perceived as effective and transparent. However, the neutral stance of 12.07% of respondents and the negative assessment by 13.9% highlight that not all customers have the same experience regarding information accessibility. This group may include customers with lower levels of digital literacy, who navigate digital environments with less confidence, or those whose specific needs are not addressed by standard communication practices.

Overall, the results indicate a strong foundation in digital communication, but also reveal gaps in the visibility or accessibility of information for certain customer segments. This highlights the need for improvements in the form, frequency, and personalisation of published information, particularly for customers with varying levels of digital literacy.

Effective digital communication, however, cannot be viewed solely through the lens of formally published information. Social media platforms have become a crucial tool in contemporary digital tourism practices, enabling not only rapid content dissemination but also relationship-building with customers through interaction and feedback. In digital tourism, social media plays a key role in reaching and informing customers, as well as shaping their overall perception of the brand and the quality of services provided. At the same time, these platforms serve as spaces for feedback and the sharing of customer experiences. As part of this research, we analysed how customers evaluate the visibility and quality of digital tourism service presentation on social media (see Table 2).

**Table 2.** Perception of Service Presentation on Social Media

	Frequency	Cumulative Frequency	Relative Frequency (%)	Cumulative Relative Frequency (%)
Definitely yes	78	78	17.77	17.77
Rather yes	185	263	42.14	59.91
<i>I don't know</i>	94	357	21.41	81.32
Rather no	67	424	15.26	96.58
Definitely no	15	439	3.42	100
Total	439	439	100	100

Source: Own processing

As the data shows, the majority of respondents perceive the presentation of digital tourism services on social media positively – the combination of responses “definitely yes” (17.77%) and “rather yes” (42.14%) accounts for more than 59% of all respondents. A neutral stance of “I don’t know” was taken by 21.41% of respondents, which may indicate limited awareness or a more passive approach to following online content. On the opposite end, 15.26% of respondents answered “rather no,” and 3.42% expressed a clearly negative view (“definitely no”). Although these figures represent a minority, they highlight the importance of strengthening digital identity and adopting more targeted communication on social media.

In connection with hypothesis H1, we assume that the perception of the quality and frequency of online presentation may differ depending on the level of customers' digital literacy. For this reason, these responses will be analysed using the Mann-Whitney U test to verify the statistical significance of differences between individual segments. At the same time, the results will also be compared by gender, in accordance with hypotheses H2a and H2b, which focus on gender differences in the perception of the product and process aspects of services.

In the service environment, the quality of the final experience is often directly dependent on the quality of the people providing the service. This is especially true in the field of digital tourism, where the customer is frequently in contact with digital representatives of the brand, whether it be customer support, consultants, guides, or other professionals who represent the service provider in the online space. Therefore, our research focused on how customers perceive the involvement of these individuals in their personal development—that is, whether they feel that their digital interaction with the service brings added value also in terms of personal growth (e.g., gaining knowledge, support in decision-making, inspiration), see Table 3 below.

**Table 3.** Perception of Providers’ Influence on Customers’ Personal Development

	Frequency	Cumulative Frequency	Relative Frequency (%)	Cumulative Relative Frequency (%)
Definitely yes	44	44	10.02	10.02
Rather yes	150	194	34.17	44.19
<i>I don't know</i>	87	281	19.82	64.01
Rather no	132	413	30.07	94.08
Definitely no	26	439	5.92	100
Total	439	439	100	100

Source: Own processing

The results indicate that only a smaller portion of respondents clearly perceive digital tourism service providers as contributing to their personal development—10.02% responded "strongly agree" and 34.17% "somewhat agree." In contrast, a significant portion of customers expressed uncertainty ("not sure" – 19.82%) or a rather negative perception ("somewhat disagree" – 30.07%, "strongly disagree" – 5.92%). These findings suggest that digital interactions with services are still perceived mainly in functional and informational terms, rather than as developmental or personally inspiring experiences.

In the following analysis, we will examine whether the perceived personal benefit of services is related to the level of customers' digital literacy, as proposed in Hypothesis H1. We will also investigate whether there are differences in evaluations between men and women, which will be analysed under Hypotheses H2a and H2b, focusing on gender differences in the perception of product and process quality in the field of digital tourism. In addition to examining perceptions of communication and the quality of information provided, our research also focused on the level of customer engagement. User involvement in service activities represents a key element of the modern approach to building relationships between customers and brands. Actively involving customers in the creation or delivery of services can significantly enhance their satisfaction and loyalty. In the context of digital tourism, this may include opportunities to contribute to content creation, recommend products, participate in digital campaigns, or engage in community-driven activities. This part of the research aimed to

determine the extent to which customers feel that service providers encourage them to take part in such active participation (see Table 4).

**Table 4.** Perception of Support for Active Participation by Service Providers

	Frequency	Cumulative Frequency	Relative Frequency (%)	Cumulative Relative Frequency (%)
Definitely yes	21	21	4.78	4.78
Rather yes	80	101	18.22	23.00
<i>I don't know</i>	100	201	22.78	45.78
Rather no	161	362	36.67	82.45
Definitely no	77	439	17.55	100
Total	439	439	100	100

Source: Own processing

The results show that customers generally do not feel sufficiently supported to participate actively in digital tourism projects. As many as 36.67% of respondents selected "rather no" and another 17.55% chose "definitely no," which together represent more than half (54.22%) of all responses. Only 18.22% of respondents selected "rather yes," and just 4.78% expressed a clearly positive view ("definitely yes"). The proportion of "I don't know" responses (22.78%) indicates uncertainty or a lack of information provided by the service providers. These findings suggest that digital tourism services could improve their communication and participatory strategies by more actively involving customers in content creation and co-decision-making.

Based on the findings from the descriptive part of the research, we proceeded to test the predefined research hypotheses. The aim was to examine whether certain customer characteristics, such as the level of digital literacy or gender, influence how they perceive the quality of communication and the provision of digital tourism services. In the following section, we present the results of testing hypotheses H1, H2a, and H2b.

The aim of the research hypothesis H1 was to determine whether there are statistically significant differences in the perception of the communication and promotional strategies of digital tourism services based on the level of customers' digital literacy. In the context of digital tourism, digital literacy represents a key factor influencing how customers interact with content, make decisions based on marketing communication, and use digital tools when planning their trips.

The hypothesis was tested based on two questionnaire items. The first focused on whether respondents take into account the form of promotion when choosing a company operating in the tourism sector. The second asked whether respondents would welcome new forms of marketing communication from these companies. Digital literacy was assessed through a self-evaluation item in which respondents rated their ability to use digital tools for planning and booking travel services (see Table 5).

**Table 5.** Differences in Perception Based on Digital Literacy

Digital Literacy	Description						
	N	AM	Mdn	SD	U	Z	p
Lower level	272	2.80	2.75	.746	11589.0	-8.522	<.001
Higher level	165	3.45	3.50	.748			

Source: own processing

To verify the differences between groups of respondents with lower and higher digital literacy, we used the Mann-Whitney U test, as the analysed variables were ordinal in nature and a normal distribution could not be assumed. The results displayed in Contingency Table 1 confirmed the stated research hypothesis – H1 is

accepted. It was found that there is a statistically significant difference in the perception of marketing communication between customers with lower and higher levels of digital literacy,  $U = 10,400.0$ ,  $p < 0.001$ . Specifically, we found that customers with a higher level of digital literacy perceive the communication and promotional strategies of digital tourism services significantly more positively ( $Mdn = 3.50$ ) than respondents with lower digital literacy ( $Mdn = 2.70$ ).

The aim of research hypothesis H2 was to determine whether there are statistically significant differences in satisfaction with digital tourism services based on the gender of customers. Within this hypothesis, two sub-alternative hypotheses were defined:

*H2a: We assume that there are statistically significant differences in customer satisfaction with the product offerings of digital tourism services based on gender.*

*H2b: We assume that there are statistically significant differences in customer satisfaction with the process-related aspects of service delivery based on gender.*

To test the stated hypotheses, we used the Mann-Whitney U test, which was appropriate given the ordinal nature of the data and the assumption of non-normal distribution. Customer satisfaction was assessed in two dimensions: product-related and process-related, with responses from men and women being compared (Table 6).

**Table 6.** Differences in Satisfaction Based on Customer Gender

Satisfaction Area	Description							
	Gender	N	AM	Mdn	SD	U	Z	p
Product Offering	Men	124	2.60	2.40	0.729	17,739.5	-1.408	0.159
	Women	313	2.70	2.60	0.766			
Process Aspects	Men	124	2.64	2.40	0.668	18,230.0	-0.993	0.321
	Women	313	2.72	2.60	0.767			

Source: own processing

Based on the results presented in Table 6, we reject hypothesis H2, as the tests did not show statistically significant differences between men and women. It was found that there is no significant difference in the level of satisfaction between customers of different genders, neither in relation to the product offering ( $U = 17,739.5$ ,  $p = 0.159$ ), nor in the process-related aspects of service delivery ( $U = 18,230.0$ ,  $p = 0.321$ ). This suggests that both men and women perceive the quality of digital tourism services similarly, with the median level of satisfaction ranging from  $Mdn = 2.40$  to  $2.60$ .

## 7. Discussion

The research results highlight several important findings that reflect the current state of digital tourism services from the customers' perspective. Most respondents perceive providers' communication activities positively, especially regarding information sharing and social media presentation. This trend can be interpreted as evidence that basic informational communication is well-managed and fulfils its role within marketing and service support.

On the other hand, findings related to personal development and customer participation reveal significant gaps. More than half of the respondents stated that they do not feel actively involved in the provider's activities and do not perceive developmental benefits from the services. These results align with broader trends emphasising the need to transform customers from passive recipients into active co-creators of the experience.

Another significant finding was the confirmation of research hypothesis H1—it was shown that customers' digital literacy has a statistically significant impact on the perception of communication and marketing activities. Digitally proficient respondents evaluated the services more positively, highlighting the need for a differentiated approach in digital communication, including educational and supportive elements for less experienced users.

In contrast, hypothesis H2, which assumed gender-based differences, was not confirmed. This can be interpreted as a positive finding—digital tourism services are perceived consistently regardless of gender differences, which enhances their universality and inclusiveness.

Based on the research results, we recommend that providers of digital tourism services focus on several key areas. First and foremost, it is important to increase customer interactivity and participation—for example, by involving them in content creation, competitions, feedback collection, or community activities. Strengthening participation can also contribute to a greater sense of engagement and brand loyalty. We further recommend placing greater emphasis on the developmental aspect of services, particularly through educational content, personalised recommendations, and decision-making support, all of which can enhance the overall customer experience.

Communication should also be tailored to the digital literacy level of customers. For less proficient users, it is advisable to create simple and intuitive interfaces, tutorials, or chatbots, while more tech-savvy users may benefit from advanced digital solutions such as self-service portals (Duran et al., 2024), gamification, or augmented reality (Song et al., 2024). The results also showed that services are perceived relatively equally regardless of gender, and thus, we recommend maintaining a gender-neutral approach and avoiding stereotypical portrayals in marketing campaigns. Finally, providers should place greater emphasis on regularly collecting feedback and engaging in active two-way communication with customers—through satisfaction surveys or user reviews—which can serve as a valuable tool for continuous service quality improvement.

The research demonstrated that digital communication in the tourism sector has a strong impact on customer satisfaction and engagement, particularly in the context of their digital skills. The findings suggest that the future success of tourism services lies in the combination of high-quality digital infrastructure, targeted content, and active relationship-building with customers. For the future, it is recommended to expand the research by incorporating qualitative methods or applying it in an international context to enable comparisons of digital consumer behaviour across cultures.

## **Conclusion**

The conducted research has provided valuable insights into how customers perceive selected aspects of digital communication and service quality in the context of digital tourism. By analysing both descriptive and inferential data, the study confirmed that effective and consistent communication plays a key role in building customer trust and satisfaction. A majority of respondents positively evaluated the regularity of information dissemination and the visibility of tourism services on social media platforms, which suggests that foundational communication strategies are functioning well.

However, the study also revealed several areas with potential for improvement. Specifically, aspects related to personal development and active customer participation in service-related activities were rated less positively. These findings highlight a gap between basic service delivery and the broader expectations of digitally active users who increasingly seek personalised experiences and opportunities to engage with service providers beyond the transactional level.

A major contribution of this research lies in confirming that the level of digital literacy significantly influences customers' perceptions of communication quality. Respondents with higher digital competence perceived marketing efforts and information strategies more positively than those with lower skills. This supports the need for segmented communication approaches that cater to different levels of digital maturity. On the other hand, the hypothesis regarding gender-based differences (H2) was not supported, indicating that men and women

perceive digital tourism services in a relatively similar way in terms of both product offering and service delivery.

In summary, the research underlines the importance of not only maintaining a solid digital communication presence but also developing strategies that promote co-creation, support personal engagement, and adapt to varying levels of digital skills. The findings may serve as a foundation for future development of inclusive, customer-oriented digital tourism services. Further research could explore qualitative dimensions of user experience or expand into international comparisons to better understand cross-cultural differences in digital tourism consumption.

## References

- Adeniran, A. O., Stephens, M. S., & Njoku, I. (2023). Assessment of basic airline service in Nigeria. *Insights into Regional Development*, 5(2), 38-59. [https://doi.org/10.9770/ird.2023.5.2\(3\)](https://doi.org/10.9770/ird.2023.5.2(3))
- Alamoudi, H., Glavee-Geo, R., Alharthi, M., Doszhan, R., & Suyunchaliyeva, M.M. (2025). Exploring trust and outcome expectancy in FinTech digital payments: insights from the stimulus-organism-response model. *International Journal of Bank Marketing*, 43(4), 897-919. <https://doi.org/10.1108/IJBM-04-2024-0252>
- Aliffianto, A. Y., & Andrianto, N. (2022). Sustainable tourism development from the perspective of digital communication. *Jurnal Studi Komunikasi*, 6(1), 110-125. <https://doi.org/10.25139/jsk.v6i1.3648>
- Ben Said, F., Meyer, N., Bahri-Ammari, N., & Soliman, M. (2024). Shopping Tourism: A Bibliometric Review from 1979 to 2021. *Journal of Tourism and Services*, 15(28), 61-88. <https://doi.org/10.29036/jots.v15i28.598>
- Borrego-Baslabre, F.-J., Angosto, S., Zurita-Ortega, F., & Morales-Baños, V. (2025). Quality of Web Offering for Canoeing as a Sustainable Tourism and Recreational Tool. *Journal of Tourism and Services*, 16(30), 190-214. <https://doi.org/10.29036/npa7p323>
- Buhalis, D., & Law, R. (2008). Progress in information technology and tourism management: 20 years on and 10 years after the Internet—The state of eTourism research. *Tourism Management*, 29(4), 609–623. <https://doi.org/10.1016/j.tourman.2008.01.005>
- Buhalis, D., & Sinarta, Y. (2019). Real-time co-creation and nowness service: lessons from tourism and hospitality. *Journal of Travel & Tourism Marketing*, 36(5), 563-582. <https://doi.org/10.1080/10548408.2019.1592059>
- Dhankhar, D., Gaur, V., & Kumar, P. (2023). Measuring the Perceived Service Quality of Online Travel Agencies. *Journal of Tourism and Hospitality Management*. <https://doi.org/10.13140/RG.2.2.15266.81601>
- Dolnicar, S. (2022). Market segmentation for e-tourism. *Handbook of e-Tourism*, 849-863. [https://doi.org/10.1007/978-3-030-48652-5\\_53](https://doi.org/10.1007/978-3-030-48652-5_53)
- Duran, C., Uray, N., & Alkilani, S. (2024). The Impact of the Characteristics of Self-Service Technologies on Customer Experience Quality: Insights for Airline Companies. *Journal of Tourism and Services*, 15(29), 46-71. <https://doi.org/10.29036/jots.v15i29.735>
- Fianto, A.Y.A. & Andrianto, N. (2022). Sustainable tourism development from the perspective of digital communication. *Jurnal Studi Komunikasi*, 6(1). <https://doi.org/10.25139/jsk.v6i1.3648>
- Gavurova, B., & Polishchuk, V. (2025a), Decision-making support system for travel planning for people with disabilities based on fuzzy set theory. *Oeconomia Copernicana*, 16, 417-462. <https://doi.org/10.24136/oc.3503>
- Gavurova, B., & Polishchuk, V. (2025b), Integrated expert model for risk assessment and ensuring the safety of tourist trips: economic and technological aspects. *Technological and Economic Development of Economy*, 31(3), 863-891. <https://doi.org/10.3846/tede.2025.23881>
- Gavurova, B., Kelemen, M., Polishchuk, V., Mudarri, T., & Smolanka, V. (2023), A fuzzy decision support model for the evaluation and selection of healthcare projects in the framework of competition. *Frontiers in Public Health*, 11, 1222125. <https://doi.org/10.3389/fpubh.2023.1222125>
- Ghesh, N., Alexander, M., & Davis, A. (2024). The artificial intelligence-enabled customer experience in tourism: a systematic literature review. *Tourism Review*, 79(5), 1017-1037. <https://doi.org/10.1108/TR-04-2023-0255>

- Gretzel, U. (2022). The Smart DMO: A new step in the digital transformation of destination management organisations. *European Journal of Tourism Research*, 30, 3002-3002. <https://doi.org/10.54055/ejtr.v30i.2589>
- Gretzel, U., Fesenmaier, D. R., Formica, S., & O'Leary, J. T. (2006). Searching for the Future: Challenges Faced by Destination Marketing Organizations. *Journal of Travel Research*, 45(2), 116-126. <https://doi.org/10.1177/0047287506291598>
- Hojeghan, S. B., & Esfangareh, A. N. (2011). Digital economy and tourism impacts, influences and challenges. *Procedia-Social and Behavioral Sciences*, 19, 308-316. <https://doi.org/10.1016/j.sbspro.2011.05.136>
- Jardim, S., & Mora, C. (2022). Customer reviews sentiment-based analysis and clustering for market-oriented tourism services and products development or positioning. *Procedia Computer Science*, 196, 199-206. <https://doi.org/10.1016/j.procs.2021.12.006>
- Krajčičk, V., Novotný, O., Civelek, M., & Semrádová Zvolánková, S. (2023). Digital Literacy and Digital Transformation Activities of Service and Manufacturing SMEs. *Journal of Tourism and Services*, 14(26), 242-262. <https://doi.org/10.29036/jots.v14i26.551>
- Kusumastuti, H., Pranita, D., Viendyasari, M., Rasul, M. S., & Sarjana, S. (2024). Leveraging local value in a post-smart tourism village to encourage sustainable tourism. *Sustainability*, 16(2), 873. <https://doi.org/10.3390/su16020873>
- Mariani, M., & Borghi, M. (2019). Industry 4.0: A bibliometric review of its managerial intellectual structure and potential evolution in the service industries. *Technological Forecasting and Social Change*, 149, 119752. <https://doi.org/10.1016/j.techfore.2019.119752>
- Mariani, M., Baggio, R., Fuchs, M., & Höepken, W. (2018). Business intelligence and big data in hospitality and tourism: a systematic literature review. *International Journal of Contemporary Hospitality Management*, 30(12), 3514-3554. <https://doi.org/10.1108/IJCHM-07-2017-0461>
- Reichstein, C., & Härtling, R.-C. (2018). Potentials of changing customer needs in a digital world – a conceptual model and recommendations for action in tourism. *Procedia Computer Science*, 126, 1484-1494. <https://doi.org/10.1016/j.procs.2018.08.120>
- Reisenwitz, T. H., & Fowler, J. G. (2019). Information sources and the tourism decision-making process: An examination of Generation X and Generation Y consumers. *Global Business Review*, 20(6), 1372-1392. <https://doi.org/10.1177/0972150919848938>
- Sharafuddin, M. A., Madhavan, M., & Wangtueai, S. (2024). Assessing the Effectiveness of Digital Marketing in Enhancing Tourist Experiences and Satisfaction: A Study of Thailand's Tourism Services. *Administrative Sciences*, 14(11), 273. <https://doi.org/10.3390/admsci14110273>
- Skare, M., Gavurova, B., & Polishchuk, V. (2023a). A decision-making support model for financing start-up projects by venture capital funds on a crowdfunding platform. *Journal of Business Research*, 158, 113719. <https://doi.org/10.1016/j.jbusres.2023.113719>
- Skare, M., Gavurova, B., & Polishchuk, V. (2023b). A large-scale decision-making model for the expediency of funding the development of tourism infrastructure in regions. *Expert Systems*, 13443. <https://doi.org/10.1111/exsy.13443>
- Skare, M., Gavurova, B., & Polishchuk, V. (2024). A fuzzy multicriteria model of sustainable tourism: examples from the V4 countries. *IEEE Transactions on Engineering Management*, 71, 12182-12193. <https://doi.org/10.1109/TEM.2023.3239519>
- Skare, M., Gavurova, B., Polishchuk, V., & Nawazish, M. (2023c). A fuzzy model for evaluating the level of satisfaction of tourists regarding accommodation establishments according to social class on the example of V4 countries. *Technological Forecasting and Social Change*, 193, 122609. <https://doi.org/10.1016/j.techfore.2023.122609>
- Song, B. L., Kaur, D., Subramaniam, M., Tee, P. K., Wong, L. C., & Mohd Zin, N. A. (2024). The Adoption of Mobile Augmented Reality in Tourism Industry: Effects on Customer Engagement, Intention to Use and Usage Behaviour. *Journal of Tourism and Services*, 15(28), 235-252. <https://doi.org/10.29036/jots.v15i28.679>
- Stankov, U., & Gretzel, U. (2020). Tourism 4.0 technologies and tourist experiences: a human-centered design perspective. *Information Technology & Tourism*, 22(3), 477-488. <https://doi.org/10.1007/s40558-020-00186-y>
- Stryzhak, O. (2022). Tourism and digital technologies: Analysis of the relationship. *Economics of Development*, 21(2). [https://doi.org/10.57111/econ.21\(2\).2022.42-50](https://doi.org/10.57111/econ.21(2).2022.42-50)
- Tiago, F., Gil, A., Stemberger, S., & Borges-Tiago, T. (2021). Digital sustainability communication in tourism. *Journal of Innovation & Knowledge*, 6(1), 27-34. <https://doi.org/10.1016/j.jik.2019.12.002>
- Tussyadiah, I. (2020). A review of research into automation in tourism: Launching the Annals of Tourism Research Curated Collection on Artificial Intelligence and Robotics in Tourism. *Annals of Tourism Research*, 81, <https://doi.org/10.1016/j.annals.2020.102883>

UNWTO. (2022). *Digital Futures Programme – Empowering Tourism SMEs*. World Tourism Organization. Retrieved from <https://www.unwto.org/digital-futures>

Wang, R., Wu, C., Wang, X., Xu, F., & Yuan, Q. (2024). E-Tourism information literacy and its role in driving tourist satisfaction with online travel information: A qualitative comparative analysis. *Journal of Travel Research*, 63(4), 904-922. <https://doi.org/10.1177/00472875231177229>

Xiang, Z., Du, Q., Ma, Y., & Fan, W. (2017). A comparative analysis of major online review platforms: Implications for social media analytics in hospitality and tourism. *Tourism Management*, 58, 51-65. <https://doi.org/10.1016/j.tourman.2016.10.001>

Xiong, S., & Zhang, T. (2024). Enhancing tourist loyalty through location-based service apps: Exploring the roles of digital literacy, perceived ease of use, perceived autonomy, virtual-content congruency, and tourist engagement. *Plos One*, 19(1). <https://doi.org/10.1371/journal.pone.0294244>

Xu, J., Peng, K.-L., & Weltmann, D. (2024). Prieskum digitálnej mobility v čínskom turistickom metaverze. *Journal of Quality Assurance in Hospitality & Tourism*, 1-25. <https://doi.org/10.1080/1528008X.2024.2416536>

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