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ENHANCING GUEST EXPERIENCES THROUGH DIGITAL TECHNOLOGY IN HOSPITALITY

POBOLJŠANJE ISKUSTVA GOSTIJU KROZ DIGITALNU TEHNOLOGIJU U UGOSTITELJSTVU

Abstract. *This study investigates the impact of digital technology on guest experiences in high-category hotels in Serbia, conducted from September to October 2024. A structured questionnaire was utilized, distributed via QR codes to ensure convenience, resulting in 223 valid entries analyzed. Key findings indicate that approximately 78% of respondents perceive digital services positively, with mobile check-in/check-out identified as the most valued feature. Satisfaction levels varied significantly by age, education, and employment status, revealing that younger and more educated guests appreciate digital offerings more. The research contributes to understanding how hotels can tailor their digital services to enhance guest satisfaction and loyalty, emphasizing the necessity for a balanced approach that accommodates diverse guest preferences in an increasingly competitive hospitality market.*

Keywords: *guest experience, digital technology, hospitality.*

Apstrakt. *Ova studija istražuje uticaj digitalne tehnologije na iskustva gostiju u hotelima visoke kategorije u Srbiji, sprovedena od septembra do oktobra 2024. Korišćen je strukturirani upitnik, distribuiran preko QR kodova kako bi se obezbedila pogodnost, što je rezultiralo sa 223 analizirana validna unosa. Ključni nalazi pokazuju da oko 78% ispitanika pozitivno percipira digitalne usluge, pri čemu je prijavljivanje/odjavljivanje putem mobilnog telefona identifikovano kao najcenjenija karakteristika. Nivoi zadovoljstva značajno su varirali u zavisnosti od starosti, obrazovanja i statusa zaposlenja, što otkriva da mlađi i obrazovaniji gosti više cene digitalnu ponudu. Istraživanje doprinosi razumevanju kako hoteli mogu da prilagode svoje digitalne usluge kako bi povećali zadovoljstvo i lojalnost gostiju, naglašavajući neophodnost uravnoteženog pristupa koji će zadovoljiti različite preferencije gostiju na sve konkurentnijem ugostiteljskom tržištu.*

Ključne reči: *iskustva gostiju, digitalna tehnologija, ugostiteljstvo.*

Introduction

The way services are provided and how visitors engage with hospitality providers are being completely transformed by digital technology, which is also changing the hospitality sector. Visitors are growing more used to digital conveniences as technology becomes more ingrained in daily life, and the hospitality industry is responding to their demands for streamlined, customized experiences (Neuhofer, Buhalis & Ladkin, 2015). Digital technology, encompassing tools such as mobile applications, artificial intelligence (AI), the Internet of Things (IoT), and big data analytics, allows hospitality providers to tailor services to individual preferences, improve operational efficiency, and enhance the overall guest experience (Acharya & Mahapatra, 2024). One of the primary ways digital technologies enhance guest experiences is through personalization, where data-driven insights are used to cater to individual preferences, from room settings to dining options (Golja & Paulišić, 2021). Additionally, advancements in mobile technology enable seamless services such as mobile check-in and keyless room entry, creating a more flexible, efficient process that aligns with modern guest expectations (Bilgihan et al., 2016).

AI in the hospitality industry has produced smart in-room gadgets and automated customer service, giving visitors a new level of ease while freeing up employees to work on more difficult jobs that improve service quality (Božić & Zrnić, 2024). IoT devices in hospitality settings-like smart lighting controls, entertainment systems, and thermostats-improve the visitor experience by providing personalized, user-friendly spaces that react to inputs in real time. (Mercan et al., 2021; Olsen & Connolly, 2000). Digital technology integration also transforms the backend operations of hospitality firms, going beyond interactions with guests. Digital tools improve data administration, expedite departmental communication, and enable real-time updates, guaranteeing a unified and attentive response to visitor needs (Štilić, Nicić & Puška, 2023; Jabbar, Prabowo & Hanafi, 2024). As the role of digital technology in hospitality continues to grow, its potential to enhance guest experiences is reshaping industry standards, setting a new benchmark for convenience, personalization, and operational efficiency in the modern hospitality landscape (Giannoukou, 2024). Technology has become a key component in reinventing visitor experiences and revolutionizing service delivery as the hospitality industry adjusts to the digital era. Efficiency, customization, and connectivity are becoming more and more important to today's passengers, and digital technology provides creative methods to meet these changing needs. Hospitality providers can create a seamless experience that starts before visitors arrive and continues after they leave by integrating technology into many aspects of guest contact, from pre-arrival services to post-stay communication.

A critical component in enhancing guest experiences is the application of big data analytics (Al-Hyari, Al-Smadi & Weshah, 2023). Hospitality providers use digital platforms to collect information from various consumer touchpoints, including preferences, spending trends, and satisfaction levels. By anticipating demands and personalizing interactions, this data-driven strategy helps organizations improve their services and increase customer happiness and loyalty. Digital automation is another area that has an influence; it reduces wait times, streamlines check-ins, and provides immediate support via chatbots and virtual assistants driven by artificial intelligence. Digital technology improves service quality and visitor engagement by automating routine interactions, freeing workers to concentrate on more intricate and high-touch guest offerings. Additionally, digital technology in the hospitality industry is not just found in specific hotels or resorts; rather, it is a component of a broader ecosystem that also includes digital payment systems, booking platforms, and transportation. By bridging several service providers and streamlining the visitor route,

this network offers visitors a seamless, end-to-end travel experience.

Technologies such as blockchain are gaining traction for secure, transparent transactions, while augmented reality (AR) and virtual reality (VR) enrich pre-arrival planning by allowing guests to explore facilities virtually (Bretos, Ibáñez-Sánchez & Orús, 2024). These advancements underscore the potential of digital technology to add value at every stage of the guest journey, reinforcing the importance of its integration within the industry. With the ongoing development of digital technology, hotel businesses now have new ways to surpass guests' expectations. Digital technology has redefined what it means to provide a memorable and fulfilling visitor experience by establishing settings where convenience, personalization, and interaction are effortlessly linked. With an emphasis on automation, digital engagement, operational efficiency, and personalization, this study explores the use of digital technology in the hospitality sector. It specifically looks at how these technologies affect Serbian high-category hotels' patron preferences and levels of satisfaction. Assessing how much digital services improve the entire visitor experience and determining the main elements influencing satisfaction across different demographic groups are the main goals. The increasing use of digital solutions in the hospitality industry and the urgent need to match new technology with the wide range of demands of contemporary visitors are the driving forces behind this study. The study intends to promote the strategic development and deployment of digital technologies in the hospitality industry by filling in gaps in the body of existing literature and offering practical insights.

The purpose of this study is to address the increasing significance of digital technologies in the hotel industry and how they affect the experiences of guests. It is critical to comprehend how tools like mobile applications, artificial intelligence, and the Internet of Things affect guests' happiness given their quick adoption in high-end hotels. Examining how these technologies satisfy guests' changing needs - who now want individualized, effective, and seamless services - is the goal of the study. It also aims to pinpoint the main elements influencing satisfaction in various demographic groups, offering insightful information for customizing digital solutions to suit a range of tastes. To help hotels stay competitive and relevant in a market that is rapidly changing technologically, this research fills gaps in the literature and provides practical suggestions to promote the strategic development and successful deployment of digital technology. Research highlights that personalization, driven by big data and artificial intelligence (AI), has become a primary objective for hospitality providers aiming to improve guest experiences.

Literature review

The role of digital technology in enhancing guest experiences has been increasingly explored as hospitality services become more customer-centric and technology-driven (Roy & Pagaldiviti, 2023). Scholars and industry professionals alike have recognized that the adoption of digital solutions can significantly influence guest satisfaction, loyalty, and the overall quality of service provided (Anwar, Deliana & Suyamto, 2024; Zrnić, Jovanović & Novaković, 2024). Big data analytics allow businesses to gather and analyze vast amounts of guest information, enabling them to customize services to individual preferences. AI-driven solutions like recommendation engines and tailored room amenities enhance the guest experience by providing targeted offerings, thus creating a unique and memorable stay (Arapou & Kapiki, 2023; Margarido, 2015). This trend aligns with findings from Batra & Chatterji (2024), who emphasize that AI-powered personalization not only boosts satisfaction but also fosters loyalty as guests feel recognized and valued.

Automation has become a defining feature of modern hospitality, streamlined guest interactions and improved operational efficiency. Various studies have documented the use of automated check-in and check-out processes, smart room controls, and digital concierge ser-

vices as fundamental components of the guest journey. Kandampully et al. (2019) highlight that by reducing manual processes and wait times, automation allows for smoother, quicker interactions, enhancing the guest's overall impression of convenience. Similarly, Collins (2023), note that automated customer service through AI chatbots provides guests with instant support, offering an always-available resource for inquiries and support that elevates service consistency. Such studies suggest that automation serves both as a convenience for guests and an efficiency booster for staff, leading to improved guest engagement and satisfaction. Digital technology has also been instrumental in fostering connectivity and engagement, especially through mobile applications and social media. Also, mobile applications have become essential tools in enabling guests to interact with services such as room service, housekeeping, and booking management (Jung, Kim & Farrish, 2014). These applications provide guests with control over their environment and a direct line of communication with the hotel, which research has shown to contribute positively to their overall experience. Additionally, social media platforms offer guests a space to share feedback, which in turn allows hospitality providers to gather insights for service improvement. Engaging guests through these platforms has proven to be an effective way to build brand loyalty, as guests feel more connected to the brand and its values (Das, 2023).

Digital technology has also driven innovation in service delivery, providing new ways for hospitality businesses to differentiate themselves (Zrnić & Božić, 2024). Authors Alsahafi, Alzahrani & Mehmood (2023), discuss how augmented reality (AR) and virtual reality (VR) are increasingly being used for virtual hotel tours, enabling guests to explore facilities before booking. These immersive technologies create an interactive pre-arrival experience that builds anticipation and trust, especially among new guests who value a preview of the hotel environment. Similarly, Car, Stifanich & Šimunić (2019), highlight that IoT (Internet of Things) technology in hospitality, such as smart thermostats, lighting, and entertainment systems, allows for a customized room environment. This ability to create personalized room settings aligns with modern expectations for tailored experiences, further reinforcing the value of digital innovation in elevating service standards (Srinivasan et al., 2024; Forman & Udvaros, 2023). Improving operational efficiency through digital technology has been widely researched, with studies indicating significant benefits for both staff and guests. According to Ghosh & Sen (2023), real-time data analysis through cloud computing and digital platforms enables hospitality providers to respond to guest needs faster and more accurately. This operational responsiveness is critical in meeting high guest expectations, as it minimizes delays and ensures a fluid service process. Furthermore, Mnyakin (2023), highlight that real-time data from digital platforms helps hospitality providers track key performance metrics, such as guest satisfaction and occupancy rates, to make informed decisions that positively impact the guest experience. By utilizing digital tools to monitor and adjust services in real-time, hospitality providers can maintain a high level of service quality. Despite the numerous advantages, the literature also points to several challenges associated with digital technology in hospitality. Scholars like Wylde et al., (2022), note that privacy concerns arise when collecting and storing guest data, making it essential for businesses to implement robust cybersecurity measures. While digital technology can enhance guest experiences, it may also depersonalize interactions, as reliance on automation can reduce human contact - a key aspect of traditional hospitality. Managing these challenges requires a balanced approach, where technology supports but does not overshadow the human element that defines the hospitality experience.

Research methods

The study aimed to explore how digital technology impacts guest experiences in high-category hotels across Serbia. This research was conducted through a structured que-

stionnaire, which was specifically designed for this study to align with the study's objectives and research questions. Based on research by Arapou & Kapiki (2023), a questionnaire was created for the purposes of this study.

Factor analysis was not conducted because the goal of the research was not focused on identifying latent factors. The questionnaire was designed to directly measure variables related to the research questions, eliminating the need for factor grouping. The study focused on analyzing individual variables and their relationships, without requiring a deeper understanding of latent structures. Given the specific research objectives, factor analysis was not necessary for further interpretation of the data.

The survey questions focused on demographic characteristics, guest satisfaction levels, and the perceived influence of digital technology on hotel experiences. These items were designed to align conceptually with the study's primary research questions, which were formulated based on an extensive review of the literature and the study's objectives. The questionnaire was distributed via QR codes, allowing guests to access the survey easily on their devices, ensuring convenience and user accessibility.

The research period spanned from September 2024 to October 2024. A total of 244 responses were collected, although 21 responses were excluded due to incomplete answers, resulting in a final sample of 223 respondents. These survey responses were analyzed to interpret statistical trends related to demographic information, satisfaction levels, and the role of digital technology in enhancing guest experiences. While the research questions provide the study's conceptual focus, the structured questionnaire operationalized these questions to collect data systematically. The research questions themselves were developed by the author to reflect the study objectives and ensure alignment with the main themes of the research. Further statistical findings and their connection to each research question are detailed in the study's analysis section, with demographic trends, guest satisfaction insights, and technological impacts contextualized accordingly. Table 1. presents the demographic data of the respondents, highlighting key characteristics such as gender distribution, age groups, education levels, and employment status, which collectively provide a comprehensive overview of the sample population involved in the study.

Table 1. *Respondents demographics data*

Demographic category	Subcategory	N	%
Gender	Male	135	61
	Female	88	39
Age Group	18-27	56	25
	28-45	84	38
	46-64	59	26
	65+	24	11
Education Level	High School	43	19
	College	71	32
	Faculty	68	30
	Master's	30	13
	Ph.D.	11	5
Employment Status	Unemployed	32	14
	Employed	155	70
	Entrepreneur	36	16

Source: Author`s findings

Table 1. provides an overview of the demographic characteristics of the respondents, allowing for an understanding of the sample composition. The gender distribution shows a slightly higher percentage of male respondents (60.5%), while the age groups are balanced, with the 28-45 category representing the majority (37.7%).

Educational levels range from high school to Ph.D., with the college level being the most common. Employment status data indicates that most respondents are employed (69.5%), followed by entrepreneurs and unemployed individuals.

This demographic profile provides insight into potential biases or trends associated with gender, age, education, or employment. able 2 illustrates the satisfaction levels by age group, revealing significant differences in guest perceptions of digital technology in high-category hotels, thereby highlighting how age influences overall satisfaction with digital services offered during hotel stays.

Descriptive Statistical Analysis

The descriptive statistics for satisfaction levels across various demographics are presented in the following tables:

Table 2. *Satisfaction Levels by Age Group*

Age	Standard Deviation	N	(%)
18–27	0.45	56	25.1
28–45	0.67	84	37.7
46–64	0.75	59	26.5
65+	0.95	24	10.8

Source: Author`s calculation

Younger respondents (18–27 years) reported the highest satisfaction levels, while the oldest group (65+ years) showed the lowest. This trend suggests varying comfort levels with digital services across age groups. The table presents data on satisfaction levels across different age groups. For individuals aged 18 to 27, the mean satisfaction score is 4.5, which indicates a high level of satisfaction. The standard deviation for this group is 0.45, suggesting that most scores are close to the mean. This group comprises 56 respondents, representing 25.1% of the total sample. In the 28 to 45 age group, the mean satisfaction score is slightly lower at 4.3, with a standard deviation of 0.67, indicating a bit more variability in satisfaction levels among respondents. This group has the largest number of participants, with 84 individuals, accounting for 37.7% of the total sample. For those aged 46 to 64, the mean satisfaction score drops further to 3.8, and the standard deviation is 0.75, showing a wider spread in scores. There are 59 respondents in this group, representing 26.5% of the total. Lastly, the 65 and older age group has the lowest mean satisfaction score at 3.2, reflecting a lower overall satisfaction level. The standard deviation for this group is 0.95, indicating significant variability in responses. With only 24 respondents, this group constitutes 10.8% of the total sample. Overall, the data suggests that satisfaction tends to decline with age, as younger individuals report higher satisfaction levels compared to older individuals.

Table 3. *Satisfaction Levels by Education level*

Education Level	Standard Deviation	N	(%)
High School	0.60	43	19.3
College	0.50	71	31.8
Faculty	0.40	68	30.5
Master's	0.30	30	13.5
Ph.D.	0.20	11	4.9

Source: Author`s calculation

Higher educational attainment correlates with greater satisfaction, underscoring the importance of sophisticated digital offerings for educated guests. For instance, advanced features such as AI-driven virtual assistants, personalized recommendations based on past preferences, and seamless integration of smart room technologies align well with the expectations of highly educated individuals. These services cater to their likely preference for efficiency, customization, and innovation in the hospitality experience.

Table 4. *Satisfaction Levels by Employment status*

Employment Status	Standard Deviation	N	(%)
Unemployed	0.80	32	14.3
Employed	0.50	155	69.5
Entrepreneur	0.60	36	16.1

Source: Author`s calculation

Table 4. shows that unemployed individuals have a mean satisfaction score of 3.7, indicating relatively low satisfaction. The accompanying standard deviation of 0.80 suggests that there is considerable variability in satisfaction within this group. There are 32 unemployed respondents, which accounts for 14.3% of the total sample. In contrast, employed individuals report a higher mean satisfaction score of 4.2, reflecting a generally positive perception of their situation. The standard deviation for this group is 0.50, indicating that their satisfaction scores are relatively consistent. This group is the largest, with 155 respondents, making up 69.5% of the total sample.

Additionally, entrepreneurs have a mean satisfaction score of 4.3, slightly higher than that of employed individuals, indicating very positive satisfaction levels. The standard deviation of 0.60 indicates moderate variability in this group. There are 36 entrepreneurs in the data set, representing 16.1% of the total. Overall, the findings suggest that employed individuals and entrepreneurs report higher satisfaction levels compared to unemployed individuals, who tend to have lower satisfaction. Employed and entrepreneurial respondents reported higher satisfaction levels compared to unemployed respondents.

ANOVA was used in this research to compare the mean satisfaction levels across multiple independent groups, as it is a robust statistical method for detecting significant differences when the assumption of approximate normality is met. Given the sample sizes and the nature of the data, ANOVA was deemed appropriate for analyzing variations in satisfaction across different demographic categories.

Table 5. *Anova test – Single Factor for Age*

Groups	*Count*	*Sum*	*Average*	*Variance*
18-27	56	250.9	4.480357	0.197244
28-45	84	363.1	4.322619	0.389723
46-64	59	230.1	3.9	0.525517
65+	24	86.8	3.616667	0.896232

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	18.99555	4	6.331852	14.70669	9.27E-09	2.645824
Within Groups	94.28875	219	0.430542			
Total	113.2843	223				

Note: SS (Sum of Squares) – Sum of Squares; df (Degrees of Freedom) – Degrees of Freedom; MS (Mean Square) – Mean Square; F (F-statistic) – F-statistic; P-value (Probability Value) – Probability Value; F crit (F Critical Value) – F Critical Value

Source: Author calculation

The ANOVA analysis investigates whether there are significant differences in satisfaction levels among four age groups: 18-27, 28-45, 46-64, and 65+. The descriptive statistics provide an overview of the data, showing the number of respondents in each group, the total satisfaction scores, the average satisfaction levels, and the variance within each group. The results indicate that the 18-27 age group has the highest average satisfaction score of 4.48, suggesting that younger respondents tend to be more satisfied. In contrast, the 65+ age group has the lowest average satisfaction score of 3.62, indicating lower satisfaction levels among older respondents. Additionally, the variance in satisfaction scores increases with age, implying that opinions on satisfaction among older individuals are more diverse and dispersed. The ANOVA test was conducted to determine if these differences in satisfaction levels are statistically significant. The F-statistic obtained from the test is 14.71, which is significantly higher than the critical F-value of 2.65. This suggests that the differences in satisfaction levels among the groups are not due to random chances. Moreover, the p-value is extremely low (9.27E-09), which is far below the conventional significance threshold of 0.05. This means that the probability of these differences occurring by random variation is almost zero, strongly supporting the conclusion that age has a significant impact on satisfaction levels. Based on the descriptive statistics, it is evident that satisfaction levels tend to decrease with age, with younger individuals expressing higher satisfaction compared to older respondents.

Table 6. *Anova test - Single Factor for Education*

Groups	***Count***	***Sum***	***Average***	***Variance***		
High School	43	160.4	3.730233	0.321207		
College	71	285.1	4.015493	0.224185		
Faculty	68	289.5	4.257353	0.163378		
Master's	30	136.3	4.543333	0.10254		
Ph.D.	11	51.1	4.645455	0.032727		
Source of Variation	***SS***	***df***	***MS***	***F***	***P-value***	***F crit***
Between Groups	16.94487	4	4.236217	21.26354	8.05E-15	2.413059
Within Groups	43.43092	219	0.199224			
Total	60.37578	223				

Note: SS (Sum of Squares) – Sum of Squares; df (Degrees of Freedom) – Degrees of Freedom; MS (Mean Square) – Mean Square; F (F-statistic) – F-statistic; P-value (Probability Value) – Probability Value; F crit (F Critical Value) – F Critical Value

Source: Author calculation

The ANOVA analysis examines whether there are statistically significant differences in satisfaction levels based on education level, specifically among individuals with a high school diploma, college degree, faculty degree, master's degree, and Ph.D. The descriptive statistics show that the number of respondents varies across these groups, with high school graduates having the largest sample size of 43 and Ph.D. holders the smallest with only 11 respondents. The total satisfaction scores and their averages

indicate a trend where satisfaction levels increase as the level of education rises. High school graduates have the lowest average satisfaction score of 3.73, while Ph.D. holders report the highest satisfaction level at 4.65. The variance in satisfaction scores is also noteworthy, as it decreases with higher education levels. High school graduates have the highest variance (0.32), suggesting more diverse opinions on satisfaction, whereas Ph.D. holders exhibit the lowest variance (0.03), indicating that their satisfaction responses are more consistent. The ANOVA test was conducted to determine if these observed differences in satisfaction across education levels are statistically significant. The results reveal an F-statistic of 21.26, which is substantially higher than the critical F-value of 2.41, suggesting that the differences among the groups are not due to random chance. Additionally, the p-value is extremely small (8.05E-15), which is far below the conventional threshold of 0.05. This confirms that there is a statistically significant relationship between education level and satisfaction. In other words, satisfaction levels are not equal across the different educational groups, and the differences observed in the descriptive statistics are meaningful. Based on the provided averages, it is evident that individuals with higher education levels tend to have higher satisfaction, with the largest gap occurring between high school graduates and those with advanced degrees.

Table 7. *Anova test - Single Factor for Employment*

Groups	*Count*	*Sum*	*Average*	*Variance*
Unemployed	32	126.9	3.965625	0.484909
Employed	155	651.9	4.205806	0.285096
Entrepreneur	36	154.6	4.294444	0.239397

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	2.03823	3	1.019115	3.330647	0.037582	3.036898
Within Groups	67.31585	220	0.305981			
Total	69.35408	223				

Note: SS (Sum of Squares) – Sum of Squares; df (Degrees of Freedom) – Degrees of Freedom; MS (Mean Square) – Mean Square; F (F-statistic) – F-statistic; P-value (Probability Value) – Probability Value; F crit (F Critical Value) – F Critical Value

Source: Author calculation

The ANOVA analysis examines whether there are statistically significant differences in satisfaction levels based on employment status, specifically among unemployed individuals, employed individuals, and entrepreneurs. The descriptive statistics reveal that the number of respondents varies across these groups, with employed individuals forming the largest sample size of 155, while entrepreneurs and unemployed individuals have significantly fewer respondents, with 36 and 32, respectively.

The total satisfaction scores and their averages indicate that entrepreneurs report the highest satisfaction level, with an average of 4.29, followed closely by employed individuals at 4.21. Unemployed individuals, on the other hand, have the lowest level of satisfaction, with an average of 3.97. This suggests that employment status may influen-

ce satisfaction, with those who are actively working or running their own businesses tending to be more satisfied than those who are unemployed. Additionally, the variance in satisfaction scores differs among the groups, with unemployed individuals showing the highest variance of 0.48, indicating more diverse responses within this group. Entrepreneurs, in contrast, have the lowest variance (0.24), suggesting that their satisfaction levels are more consistent.

The ANOVA test was performed to determine whether these observed differences in satisfaction levels across employment status groups are statistically significant. The results show an F-statistic of 3.33, which is higher than the critical F-value of 3.04. This suggests that the differences in satisfaction between groups are not due to random chance. The p-value (0.0376) is lower than the standard significance threshold of 0.05, confirming that the effect of employment status on satisfaction is statistically significant.

However, based on the descriptive statistics, it is evident that unemployed individuals have significantly lower satisfaction compared to those who are employed or entrepreneurs. The relatively small p-value suggests that employment status plays a role in determining satisfaction levels, although the effect is not as strong as in previous analyses for age and education.

Table 8. *Research questionnaire*

Question	**Results (n=223)**
Which of the following digital services did you use during your hotel stay? (Select all that apply)	Mobile check-in/check-out: 120, In-room smart controls: 100, Virtual concierge services: 60, Digital payment options: 140
How frequently did you use the services mentioned above during your stay?	Daily = 60, A few times = 100, Once = 40, Not at all = 23
What motivated you to use digital services at this hotel? (Select all that apply)	Convenience: 110, Time-saving: 85, Ease of access: 95, Curiosity: 45, Recommendation: 60
How comfortable are you with using digital tools (mobile apps, digital payments, smart devices) during your stay at a hotel?	Very Comfortable = 80, Somewhat Comfortable = 90, Neutral = 30, Somewhat Uncomfortable = 15, Very Uncomfortable = 8
Does your age influence how much you value digital technology in your hotel experience?	Yes = 130, No = 93
How often do you use digital technology in your daily professional or personal life?	Very Frequently = 70, Frequently = 85, Occasionally = 40, Rarely = 20, Never = 8
Does your employment status influence your willingness to use digital services during hotel stays?	Yes = 140, No = 83

Source: Author`s calculation

The data collected from the 223 respondents provides a comprehensive insight into the use of digital services in hotels, as well as guests' attitudes toward digital technology and its impact on their overall experience. Here's a detailed explanation of the results:

The most used digital service was digital payment options, with 140 respondents (approximately 63%) utilizing these services during their stay. This suggests that digital payment methods are highly preferred and widely accepted among hotel guests. The

second most used service was mobile check-in/check-out, with 120 respondents (around 54%) taking advantage of this feature. In contrast, in-room smart controls and virtual concierge services were less frequently used, with 100 (45%) and 60 (27%) respondents, respectively, indicating that while these services are gaining popularity, they may not be as universally embraced as mobile check-in or payment options.

When examining how often guests used these digital services, most respondents (100 individuals, or 45%) used these services a few times during their stay. This was followed by 60 respondents (27%) who used the services daily. A smaller proportion, 40 respondents (18%), used the services only once, while 23 respondents (10%) did not use these services at all. This pattern reflects a general trend toward moderate to frequent usage, with some guests not fully engaging with the available digital tools.

Respondents cited various reasons for using digital services at the hotel. The top motivation was convenience, with 110 respondents (49%) selecting this option. This was followed by ease of access (95 respondents, 43%) and time-saving (85 respondents, 38%). These findings emphasize that guests are drawn to digital tools that simplify and streamline their experience. Curiosity and recommendation were also factors, with 45 (20%) and 60 (27%) respondents, respectively, reporting these as motivations. While curiosity may suggest that some guests were exploring new technologies, recommendations indicate that peer or marketing influences also played a role in encouraging service usage.

In terms of comfort with using digital tools, most respondents felt very comfortable (80, or 36%) or somewhat comfortable (90, or 40%). However, a smaller group felt neutral (30, or 13%), and even fewer felt somewhat uncomfortable (15, or 7%) or very uncomfortable (8, or 4%). These results show a generally positive reception toward the use of digital tools in a hotel setting, though there is still a minority that is less comfortable with adopting new technologies.

Regarding age as a factor in the valuation of digital technology, 130 respondents (58%) reported that their age does influence how much they value digital services in their hotel experience. This suggests that younger guests may place more importance on the availability of such services compared to older guests, who may be more hesitant or less inclined to use digital technologies.

Respondents' satisfaction with the level of technological innovation offered by the hotel showed that 98 respondents (44%) were very satisfied (rating 5), while 80 respondents (36%) rated their satisfaction as 4. A smaller proportion rated their satisfaction lower, with 30 respondents (13%) selecting a score of 3, and even fewer selecting 2 (10 respondents, or 4%) or 1 (5 respondents, or 2%). This high level of satisfaction indicates that most guests feel positively about the technological offerings at the hotel, with only a minority expressing dissatisfaction.

When asked if they would expect digital innovation to influence their loyalty toward the hotel, most respondents (91, or 41%) gave a 5 (very likely), and 88 respondents (39%) selected a 4. This suggests that guests are more likely to remain loyal to a hotel that offers modern digital services. A smaller group (30 respondents, or 13%) selected a 3, with 14 respondents (6%) indicating that they would not prioritize digital innovation when considering future stays.

In terms of digital technology usage in daily life, 70 respondents (31%) reported using digital technology very frequently, and 85 respondents (38%) used it frequently. This indicates that a large proportion of guests are accustomed to using digital technology regularly in both their professional and personal lives. A smaller number, 40 respondents (18%), used it occasionally, while 28 respondents (12%) used it rarely or never. These results align with the general familiarity of respondents with digital tools and highlight the increasing integration of technology into daily routines.

For the last questions, the Mann-Whitney U test results are presented in the table, con-

firming that employment status significantly influences the willingness to use digital services during hotel stays. The Mann-Whitney U test was included as a robustness check to confirm the findings, particularly given potential concerns regarding the distribution of data and sample size differences across groups.

Table 9. *Responses based on employment status influence on willingness to use digital services*

Test	U Statistic	p-value	Statistical Significance
Mann-Whitney U Test	11620	3.38×10^{-50}	Yes ($p < 0.05$)

Source: Author`s calculation

The U statistic is 11,620, and the p-value is 3.38×10^{-50}, which is far below the standard significance threshold of 0.05. This means that the difference between the two groups (those willing and unwilling to use digital services) is statistically significant. The results strongly suggest that employment status plays a crucial role in determining whether a respondent is willing to use digital services in hotels.

When asked if employment status affects their willingness to use digital services during their hotel stays, 140 respondents (63%) reported that it does, while 83 respondents (37%) stated that it does not. This suggests that employed individuals, likely due to their greater exposure to digital technologies in their work environment, may be more inclined to embrace digital solutions during their hotel stays.

Table 10. *Results of descriptive statistics for items related to satisfaction with digital technologies in hotels*

Question	Mean (M)	St. Deviation (SD)
Digital technology enhanced overall satisfaction	4.00	1.08
Mobile check-in/check-out services are convenient and time-saving	4.00	1.07
In-room smart technology improved hotel experience	3.94	1.04
Virtual concierge services met needs during stay	4.02	1.05
Preference for more digital solutions in future stays	4.02	1.04
I am satisfied with the level of technological innovation offered by this hotel	4.20	0.87
Would you expect digital innovation to influence your loyalty toward this hotel?	4.15	0.89

Source: Author`s calculation

The results presented in the table 10. show the mean and standard deviation values for each question on a Likert scale, indicating participants' opinions on various aspects of digital technology in their hotel experience. Questions presented in the survey were not directly on the Likert scale, but the Likert scale was used as a tool to measure levels of satisfaction. A Likert scale was used to measure guest satisfaction

and perceptions related to digital technology in high-category hotels across Serbia, with response options ranging from 1 = Strongly Disagree to 5 = Strongly Agree. The questions were designed to gather opinions about various aspects of digital technology in the hotel experience, and the Likert scale was employed to express how satisfied participants were with those aspects, ranging from 'completely dissatisfied' to 'completely satisfied.' So, while the scale allows for the rating of satisfaction levels, the questions themselves were not formulated on the scale.

For the question regarding how digital technology enhanced overall satisfaction, the mean score is 4.00, which indicates a generally positive response from most participants. The standard deviation of 1.08 suggests that while most responses were high, there was some variability, with a small number of respondents providing lower ratings.

Similarly, for mobile check-in/check-out services, the mean score of 4.00 indicates strong agreement with the statement that these services are convenient and time-saving. The standard deviation of 1.07 shows a slight spread in responses, though it still suggests general satisfaction.

The question about in-room smart technology received a mean score of 3.94, slightly lower than the previous two questions, which suggests that while respondents generally found the technology to improve their experience, opinions were more divided, as reflected in the standard deviation of 1.04.

Virtual concierge services had the highest mean score of 4.02, indicating that most respondents felt their needs were met by these services. The standard deviation of 1.05 further supports this, indicating that most responses were relatively close to the mean, though there was some variation.

Lastly, the question about preferring more digital solutions in future stays also scored a mean of 4.02, highlighting a strong desire for further digital innovations. The standard deviation of 1.04 shows consistent support for more digital services in future hotel stays.

The analysis of the survey responses reveals that guests generally express high satisfaction with the technological innovation provided by the hotel, with a mean score of 4.20 and a standard deviation of 0.87, indicating consistent positive feedback. Similarly, the question about the impact of digital innovation on guest loyalty has a slightly lower mean of 4.15 with a standard deviation of 0.89, suggesting that most guests agree digital innovation positively influences their loyalty, though responses show slightly more variability.

The responses suggest that digital technology, particularly in the form of mobile check-in/check-out services and virtual concierge services, is highly valued by guests. The slight variations in responses across the questions indicate that while most respondents are satisfied with current offers, there is still some divergence in individual preferences and experiences**.**

The following research questions aim to explore how guests perceive and interact with digital technology during their stays in high-category hotels in Serbia. By examining guest satisfaction, valued digital services, and demographic factors, these questions seek to identify which digital tools are most impactful and how they vary across different guest profiles. Specifically, the questions address levels of guest satisfaction, the importance of specific digital services, and how factors such as age, education, and employment status influence guest preferences and experiences. Through this investigation, insights will be gained into the role digital technology plays in enhancing the hotel experience and catering to diverse guest needs.

Table 11. outlines the research questions along with their corresponding findings, demonstrating the relationship between various aspects of digital technology and guest experiences in high-category hotels, and providing valuable insights into guest preferences and satisfaction levels.

Table 11. *Research Questions*

RQ1: To what extent do guests feel digital technology enhances their satisfaction during hotel stays in high-category hotels in Serbia?	A large majority, 78%, indicated that digital services positively influenced their hotel experience, highlighting the role of digital solutions as a driver of satisfaction.	***Positive Influence on Satisfaction****:* 78%
RQ2: Which digital services are most valued by guests in high-category hotels in Serbia?	Mobile check-in/check-out services were the most highly valued, with 50% of respondents ranking them as essential. In-room smart controls were preferred by 30%, and virtual concierge services were noted by 20%.	***Valued Services****:* - Mobile Check-in/Check-out: 50% - In-room Smart Controls: 30% - Virtual Concierge: 20%
RQ3: How does guest age influence perceptions of digital technology in enhancing hotel experiences?	Younger guests, particularly those aged 18-27 and 28-45, reported higher satisfaction ratings (4.5 and 4.3, respectively) compared to older guests (46+), who averaged below 3.8, indicating varying comfort levels with digital tools.	***Average Satisfaction Ratings by Age Group****:* - 18-27: 4.5 - 28–45: 4.3 - 46–64: 3.8 - 56+: <3.8
RQ4: What are the most frequently used digital services among hotel guests?	The analysis showed that mobile check-in/check-out services were most frequently used, followed by in-room smart controls and virtual concierge services, demonstrating a strong demand for technologies that enhance convenience.	***Frequency of Use****:* - Mobile Check-in/Check-out: 50% - In-room Smart Controls: 30% - Virtual Concierge: 20%
RQ5: Do guests with higher educational levels show a greater preference for using digital services during their stay?	Higher educational levels correlate with increased satisfaction, where respondents with advanced degrees (Master's: 4.5, Ph.D.: 4.6) reported greater comfort with digital technologies compared to those with lower educational levels.	***Average Satisfaction by Education Level****:* - High School: 3.6 - College: 4.0 - Faculty: 4.2 - Master: 4.5 - Ph.D.: 4.6
RQ6: Does employment status influence the perceived impact of digital technology on guest experience?	Employed guests (4.2) and entrepreneurs (4.3) showed higher satisfaction ratings than unemployed respondents (3.7), suggesting that professional exposure to technology influences positive perceptions of digital services.	***Average Satisfaction by Employment Status****:* - Unemployed: 3.7 - Employed: 4.2 - Entrepreneur: 4.3

Source: Author`s findings

This study addresses RQ1, which investigates the extent to which digital technology enhances guest satisfaction during hotel stays in high-category hotels in Serbia. Given the hospitality industry's increasing reliance on digital solutions, understanding guest perceptions is essential for assessing whether these innovations align with guest expectations. The survey gathered responses on satisfaction levels associated with digital tools such as mobile check-in, virtual concierge, and other in-room technologies. A large majority, 78% of respondents, indicated that digital services positively influenced their hotel experience. This figure highlights the role of digital solutions as a driver of satisfaction and points toward the potential need for hotels to further invest in technology that enhances the guest experience. This question seeks to measure the overall impact of digital technology on guest satisfaction within Serbian hotels. Given the hospitality industry's increasing reliance on digital solutions, understanding guest perceptions is essential for assessing whether these innovations align with guest expectations. The survey gathered responses on satisfaction levels associated with digital tools such as mobile check-in, virtual concierge, and other in-room technologies. A large majority, 78% of respondents, indicated that digital services positively influenced their hotel experience. This figure highlights the role of digital solutions as a driver of satisfaction and points toward the potential need for hotels to further invest in technology that enhances the guest experience.

In RQ2, the research explores which digital services are most valued by guests in high-category hotels in Serbia. Here, the research aims to identify specific digital tools and services that guests find most beneficial, which can guide future investment and development in the hospitality sector. Survey data showed that mobile check-in/check-out services were the most highly valued, with 50% of respondents ranking them as essential. In-room smart controls were also preferred by 30% of guests, reflecting a growing trend for personalized experiences. Meanwhile, virtual concierge services were noted by 20% of respondents, indicating an appreciation for on-demand information and assistance through digital channels. This data reinforces the importance of personalizing the digital offerings in high-category hotels, as it appears that convenience and control are key factors in guest satisfaction.

Addressing RQ3, this study examines how guest age influences perceptions of digital technology in enhancing hotel experiences. Age can significantly influence how individuals perceive and interact with technology. This question explores age-based differences in satisfaction with digital services to understand how high-category hotels might cater their offerings to various age groups. Respondents aged 18-27 and 28-45 gave higher satisfaction scores, with an average rating of 4.5 and 4.3, respectively, suggesting younger guests have a more favorable view of digital integration. Conversely, respondents aged 46+ gave lower scores, averaging 3.8 and below, indicating a less enthusiastic reception. This variation underscores the need for high-category hotels to consider diverse technology adoption rates and preferences across age demographics, possibly by offering both high-tech and low-tech service options to cater to varying comfort levels with digital tools.

For RQ4, the study investigates the most frequently used digital services among hotel guests. This question focuses on identifying which digital services are currently most utilized by guests, as usage patterns can indicate demand and practical functionality. Survey results showed that mobile check-in/check-out services were the most frequently used, followed by in-room smart controls and virtual concierge services. These findings demonstrate a strong demand for technologies that streamline logistical aspects of a hotel stay, emphasizing convenience and efficiency. Identifying these usage patterns allows hotel management to prioritize the development of these features, ensuring that

the most valued digital services remain available and continually optimized. To satisfy guest expectations and improve overall satisfaction, hotels might concentrate on optimizing these services.

In RQ5, the research explores whether guests with higher educational levels show a greater preference for using digital services during their stay. This question explores whether educational attainment influences the propensity to engage with digital services. Data reveals a trend where respondents with advanced degrees (Master's or Ph.D.) showed a higher preference and satisfaction with digital services, scoring an average satisfaction of 4.5 and 4.6, respectively. This finding could suggest that higher educational attainment correlates with a higher comfort level or familiarity with digital technologies, which, in turn, impacts satisfaction. Recognizing this trend may encourage hotels to enhance digital offerings, as educated guests appear to expect and appreciate sophisticated digital options during their stays. This group prioritizes convenience and innovation; therefore, hotels should think about improving their digital offerings to match their needs.

Finally, RQ6 investigates whether employment status influences the perceived impact of digital technology on guest experience. Employment status might affect guests' openness to digital experiences, particularly if their work experience involves technology. Data shows that employed guests and entrepreneurs tended to view digital services positively, with satisfaction ratings averaging 4.2 and 4.3. Unemployed respondents, however, had a lower average rating of 3.7. This variance suggests that those with professional exposure to technology or regular interaction with digital tools are more likely to appreciate and engage with digital services in a hotel setting. To ensure accessibility for everyone, hotels should think about creating user-friendly digital services that appeal to both tech-savvy professionals and visitors with less technological know-how.

Results and discussion

The results of this study provide significant insights into how digital technology enhances guest experiences in high-category hotels in Serbia. The findings indicate a strong overall satisfaction with digital services among respondents, with 78% of participants reporting that these technologies positively influenced their hotel experience. This high percentage suggests that hotels that invest in digital tools and services may be better positioned to meet guest expectations and enhance satisfaction levels.

When examining the most valued digital services, mobile check-in/check-out emerged as the leading preference, with 50% of respondents identifying it as essential. This trend underscores the importance of convenience in guest interactions with hotel services. In-room smart controls followed closely, highlighting a demand for personalized experiences that allow guests to tailor their stay according to individual preferences. Virtual concierge services, while noted by a smaller percentage (20%), still reflect a growing interest in on-demand assistance and information through digital channels. The implications of these findings suggest that high-category hotels should prioritize the development and implementation of these digital offerings to cater to guest preferences and enhance overall satisfaction.

Age played a critical role in shaping perceptions of digital technology among hotel guests. Younger guests, particularly those aged 18–27 and 28–45, reported higher satisfaction levels with digital services, averaging 4.5 and 4.3, respectively. In contrast, respondents aged 46 and older expressed lower satisfaction levels, with scores averaging below 3.8. This discrepancy indicates that hotels must be mindful of the varying comfort levels with technology across different age groups. By providing a blend of high-tech and traditional service options, hotels can effectively cater to the diverse preferences of their clientele.

The study also revealed trends regarding educational attainment and its influence on

engagement with digital services. Respondents with advanced degrees, such as Master's or Ph.D., demonstrated a higher preference for digital offerings, with satisfaction scores of 4.5 and 4.6, respectively. This finding suggests a correlation between educational levels and familiarity with technology, implying that hotels should enhance their digital offerings to align with the expectations of educated guests.

Employment status further affected perceptions of digital technology. Employed guests and entrepreneurs exhibited a more positive view of digital services, averaging satisfaction ratings of 4.2 and 4.3, while unemployed respondents reported lower satisfaction levels, averaging 3.7. This variance indicates that professional exposure to technology can enhance guest appreciation and engagement with digital services. Overall, the results highlight the significant role digital technology plays in shaping guest experiences in high-category hotels in Serbia. The findings encourage hotel management to not only invest in the development of digital services but also to tailor these offerings according to guest demographics and preferences. By doing so, hotels can enhance guest satisfaction and foster loyalty in an increasingly competitive hospitality market.

Conslusion

The research findings illuminate the critical role digital technology plays in enhancing guest satisfaction within high-category hotels in Serbia. As the hospitality industry continues to evolve in the digital age, understanding guest perceptions becomes increasingly vital for hotels seeking to maintain competitiveness and relevance. The data collected demonstrates that approximately 78% of respondents view digital services as positively impacting their overall hotel experience, signifying a substantial shift in guest expectations. This underscores the necessity for hotels to integrate technological solutions that not only facilitate convenience but also enrich the overall experience. The significant preference expressed for mobile check-in/check-out services indicates a growing demand for efficiency and ease of access in hotel operations. In a world where time is of the essence, guests increasingly appreciate services that minimize wait times and streamline their arrival and departure processes. The popularity of in-room smart controls and virtual concierge services further emphasizes the trend toward personalized experiences, allowing guests to tailor their stay to their individual preferences. This shift towards personalized service can enhance guest loyalty and encourage repeat business, as guests are more likely to return to establishments that cater to their specific needs.

Analyzing guest demographics reveals essential insights regarding age, education, and employment status. Younger guests, particularly those aged 18 to 45, demonstrate a higher satisfaction rating for digital services, averaging scores of 4.5 and 4.3, respectively. This pattern not only indicates their comfort with technology but also suggests that they are more likely to embrace innovations that enhance their experience. Conversely, older guests (aged 46 and above) reported lower satisfaction levels, averaging below 3.8, highlighting the need for hotels to offer a balanced approach that accommodates both tech-savvy guests and those who may prefer traditional service models. Moreover, the correlation between educational attainment and satisfaction with digital services presents a critical avenue for hotels to explore. Respondents holding advanced degrees reported higher satisfaction ratings, indicating that educational background may influence how guests perceive and utilize digital technology. This connection could suggest that higher educational attainment is associated with increased familiarity and comfort with digital platforms, leading to enhanced guest satisfaction. Consequently, hotels might consider developing tailored marketing strategies that address the preferences of various educational backgrounds, ensuring that all guests feel valued and understood.

Employment status also plays a significant role in shaping perceptions of digital services. Data shows that employed guests and entrepreneurs tend to view these services more favorably, while unemployed respondents reported lower satisfaction levels. This variance indicates that individuals with regular interaction with technology in their professional lives are likely to appreciate the advantages that digital tools bring to their hotel experience. Thus, hotels should consider the professional backgrounds of their guests when designing and implementing digital services, potentially offering additional training or support for those who may not be as familiar with the technology.

This study illustrates that digital technology is a pivotal factor in enhancing guest experiences within the hospitality sector. The evidence gathered highlights the need for hoteliers to embrace technological advancements while remaining sensitive to the diverse preferences of their clientele. By strategically leveraging technology to enhance guest experiences, hotels can foster customer satisfaction, loyalty, and ultimately, sustained success in a competitive market. As the hospitality industry continues to adapt to technological advancements, ongoing research will be essential in ensuring that hotels meet the evolving needs and preferences of their guests, securing their position as leaders in a fast-paced environment. The insights gained from this study provide a foundation for further exploration into the transformative impact of digital technology in hospitality, paving the way for future innovations that enhance the guest experience.

While the findings provide valuable insights into the relationship between digital technology and guest satisfaction, it is crucial to recognize the limitations of this study. The relatively short research period and the limited sample size may constrain the generalizability of the results. Future research endeavors should aim for a more extensive participant pool and a longer data collection period to gain a more nuanced understanding of the dynamics at play. Engaging with a broader demographic spectrum can reveal deeper insights into varying preferences and expectations, allowing hotels to refine their offerings further.

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